Part C

School Subjects





*The first chapter of this part is about the **Foundational Stage** (up to Grade 2) — drawing the links of this NCF to the NCF-FS. The next eight chapters cover the subjects to be taught in schools from Grades 3 to 10, across all Curricular Areas, namely, **Languages, Mathematics** and **Computational Thinking, Science, Social Science, Art Education, Interdisciplinary Areas, Physical Education** and **Well-being, and Vocational Education.***

Each subject chapter is organised with the details of its aims, nature, principles of the approach, and most crucially, the Learning Standards with Curricular Goals and Stage-wise Competencies to be achieved. Stage-wise pedagogical and assessment strategies have also been highlighted.

The last chapter of this part is about the second phase of the Secondary Stage — which outlines the design and curricular approach in Grades 11 and 12.

Chapter 1

Learning in the Foundational Stage

The Foundational Stage envisions an integrated approach to Early Childhood Care and Education for children between ages 3-8. This is the first Stage in the 5+3+3+4 curricular and pedagogical restructuring of school education as envisioned in NEP 2020. Children start schooling in this Stage.

This chapter summarises the characteristics and importance of this Curricular Stage, and the Learning Standards, suggested content, pedagogy, and assessment for this Stage. **The National Curriculum Framework for the Foundational Stage (NCF-FS) deals with all these in detail. For a better understanding of the curriculum for this stage, readers should refer to that.**



Section 1.1
Introduction

1.1.1 Early Childhood

The first eight years of a child's life are truly critical and lay the foundation for lifelong well-being and overall growth and development across all dimensions — physical, cognitive, and socio-emotional.

The pace of brain development in the first eight years is more rapid than at any other stage of a person's life. Research from neuroscience informs us that over 85% of an individual's brain development occurs by the age of 6, indicating the critical importance of appropriate care and stimulation in a child's early years to promote sustained and healthy brain development and growth.

The most current research also demonstrates that children under the age of 8 tend not to follow linear, age-based educational trajectories. It is only at about the age of 8 that children begin to converge in their learning trajectories. Even after the age of 8, the non-linearity and varied pace continues to be inherent characteristics of learning and development; however, up to the age of 8, the differences are so varied that it is effective to view the age of 8, on average, as a transition point from one stage of learning to another. In particular, it is only at about the age of 8 that children begin to adapt to more structured learning.

Early Childhood Care and Education (ECCE) is generally defined as the care and education of children during this period, from birth to eight years.

1.1.2 ECCE Primarily at Home: Ages 0-3

Up to 3 years of age, the environment in which most children grow up is in the home with families, while some children do go to creches. Up to age 3, the home environment is (and should remain) almost the sole provider of everything that constitutes and forms the basis for ECCE.

This includes not only health, safety, and nutrition, but also cognitive and emotional care and stimulation of the infant through talking, playing, moving, listening to music and sounds, and stimulating all the other senses, particularly sight and touch so that at the end of three years, optimal developmental outcomes are attained in various development domains, including physical and motor, socio-emotional, cognitive, communication, and emergent literacy and numeracy. It must be noted that these domains are overlapping and indeed deeply interdependent.

The guidelines and/or suggested practices to enable high-quality ECCE at home for ages 0-3 would be developed and disseminated by the Ministry of Women and Child Development (MWCD).

1.1.3 ECCE in Institutional Settings: Ages 3-8

After the age of 3, a large proportion of children spend significant time in institutional settings. Hence, during the ages of 3 to 8, appropriate and high-quality ECCE provided in institutional environments must be available to all children.

From ages 3-8, ECCE includes continued attention to health, safety, care, and nutrition, but also, crucially, self-help skills, motor skills, hygiene, the handling of separation anxiety, physical development through movement and exercise, expressing and communicating thoughts and feelings to parents and others, being comfortable around one's peers, sitting for long periods of time in order to work on and complete a task, ethical development, and forming all-round good habits.

It is important during this age range to nurture and develop the child's innate abilities and capacities of curiosity, creativity, critical thinking, cooperation, teamwork, social interaction, empathy, compassion, inclusiveness, communication, cultural appreciation, playfulness, and awareness of the immediate environment, as well as the ability to interact with Teachers, fellow students, and others successfully and respectfully.

ECCE during these years also entails the development of early literacy and numeracy, including learning about the alphabet, languages, numbers, counting, colours, shapes, drawing/painting, indoor and outdoor play, puzzles and logical thinking, art, craft, music, and movement. This becomes particularly important during the ages 6-8, forming the basis for the achievement of Foundational Literacy and Numeracy (FLN). The importance of FLN to overall education is well-understood and fully emphasised in NEP 2020.

Section 1.2
Foundational Stage

1.2.1 Aims

Considering all the above, NEP 2020 has articulated the Foundational Stage as a single curricular and pedagogical phase which comprises five years of flexible, multilevel, play and activity-based learning for children between ages 3-8 years.

Due to the critical importance of the Foundational Stage for the development of an individual, and for the long-term benefit to society as a whole, NEP 2020 articulates a clear goal — that every child in the age range of 3-8 years must have access to free, safe, high quality, developmentally-appropriate ECCE by the year 2025.

Regardless of the circumstances of birth or background, quality ECCE enables children to participate and flourish in the educational system throughout their lives. ECCE is thus perhaps one of the greatest and most powerful equalisers. High-quality ECCE in the Foundational Stage gives the best chance for all children to grow into good, ethical, thoughtful, creative, empathetic, and productive human beings.

NEP 2020 specifically calls for the attainment, by all children of optional outcomes in the domains of physical and motor development, cognitive development, socio-emotional-ethical development, cultural/artistic development, and development of communication and early language, and literacy and numeracy.

1.2.2 Current State, Challenges

In India, where ECCE in available in institutional settings for ages 3-8, it is typically carried out as follows:

3-6 years: Early childhood education programmes in *Anganwadis, Balvatikas*, or preschools

6-8 years: Early primary education programmes in school (Grades 1 and 2)

ECCE has evolved significantly over the past several decades. While early childhood has always had a special cultural and social place in India, it has gained greater focus in education systems and policies over the years. The Integrated Child Development Scheme (ICDS) launched in 1975, the 1986 National Education Policy, the National Early Childhood Care and Education Policy in 2013, National Early Childhood Care and Education Curriculum Framework in 2014 have all been significant milestones. In 2019, the NCERT developed a Preschool Curriculum for three years of preschool education along with Guidelines for Preschool Education.

Despite the progress and the great potential, challenges exist:

a. Many children directly enrol or enter Grade 1 with limited experience due to a lack of suitable preschool options, especially among disadvantaged groups.

b. Due to deficiencies in supplies, infrastructure, and trained Teachers in ECCE, *Anganwadis* generally focus less on the educational aspects of ECCE.

c. Low enrolment and attendance remain significant challenges, even with the implementation of the ICDS scheme.

d. Out of the total number of sanctioned posts in *Anganwadis*, 5% are vacant, and for the posts for *Anganwadis* helpers, 7% are vacant.

e. The private preschool sector remains largely unregulated despite the National ECCE Policy (2013). In the private sector, some preschools have better infrastructure and learning resources but often prioritise formal teaching and rote memorisation, with high Pupil-Teacher Ratios and limited play-based and activity-based learning.

f. The number of teacher education institutions offering programmes preparing Teachers for preschool is extremely low, with the North-Eastern States having none.

g. While India has made progress in key nutritional indicators for children, significant challenges persist, including high rates of chronic under-nutrition, acute under-nutrition, and underweight children under the age of five, which impacts their holistic development in the short and long term.

h. Moreover, there has been inadequate focus on the achievement of educational outcomes in ECCE institutions, which tends to cumulate through later school years.

i. Most children lack readiness Competencies when they join school. The challenges during ages 6-8 — pedagogical, curricular, systemic, and more — are the key roots of India's educational challenges.

Section 1.3
Learning Standards

There has been a long tradition of inquiry both in India and in other cultures on the various domains of development that have been observed in young children that are both natural and desirable. The *Panchakosha* concept in the *Taittiriya Upanishad* is one of the earliest articulations of the different domains of development of the human being. These descriptions remain relevant along with the more modern understanding that has emerged through Developmental Biology, Psychology, and Cognitive Neurosciences.

Physical Development or *annamaya kosha* and *pranamaya kosha* understood together, includes bodily awareness and embodied learning through active engagement of all sensorial perceptions.

Emotional and spiritual development or the *manomaya kosha* involves becoming aware of and skilfully regulating our emotions. The domain of **Socio-emotional and Ethical Development** thus emerges as an important domain of development both from the Indian traditions and current research.

The development of the intellect, or *vijnanamaya kosha*, is emphasised to engage meaningfully with the cognitive and conscious aspects of human experience. The domain of **Cognitive Development** captures this aspect of development.

Anandamaya kosha, or experience of transcendence, is best addressed for this age group through Art and culture. Thus, including the domain of **Aesthetic and Cultural Development,** makes the educational experience holistic and complete.

NEP 2020 has emphasised on Foundational Literacy and Numeracy as an 'urgent and necessary prerequisite to learning.' This emphasis has been realised by giving special attention to Foundational Literacy through the domain of **Language and Literacy Development** and Foundational Numeracy through the domain of Cognitive Development.

Finally, the Foundational Stage is also seen as setting the foundations for formal schooling. The development of **Positive Learning Habits** that are more appropriate for a formal school environment becomes another important Curricular Goal for this Stage.

Thus, the Curricular Goals for the Foundational Stage have been derived by giving equal consideration to the vision and details of NEP 2020, and the domains of development.

Section 1.4
Curricular Goals and Competencies

The Curricular Goals for the Foundational stage and the Competencies against each of the Curricular Goals have been outlined in this Section. Curricular Goals been numbered as CG 1, CG 2 and so on; Competencies have been numbered as C-1.1, C-1.2 and so on.

Domain: Physical Development

Table 1.4i

CG-1 Develops habits that keep them healthy and safe	C-1.1	Shows a liking for and understanding of nutritious food and does not waste food
	C-1.2	Practises basic self-care and hygiene
	C-1.3	Keeps school/classroom hygienic and organised
	C-1.4	Practises safe use of material and simple tools
	C-1.5	Shows awareness of safety in movements (e.g., walking, running, cycling) and acts appropriately
	C-1.6	Understands unsafe situations and asks for help
CG-2 Develops sharpness in sensorial perceptions	C-2.1	Differentiates between shapes, colours, and their shades
	C-2.2	Develops visual memory for symbols and representations
	C-2.3	Differentiates sounds and sound patterns by their pitch, volume, and tempo
	C-2.4	Differentiates multiple smells and tastes
	C-2.5	Develops discrimination in the sense of touch
	C-2.6	Begins integrating sensorial perceptions to get a holistic awareness of their experiences
CG-3 Develops a fit and flexible body	C-3.1	Shows coordination between sensorial perceptions and body movements in various activities
	C-3.2	Shows balance, coordination, and flexibility in various physical activities
	C-3.3	Shows precision and control in working with hands and fingers
	C-3.4	Shows strength and endurance in carrying, walking, and running

Domain: Socio-Emotional and Ethical Development

Table 1.4ii

CG-4 Develops emotional intelligence, i.e., the ability to understand and manage their own emotions, and responds positively to social norms	C-4.1	Starts recognising 'self' as an individual belonging to a family and community
	C-4.2	Recognises different emotions and makes deliberate efforts to regulate them appropriately
	C-4.3	Interacts comfortably with other children and adults
	C-4.4	Shows cooperative behaviour with other children
	C-4.5	Understands and responds positively to social norms in the classroom and school
	C-4.6	Shows kindness and helpfulness to others (including animals, plants) when they are in need
	C-4.7	Understands and responds positively to different thoughts, preferences, and emotional needs of other children
CG-5 Develops a positive attitude towards productive work and service or *'Seva'*	C-5.1	Engages in age-appropriate work at school and/or at home
CG-6 Develops a positive regard for the natural environment around them	C-6.1	Shows care for and joy in engaging with all life forms

Domain: Cognitive Development

Table 1.4iii

CG-7 Makes sense of the world around through observation and logical thinking	C-7.1	Observes and understands different categories of objects and the relationships between them
	C-7.2	Observes and understands cause and effect relationships in nature by forming simple hypotheses and uses observations to explain their hypotheses
	C-7.3	Uses appropriate tools and technology in daily life situations and for learning

CG-8 Develops mathematical understanding and abilities to recognise the world through quantities, shapes, and measures	C-8.1	Sorts objects into groups and sub-groups based on more than one property
	C-8.2	Identifies and extends simple patterns in their surroundings, shapes, and numbers
	C-8.3	Counts up to 99 both forwards and backwards, and in groups of 5s, 10s, and 20s
	C-8.4	Arranges numbers up to 99 in ascending and descending order
	C-8.5	Recognises and uses numerals to represent quantities up to 99 with the understanding of decimal place value system
	C-8.6	Performs addition and subtraction of 2-digit numbers fluently using flexible strategies of composition and decomposition of both numerical and word problems
	C-8.7	Recognises multiplication as repeated addition and division as equal sharing
	C-8.8	Recognises, makes, and classifies basic geometric shapes and their observable properties, and understands and explains the relative relation of objects in space
	C-8.9	Selects appropriate tools and units to perform simple measurements of length, weight, and volume of objects in their immediate environment
	C-8.10	Performs simple measurements of time in minutes, hours, day, weeks, and months
	C-8.11	Performs simple transactions using money up to INR 100
	C-8.12	Develops adequate and appropriate vocabulary for comprehending and expressing concepts and procedures related to quantities, shapes, space, and measurements
	C-8.13	Formulates and solves simple mathematical problems related to quantities, shapes, space, and measurements
	C-8.14	Feels confident and sees Mathematics as doable and worthwhile

Domain: Language and Literacy Development

Table 1.4iv

CG-9 Develops effective communication skills for day-to-day interactions in two languages[1]	C-9.1	Listens to and appreciates simple songs, rhymes, and poems
	C-9.2	Creates simple songs and poems on their own
	C-9.3	Converses fluently and can hold a meaningful conversation
	C-9.4	Understands oral instructions for a complex task and gives clear oral instructions for the same to others
	C-9.5	Comprehends narrated/read-out stories and identifies characters, storyline, and what the author wants to say
	C-9.6	Narrates short stories with clear plot and characters
	C-9.7	Knows and uses enough words to carry out day-to-day interactions effectively and can guess the meaning of new words by using existing vocabulary

[1] This should be the goal for most classrooms given the need for multilingualism, but in circumstances where Language 2 is very unfamiliar to the children, many of the Competencies (from C-9.1 to C-9.7) can be in the emergent stage for Language 2 by the end of the Foundational Stage and consolidated in the early Preparatory Stage.

CG-10 Develops fluency in reading and writing in Language 1	C-10.1 Develops phonological awareness and blends phonemes/syllables into words and segments words into phonemes/syllables C-10.2 Understands the basic structure/format of a book, idea of words in print and direction in which they are printed, and recognises basic punctuation marks C-10.3 Recognises all the letters of the alphabet (forms of akshara) of the script and uses this knowledge to read and write words C-10.4 Reads stories and passages with accuracy and fluency with appropriate pauses and voice modulation C-10.5 Reads short stories and comprehends their meaning - by identifying characters, storyline and what the author wants to say - on their own C-10.6 Reads short poems and begins to appreciate the poem for its choice of words and imagination C-10.7 Reads and comprehends the meaning of short news items, instructions and recipes, and publicity material C-10.8 Writes a paragraph to express their understanding and experiences C-10.9 Shows interest in picking up and reading a variety of children's books
CG-11 Begins to read and write in Language 2	C-11.1 Develops phonological awareness and is able to blend phonemes/ syllables into words and segment words into phonemes/syllables C-11.2 Recognises most frequently occurring letters of the alphabet (forms of akshara) of the script and uses this knowledge to read and write simple words and sentences

Domain: Aesthetic and Cultural Development

Table 1.4v

CG-12 Develops abilities and sensibilities in Visual and Performing Arts and expresses their emotions through art in meaningful and joyful ways	C-12.1 Explores and plays with a variety of materials and tools to create two-dimensional and three-dimensional artworks in varying sizes C-12.2 Explores and plays with own voice, body, spaces, and a variety of objects to create Music, role-play, Dance, and Movement C-12.3 Innovates and works imaginatively to express a range of ideas and emotions through the Arts C-12.4 Works collaboratively in the Arts C-12.5 Communicates and appreciates a variety of responses while creating and experiencing different forms of art, local culture, and heritage

Positive Learning Habits

Table 1.4vi

CG-13 Develops habits of learning that allows them to engage actively in formal learning environments such as a school classroom	C-13.1 Attention and intentional action: Acquire skills to plan, focus attention, and direct activities to achieve specific goals C-13.2 Memory and mental flexibility: Develop adequate working memory, mental flexibility (to sustain or shift attention appropriately), and self-control (to resist impulsive actions or responses) that would assist them in learning in structured environments C-13.3 Observation, wonder, curiosity, and exploration: Observes minute details of objects, wonders, and explores using various senses, tinkers with objects, asks questions C-13.4 Classroom norms: Adopts and follows norms with agency and understanding

Section 1.5
Pedagogy

Children are natural learners. They are active, eager to learn, and respond with interest to new things. They have an innate sense of curiosity — they wonder, question, explore, try out, and discover to make sense of the world. By acting on their curiosity, they continue to discover and learn more.

Children learn best through play — through activity and doing. They like to run, jump, crawl, and balance, they enjoy repetition, respond spontaneously to rhythm, talk, ask, reason, and answer questions posed to them. They learn through first—hand experiences involving manipulation, exploration, and experimentation.

Engaging with materials, ideas, thoughts, and feelings during play helps in developing children's creativity, flexible thinking, and problem-solving abilities, and enhances their concentration, attention, and perseverance. Children also improve their thinking, vocabulary, imagination, speaking, and listening skills through play, whether they are reconstructing real situations or creating imaginary worlds.

Learning at this Stage is, therefore, an active and interactive process in which children learn through play and through interaction with other children and more experienced others. Children are actively engaged in their social and cultural experiences, and they constantly adjust and use new information to make sense of their perceptions and their experiences.

Children's playfulness can be nurtured and strengthened through experiences of active participation with others, and with natural, real-world materials that provoke and enhance learning, imagination, creativity, innovation, and problem-solving in diverse and unique ways.

It is vital that the learning of children at this Stage be anchored by nurturing relationships with those around them. These relationships help children feel safe, and become more optimistic, curious, and communicative.

1.5.1 Building a Positive Relationship between Teachers and Children

When we walk into our classrooms, we see wide-eyed children who are bright, quick to observe, and interested in everything around them. They constantly ask questions. Sometimes they can quietly observe something for a long time. At other times, they lose interest in a matter of minutes. Sometimes they need to jump and move around. At other times, they enjoy a quiet story. Sometimes they cry and clamour to go home. At the same time, they like to be comforted and cajoled, and are willing to be convinced to stay back! They can be curious and considerate, delightful, and determined, affectionate, and adventurous, funny, and fearless.

At this Stage, for many children, it could also be their first experience of spending several hours away from their homes. Children require tenderness, nurturing and love. Working with them, being with them, caring for them means enjoying all the different personalities that they have. Teachers need to be warm and genuine, patient and calm, understanding and empathetic. We need to give our children unhurried time and attention.

Children must feel that they belong, that they can trust, and they are free to try out and explore and, therefore, learn better.

It is our job as Teachers to ensure that children settle and enjoy their time at school. A safe, positive relationship between Teacher and child is enriching for emotional and cognitive development. To build such a relationship, Teachers should get to know each child individually, listen to them, observe them, encourage their intuitional responses, recognise, and respond to their moods, and visit their homes regularly.

1.5.2 Learning through Play

Play is a child's work. Play, by its very nature, is something young children like to do and actively engage in. We can say that play and learning are two-way reciprocal processes. Play enables learning by allowing children to remain active, engaged, and involved in social interaction with other adults and children, thus meeting all the necessary conditions for learning to occur.

In this active playing process, children are learning — to make sense of the world, solve problems, about themselves, others, Language and Mathematics. Choice, wonder, and joy are key aspects of children's play, and our classrooms would do well to be organised around these three aspects. The play unfolds in the classroom when Teachers use conversations, stories, toys, music, movement, art, craft, and games. All these can be free, guided, or structured.

1.5.2.1 Conversations

Language is the medium through which children talk to themselves and to others, and it is with words that they begin to construct and get a grip on their reality. The ability to understand and use language clearly and cogently is essential for learning.

Conversations are very important for children's ability to connect with people and things around them. Continuous conversations with children in the classroom help build relationships of trust.

Teachers can engage with children through **free conversations** where children can sit with the teachers and discuss any interesting things that have occurred throughout the day, on their way to school or anything they wish to share. In **structured conversations,** the teacher can plan and organise a session in the morning hour where they talk and think through a topic together. Topics are often about children's daily life events and happenings, and their feelings.

1.5.2.2 Storytelling

Stories are a particularly good medium for learning about social relationships, ethical choices, understanding and experiencing emotions, and becoming aware of life skills. While listening to stories, children learn new words, thus expanding their vocabulary, and learn sentence structure and problem-solving skills. Children with very short attention spans concentrate for a longer time when engrossed in a story. Through culturally contextual stories, we can acquaint children with their culture and social norms and create awareness about their surroundings.

Teachers can use picture books, story books with or without pictures, or story books in multiple languages. Flash cards that have story scenes drawn or printed on them can also be used to tell stories.

Besides listening to stories, children must also have the opportunity to tell stories. Stories told by children can be the same ones they have heard or something they have created. The Teacher can begin to tell a story and ask the children to complete it.

1.5.2.3 Toy-Based Learning

Young children learn from first-hand experiences and working with actual objects. They try out and explore and learn. The classroom environment should cultivate this spirit of exploration through play with toys and manipulatives.

Many local toys are available in every child's surroundings. These should be used as important resources for teaching and learning. Whether a toy is simple or complex, it has a lesson for the child to learn. When a child holds a toy and manipulates it, she is practicing her motor skills and strengthening her hand-eye coordination.

When a child builds a tower with blocks and eventually watches it fall to the ground, she learns concepts and thinks about a solution to stop this fall. A puzzle helps a child explore patterns. When children use blocks, dolls, animal toys, balls, mini-cars, or pretend toys, they start creating stories and living out scenarios in their minds. Board games teach children to follow simple rules and enhance their understanding of Language and Mathematics.

Toys can also be made from readily available items such as fabric, bottles, cardboard boxes, yarn, cooking pans, bangles, pipe cleaners, and pinecones.

NCERT's handbook on Toy-Based Pedagogy is an excellent guide for this.

1.5.2.4 Songs and Rhymes

Children love singing songs and rhymes and dancing to music. Songs are also a wonderful means of learning language. Children understand different concepts through songs and their vocabulary also expands. Physical movements accompanying the songs enhance gross and fine motor movements, and body movements and gestures help children understand concepts. Songs promote interaction among children and lead to cooperation.

Local context-specific songs and rhymes are another good way to increase vocabulary, imagination, and expression. Songs in different languages provide children with the ability to infer and make connections between common and different words in a language. Most of us in India are multilingual, and it is important that the songs and rhymes promote children's ability to remain multilingual.

The Teacher could select a few rhymes or songs in two or three local languages, practise them and sing with children. Grandparents, parents, and community members can be wonderful resources for this.

1.5.2.5 Music and Movement

Music is joy. Music is also a strong stimulant for brain development and the formation of synaptic connections. So, following the rhythm, playing simple musical instruments, and singing should be encouraged. Body movements can accompany claps or rhythm played on a tin box or a *khanjira* (tambourine) or *manjira* (cymbals).

Music and movement activities can also be done in different ways. Children could quietly listen to instrumental music or dance freely to rhythm or make body movements accompanied by rhythm. A range of instruments, which are either local, homemade, or purchased, should be made available to children for first-hand experiences in sound exploration and music-making.

Teachers could include a variety of music, dances, sound sources, rhymes, chants, and songs with different moods, contexts, and languages for children to listen to and perform in the classroom.

Dancing, singing, rhymes, folk songs, action songs, and finger plays provide opportunities for children to learn musical concepts.

1.5.2.6 Art and Craft

Children enjoy playing with colours and creating something that is of interest to them. Art and craft provide another medium for children to express their ideas, emotions, and feelings.

Teachers can encourage children to draw using paper and crayons, sketch pens, coloured or black pencils, or charcoal. Children can also draw on slates, blackboards, or floors; every corner of the classroom can be utilised. Similarly, painting, pasting, and clay moulding are great ways to engage children. All these should be open-ended, with minimal direction from the Teacher. Notions of 'right' and 'wrong', 'good' and 'bad' in terms of artistic expression must be avoided. Instead, different viewpoints, experiences, expressions, and imaginations should be encouraged and celebrated. Within each Art discipline too, children need to be encouraged to discover their own methods and techniques of using instruments and materials, in addition to conventionally accepted methods. Children not only need to observe their surroundings visually, but also

become keen observers of their own thoughts, feelings, emotions, expressions, actions, and overall behaviour. The Teacher should ensure that the Art classroom is always an inclusive environment.

1.5.2.7 Indoor Games

Just as exercising the body is important to keep it fit and healthy, so too is exercising the mind. Games of strategy, logic and word puzzles, and recreational Mathematics are the best way to excite children about Mathematics and to develop the logical skills that are so critical throughout their school years and indeed throughout life.

Jigsaw puzzles, playing with blocks, and solving mazes help to develop a child's spatial reasoning. Different games of strategy (e.g., tic-tac-toe, and leading up to deeper games such as chess) develop strategic thinking and problem-solving skills.

Playing games (e.g., *Chaupad,* Snakes and Ladders*, Ludo*) is fun — it also teaches counting, strategy, collaboration, healthy competition, and bonding with peers. Word and logic puzzles are another fun way to teach deductive reasoning. Simple puzzles such as those in the box above help develop children's skills of logical and creative thinking in an enjoyable manner. The puzzles can get more challenging, and incorporate arithmetic and other elements, as children get older. Arithmetic puzzles and games can help develop a comfort with numbers and develop quantitative reasoning.

Making learning enjoyable through fun exercises, games, and puzzles can be a key aspect in ensuring that children stay engaged and, at the same time, develop mental capacity and creativity.

1.5.2.8 Outdoor Games

Children in their early years cannot sit in one place for a long period of time — they need to move around. Playing outside gives them a chance to explore the natural environment, test their physical limits, express themselves, and build self-confidence. Most importantly, it helps to build gross motor skills, physical fitness, and balance.

Children enjoy the space, the freedom to run and jump, to climb, kick and fall. Playing outside also helps many children relax and calm down.

1.5.2.9 Spending Time in Nature

Children are naturally curious and need opportunities to explore, experiment, manipulate, create, and learn about the world around them. Children start exploring their environment through their senses by scanning their environment, touching, holding, and handling whatever they see, listening to and responding to sounds, music, and rhythm, and getting excited by unusual noises.

Children's thinking evolves as they construct an understanding of people, objects, and real-life situations through first-hand experiences. Children bring their own ideas, interests, and beliefs based on their own experiences and contexts as well as their own abilities.

Teachers and families must provide opportunities to children to explore the world around them, experiment and discover, compare, ask questions, make close observations, think, and talk about their observations and predictions. Through this process, they are helped to satisfy their curiosities and make more discoveries. Sustaining children's natural curiosity to explore the world through first-hand experiences at home and in school lays the foundation for learning.

Spending time with plants and trees and birds and animals or just being quiet around nature can develop the basis for Lifestyle for Environment (LiFE).

1.5.2.10 Field Trips

Small, local field trips as part of the learning process reinforce the knowledge the children have gained in the classroom and push them to ask more questions and build further connections with things that they already know. Children also learn to manage themselves and to be with others through these experiences.

The local vegetable market, doctor's clinic, bus depot, post office, and police station could all introduce children to an unfamiliar but interesting world, teaching them many new things.

1.5.3 Strategies for Literacy and Numeracy

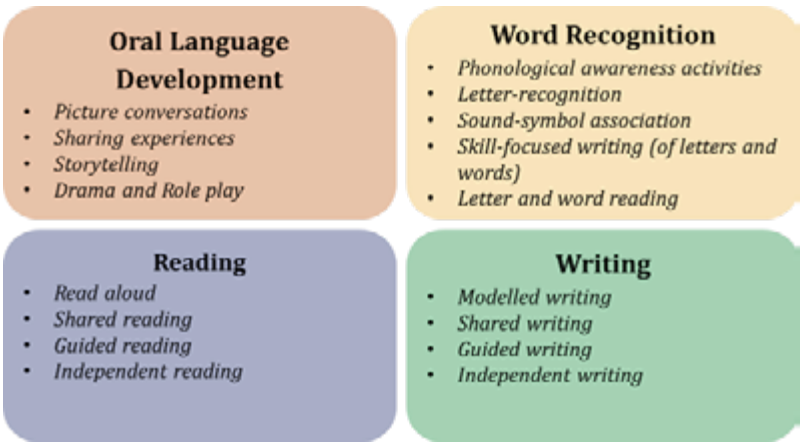
A significant component of structured learning should be added for literacy and numeracy, especially for Grades 1 and 2. It is important to ensure that the curriculum for children of ages 3-6 onwards must be planned in a way that builds on children's capacities of that particular age and leads to formal learning instead of a downward extension of the curriculum from Grade 1.

i. Classroom Strategies for Literacy

The teaching of language and literacy should provide children with ample opportunities to explore themselves as readers and writers, along with providing a balance of learning 'lower-order' skills (e.g., phonological awareness, decoding, writing letters and words correctly) and 'higher-order' skills (e.g., oral language development, engaging with books, drawing, and original writing) which are meaning-focussed.

There are four major components in language and literacy instruction — oral language, word recognition, reading, and writing. While activities for the four blocks may be implemented in an integrated manner, it is important that children spend time working on each of the blocks on a regular basis.

Figure 1.5i



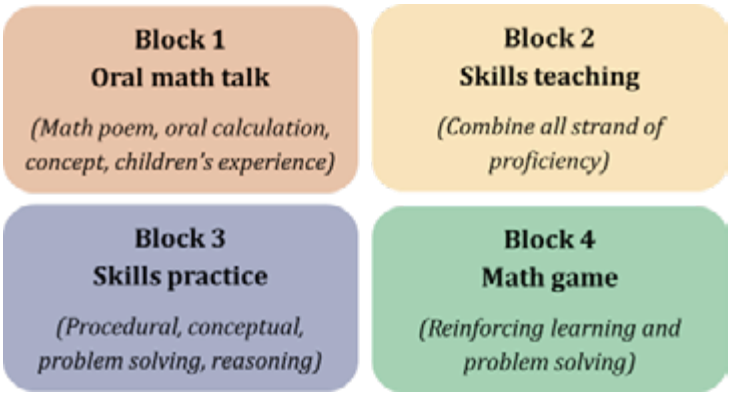
ii. Classroom Strategies for Numeracy

Learning goals for Mathematics can be categorised into higher goals such as mathematisation of a child's thought processes (e.g., ability to handle abstract thinking, problem-solving, visualisation, representation, reasoning, and making connections of Mathematics concepts with other domains) and content-specific goals (those related to different concepts in Mathematics (e.g., understanding numbers, shapes, patterns).

To become mathematically proficient, children need to build conceptual understanding, procedural understanding, strategies competence/application, communication and reasoning, and a positive attitude towards Mathematics.

All these strands of mathematical proficiency can be designed in the following four blocks for the daily classroom process.

Figure 1.5ii



1.5.4 Creating a Positive Classroom Environment

As children enter school, their worlds expand, they make friends, begin connecting with adults beyond the family, and become more and more mobile and verbal. They want to explore and learn about everything. The role of the Teacher is very important in guiding children in their behaviour and in forming strong positive relationships.

Teachers, therefore, must be thoughtful and responsive to the needs of children. Caring for children is complex and important work. It is complex because there are many parts involved in establishing relationships with children and their families.

1.5.4.1 Classroom Environment and Norms

A safe, secure, comfortable, and happy classroom environment can help children learn better. It is important that the necessary facilities such as learning materials, equipment, and space for doing activities, working together, and playing, to help each child learn better, are available. Care is central to the classroom environment at the Foundational Stage — an attitude of concern and responsibility for children and relationships. The classroom must be an inclusive, enabling learning environment that provides every child freedom, openness, acceptance, meaningfulness, belonging and challenge.

Introducing children, gently but clearly, to agreed norms of being in a classroom together should be done as early as possible. This gives them both clear direction and a way to settle well in class. It is best to have conversations with children and agree on norms with them. This leads to an enhanced sense of ownership and responsibility while helping nurture and build a positive classroom culture. Norms should be short, clear, and easy to understand with positive phrasing.

1.5.4.2 Managing Difficult Behaviour

Teachers will also have to learn to manage difficult behaviours as behaviour is often the unspoken language through which children act out feelings and thoughts. It is also often because they are unaware of behaviour norms or alternative ways of behaving.

Teachers should help children settle and guide their behaviour positively. Positive guidance is crucial because they promote children's self-control, teach children responsibility, and help children make thoughtful choices. Caring and respectful adults create a supportive atmosphere to help young children explore alternative behaviours, develop social skills, and learn to solve problems. This is called a positive approach to guidance. An effective guidance approach is interactive. Adults and children both learn to change as they interact with one another towards a common goal.

Understanding the development of a child will help us set appropriate standards of behaviour/ expectations from children, think of appropriate alternatives, as well as age-appropriate explanations or ways to explain to the child.

Actions that insult or belittle are likely to cause children to view their Teachers, parents, and other caregivers negatively, which can inhibit learning and can teach the child to be unkind to others. However, actions that acknowledge the child's efforts and progress, no matter how slow or small, are likely to encourage healthy development.

1.5.4.3 Discipline

Discipline is a part of the guidance strategies adults use to help children become responsible for their actions, learn self-control, and behave appropriately. Discipline does not mean punishing and preventing behaviours.

One of the major goals of a good guidance process is to help children achieve self-discipline. This happens only if adults lead in ways that support children's developing ability to control themselves. By gradually handing over to children, the opportunity to govern their actions, adults communicate trust.

1.5.4.4 Language Used by Teacher

As Teachers gain experience in handling problem behaviours, they learn to use the right kind of language. Teachers discover how potent the voice can be and what words will work best and when. They become aware of facial expressions and what a touch or a look will convey to children.

How they use their body reflects a distinct attitude and approach to discipline. Through experience, new Teachers learn how to use these tools in ways that will work best for them and the children. Teachers should talk to children in the same way they talk to other people. Learn to control the volume of their voice and use good speech patterns for children to imitate. To be heard, get close enough to speak in a normal tone; get down to the child's physical level. Often, lowering volume and pitch is effective. Use simple, clear statements, spoken once, will have more

impact. The child will be able to focus on the real issues involved. When working with small children, the Teacher must be aware of body height and position and get down to the level of the child. The way Teachers use their body invites or rejects close relationships and familiarity. A child will find Teachers more approachable if they are seated low, with arms unfolded, rather than standing, with arms folded. Non-verbal behaviours of a Teacher such as gestures, posture, and eye contact must be such that a child can approach them without any hesitation.

The Teacher has to examine the way she was disciplined and acknowledge her experiences and feelings about it, particularly assumptions she may have on how children behave depending on their context and background.

The most effective methods of guidance are clear, consistent, and fair rules that are enforced in consistent, humane ways. Children should be aware of the consequences if the rules are broken. Good guidance practices emphasise the positive aspects of a child's behaviour, not just problem behaviours. Guidance measures have greater meaning to children if they are encouraged to take responsibility for their actions and are part of the problem-solving process.

Section 1.6
Content for Teaching

Teaching at the Foundational Stage must be informed by the Curricular Goals, Competencies, and Learning Outcomes. The content to be used in the teaching-learning process includes the learning environment, TLMs, and books.

The syllabus must contextualise the Learning Outcomes, guide Teachers through handbooks on the sequence of learning planned in the syllabus and provide broad guidelines for assessments.

Content chosen should be sensorially engaging (e.g., activate the child's senses, have aesthetic appeal) and/or be practically relevant in the context of the child's experiences. It should be derived from children's life experiences and reflect the cultural, geographical, and social context in which the child is developing and growing, move from familiar to unfamiliar, simple to complex, and from self to others, and accommodate the diverse interests of children.

The texts for Language should be a good balance of stories and poems, along with content on the local natural and human environments. While stories and poems enhance the imaginative and linguistic capacities of young children, content on both flora and fauna as well as social and cultural aspects allow children to gain understanding of the world around them. Content could be in the form of textbooks, workbooks, children's literature, materials such as flashcards, games, and puzzles, and various audio-visual materials.

Similar to Language, content in Mathematics can reflect engagement with the local environment. Mathematical activities, whether understanding shapes or counting, can be integrated with engagement with the natural and human environments. The content in textbooks and workbooks should be complemented with appropriate manipulatives in the classroom.

Art learning experiences are to be planned as activities focused on specific Learning Outcomes and the content is drawn from the local context of the school.

1.6.1 Teaching-Learning Materials

Teaching-Learning Materials (TLMs) at this stage should engage children in multi-sensorial activities and encourage them to actively use their hands; this incudes simple toys to manipulatives for counting and numeracy, children's books, picture books, activity books, worksheets, and audio-visual materials support learning.

The Teachers should develop the capacity to prepare TLMs using locally available materials. Engaging children in the process of creating TLMs such as toys, puzzles, and boards using locally available products helps engage all aspects of their development. Some resources that are attractive, safe, and provide adequate opportunities for the children to explore and experiment with curiosity, which are not locally available, can be purchased from the market.

The use of TLMs can enhance the learning of the children by providing them concrete experiences. For Mathematics, Teachers can create simple TLMs such as counters, bundle-sticks, *ganitmala*, arrow cards, flats-longs-units, shapes cut-outs, straw models, and polyominoes using locally available materials such as seeds, sticks, pebbles, paper, cardboards, and beads.

The idea of a library being not merely a collection of books but an attractive display of good books which changes periodically is essential for the library to be an active place and to generate motivation and interest in reading. The Teachers and other adults can model reading behaviour, read-aloud, and plan other engagements with texts in the library. The library or designated reading corners should provide children access to good children's literature, and the Teachers should encourage them to 'borrow' books from the library and place them back in the classroom or the library.

As a part of pedagogic practice, Teachers should model careful use of materials. A culture of care and responsibility in using and sharing material should be an essential Learning Outcome for this Stage and should be carried through the later Stages of schooling.

With a balanced approach between protection and participation, different types of technology, digital, and audio-visual material can also be used as a TLM. Children should have access to a diverse range of content and material that is contextual for the child, age-appropriate, and available in range of languages and materials. They should contain diverse forms, spaces, and formats to ensure access and inclusion of children with disabilities. The key should be to create an enjoyable experience for the learner and feed the child's innate curiosity and agency, for which the capacity development of Teachers, parents, and the community should be supported.

1.6.2 Books and Textbooks

Children at the Foundational Stage need to engage with texts in a variety of forms (e.g., picture books, storybooks, graded readers, and worksheets). A wide variety of books that are appropriate for all children including 3-year-olds should be made available to schools. Large picture books, colourful graded readers, books with engaging stories and poems, all these would make reading books an exciting and engaging experience for children. Our country has a rich heritage of stories, folklores and legends that vary from region to region. These stories need to be translated into all languages and good children's literature can be produced from these sources and be made available to all. By making a variety of books available in schools, a sense and taste of *sahitya* can be encouraged in young minds.

Textbooks should be designed specifically to achieve the Competencies as articulated for the Foundational Stage. For the ages 3-6, learning environment, TLMs, and worksheets are sufficient to meet their Curricular Goals and pedagogical needs. They should not be burdened with the textbooks. For the ages 6-8, simple and attractive textbooks should be considered, which should also act as a workbook but should not be limited to the textbooks only.

Textbooks are often the only books many children will engage with. Their understanding of the world beyond their immediate surroundings is built through the illustrations in the textbooks, the activities and assessments introduce them to the expectations of them, and the content of the textbook, as well as the language it uses, motivates them.

When developing and design a textbook, one should be guided by the underlying principles of curriculum, discipline, pedagogy, technology, context, presentation, and diversity and inclusion. Applying these principles, the process could include the creation of a syllabus document, panels of textbook writers, reviewers, and designers/illustrators, choice of content, pedagogy, and assessment, structure of the textbook and language used, presentation and design, writing, review, and pilot run, and textbook orientation of the Teachers.

Textbook developers should have sound knowledge of applied linguistics and Mathematics, a clear understanding of the pedagogy that is appropriate for the competency and content, and also be aware of the current technology and audio-visual materials available for enhancing the learning experience of children. Local context and environment are also important considerations.

The textbook must provide Teachers with concrete ways of integrating assessment with teaching and learning. If practicable, a Teacher's manual can be developed as a companion to the textbook, aligned with both its approach and content. While the Teacher manual is primarily intended for the Teacher, its use will benefit children as well.

1.6.3 Learning Environment

An inclusive, welcoming, colourful, and joyful learning environment that supports every child's participation is very critical for achieving the Competencies outlined in the NCF.

a. The indoor environment needs to be well-lit and well-ventilated.
b. It should feel safe and inviting for the children.
c. It needs to be inclusive.
d. It should have a balance of both familiar and novel experiences for the child.
e. It should have a balance of materials that encourage different domains of development.
f. It should allow for both individual work and cooperative work.
g. It should include displays of children's work and also allow for children's work-in-progress to be preserved.

Considering the points mentioned above, the classroom environment can be optimised for engagement and learning by implementing some of the fundamental principles of ECCE. Some of the points are mentioned below.

1.6.3.1 Indoor Environment

a. **Running Blackboard:** The running blackboard should be at children's reach as it allows them to express themselves artistically and engages them in activities.

b. **Circle Area:** Clean and organised circle area on the floor should be designated for circle time activities.

c. **Corner Set-up:** Corners can be planned inside the classroom to enable a variety of activities – including a dramatic play corner with masks and puppets, a blocks/puzzles and Math corner, an art/drawing corner, a tinkering corner, and a books/Language corner. These corners encourage imaginative play, sensorial development, creativity, problem-solving, and language skills

d. **Classroom Display:** To make a classroom dynamic and vibrant, an area should be allocated to display both children's and Teacher's work. This can include a weather chart, a timetable, Teacher-prepared charts, and norm charts.

e. **Portfolio Bag:** For easy access and visibility of children's work and to keep records and store children's work, the portfolio bags, neatly labelled with their names, can be hung on a wire/rope.

f. Every classroom should have basic elements such as a mirror, a clock, space to keep footwear, and a dustbin.

The labelling of these locations, the text in the displays, and the reading corners should make the environment print rich, colourful and a happy place.

1.6.3.2 Outdoor Environment

a. **Sand pit:** Sand pit is an excellent play area for children, which can also be used during free play. This can also be setup with the use of bricks and filled with sand or mud.

b. **Clay box:** To develop gross and fine motor abilities, mixing, kneading, and making clay figures and toys is a very good exercise. This can be made using a small box built with bricks containing claying soil.

c. **Water:** A simple arrangement of buckets, mugs, and a tub for water activities should be kept alongside the sand and clay areas. Children find it calming and these activities help coordination of multiple muscles and increase attention.

d. **Kitchen garden:** A small kitchen garden gives children sensorial experiences, opportunities to work with their hands and concepts about the natural environment. Group work, physical labour, and other such positive attitudes towards work can also be achieved by children working in a kitchen garden.

e. **Outdoor play equipment:** Slides, see-saws and swings are some essential outdoor play equipment. Ladders give opportunities for very young children to climb, which is an important developmental activity. In later years, simple rope ladders can be set up for a more demanding climbing experience.

Section 1.7
Assessment

Assessment should be well-designed and aligned to the Learning Outcomes and Competencies of the Foundational Stage. While analysing the evidence from an assessment, Teacher should be unbiased and open-minded. The assessment should be formally and informally integrated through the course of the day in the classroom and out-of-classroom activities. Teacher should have a proper mechanism to collect and document evidence. While analysing the assessment, Teacher should focus on what children know, identify the gaps, and utilise them in plans.

In the Foundational Stage, assessment is through observation and analysing artefacts. Observation across time provides the Teacher with a comprehensive understanding of the child's learning. There can be several contexts where children exhibit their behaviour, attitudes, and their learnings. Objects/Artefacts are created by a child during the teaching-learning process. These artefacts provide clues about the level of Learning Outcomes of the child and are a source of information about the child's abilities and strengths.

The Holistic Progress Card would include this analysis, general information about the child's family, and the Teacher's narrative summary of the child's progress.

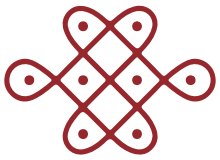
Section 1.8
Addressing Developmental Delay and Disability

The Foundational Stage is critical to learning and development. We should aim to provide a safe, supportive, and responsive environment that upholds the dignity of every child learning with us. It is important for Teachers and educational institutions to identify and address any risks pertaining to the children as early as possible so that all children attain their learning goals and make sure that our children are safe and secure while they learn.

Recognising and addressing developmental delay and disability in the Foundational Stage is very important because these years are vital for the pathways on which future learning is based. The sooner we recognise and address any challenges to learning and development, the better the chance for redressal and success. Optimal nutrition and a caring and stimulating environment are crucial to learning and development at this Stage. We need to support children in such a way that there are bridges, rather than gaps, between early and later school learning. Developmental delay refers to very noticeable lags in achieving developmental milestones, beyond the individual differences that exist among children. The delay could be in any developmental domain. Developmental disability — e.g., autism spectrum disorder, cerebral palsy, intellectual disability, visual impairment, hearing impairment — usually becomes apparent during infancy or childhood and is marked by delayed development and functional limitations in learning, language, communication, cognition, behaviour, socialisation, or mobility. Children often catch up or outgrow developmental delays with continuous support and stimulation. Developmental disabilities are long-lasting, though children can make a lot of progress in managing them as well with similar support.

Educational institutions and Teachers are not authorised to make any diagnosis of developmental delay or disability. That is the job of authorised medical professionals. However, if a Teacher notices a concern or persistent issue, she must observe the child across all developmental domains and keep a regular record to support proper diagnosis of the issue and appropriate action.

All our educational settings are committed to providing an environment that is not only stimulating and joyful but safe and secure as well. Schools and Teachers must take care of Physical and Emotional Safety and create a culture of zero tolerance of Child Sexual Abuse.



Chapter 2

Language Education

Language lies at the centre of human cognitive, social, and cultural experiences. Proficiency in languages gives individuals the capacity to comprehend, analyse, and relate to their locality, nation, and the world. It enables effective communication, which is integral to the formation and functioning of societies and cultures. Language additionally serves as an indispensable tool for the acquiring, accumulating, and advancing of knowledge. Thus, issues related to Language are some of the most fundamental in education. The effects and benefits of Language learning go far beyond proficiency in the languages themselves.

Language learning is, therefore, an important aspect of this NCF. Multiple studies show that individuals knowing many languages not only gain the ability to communicate with a wider range of people, but also develop expanded cognitive abilities. In addition, they demonstrate improved capacities of cultural awareness and expression, which is among the major competencies considered important to develop in students. This provides them with a sense of their own identity and belonging, as well as an appreciation of other cultural identities.



Learning multiple languages enriches children intellectually and culturally, enabling them to think in more than one way by being equipped with the structures of expression, vocabulary, idioms, and literature of more than one language. A multilingual India is thereby better educated and also better nationally integrated. Moreover, India's languages are some of the richest, most scientific, and most expressive in the world, with a huge body of ancient as well as modern literature that helps form India's cultural unity and national identity.

The science of child development and language acquisition clearly demonstrate that young children become literate in and learn best through their mother tongue. Moreover, young children who become literate in their mother tongue gain a greater ability to learn multiple languages as students in their later years with its associated benefits.

This NCF thus gives central importance to learning in the mother tongue in the initial Stages, and to Language learning across all Stages, with a commitment to multilingualism. This multilingualism promotes, both socio-emotional and cognitive capacities at the individual level as well as cultural unity at the local and national levels.

Section 2.1
Aims

Learning Languages enables students to access the understanding, knowledge, and skills available in written or spoken forms in a society. It develops students' abilities to express ideas and feelings, be creative, think rationally, make well-informed choices, and act on those choices.

Proficiency in Languages is essential for a democratic society in which individuals participate and contribute to its political, economic, social, and cultural life. Proficiency in multiple languages, including mother tongues and regional languages, promotes a society which respects and appreciates one's own as well as others' cultures. Such multilingualism also has direct benefits for the individual in terms of cognitive development and flexibility.

Language Education in schools must specifically aim to achieve:

a. **Oracy and literacy:** Oracy and literacy are fundamental to school education. Achieving oracy means students develop fluency in expression and understanding of spoken Language. Literacy means that all students demonstrate fluent and critical reading, writing, and comprehension capacities in the Language. The capacities to use Language in spoken and textual form are critical not just for Language Education They are also a foundational capacity for all other curricular areas.

b. **Effective communication skills:** Students should develop their Language capacities to think critically, identify real-world problems, analyse them, make rational arguments, and work out solutions. The capacity to use language to think and communicate well in a variety of situations is critical for effective democratic, social, and cultural participation.

c. **Literary and creative capacities:** Language teaching in schools must aim at building capacities in students towards an appreciation of the literary aspects of Language. It should also allow for an exploration of how to be creative and imaginative in their spoken and

written expressions. Language serves as a vehicle for aesthetic and creative expression across cultures. Appreciation of the creative and aesthetic aspects of Language can be accomplished through creative prose, poetry, storytelling, word games, puzzles, jokes, riddles, and more.

d. **Multilingual capacities:** Language Education in schools should aim to make a student an independent speaker, reader, and writer in at least three languages, as laid out in NEP 2020. These three languages are denoted R1, R2, and R3 in this document. *(See §2.4, Box 2.4i for definitions of R1, R2, and R3)*

   It should aim to achieve this in R1 by age 8 (Grade 3), in R2 by age 11 (Grade 6), and in R3 by age 14 (Grade 9). Schools must ensure the development of the capacity for basic communication for social purposes and linguistic proficiency for academic use in the classrooms in R1 and R2, and to the extent possible in R3 as well by age 15 (Grade 10).

e. **Appreciation and engagement in culture:** Learning a language is learning a culture. Thus, language plays an important role in the immersion and participation in culture. Given the wide range of languages and the richness of their cultures in India, students must be given the opportunity to understand and appreciate the rich linguistic cultures of India. This can be achieved through introducing samples of various kinds of literature from languages across the country, including some of the great classical literature of India.

Section 2.2
Nature of Knowledge

In its most basic function, Language is a system of the use of words and sentences when speaking, writing, or making gestures for communication among human beings.

a. **Language is a rule-governed system.** The spoken and written components of language are governed by rules that are often a set of conventions or practices. Learning relevant sounds, shapes, words, sentence structures, and grammar rules as well as understanding the functional and situational aspects of language use requires understanding and engagement with these rules.

b. **Language is an integral part of culture.** Language does not operate in isolation but is related to social interaction, context, and culture. Thus, language development among students is an act of cultural development; it invariably requires learning about an associated culture and society.

c. **Language evolves constantly.** Languages evolve over time, learn from other languages, and adapt to the varying contexts in which they are spoken. They constantly add to their vocabularies as new concepts arise. Learning any language thus involves being able to appreciate and engage with such evolution.

Such specific characteristics of Language guide the framing of the curriculum for Language and its teaching. Other aspects such as the aims of Language Education (described earlier) and how children learn languages (described at the beginning of §2.6) guides the curriculum as well.

Section 2.3
Current Challenges

Language learning in schools across the country currently faces a few challenges which need urgent addressing.

a. **Low levels of literacy:** India is currently in a crisis of learning, where a large proportion of students currently in elementary school have not attained foundational skills in literacy, i.e., the ability to read, comprehend, and write basic text.

b. **Low-quality learning materials:** The learning materials used for Language teaching across the Stages are currently of uneven quality, with a lot of them being of low quality. Good quality materials need a careful selection of relevant content (words, context, illustrations, layout) that is age appropriate and interesting for students to learn from. Relying only on the content in textbooks is very limiting for Language learning. The lack of availability of age-appropriate children's literature in Indian languages has posed a severe constraint in Language classrooms across the nation.

c. **Inadequate levels of Teacher preparation:** Too often, an assumption is made that anyone can teach Language to students without adequate training in the subject and/or without adequate time for preparation. This contributes to underachievement in Language learning and classes becoming ineffective. There has been a severe scarcity of skilled Language Teachers in India, despite various measures being taken. Teachers with appropriate preparation, flair, and practice in the subject are essential for a meaningful and enjoyable student experience in Language learning.

d. **Ineffective pedagogic strategies:** Many often-used teaching practices are not based on a sound understanding of how Language works and how students learn Language across various age groups. Teachers need to take stock of the strategies they have been using till now for their enjoyability, effectiveness, and ability to engage students meaningfully.

e. **Focus on content-completion rather than Competency-based teaching:** In Language Education, gaining Competencies is far more important than mastering content. In practice, this is too often not considered by Teachers or assessment developers. Effective Language teaching must be driven by the achievement of Competencies and Learning Outcomes by students, rather than a focus on merely finishing the content given in the textbook.

f. **Memory-based assessment:** Language Education intends to achieve Language proficiency, communication and functional ability, and appreciation of literature. Most assessments tend to focus on assessing recall of content given in a textbook rather than assessing Language abilities. While the recall of details of the content may be one way of demonstrating learning, it is not the core aim of teaching and learning Language.

Box 2.3i

Use of Contemporary Language in the Indian Language Context

Many Indian languages have literary traditions spanning thousands of years. Often, vocabulary and sentence structures used in such literature are not in contemporary use anymore. In addition, there is a significant difference between the spoken and written forms in many Indian languages.

Content in Language textbooks, in terms of vocabulary and sentence structures, should aim to reflect the contemporary use of the language, particularly in the Foundational and Preparatory Stages, while also attempting to bridge it over time to the more literary form of the language so that literature can be read and appreciated. This would make Language and literature learning more interesting and relevant to students. Understanding and engaging with the literature of the Language is viewed as a separate Curricular Goal in the Middle and Secondary Stages. The language used to achieve this goal can have content drawn from such literature to make students familiar with the literary tradition of that Language (though the literature studied should also be chosen to be of a kind that is of contemporary interest to students). The language used in other chapters, or that is used to teach other Curricular Areas, can continue to adopt contemporary language usage even in the higher Stages, in accordance with what works best for learning in that context in view of the overall Curricular Goals.

Vocabulary for new concepts or ideas should be introduced into Indian languages in a way that is intuitive and relevant to the Indian context, by the appropriate authorities (such as by the Language Academies proposed in NEP 2020), and such new words should be employed in a uniform manner across the country to ensure ease and effectiveness of communication.

Section 2.4
Learning Standards

As mentioned earlier, the approach to language teaching and learning in schools, including the Learning Standards to be achieved, is guided by the flexible, three-language formula as laid out in NEP 2020.

In the **Foundational Stage,** the focus is on building familiarity of students with two spoken Languages (R1 and R2). At the end of this Stage, students are expected to read fluently in R1 and comprehend what they read, and begin writing sentences in R1 to express experiences, themes, and what they see in pictures. They gain some familiarity with reading and writing in R2.

In the **Preparatory Stage**, students develop proficiency in speaking and Competencies in reading and writing in both Languages (R1 and R2). While students achieve these faster in R1, they are expected gain familiarity with R2, gradually progressing from basic communication skills to greater fluency and proficiency in speaking and writing.

By the end of the **Middle Stage,** Teachers should aim to achieve similar levels of students' capacities in both R1 and R2. Some transfer of skills from R1 to R2 enables quicker learning of R2. By the end of this Stage, students can understand and appreciate the distinctive features of

Box 2.4i

Learning Three Languages

The NCF aims to enable all our students to learn at least three languages, fully leveraging our socio-cultural context and resources. Our languages are one of our greatest heritages. This provides a remarkable opportunity for our students to learn multiple languages, when complemented by the education system.

Proficiency in several languages has a range of benefits, including in practical matters of communication, expanding cultural richness, and development of multiple cognitive capacities as suggested by research in Brain Neurosciences and Developmental Psychology.

The three languages that our students will learn in their school years are denoted R1, R2, and R3 in this document.

***R1:** This is the Language in which literacy is first learnt in school. For this, it is of critical importance to be able to use the language that the student already knows, because that enables the full use of the linguistic and cultural knowledge (and resources) from one's home and community that the student already has, resulting in a deeper engagement and relevance, and a greater effectiveness and efficiency in the attainment of literacy.*

Thus, R1 should preferably be the Language most familiar to the students, which would be the mother tongue. If that is not possible because of practical considerations, then it should be the State Language, which would be a familiar Language.

Also, since it is in R1 that literacy is first attained, it must be used as the medium of instruction (MoI) for other subjects, at least until literacy in another language is attained.

***R2:** Any Language other than R1.*

***R3:** Any Language other than R1 and R2.*

Furthermore, at least two of these three Languages — R1, R2, and R3 — must be native to India. The State or other relevant bodies would decide the choices of R1, R2, or R3 that would be given to students. An Indian language must be available for students as an option for the MoI through school education all the way up to Grade 12.

A few other related aspects on Language learning:

- *'Practical considerations,' referred to earlier, could be of various kinds, including the diversity of mother tongues in a class/school/community/region, dearth of written resources in the language despite rich oral traditions. the complexity and difficulty of developing written resources for languages that are spoken by relatively small populations is a part of these considerations as well.*
- *There may be regions or areas in a state where the linguistic diversity is such that the most familiar language for students (after their mother tongues) is another widely spoken local language. These familiar languages may also be different from the State language. In such circumstances, if (because of practical considerations) the mother tongue cannot be R1, then the most familiar local language may be used as R1.*
- *In this NCF, we do not make any distinctions between 'languages' and 'dialects;' all variations of a language used for communication or literature in a given region are also referred to as languages.*
- *The approach to literacy in R1 is taken up in detail in the chapter on the Approach to Language Education and Literacy in the Foundational Stage — Chapter 3, §3.2 in NCF-FS. This includes the wide use of the mother tongue of students in the classroom and school, even when R1 is not the mother tongue, which will enable literacy in R1.*

the language, engage in collaborative discussions, debates, and presentations, analyse and interpret what they read, and write independently with appropriate structure, grammar, vocabulary, and creativity.

A new third Language, R3, is introduced in this Stage. Students acquire familiarity with the spoken form of this Language, along with the basics of reading and writing. They are expected to read various simple texts with comprehension in R3 by the end of the Middle Stage.

In the **Secondary Stage,** up to Grade 10, the Curricular Goals in R1 and R2 are almost the same. The same level of effective communication (both oral and written) in both languages must be achieved. Students can use these languages for reasoning and argumentation and make effective presentations. They also read and analyse a variety of texts (from early writing to contemporary literature), articles, and documents. They further develop their critical reading and listening skills, their ability to evaluate arguments, and make connections between different texts. Students refine their writing skills through persuasive essays, literary analyses, researched writing, and creative writing. Students develop linguistic proficiency for academic use in R1 and R2 by the end of this Stage. In R3, students engage with different forms and types of literature and learn to apply the basics of linguistic rules in speech and writing. They also develop linguistic proficiency for academic use in the classroom to the extent possible. A higher level of familiarity, understanding, and interpretation of literature is achieved for at least one of the Languages — R1, R2, or R3 — that is native to India.

In Grades 11 and 12, at least two languages will be studied, at least one of which is native to India, and would be chosen by students from the pool of language and literature courses that are offered. In addition to the possibility of continuing study in R1, R2, and/or R3, the choices for languages would include Sanskrit and other modern/classical languages and literatures of India, including classical Tamil, Telugu, Kannada, Malayalam, Odia, Pali, Persian, and Prakrit. This is to ensure that these languages and literatures stay alive and vibrant, especially in States where they may be best taught and nurtured. In addition to this, foreign languages, such as French, German, Japanese, and Korean would also be offered.

As per NEP 2020, opportunities to study Languages, such as those mentioned in the previous paragraph, will also be given to students in the Middle Stage and in Grades 9 and 10 as optional additional courses, wherever it becomes feasible as school resources increase.

This section lays out Curricular Goals and Competencies, for R1, R2, and R3 for the Preparatory, Middle, and Secondary Stages; some variations and permutations may certainly occur across R1, R2, R3 and across Stages, depending on practical considerations and on the choices offered for the three languages R1, R2, and R3. Particularly for the learning of Languages, it is important to keep in mind that Curricular Goals and Competencies must be attained by students in an integrated manner and not separately — in particular, there should not be separate chapters or units in textbooks for individual Curricular Goals.

As throughout this NCF, Curricular Goals and Competencies have not been given for the Grades 11 and 12 courses and optional courses described above, due to the wide variety and levels of courses that would be on offer for students.

Box 2.4ii

Indian Sign Language

Sign Language is a mode of communication used predominantly by/for people with hearing impairment where there are no spoken words. The Language involves using gestures or 'signs' (with both hands) for articulation to communicate meaningfully. There are many sign languages in the world. The one that is extensively used in India is called Indian Sign Language (ISL).

ISL has its own specialised hand gestures, grammar, and style. While there are regional variations in the way the Language is used for communication and the signs themselves may vary in their signifying (a particular object, idea, or meaning), ISL is useful, well-known, and standardised in its lexicon and glossary.

In India, students with partial or full hearing impairment often find it difficult to get admission into regular schools as these are not yet equipped to be inclusive. These students often drop out of schooling either due to inadequate Teacher training in inclusive education or ISL to run classes in the higher grades. They also drop out as they do not receive adequate support for their learning needs.

Schools could consider offering ISL as part of their Language curriculum. The Learning Standards for ISL could follow those of R1 or R2 illustrated in this document. All students, even those without hearing impairment, would be given some basic familiarity with ISL and a few of its basic signs.

2.4.1 Language 1 (R1)

2.4.1.1 Preparatory Stage

CG-1 Develops oral language skills using complex sentence structures to understand and communicate ideas coherently	C-1.1	Converses fluently and meaningfully in different contexts
	C-1.2	Summarises core ideas from material read out in class
	C-1.3	Makes oral presentations (show and tell, short welcome notes, anchoring of small events, short speeches, class debates)
CG-2 Develops the ability to read with comprehension by gaining a basic understanding of different forms of familiar and unfamiliar texts (such as prose and poetry)	C-2.1	Applies varied comprehension strategies (inferring, predicting, visualising) to understand different texts
	C-2.2	Understands main ideas and draws essential conclusions from the material read
CG-3 Develops the ability to write simple and compound sentence structures to express their understanding and experiences	C-3.1	Uses writing strategies, such as sequencing, identifying headings/sub-headings, the beginning, and ending, and forming paragraphs
	C-3.2	Writes clear and coherent paragraphs that convey their understanding of a given topic/concept or on a reading of a text
	C-3.3	Creates posters, invites, simple poems, stories, and dialogues with appropriate information and purpose
	C-3.4	Uses appropriate grammar and structure in their writing

CG-4 Acquires a more comprehensive range of words in various contexts (of home and school experience) through different sources	C-4.1	Discusses meanings of words and develops vocabulary by listening to and reading a variety of texts
	C-4.2	Discusses meanings of words and develops vocabulary by listening to and reading a variety of texts or other content areas
CG-5 Develops interest and preferences in reading	C-5.1	Borrows books from the Library regularly to read at home
	C-5.2	Demonstrates interest in reading books from the Library

2.4.1.2 Middle Stage

CG-1 Develops the capacity for effective communication using Language skills for description, analysis, and response	C-1.1	Identifies main points and summarises from a careful listening or reading of the text (news articles, reports, editorials)
	C-1.2	Listens to, plans, and conducts different kinds of interviews (structured and unstructured)
	C-1.3	Raises probing questions about social experiences using appropriate language (open-ended/closed-ended, formal/informal, relevant to context, with sensitivity)
	C-1.4	Writes different kinds of letters, essays, and reports using appropriate style and registers for different audiences and purposes
	C-1.5	Creates content for audio, visual, or both, for different audiences and purposes
CG-2 Appreciates the language and literary and cultural heritage in and related to Language by exploring the various forms of literary devices	C-2.1	Identifies and appreciates different forms of literature (prose, poetry, drama) and styles of writing (narrative, descriptive, expository, persuasive) from various cultures and time periods
	C-2.2	Identifies literary devices [simile, metaphor, personification (alankaras), hyperbole (athishayokthi), alliteration (anuprasa), idioms, proverbs, and riddles] by reading a variety of literature and uses them in writing
	C-2.3	Expresses through speech and writing their ideas and critiques on the various aspects of their social and cultural surroundings
CG-3 Develops the ability to recognise basic linguistic aspects (word and sentence structure) and use them in oral and written expression	C-3.1	Interprets and understands basic linguistic aspects (rules), such as sentence structure, punctuation, tense, gender, and parts of speech, while reading different forms of literature, and applies them while writing
	C-3.2	Writes prose, poetry, and drama using appropriate style and language
CG-4 Develops the ability to write reviews and uses the Library to find references	C-4.1	Reads, responds to, and critically reviews books of varied genres (fiction and non-fiction)
	C-4.2	Uses books and other media resources effectively to find references to use in projects and other activities

CG-5 Develops an appreciation of the distinctive features of the particular language, including its alphabet and script, sounds, rhymes, puns, and other wordplays and games unique to the language	C-5.1	Understands the phonetics and script of the language, the number of vowels and consonants, and how they interact and are used
	C-5.2	Engages in the use of puns, rhymes, alliteration, and other wordplays in the language, to make speech and writing more interesting and enjoyable
	C-5.3	Becomes familiar with some of the major word games in the language (e.g., palindromes, spoonerisms, sentences without given letters or sounds, riddles, jokes, antakshari, anagrams, crosswords)

2.4.1.3 Secondary Stage

CG-1 Uses language for effective communication through writing various forms (essays, letters, articles, discussions, interviews, public speeches) and for new media (email, audio, and visual material)	C-1.1	Uses language appropriate to social context, expresses agreement and disagreement with reasons, and arrives at conclusions through discussion and debate
	C-1.2	Writes in different styles (narrative, descriptive, expository, persuasive) from their own experiences and experiences of others
	C-1.3	Writes for real-life situations (invitations, speeches, condolence messages, notices, creative slogans, advertisements) and for school newsletter/magazine/journal
	C-1.4	Scripts to inform and communicate ideas effectively with the use of technology
CG-2 Develops an appreciation of the aesthetics in different genres (humour, suspense, tragedy) through analysis of style (narrative, descriptive, expository, persuasive) and employs these elements in their writing	C-2.1	Describes characteristics of works of literature from different time periods (such as early, medieval, contemporary)
	C-2.2	Analyses a literary text by close reading, critiquing form and style, and interpreting possible meanings
	C-2.3	Composes literary texts by using appropriate literary devices
CG-3 Uses language to develop reasoning and argumentation skills by engaging with a variety of audio and written material	C-3.1	Analyses and evaluates the different audio and written material
	C-3.2	Argues with proper rationale by carefully evaluating premises

CG-4 Appreciates literary and cultural heritage in and related to the language and the richness of Indian languages	C-4.1	Recognises the multilingual nature of Indian society and richness of its literary work through reading texts and watching content of different genres
	C-4.2	Appreciates the richness of culture and heritage in the different works of regional language literature and their connections
	C-4.3	Shows an understanding of the role of language in the formation of our identities and culture
	C-4.4	Demonstrates a basic knowledge of the commonalities among some of the major Indian languages, such as their common phonetic and scientifically arranged alphabets and scripts, common grammatical structures, origins and sources of vocabularies from Sanskrit and other classical languages, as well as their rich inter-influences and differences
	C-4.5	Demonstrates a basic knowledge of which languages are spoken in which geographical areas, a sense of the nature and structure of tribal languages, and becomes familiar with a few useful words and phrases and works of literature from a few Indian languages from across the country

2.4.2 Language 2 (R2)

2.4.2.1 Preparatory Stage

CG-1 Sustains effective communication skills for day-to-day interactions, enhancing their oral ability to express ideas	C-1.1	Listens to poems, stories, and conversations and locates important ideas in them
	C-1.2	Comprehends narrated/read out stories and identifies characters, storyline, and key aspects
	C-1.3	Converses meaningfully and coherently
	C-1.4	Makes oral presentations and participates in group discussions
CG-2 Develops fluency in reading and the ability to read with comprehension	C-2.1	Develops phonological awareness further by blending phonemes/ syllables into words and segmenting words into phonemes/ syllables
	C-2.2	Examines the basic structure of the text and recognises words and sentences in print and basic punctuation marks
	C-2.3	Reads stories and passages fluently and accurately with appropriate pauses
	C-2.4	Comprehends the meaning of stories, poems, and story posters
	C-2.5	Demonstrates interest in picking up and reading a variety of children's books
CG-3 Develops the ability to express understanding, experiences, feelings, and ideas in writing	C-3.1	Writes a paragraph to express understanding and experiences
	C-3.2	Creates simple posters, invites, and instructions with appropriate information and purpose
	C-3.3	Writes stories, poems, and conversations based on imagination and experiences

CG-4 Develops a wide range of vocabulary in various contexts and through different sources	C-4.1	Discusses meanings of words and develops vocabulary by listening to and reading a variety of texts in other content areas

2.4.2.2 Middle Stage

CG-1 Develops independent reading comprehension and summarising skills by engaging with a variety of texts (stories, poems, extracts of plays, essays, articles, news reports) and shows interest in reading books	C-1.1	Applies varied comprehension strategies (inferring, predicting) to understand different texts
	C-1.2	Identifies main points, summarises after a careful reading of the text, and responds coherently
	C-1.3	Identifies and appreciates the main idea in the various texts
	C-1.4	Shows interest in choosing and reading a variety of books
CG-2 Attains the ability to write about thoughts, feelings, and experiences of social events (e.g., village fairs, festivals, occasions)	C-2.1	Uses writing strategies, such as sequencing ideas, identifying headings/sub-headings and forming clear beginning, ending, and paragraphs
	C-2.2	Expresses experiences, emotions, and critiques on various aspects of their surroundings in writing
CG-3 Develops the capacity for effective communication using language skills for questioning, describing, analysing, and responding	C-3.1	Writes different kinds of letters and essays using appropriate style and registers for different audiences and purposes
CG-4 Explores different literary devices and forms of literature	C-4.1	Identifies and appreciates different forms of literature (samples of prose, poetry, and drama)
	C-4.2	Identifies literary devices, such as simile, metaphor, personification (alankaras), hyperbole (athishayokthi), and alliteration (anuprasa), by reading a variety of literature and uses in writing
CG-5 Develops the ability to recognise basic linguistic aspects (word and sentence structure) and uses them in oral and written expression	C-5.1	Uses appropriate grammar and structure in their writing

CG-6 Develops an appreciation of the distinctive features of the language, including its alphabet and script, sounds, rhymes, puns, and other wordplays and games unique to the language	C-6.1 Understands the phonetics and script of the language, the number of vowels and consonants, and how they interact and are used C-6.2 Engages in the use of puns, rhymes, alliteration, and other wordplays in the language, to make speech and writing more interesting and enjoyable C-6.3 Becomes familiar with some of the major word games in the language (e.g., palindromes, spoonerisms, sentences without given letters or sounds, riddles, jokes, antakshari, anagrams, crosswords)

2.4.2.3 Secondary Stage

CG-1 Uses language for effective communication through various oral activities (discussions, interviews, public speeches) and writing activities (essays, letters, articles), including new media (email, audio, and visual material)	C-1.1 Uses language appropriate to social context, expresses agreement and disagreement with reasons, and arrives at conclusions through discussion and debate C-1.2 Writes in different styles (narrative, descriptive, expository, persuasive) from their own experiences and experiences of others C-1.3 Writes for real-life situations (invitations, speeches, condolence messages, notices, creative slogans, advertisements) and for school newsletter/magazine/journal. C-1.4 Scripts to inform and communicate ideas effectively with the use of technology
CG-2 UseslLanguage to develop reasoning and argumentation skills by engaging with a variety of audio and written material	C-2.1 Analyses and evaluates different audio and written material C-2.2 Argues with proper rationale by carefully evaluating premises
CG-3 Develops an appreciation of the aesthetics in different genres (humour, suspense, tragedy) through an analysis of style (narrative, descriptive, expository, persuasive) and employs these elements in their writing	C-3.1 Describes characteristics of works of literature from different time periods (such as early, medieval, contemporary) C-3.2 Analyses a literary text by close reading, critiquing form and style, and interpreting possible meanings C-3.3 Composes literary texts using appropriate literary devices

2.4.3 Language 3 (R3)

2.4.3.1 Middle Stage

CG-1 Develops effective communication skills for day-to-day interactions, enhancing their oral ability to express ideas by describing and narrating events and situations	C-1.1 Makes conversations relevant to the context C-1.2 Listens to varied texts (stories, poems, and conversations) and summarises core ideas from the material C-1.3 Makes oral presentations (class debates, short welcome notes, anchoring of small events, short speeches)

CG-2 Develops fluency and the ability to comprehend what they read	C-2.1	Reads stories and passages with accuracy and fluency with appropriate pauses and intonation
	C-2.2	Comprehends the meaning of stories, poems, conversations, posters, and instructions and the main idea in the text
CG-3 Develops the ability to express their understanding, experiences, feelings, and ideas in writing instructions, invitations, and letters	C-3.1	Writes a paragraph to express their understanding and experiences

2.4.3.2 Secondary Stage

CG-1 Develops reading comprehension and summarising skills by engaging with a variety of texts (stories, poems, extracts of plays, essays, articles, and news reports) and uses various strategies to write for different audiences	C-1.1	Identifies main points, summarises after a careful reading of the text, and responds coherently
	C-1.2	Uses strategies to organise ideas and information to write for an intended purpose and audience
CG-2 Develops the capacity for effective oral and written communication in different situations (formal and informal)	C-2.1	Listens critically and reads different news articles, reports, and editorials to express opinions
	C-2.2	Asks a variety of questions on social experiences using appropriate language (open-ended/closed-ended, formal/informal, relevant to context, with sensitivity)
	C-2.3	Shares ideas and critiques on the various aspects of their social and cultural surroundings in oral and written form
	C-2.4	Writes different kinds of letters and essays in an appropriate language for different audiences
CG-3 Explores different forms of literature (samples from early to contemporary period)	C-3.1	Identifies and appreciates different forms of literature such as samples of prose, poetry, and drama (early to contemporary)
CG-4 Develops the ability to recognise basic linguistic aspects (word and sentence structure) and use them in oral and written expression	C-4.1	Interprets, understands, and applies basic linguistic aspects (rules), such as sentence structure, punctuation, tense, gender, and parts of speech

CG-5 Develops an appreciation of the distinctive features of the particular language, including its alphabet and script, sounds, rhymes, puns, and other wordplays and games unique to the language	C-5.1 Understands the phonetics and script of the language, the number of vowels and consonants, and how they interact and are used C-5.2 Engages in the use of puns, rhymes, alliteration, and other wordplays in the language, to make speech and writing more interesting and enjoyable C-5.3 Becomes familiar with some of the major word games in the language (e.g., palindromes, spoonerisms, sentences without given letters or sounds, riddles, jokes, antakshari, anagrams, crosswords)

Section 2.5
Content

The approach, principles, and methods of selecting content have commonalities across subjects — those have been discussed in Part A, Chapter 3, §3.2 of this document. This section focusses only on what is most critical to Language Education in schools. Hence, it will be useful to read this section along with the above-mentioned section.

2.5.1 Principles of Content Selection

It is important to choose content that is appropriate and relevant to the developmental stages of language learning in students. Inadequate, age inappropriate, and low-quality materials are taking away the value of and joy in Language classrooms. **Teachers must ensure the use of good quality TLMs, carefully chosen and curated for students across all age groups.** This will ensure enthusiasm for learning and foster a connection with the languages being learnt.

2.5.1.1 R1 and R2 in the Preparatory Stage

a. **For developing oracy:** Learning materials that lend themselves to students practicing conversation with each other should be chosen. Playful language activities remove the fear of Language and induce the fun element into learning. Content should have a variety of activities such as read-aloud rhymes, sing-aloud songs, role plays, dramas, and interviews that allow students to practise these in the classroom.

b. **For developing reading skills:** Reading material should have variety, including stories, poems, plays, essays, diaries, comics, cartoons, letters, and travelogues. It should have a balance of familiar and unfamiliar text and context. Large font sizes, coloured pictures, and catchy titles of the chapters would arouse interest in the students. The text should be thought-provoking and generate imagination and interest among students. Content should lend itself to helping students progress from guided reading to independent reading.

c. **For developing writing skills:** Chosen content must enable students to learn writing skills systematically and joyfully. The material must be designed to make students practise simple sentences on their own. Activities such as the completion of stories, finding suitable titles for pictures, catchy headlines for incidents, poster making, and banners should be part of textbooks.

d. **For developing values and dispositions:** The content chosen should align with the larger purposes of education and the values and dispositions that are embedded in NEP 2020 and Constitutional values. This means choosing content that promotes these values, emphasises the unity in diversity of our country, and includes authors from all walks of life, kinds of literature that represent local, regional, and linguistic diversity in languages, with the explicit teaching of appreciation for the rich cultural heritage of the country.

2.5.1.2 R1 and R2 in the Middle and Secondary Stages

a. **For developing functional Language skills:** Any learning material that is chosen must allow learners to grow in the functional use of Language. Suggested content in this regard includes:

   i. Choosing themes and topics that are familiar to students and impact their daily life, allowing them to participate in group activities including discussions, debates, and role plays on topics such as traffic jams in cities, effective town planning, floods, drought, and pollution.

   ii. Letter writing, whether on paper or by email, is an important skill. Content must have samples of various kinds of letters, especially formal letters, including samples of letters for real-life situations such as applying for a new course in a college, a scholarship, a loan in the bank, or completing/submitting any application in a government office.

   iii. A variety of content including notes, presentations, statements of purpose, and presentations, articles, features, news items, and reports, and advertisements, posters, banners, headlines, videos, and scripts for social media should be used in Language classrooms.

b. **For developing literary skills:** Students must be introduced to and given adequate exposure to different genres of literature. In the Middle Stage, introducing nonfiction and fiction would help students broaden their critical reading and writing abilities. In the Secondary Stage, students must be taught to enjoy the beauty of literature in greater depth and breadth. The selection of literature should be from regional, national, and global writers and varied genres. These can be relevant extracts so that students can engage with close and critical reading. The content should also have a diversity of experiences from writers from all walks of life. For example, contemporary *Janapada Geete* and *Janapada Kathe* in Kannada literature, and stories such as *Konni Juj* in Assamese literature.

c. **For developing linguistic skills:** The content should help with improving fluency and accuracy in the Language. Linguistic aspects such as punctuation marks, use of gender, sentence structures, and tenses must be prominently identifiable in the material to enhance Language proficiency in reading, speaking, and writing. Similarly, the selected content should allow students to practise advanced creative writing with greater sophistication using various literary devices and contexts.

d. **For developing an appreciation of linguistic heritage and diversity:** Content should consider the multilingual aspect of the country, making a place for local and regional language variations in the materials selected. There should be a provision for neighbouring States' literature to be read by students of each State in the Middle and Secondary Stages.

e. **For art and sports integration in the learning of Languages:** Compositions in Art and Language can share some common aspects in aesthetics of form, style, and content. Using art to access ideas, to represent feelings and events along with descriptive writing would only enhance the connection to the learning and the expression of the students. Making posters, signs, and symbols, and illustrating for narrative and descriptive writing can lead to an interesting interdisciplinarity of approach in the understanding of Language and expression (e.g., Utsara in Assamese textbooks talks about various festivals in the state of Assam and various dance and art forms linked to the festivals). Similarly, using games and activities in Language classes as springboards to a conversation (and as energisers) can improve the experience of Language learning significantly.

f. **For developing values and dispositions:** The content chosen should be aligned with the larger purposes of education and the values and dispositions that are embedded in NEP 2020 and Constitutional values. This means choosing content that promotes these values, emphasises the unity in diversity of our country, and includes authors from all walks of life, kinds of literature that represent local, regional, and linguistic diversity in Languages, and explicit teaching of appreciation for the rich cultural heritage of the country. It also means choosing content that lends itself to the development of social, emotional, ethical, and aesthetic sensibilities in students through effective Language Education.

2.5.1.3 R3 in the Middle Stage

For learning R3, the chosen content should have materials such as letter charts and sentence cards that introduce the basic script.

a. For reading and writing development in R3, the book should contain small stories and poems in that Language.

b. Reading and writing materials of R3 should be organised from simple to complex levels of learning; they should have some basic introduction to simple literature in to start with.

c. The chosen content must lend itself to oral presentations and conversations, such as continuing a story or completing a conversation.

d. Content should enable the learning of functional skills in the Language of R3 such as basic letter writing, day-to-day conversations, poster making, and invitations.

2.5.1.4 R3 in the Secondary Stage

The choice of content for the teaching and learning of R3 can follow the same principles given in § 2.5.1.2 for content selection in R1 and R2. However, the level of sophistication of content chosen can include both simple and complex learning material in R3 and move rapidly from one to the other (given the amount of time available and the quicker transferability of skills from R1 and R2), thus allowing for the development of linguistic proficiency for academic use in R3.

Box 2.5i

Teaching Print and Digital Reading Skills: Future 'biliteracy'

One important thing to consider, given the nature of the current social milieu and what is to likely come, is the daily presence of digital media and screen-based devices in the lives of students. Reading and writing on smartphones and computers are rising norms among people. Given this, it is the need of the hour to teach students to be 'biliterate' in their reading skills. This will not only save them from the 'shallow reading' that digital media seems to foster, but also maximise the benefits of digital media in their learning. Contemporary research suggests the value of 'deep reading' in the lives of human beings, and while well-meaning adults still struggle to switch between printed text and screens, students could be taught to read each medium and switch easily between the two (much like switching between two languages) without compromising on focussed attention, the pace of reading, and good meaning-making. This would mean a planned and deliberate teaching for students on how to read digital media, instead of treating the two mediums as the same.

Students need to develop a deep reading circuit in the first place, before being flooded with the distractions that are common to digital media. So, students spending their early years immersed in print material and then being introduced to digital reading with Teacher guidance may be a way forward in this realm.

Section 2.6
Pedagogy and Assessment

The approach, principles, and methods of pedagogy and assessment have commonalities across subjects – those have been discussed in **Part A, Chapter 3, §3.3 and §3.4** of this document. This section focusses only on what is most critical to Language Education in schools. Hence, it will be useful to read this section along with the above-mentioned section.

2.6.1 Pedagogy for Languages

While all children have an innate and natural capacity to learn languages, it is necessary to know how Language is learned best by students in the educational context of a school. The following ideas on how students learn a language will inform effective pedagogic strategies in each Stage.

a. **Students learn a Language well through deliberative processes in schools:** Language must be formally and purposively taught through direct instructions and essential rules. This kind of Language learning is a conscious process unlike 'language acquisition' in early life when a language is absorbed subconsciously. Reading and writing hence involve an active teaching-learning process as they are not natural or intuitive skills.

b. **Students learn better from a balanced approach to literacy:** Students become independent readers gradually when exposed to a balance of instructions for meaning making and for reading through decoding and spelling. Proficiency in literacy can be achieved by focussing on both word recognition and accuracy along with language comprehension and expression.

c. **Students need sustained regular practice once early oracy and literacy is achieved:** Early oracy and literacy set the base for students to learn speaking, reading, and writing well. But this is not enough. Expanding vocabulary through sustained engagement and systematic repetition of listening, speaking, reading, and writing skills through the school years are necessary for mastery of any Language.

d. **Students grow in their overall Language abilities from sustained exposure to a variety of literature:** Exposure to a variety of literature and forms appropriate to a student's grade level would create an interest in reading. This enables students to graduate from 'learning to read' to the 'reading to learn' stage. By the Middle Stage, students are developmentally ready with the capacity to analyse, synthesise, describe, narrate, and apply their Language skills. In the Secondary Stage, students can recognise, think about, and express independent responses to social events and interactions.

2.6.1.1 Strategies for Teaching R1 and R2

2.6.1.1.1 Preparatory Stage

a. Teaching for oracy

Listening to a variety of texts and literature enhances students' vocabulary, contributing to proficiency in speaking a language. Students will grow in their oral Language skills and capacities when they regularly speak about their experiences, describe the texts that they listen to or read, listen to Teachers talking about books, and read texts from diverse genres themselves. Similarly, students listening to/watching the news (radio/TV), movies, serials, educational channels with subtitles, and audio-video materials gives them an active sense of how to speak and listen. They must be taught to respond, describe, narrate, summarise, discuss, and role play from what they listen to. Both free and guided conversations enable development of oral Language skills.

b. Developing reading comprehension

There are several steps in this process, starting from making meaning of individual words all the way to grasping the whole meaning of a text through connecting imagination and experiences. All these steps must be systematically taught for reading comprehension. Teachers must facilitate reading activities for developing the ability to understand different texts. Through this, students will acquire the pleasure of reading and continue to explore different genres of reading encouraged by the Teacher. Dedicated Library hours will ensure that students continue to engage with a variety of books on a wide range of topics.

Some classroom strategies to develop reading comprehension are students reading aloud, reading, and discussing what was read, repeated reading for fluency, doing shared readings, guided readings, independent readings, relating readings to prior knowledge, and summarising. *(See Box 2.6iv)*

c. Developing writing skills

Writing activities require persistent, deliberate, and methodical practice in the classroom for any significant growth or improvement. Writing activities that are limited to copying a given text, copying answers to questions, and reproducing what is memorised do not help with the actual development of writing skills.

Writing can be taught effectively through purposive speaking first. Teachers should then expose students to different samples of writing forms and styles. They should teach students planning, drafting, and finally writing a piece based on audience and purpose. Teachers should also model good writing for them. Teachers' feedback on draft plans is formative in developing a good piece of writing. They should help students progress from writing with their guidance to writing independently.

d. Developing vocabulary

Learning new words and their uses must be integrated with other language skills and should be part of daily instruction. Some useful strategies for developing vocabulary are helping students predict the contextual meaning of words, engaging them in word games and word-building activities, teaching them to use a dictionary extensively, and encouraging them to use new words they acquire in speech and writing. Students can also develop their range of vocabulary by engaging with books from the Library. *(See Box 2.6iv)*

Teacher's Voice 2.6i

Developing Interest and Preference in Reading

As a Teacher of Grade 4, I believe that it is necessary to give my students regular access to books, and also give them a chance to connect and engage with them. I do this often.

One such class, I decided to read the book **'Kali Aur Dhamin Saap'** by Zai Whitaker to my students. The story is about Kali, who is isolated in school and has no friends because he comes from a marginalised section of society. He is very good and clever at catching rat snakes, which other children can't do.

Before reading from the book, I showed my students the cover of the book and asked them to read the title aloud. Some of them did so. Then, I briefly introduced the author to them.

Next, I asked my class, 'Who is Kali?'

The students said, 'Kali is the name of the boy who is in the picture…' and 'Dhamin is the name of the snake…' Students further added, 'It looks as if the snake and boy are friends.'

Then, I told the class that the Dhamin snake is long, lives in the agriculture fields, and eats rats.

I continued, 'Look at this picture, what do you think the story is about?'

Sahiba spoke, 'There will be a snake near the river. The boy will go there, and they become friends.'
Muskan surmised, 'The boy will go and ask the snake to be his friend.'

Lucky guessed, 'Kali looks very poor. He will earn money by showing the snake to people.'

A few other children also shared their guesses.

I started reading the story, periodically showing pictures, and asking my students to share about what they saw, what Kali was doing, and what would happen next. My students answered my questions enthusiastically. I would periodically also ask what they thought about developments.

Soon, the children could identify the emotions depicted in the pictures. When asked 'why' questions, many of my students gave answers that connected to their own life, like that Kali was sad because his mother/grandmother forced him to go to school. They were able to make predictions about what would happen next rather accurately also. From this, I was also getting to know that they were able to understand important concepts/themes in the book with the help of experiences from their own social interactions.

My students also liked the pictures in the book very much. The class was happy to see the last picture where many children agreed to be friends with Kali.

I planned four to five activities designed to help my students engage more with the story. The first activity was a simple one, where my students sat in groups to draw a picture of Kali and his new friends playing, and then shared and spoke about their drawings with each other. Some of these pictures are still put up in my classroom.

Subsequent activities included extending the story, enacting Kali's story, picture sequencing (and writing a line to describe the picture), and story retelling (by my students) activities. On finishing all the activities, I showed the class a few other story books (from the school library) with diverse contexts and talked about how interesting those stories are. I allowed them to choose books and told them to take them home to read. A few wanted to explore other books in the Library too.

I have been seeing many small positive changes in my students. They were more inclined to picking up books to take home. They were also sharing more intuitive points about the books and pictures in post-reading activities. I felt that this whole process was very helpful in motivating my students to choose books they were interested in.

2.6.1.1.2 Middle Stage

a. Teaching critical listening and oral presentation skills:

As the functional and literary aspects of Language take on a central focus, students in the Middle Stage learn to use Language more formally than in the Preparatory Stage. They progress to learning critical listening skills, listening to a variety of texts, contexts, and varied kinds of literature that would enhance their vocabulary, leading to proficiency in speaking, reading, and writing. Listening and speaking activities must occur together in the classroom. Some specific classroom activities can include panel discussions, debates, interviews, anchoring, public speaking, and reviews of movies, plays, or short films.

Box 2.6i

Individual Differences in Classroom Participation

It is common to find some students in the Middle Stage communicating more freely in the classroom than others. In many cultures, boys are encouraged to interact more freely and assertively than girls, and some students from economically privileged backgrounds express themselves more confidently than others who come from less privileged backgrounds. Students who tend to speak with hesitation for various reasons (such as personal and socio-cultural beliefs) must be encouraged to participate freely in Language class activities. Language classes can be a space for empowering students and giving them encouragement and ***equal opportunities*** *to express themselves through reading, speaking, and writing. These classes can be a place for understanding and addressing the root causes of such hesitation, thus instilling the spirit of free speech and democratic participation.*

b. Developing reading skills:

This is the stage where 'reading-to-learn' would happen to a greater extent.

i. **Functional reading skills** can be taught through samples of applications, letters, reports, invitations, emails, essays, posters, and circulars. They learn to recognise and understand the purpose of each of these with the teacher's help through questions on format and target audience.

ii. **For developing literary reading skills in this Stage,** Teachers can conduct a variety of literature-related activities (e.g., choosing a genre for the week, or a theme for the week). In these activities, students must be taught to describe the effect elicited on reading the words used, identify basic literary devices, and share their overall experience of reading the text.

iii. **For developing critical reading skills**, the Teacher encourages independent student reading of a fiction or non-fiction text and gives space to discuss the intent of the author, understand the context, identify core content, and interpret possible meanings thus enabling critical reading.

iv. It is necessary to **build interest in reading among students** through exciting activities at school. These activities must be a part of the regular Language classroom. For example, activities such as 'book of the day' (where extracts from a chosen book are read in the class, and students discuss the plotline, characters, and themes in the book), 'author of the day' (where students read many works of the same author and discuss their style and broader concerns of the author), making a trip to the local Library (to learn about book cataloguing, book search, and Library maintenance), organising for a literature festival (filled with book talks, exhibitions, creative writing competitions, have exhibits about authors from all walks of life), and a book exhibition (students display their current readings) would enhance student interest in books and reading. (*See Box 2.6iv*)

c. Activities for developing writing skills:

i. **Functional Language writing skills:** Teachers should provide students with opportunities to write a variety of forms including essays, reports, emails, blogs, and social media comments and posts. Pedagogy should include Teachers providing samples, explaining attributes and strategies for each form, encouraging students to ideate and write independently, as well as to proofread and revise their own writing.

ii. **Literary Language writing skills:** This should include experiential writing – i.e., where students are encouraged to write based on their own experiences and writing appreciation or critique of literary works. The pedagogy here also should include Teachers providing samples, explaining attributes and strategies, encouraging students to write independently, as well as to proofread and revise their work. Critique of literature also needs students to read the texts carefully and often repeatedly, sometimes with the Teacher's help.

Teacher's Voice 2.6ii

Learning to Interview

I am a Teacher working with Grade 6 students. Developing interviewing skills is one of the prescribed Learning Outcomes. I designed a series of activities to help my students develop this skill — one of them is described here.

To provide students with a preliminary experience of conducting interviews, I gave them the task of talking with the clerk, Head Teacher, or other staff working in the school, and asked them to learn more about their work and areas of interest/hobbies. I made four teams. I told students to go and interview whomever they wished to during the break. While observing the interviews, I identified some key points to discuss in the next stage.

I asked my students to share their experience. Then, I asked 'What do you think are the things that you should keep in mind while interviewing someone?' I allowed students to share their thoughts, I wrote their points on the blackboard while appreciating their efforts.

Drawing the attention of the students to the specific points on the blackboard, including **mutual introduction, statement of purpose, preparation of interview questions, and documentation**, I planned to provide opportunities to strengthen their skills on these areas.

To start with, I asked my class 'Imagine that you are interviewing a farmer. How would you introduce yourself? Let us act out this situation.' I allowed six students to act out this scenario. While the children were engaging in the role play, I made sure that they clearly mentioned the purpose of the interview and that the other students took notice.

To further provide students with the experience of framing interview questions, I asked the students to create interview questions for a different situation. I reminded them that the questions should be clear, simple, and relevant to the topic. I also informed them that the questions should be respectful to the person and their profession. Following this, I paired my students, and asked them to interview each other with the questions they prepared. (The interviewee would assume the role mentioned in the situation given.)

In my next class, I asked students again about their experience conducting interviews and being interviewed. I slowly led my students to realise that while some of their questions were appropriate, others we not. I gave them some time to review their interview questions once more and asked them to conduct their interviews again.

In my next class, I told the students about the way to record interviews: I introduced the two models to record interviews [**Recording the Conversation (verbatim)** and **Summarising with Key Points**], depending on the purpose of the interview. I engaged my students in a small discussion about how to prepare these reports as well. I then played a video of an interview, and helped my students prepare a report of the same.

I decided that it was now time to provide my students practical exposure in conducting interviews. I told the class, 'Now, we have understood the method of conducting an interview. Can you conduct an interview with any one person of your choice outside the school?'

I regularly followed up in my subsequent classes about the progress of the class in selecting a person to interview, prepare and review their questions, conducting the interview and preparing the report. After a period of two weeks, my whole class had completed their interviews and were preparing their reports.

The final activity involved narrating and editing the interview they had done, and their experience throughout the process.

2.6.1.1.3 Secondary Stage

a. Oral presentations

Students must be given opportunities for sharing their ideas freely and listening to others' points of view. They must also ask questions, argue for their own views, and accept others' views with proper justification. Students must be taught focussed dialogue and conversation which require organising their thoughts for better clarity, the art of raising relevant questions, brainstorming, and thinking aloud, active participation, and skills of literary appreciation.

Teachers must use methods such as role play, group discussion, debate, open house dialogue, and interviews to allow students to ask questions and learn to respond impromptu. Club-based activities, assembly gatherings, and celebrations in the school should be used as platforms to practise these methods and should not be seen as a separate exercise. Teachers must also find ways to teach students how to work on their listening skills (paying attention to details, summarising) and use the same in day-to-day life.

b. Developing reading skills

i. **Literary Language skills:** At the Secondary Stage, students should be encouraged to participate in group activities in critically analysing a literary text in the class (by engaging with questions related to form and vocabulary used, and ideas and feelings provoked) and participate in the activities of the school literature club, poetry house, and fiction-reading groups.

ii. **Critical reading skills:** The Teacher should focus on enabling students to make meaning of a variety of texts, move from initial impressions to a closer reading of the text by asking questions related to the effect of words and ideas expressed, and how the effect of the language used in a text is working for specific purposes.

iii. **Exposure to reading multicultural texts:** Teachers must bring a variety of texts from

different regions and languages and should encourage students to read and then share views on them. Activities such as the comparison of literary works of two different writers can be done effectively by inquiring into the author's voice, cultural background, and context of the work, and talking about other similar works in the genre. Projects, plays, folk music performances, and posters are important ways in which students in this Stage can be introduced to texts from a different era. Multicultural texts should be available in the Library for students to read in their free time. *(See Box 2.6iv)*

c. Developing writing skills

i. Functional Language writing skills: Students should be given enough opportunity to practise writing reports, essays, notes, applications, letters to editors, advertisements, and notices. Students should also be encouraged to write in magazines, newsletters, newspapers, and blogs.
Teachers must encourage students to make well-planned and scripted videos, plan for educational YouTube channels and podcasts, and should guide students to pick the right kind of content for these means. Here, the focus should be on writing the script for the content (core idea, related ideas, order of ideas to be communicated, and elements of evocative communication).

ii. Literary Language writing skills: Students must be guided towards independent and creative writing in this Stage. They must be taught capacities for analysing literature and connecting it to its historical and socio-economical aspects rather than reading it in isolation, enabling the writing of a critical review. Teachers must ensure students practise writing poems, stories, or plays with literary devices (e.g., similes, metaphors, hyperbole, irony, puns, and oxymorons). Teaching them to identify voice and style of a writer taking cues from the material they read will help them find their own voice. The Teacher should give constant feedback to help students improve their writing which comprises inputs on students' level of literary skills, proficiency in grammar, and appropriateness of style in writing.

Box 2.6ii

Teaching an Unfamiliar Language

The teaching of an unfamiliar or less familiar language would require a base of connections with an already-known language.

The rules of grammar in speech and writing in one language are often the basis for learning other languages in the life of a student at school. A certain degree of knowledge, skills, and dispositions required for literacy is transferable to other new languages to be learned.

After initial exposure to listening to the language being used in simple transactions, developing a basic understanding of what combination of sounds/phonemes are typical (and permissible) in a language, the patterns of stress and intonation in speaking it, the shapes of the letters and words (and sounds associated with them) are all important milestones in learning the unfamiliar language. Once this is achieved, Teachers may introduce new vocabulary, idioms, and samples of different forms of writing and literature.

The essential principles of how the meaning-making of written texts work, including literary appreciation (stylistic analysis, the effect of the language used and so on) are often common across many languages. The time taken for learning these the first time around in a

particular language is often greater than the time taken to learn the same aspects in a newer language.

This means R2 and R3 in Language Education would require adequate practice time, but not necessarily an equal amount of initial learning time as R1. A speech-rich and text-rich class environment will allow for immersive learning of these newer languages.

2.6.1.2 Strategies for Teaching R3

2.6.1.2.1 Middle Stage

Since the students would have already become proficient in their basic skills in R1 and R2, they will acquire these Competencies much faster given the nature of the transfer of Language skills.

a. Listening and oral development

To develop oral proficiency in R3, students must get a chance to listen and converse in that language first. This can be done through listening and talking about movies, plays, and short films. As part of these listening activities, a pre-viewing and post-viewing talk about the movie/play and its significance can be discussed. Students can also do a detailed review of movies/plays/short films that can be presented orally in the classroom.

Similarly, students must engage in basic conversations to develop day-to-day speaking skills in the language. The Teacher can provide relevant imaginary contexts for conversation between/among students (e.g., interactions between a shopkeeper and a customer, between a Teacher and a student, between a doctor and a patient, and so on). After acquiring basic conversation skills, students may use real-world issues to discuss and debate in the classroom using R3. This will help the students sustain the conversation in the targeted language.

b. Development of reading skills

Reading skills in R3 can be taught in a systematic manner similar to the teaching of R1 and R2 Languages at an earlier Stage. This would entail the teaching of script decoding and encoding through practice, and comprehension of new words (with support) from reading short stories and poems. Students also need to be taught to read in the language purposively for events such as 'book for the day' and 'author for the day,' expand their vocabulary with word-building exercises and the use of a dictionary, as well as read functional material such as recipe books, formal and informal letters, and invitations. A wide range of books and resources in R3 must also be available in the Library that students can use to develop their interest in reading and their reading skills.

c. Development of writing skills

Here, students learn to apply already learned writing strategies (from R1 and R2 Languages) to write in R3. The Teacher can introduce the R3 script contextually with the help of sign boards, nameplates, and invitations (this can help in guessing the letters). Immediately after, the Teacher may give students writing practice with the *aksharas* and *maatras* in the language. After learning the script, the Teacher can give students basic tasks such as writing signboards, nameplates, and invitations. Gradually, they can be given the task of writing small sentences for conversations helping the students use the Language coherently. Writing for

functional use is a necessary skill in R3. This can be achieved through simple activities such as diary writing, letter writing, and short story writing.

2.6.1.2.2 Secondary Stage

The pedagogic strategies for R3 in this Stage will resemble the techniques employed in the teaching of R1 and R2 for oral, reading, and writing proficiency in the Secondary Stage . The degree of complexity of literary texts used may not equal those of the texts used in R1 and R2, but the essential linguistic and literary skills developed could be aimed at matching those of R1 and R2 as much as possible.

2.6.1.3 Some Additional Considerations

2.6.1.3.1 Specific Learning Disabilities

The box below (Box 2.6iii) is a brief note on the idea of Specific Learning Disabilities in the classroom. Students with these disabilities struggle in the Language classroom and face significant difficulty in completing the tasks assigned to the class independently. Classroom activities for students with Specific Learning Disabilities require more careful planning and more support from the Teacher.

Box 2.6iii

Specific Learning Disabilities in the Language Classroom

Specific Learning Disabilities *are a group of conditions that obstruct a person's ability to listen, think, speak, write, spell, or perform mathematical calculations. One or more of these abilities may affect a student at a time. Specific Learning Disability interferes with the developmentally predictable learning process of a student. The term does not include*

learning problems that are primarily the result of visual impairment, hearing impairment, motor disabilities, mental retardation, emotional disturbance, or of cultural, environmental, or economic disadvantage.

As Language classrooms are one of the biggest sites for observation of such learning disabilities, Teachers must be alert to the presence of any such learning challenges a student may be experiencing.

The Rights of Persons with Disability (RPWD) Act 2016 defines Specific Learning Disabilities as a dissimilar group of conditions wherein there is a deficit in processing language, spoken or written, that may show itself as a difficulty to comprehend, speak, read, write, spell, or to do mathematical calculations.

Teachers will need to find a professional diagnosis of such disabilities in Grade 3 (or at eight years of age, whichever is earlier). The School Principal, Teachers, parents, and the clinical psychologist or doctor will have to collaborate to develop learning strategies for a student with a learning disability, based on the kind and extent of their learning challenges.

This means framing special considerations in the kind of content selected, the methods of pedagogy used, and the assessment tools used for the learning of such a student.

2.6.1.3.2 School Library for Language Development

Well-resourced libraries are necessary for students across all the Stages . A wide range of books must cater to the interests and needs of all the students in the school to promote interest in reading, as well as address academic demands.

There is a need for students to engage more with books and develop a habit of reading. Therefore, specific Curricular Goals refer to developing an interest in reading and the regular use of the Library. These Goals, particularly in the Secondary Stage, would also require the Library to have literary works in many Indian languages, as also translated works of well-known authors.

Box 2.6iv

Library and Language development

The school Library is of paramount importance in developing language abilities among students across the Stages. A well-equipped Library provides access to diverse reading materials, promotes a love for reading, nurtures storytelling skills, fosters critical thinking and creativity, enhances information literacy skills, and offers a safe and inclusive learning space. By engaging with the resources and activities provided by the Library, students can develop invaluable language abilities that serve as a foundation for their academic success and lifelong learning.

Role of the Library in Language development:

1. ***Access to a wide range of resources:*** *A school Library could provide students with access to a wide range of resources, including books, magazines, newspapers, and other reading materials. If books are sorted according to Grade levels, categorised, and labelled according to themes and subjects, it would provoke students' interest and allow easy access to them.*
2. ***Development of Language abilities:*** *Exposure to reading diverse texts helps improve language skills, such as vocabulary, comprehension of different forms of text and language structure, different viewpoints, and overall language proficiency.*
3. ***Opportunities for independent reading:*** *A Library can provide space for students to choose books that interest them and read at their own pace. Encouraging students to take books home and conducting activities in assemblies around books promotes reading among all students.*
4. ***Support for classroom learning:*** *The school Library needs a mapping of Library books to Learning Standards, so that the Library would not stand in isolation outside the classroom. Instead, it would be part of classroom resources and processes.*
5. ***Encouragement of a love of reading:*** *By providing a wide range of engaging and age-appropriate books, students can develop a lifelong love of reading, which can have a positive impact on their language and overall development.*
6. ***Promotion of literacy skills:*** *The school Library can help promote literacy through activities such as book clubs, writing workshops, and storytelling sessions, which can help students develop their language skills and become more confident readers and writers.*
7. ***Supporting research and inquiry:*** *The Library offers resources such as encyclopaedias, dictionaries, and reference materials that support students' research and inquiry-based learning. By engaging in projects, students improve their reading, writing, and*

information literacy skills, enabling them to express themselves effectively and communicate their findings.

Illustrative Library activities for Language development:

1. ***Drawing Time:*** *Students can be invited to the Library to select and read a book of their choice. Following this, they can be provided with stationery to draw a picture based on their understanding of the text.*
2. ***Book Reviews:*** *Students must be encouraged to process their reading of books through discussions and presentations. The task of presenting a book review to others helps with structuring one's own understanding and response to reading for the sake of clear communication with others.*
3. ***Storytime:*** *Storytime in the Library would invite students to the space. These sessions can be interactive and engaging, by incorporating elements such as songs and finger puppets.*
4. ***R eading buddies:*** *Pairing younger students with older ones can be a fun and effective way to promote reading and writing skills. The older students can help in reading to the younger and together learn Language.*
5. ***Book clubs:*** *Setting up a book club for young students can encourage them to read more and discuss the books they are reading. They could encourage students to express their ideas in writing. It can be carried out for Middle Stage students in the Library.*
6. ***Writing workshops:*** *Writing workshops can focus on specific types of writing, such as poetry or creative writing, and can be tailored to the age and skill level of students.*
7. ***Book displays:*** *Visually appealing displays can be created, themed around specific topics or events. These can also include activities, such as writing prompts or book reviews.*
8. ***Enrichment programmes:*** *Events, such as author visits, Author of the day, Genre of the week, and so on, would enhance students' listening and speaking skills as they engage in discussions, share their thoughts, and interact with others.*
9. ***Book repairs and book canvassing:*** *These activities teach students the value of good books and ideas.*

2.6.2 Assessment in Languages

Few key principle for assessment in Language are:

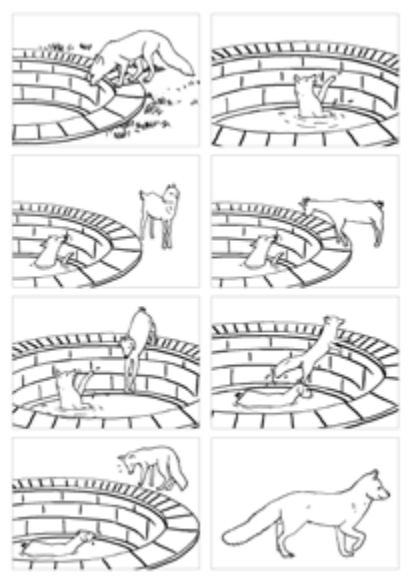
Students must be assessed for their fluency and proficiency in the language(s) taught, their ability to effectively communicate in those language(s), and their skill of reading and writing in various forms, such as picture descriptions, simple stories, complex essays, literary descriptions, and research papers.

Students must be assessed for not only their fluency and proficiency in reading and comprehending a wide variety of texts, but also answering questions based on familiar/seen as well as unseen passages/unfamiliar text, producing a variety of written materials such as essays, letters, posters, and other creative writing pieces, oral communication in class discussions, debates, role plays and other forms of presentations.

A few Teacher Voices illustrate assessment in Language below.

Teacher's Voice 2.7i

Using Story Sequences to facilitate Independent Writing



I wanted to assess my Grade 5 students' ability to express in writing their own thoughts and feelings. I didn't want them to just memorise a few sentences on any matter and reproduce it in writing.

I tried something different this time. I decided to give them a picture series of ***The Fox and the Goat*** to motivate them to write about it in their own words. Since all students in my class were not very confident, I also gave them some clues to start thinking about what to write.

I distributed copies of the pictures to my class and said, 'Now, listen, everyone. Let us try a fun task today. First, does anyone in this class write stories? Have any of you tried?' I waited for my class to respond, and I was not disappointed. Rama, one of the quieter students, slowly raised his hand. He shared that he had written a story about a naughty boy and his dog. He had also drawn a picture to go along with his story.

I drew my students' attention to the picture series I had given them. 'Now, look at these pictures. Which animals can you see?' A chorus of voices rang across the classroom, 'Fox!' and 'Goat…'

'Good! Now, Rama, what can you see in the first picture?'

'Fox is jumping!' he said.

I gave other students a chance to respond as well, and 2-3 more students offered responses along the same lines.

'Very nice!' I complimented my students. 'Then, let us write the same story in 6-8 sentences with the help of the given clues. Remember, the clues are not in order, and you will have to expand on them for your story. When you read all the lines together, it should be a short story…'

I also wrote some clues on the blackboard to help them organise their thoughts.

Clues: not very deep, could not get out again, thirsty goat, water was good, jump in, began to drink, jumped on the goat's back, out of the well, begged the fox, to help him out
I gave my students the rest of the class to try and frame sentences independently. I walked around, offering support (in the form of words and spellings) to students who were facing difficulty. Some of them needed support in elaborating the connection between pictures.

By the end of the class, most of my students had a short story written down in their copybooks.

This is the criteria I used for grading my students:

Criteria	Grade D	Grade C	Grade B	Grade A
Length and coherence in the story	Writes 1 - 2 sentences with limited coherence	Writes 3 - 4 sentences with a partially clear and coherent narrative	Writes 5 - 6 sentences with an almost clear and coherent narrative	Writes 6 - 8 sentences with a clear and coherent narrative
Clues Used	Develops the story using few to none of the clues	Develops the story using 2-3 clues	Develops the story using 4-7 clues	Develops the story using 8-10 clues
Writing Skills	Demonstrates no variation in sentence structures, vocabulary, and sequencing	Demonstrates limited variation in sentence structures, vocabulary, and sequencing	Demonstrates some variation in sentence structures, vocabulary, and sequencing	Demonstrates a variety of sentence structures, vocabulary, and appropriate sequencing
Grammar and Punctuation	Makes more than 10 grammar and punctuation errors that impede understanding	Makes 7-10 grammar and punctuation errors that impede understanding	Makes 3-6 grammar and punctuation errors that impede understanding	Grammar and punctuation are accurate with less than 3 errors

Teacher's Voice 2.7ii

Poem: Understanding verses

I teach Language to Grade 7. I wanted to assess my students' ability to understand poems. Students tend to learn the lines of the poem by-heart without understanding it. They also memorise the answers to the questions provided at the end of the poem.

So, I did something different.

I selected a poem that my students would be able to read and understand from an external source. I wanted to see if my students could read the poem independently and respond to questions based on it.

This was the poem that I selected:

Pirate Story

Three of us afloat in the meadow by the swing,

Three of us abroad in the basket on the lea.

Winds are in the air, they are blowing in the spring,

And waves are on the meadow like the waves there are at sea.

Where shall we adventure, to-day that we're afloat,
Wary of the weather and steering by a star?
Shall it be to Africa, a-steering of the boat,
To Providence, or Babylon or off to Malabar?

Hi! but here's a squadron a-rowing on the sea--
Cattle on the meadow a-charging with a roar!
Quick, and we'll escape them, they're as mad as they can be,
The wicket is the harbour and the garden is the shore.

Robert Louis Stevenson

I divided my students into groups of three. I asked them to read the poem, discuss it, and then answer a few questions. The questions I gave my class were as follows:

---

1. What do you think is the theme of the poem?

i. nature ii. **voyage**

iii. love iv. friendship

2. The questions in the following stanza convey a sense of:

Where shall we adventure, to-day that we're afloat,
Wary of the weather and steering by a star?
Shall it be to Africa, a-steering of the boat,
To Providence, or Babylon or off to Malabar?

i. melancholy ii. resolve

iii. woe iv. **uncertainty**

3. List all the new words that you learnt in this poem. Now pick any 2 words and frame a new sentence with it.

New words:

Sentence 1:

Sentence 2:

4. Describe any of the stanzas in the poem in your own words. (In 7-8 lines)

_____
_____
_____
_____

The third question was difficult for my students. So, I allowed them to use the dictionary to find out the meaning of the new words and then frame sentences using it.

After the class answered all 4 questions, this is how I graded them:

Criteria	Grade D	Grade C	Grade B
No. of questions answered	Answers all 4 questions correctly	Partially answers all 4 questions	Answers only 1-2 questions
Identifying new words and framing sentences	Identifies new words and frames grammatically correct sentences	Identifies new words and frames sentences with grammatical errors	Identifies new words, but is unable to frame meaningful sentences
Description of the stanzas	Describes accurately the meaning of the stanza in their own words	Describes the meaning of the stanza, but shows gaps in accuracy	Describes the stanza primarily using words from the poem
Use of Vocabulary and Expressions	Uses appropriate vocabulary and other forms of expression to enhance their writing	Uses very limited vocabulary and expressions in their writing	Unable to express themselves meaningfully, makes errors in writing

Teacher's Voice 2.7iii

Class Debates: Supporting Each Other to Speak

I teach Grade 9. Students are often uncomfortable when they are expected to speak. They are often unable to put across their points in the class and contribute to discussions and debates. So, I wanted to create a space for my students to talk. I divided the class into groups and gave them the topic: **Online teaching is the best way for students to learn.**

I taught them how to research topics using books from the Library and the internet. I also explained to them some ways in which they could frame their arguments and present it to the group, such as:

'Excuse me, may I please have your attention for a few seconds?'

'In my opinion, …'

'I am not convinced about…'

'I agree with the views expressed by…'

Each of my students made their own points for or against the topic. I gave them time to share their ideas with the group, discuss their points and then decide whether they agree/disagree with the topic. By the end of the class, I had taken note of the stance of each group, and the members in each group. That evening, I prepared two sets of chits — one with names of students in groups who were for the topic, and the other with names of students in groups who were against the topic.

In my next class, I walked in carrying the two sets of chits and asked my students to sit in their groups. Then, I asked all the groups who supported the topic to sit on the right, and those who were against the topic to occupy the left side of the classroom.

I picked up two chits — one from each pile and asked them to share the points (one point each, in turns) they had discussed with the rest of the class. If they got stuck at any point of the debate, I gave them two chances to ask for support from their group members. I felt that my students were more willing to speak in front of the class when they knew that they had an option to take support from their group members; this probably made them feel less 'put on the spot'.

These are the areas in which I assessed my students and gave them qualitative ***feedback***:

Areas of assessment	**High**	**Moderate**	**Feedback to student**
Relevance of the argument			
Connection and logic between ideas			
Grammatically correct sentences			
Confidence in speaking			

The whole activity took approximately 2-3 classes, but all my students made a genuine attempt to speak in the class. I was very happy with the results of this activity and decided to try more of such activities in the future.

Chapter 3

Mathematics Education

Mathematics is the art and science of discovering patterns and explaining them. These patterns are all around us, in nature, in technology, and in the motion of the earth, sun, moon, and stars. There is Mathematics in everything that we do and see, from shopping and cooking, to throwing a ball and playing games, to solar eclipses and climate patterns. Mathematics thus gives us the foundational concepts and capacities required to think about the world around us and the world beyond us. But most of all, when taught well, Mathematics is truly enjoyable and can become a lifelong passion. The goal of Mathematics Education is to bring to life these aspects of Mathematics.

Mathematics, including Computational Thinking, has never been more important globally, for students and for society, with the growing challenges with respect to artificial intelligence, machine learning, data science, climate modelling, infrastructure development, and the numerous other related scientific issues faced by India and all nations today. Quality education in mathematics and mathematical thinking will thus be indispensable for India's future, and indeed for ensuring India's leadership role in these critically important and emerging fields.

Mathematics Education aims to develop capacities of logical thinking, finding patterns, explaining patterns, making, refuting, and proving conjectures, problem solving, computing fluently, and communicating clearly and precisely — through content areas such as arithmetic, algebra, geometry, probability, statistics, trigonometry, and calculus.



Section 3.1
Aims

Mathematics helps students develop not only basic arithmetic skills, but also the crucial capacities of logical reasoning, creative problem solving, and clear and precise communication (both oral and written). Mathematical knowledge also plays a crucial role in understanding concepts in other school subjects, such as Science and Social Science, and even Art, Physical Education, and Vocational Education. Learning Mathematics can also contribute to the development of capacities for making informed choices and decisions. Understanding numbers and quantitative arguments is necessary for effective and meaningful democratic and economic participation.

Mathematics thus has an important role to play in achieving the overall Aims of School Education. The specific aims of Mathematics Education in this NCF are as follows:

a. **Basic Numeracy.** Numbers and quantities along with words (language) are the two ways in which human beings understand and interpret the world. Numbers and quantities also play a very important role in day-to-day interactions within a complex society. Fluency in quantifying and performing calculating is essential for basic daily interactions, such as shopping and banking. Mathematics Education in schools should ensure that all students are fluent in basic numeracy. This would include not just fluency in numbers and number operations using Indian numerals, but also the capacities to handle situations that involve space and measurement.

b. **Mathematical Thinking.** Mathematical thinking involves systematic and logical ways to think about and interpret the world. The capacities for identifying patterns, explaining patterns, quantifying and measuring, using deductive reasoning, working with abstractions, and communicating clearly and precisely are some illustrations of mathematical thinking. Mathematics Education in schools should aim for developing such mathematical thinking in all students.

c. **Problem Solving.** The capacity to formulate well-defined problems that can be solved through mathematical thinking is an important aspect of learning Mathematics. Clear and precise formulation of problems and puzzles, knowing the appropriate mathematical concepts and techniques that can model the problems, and possessing the techniques and the creativity to solve the problems are core aspects of problem solving. Mathematics Education in schools should aim for developing such problem-solving capacities in all students. Problem solving also develops the capacities of perseverance, curiosity, confidence, and rigour.

d. **Mathematical Intuition.** Developing an intuition for what should or should not be true in Mathematics is often just as important as the more formal 'paper - pencil' doing of Mathematics. Focusing on the common themes and patterns of reasoning across mathematical areas, guessing correct answers (in terms of, e.g., 'order of magnitude') before working out precise answers, and engaging in informal argumentation before carrying out rigorous proofs are all effective ways of developing such mathematical intuition in students. Developing such mathematical intuition in all students should be one of the aims of Mathematics Education in schools.

e. **Joy, curiosity, and wonder.** Discovering, understanding, and appreciating patterns and other mathematical concepts, ideas, and models can require great creativity and often generates great wonder and joy. To see Mathematics as merely calculations and mechanical procedures is very limiting. Mathematics Education in schools should nurture this sense of joy, curiosity, aesthetics, creativity, and wonder in all students.

Section 3.2
Nature of Knowledge

Unlike any other subject, the notion of truth in Mathematics is timeless and absolute. In other words, once assumptions (sometimes called axioms) are agreed upon, and a mathematical truth is established based on those assumptions through logical and rigorous reasoning (sometimes called proof), then that truth cannot be refuted or debated and is true for all time. On occasion, mathematicians may find completely new logical arguments or proofs to establish the same truth, and this too is considered a breakthrough; this is because Mathematics is not just a collection of truths, but is also a framework of methods, tools, and arguments used to arrive at these truths.

Over thousands of years, the mathematical truths that are known to humans have grown in number and scope. Quite often, new mathematical truths that are discovered and established build on previously known truths. For that reason, mathematical education, like mathematics knowledge, is cumulative — new concepts that are learned often build on those learned previously.

Mathematical knowledge is built through finding patterns, making conjectures (i.e., proposed truths), and then verifying/refuting those conjectures through logical and rigorous reasoning (i.e., through explanations/proofs or counterexamples). The process of finding patterns, making conjectures, and finding proofs or counterexamples often involves a tremendous amount of creativity, sense of aesthetics, and elegance. Often, there are many different ways to arrive at the same mathematical truth and many different ways of solving the same problem. It is for that reason that mathematicians often refer to their own subject as more of an art than a science.

Mathematics often uses a formal, stylised, and symbolic language for communication — in order to be abstract and provide rigorous explanations of claims. In reality, mathematical discovery is characterised by informal arguments based on the development of reliable intuition. It is for this reason that developing intuition is described as an important aspect of learning and doing Mathematics.

Section 3.3
Current Challenges

Our current education system has faced multiple challenges with respect to Mathematics learning.

a. Currently, a large proportion of students in the early grades are not achieving Foundational Literacy and Numeracy. This makes it difficult for students to achieve any further higher learning in Mathematics and excludes them from effective economic and democratic

participation in later years as described in earlier sections. Attaining Foundational Literacy and Numeracy for all students must therefore become an immediate national mission and a central goal of the Foundational Stage curriculum.

b. Mathematics learning has traditionally been more 'robotic' and 'procedural' rather than creative and aesthetic. This is a misrepresentation of the nature of Mathematics and must be addressed in the school curriculum.

c. Very often, the content presented in textbooks to illustrate mathematical concepts is far removed from the contextual realities of the learners. Young students find some mathematical concepts easier to absorb when they are directly connected to their experiences. Textbooks, classroom activities, and examples should aim to be motivated by and related to students' lives whenever possible.

d. There has also been a mistaken and exclusive emphasis on symbolic language and formalism in Mathematics teaching and learning, rather than on the informal argumentation and development of mathematical intuition that is so important for mathematical discovery.

e. Methods of assessment, too, have encouraged rote learning and meaningless drills and exercises, which in turn have promoted the perception of Mathematics as highly mechanical and computational. Assessment must move towards encouraging genuine understanding of core mathematical capacities, competencies, and creativity rather than mechanical procedures and rote learning.

f. Ultimately, many students in the current system have unfortunately developed a real fear of Mathematics. Tackling this will require some changes in how society perceives and talks about Mathematics but can also be addressed through the use of teaching-learning methods that encourage students to find meaning and joy in Mathematics and assessment methods that do not kill this joy. Interactive teaching-learning methods involving play, exploration, discovery, discussion, games, and puzzles may also help counter this fear.

Box 3.3i

Fear of Mathematics

There are two major aspects that cause fear of Mathematics: (1) the nature of the subject and how it is taught and assessed; and (2) how it is perceived in society.

1. The nature of Mathematics and how it is taught:

a. Concepts in Mathematics are often cumulative in nature. If students struggle with place value, then certainly they will struggle with all four basic operations and decimal numbers, and hence in word problems. In early grades, the Teacher must provide differentiated learning experiences to ensure that each student has mastered the foundational concepts in Mathematics.

b. When symbols — part of the 'language' of Mathematics — are manipulated without understanding, after a point, boredom and bewilderment dominate many students, and dissociation develops. Hence, it is important for the Teacher to start teaching the concept by making connections to real life using the local language (especially up to Preparatory Stage), providing exposure to explore using concrete objects or examples, and gradually shift to more algebraic language.

c. *Most of the assessment techniques and questions focus on facts, procedures, and memorisation of formulas. However, assessment should focus on understanding, reasoning, and when and how a mathematical technique is to be used in different contexts.*

2. ***Societal perceptions and expectations:***

   a. *A large number of parents expect their children to choose a career in the Science stream, regardless of their children's individual passions and interests — this inhibits them from the enjoying the process of mathematical discovery.*

   b. *Similarly, mathematical ability is seen as central to 'cracking' competitive entrance exams for professional courses, such as those in engineering. Due to immense competition in these exams, parents sometimes end up burdening their children with immense pressure to go to coaching classes and get a high score in Mathematics, instead of allowing them to proceed at their own pace and appreciate its joy and wonder.*

Hence, we must rethink the approach of teaching to one where students see Mathematics as a part of their life, and enjoy it with a greater focus on reasoning and creative problem solving. As with Language learning, students should not be allowed to fall behind in Mathematics and should be immediately supported to catch up if they do fall behind. NEP 2020 already has suggested delinking competitive entrance exams and the 'coaching culture' from the scheme of studies in schools. These measures should help redress this situation.

Section 3.4
Learning Standards

In the **Foundational Stage,** attaining foundational numeracy represents the key focus of Mathematics. Foundational numeracy includes understanding Indian numerals, adding and subtracting with Indian numerals, developing a sense of basic shapes and measurement using non-standard tools, and early mathematical thinking through play.

In the **Preparatory Stage,** while the focus is on to work on building conceptual understanding of numbers, operations (all four basic operations), shapes and spatial sense, measurement (standard tools and units) and data handling, the objective is to develop capacities in procedural fluency, and mathematical and computational thinking to solve problems from daily life.

In the **Middle Stage,** the emphasis moves towards abstracting some of the concepts learned in the Preparatory Stage to make them more widely applicable. Algebra, in particular, is introduced at this stage via which students are able to, for example, form rules to understand, extend, and generalise patterns. More abstract geometric ideas are also introduced at this Stage and relations with algebra are explored to solve problems and puzzles.

Finally, the **Secondary Stage** focusses on further developing the ability to justify claims and arguments through logical reasoning. Students become comfortable in working with abstractions and other core techniques of Mathematics and Computational Thinking, such as the mathematical modelling of phenomena and the development of algorithms to solve problems.

Across the Stages, students develop mathematical skills such as problem solving, visualisation, optimisation, representation, and communication, and thereby develop the capacities of Mathematics and Computational Thinking. Through creating and solving puzzles, pictorials, word problems, and optimisation problems, various values and dispositions such as perseverance, curiosity, confidence, rigour, and honesty would be developed across grades.

Finally, Mathematics has an extremely rich history in India spanning thousands of years. India is where the place value number system (including zero) — that we all use today to write numbers — was first developed and used and is where many of the key foundations of algebra, geometry, trigonometry, and calculus were laid. By learning about the development of Mathematics in India as well as throughout the world, the rootedness in India can be enhanced, along with a more general appreciation of the history of Mathematics, and of the remarkable evolution and development of mathematical concepts through time (and India's critical roles in these developments).

3.4.1 Curricular Goals & Competencies

3.4.1.1 Preparatory Stage

CG-1 Understands numbers (counting numbers and fractions), represents whole numbers using the Indian place value system, understands and carries out the four basic operations with whole numbers, and discovers and recognises patterns in number sequences	C-1.1 Represents numbers using the place value structure of the Indian number system, compares whole numbers, and knows and can read the names of very large numbers C-1.2 Represents and compares commonly used fractions in daily life (such as ½, ¼) as parts of unit wholes, as locations on number lines and as divisions of whole numbers C-1.3 Understands and visualises arithmetic operations and the relationships among them, knows addition and multiplication tables at least up to 10x10 (pahade) and applies the four basic operations on whole numbers to solve daily life problems C-1.4 Recognises, describes, and extends simple number patterns such as odd numbers, even numbers, square numbers, cubes, powers of 2, powers of 10, and Virahanka–Fibonacci numbers.
CG-2 Analyses the characteristics and properties of two - and three-dimensional geometric shapes, specifies locations and describes spatial relationships, and recognises and creates shapes that have symmetry	C-2.1 Identifies, compares, and analyses attributes of two- and three-dimensional shapes and develops vocabulary to describe their attributes/properties C-2.2 Describes location and movement using both common language and mathematical vocabulary; understands the notion of map *(najri naksha)* C-2.3 Recognises and creates symmetry (reflection, rotation) in familiar 2D and 3D shapes C-2.4 Discovers, recognises, describes, and extends patterns in 2D and 3D shapes

CG-3 Understands measurable attributes of objects and the units, systems, and processes of such measurement, including those related to distance, length, weight, area, volume, and time using non-standard and standard units	C-3.1	Measures in non-standard and standard units and evaluates the need for standard units
	C-3.2	Uses an appropriate unit and tool for the attribute (like length, perimeter, time, weight, volume) being measured
	C-3.3	Carries out simple unit conversions, such as from centimetres to metres, within a system of measurement
	C-3.4	Understands the definition and formula for the area of a square or rectangle as length times breadth
	C-3.5	Devises strategies for estimating the distance, length, time, perimeter (for regular and irregular shapes), area (for regular and irregular shapes), weight, and volume and verifies the same using standard units
	C-3.6	Deduces that shapes having equal areas can have different perimeters and shapes having equal perimeters can have different areas
	C-3.7	Evaluates the conservation of attributes like length and volume, and solves daily-life problems related to them
CG-4 Develops problem-solving skills with procedural fluency to solve mathematical puzzles as well as daily-life problems, and as a step towards developing computational thinking	C-4.1	Solves puzzles and daily-life problems involving one or more operations on whole numbers (including word puzzles and puzzles from 'recreational' areas, such as the construction of magic squares)
	C-4.2	Learns to systematically count and list all possible permutations or combination given a constraint, in simple situations (e.g., how to make a committee of two people from a group of five people)
	C-4.3	Selects appropriate methods and tools for computing with whole numbers, such as mental computation, estimation, or paper-pencil calculation, in accordance with the context
CG-5 Knows and appreciates the development in India of the decimal place value system that is used around the world today	C-5.1	Understands the development of zero in India and the Indian place value system for writing numerals, the history of its transmission to the world, and its modern impact on our lives and in all technology

3.4.1.2 Middle Stage

CG-1 Understands numbers and sets of numbers (whole numbers, fractions, integers, rational numbers, and real numbers), looks for patterns, and appreciates relationships between numbers	C-1.1	Develops a sense for and an ability to manipulate (e.g., read, write, form, compare, estimate, and apply operations) and name (in words) large whole numbers of up to 20 digits, and expresses them in scientific notation using exponents and powers
	C-1.2	Discovers, identifies, and explores patterns in numbers and describes rules for their formation (e.g., multiples of 7, powers of 3, prime numbers), and explains relations between different patterns
	C-1.3	Learns about the inclusion of zero and negative quantities as numbers, and the arithmetic operations on them, as given by Brahmagupta
	C-1.4	Explores and understands sets of numbers, such as whole numbers, fractions, integers, rational numbers, and real numbers, and their properties, and visualises them on the number line
	C-1.5	Explores the idea of percentage and applies it to solve problems
	C-1.6	Explores and applies fractions (both as ratios and in decimal form) in daily-life situations
CG-2 Understands the concepts of variable, constant, coefficient, expression, and (one-variable) equation, and uses these concepts to solve meaningful daily-life problems with procedural fluency	C-2.1	Understands equality between numerical expressions and learns to check arithmetical equations
	C-2.2	Extends the representation of a number in the form of a variable or an algebraic expression using a variable
	C-2.3	Forms algebraic expressions using variables, coefficients, and constants and manipulates them through basic operations
	C-2.4	Poses and solves linear equations to find the value of an unknown, including to solve puzzles and word problems
	C-2.5	Develops own methods to solve puzzles and problems using algebraic thinking
CG-3 Understands, formulates, and applies properties and theorems regarding simple geometric shapes (2D and 3D)	C-3.1	Describes, classifies, and understands relationships among different types of two - and three-dimensional shapes using their defining properties/attributes
	C-3.2	Outlines the properties of lines, angles, triangles, quadrilaterals, and polygons and applies them to solve related problems
	C-3.3	Identifies attributes of three-dimensional shapes (cubes, parallelepipeds, cylinders, cones), works hands-on with material to construct these shapes, and also uses two-dimensional representations of three-dimensional objects to visualise and solve problems
	C-3.4	Draws and constructs geometric shapes, such as lines, parallel lines, perpendicular lines, angles, and simple triangles, with specified properties using a compass and straightedge
	C-3.5	Understands congruence and similarity as it applies to geometric shapes and identifies similar and congruent triangles

CG-4 Develops understanding of perimeter and area for 2D shapes and uses them to solve day-to-day life problems	C-4.1	Discovers, understands, and uses formulae to determine the area of a square, triangle, parallelogram, and trapezium and develops strategies to find the areas of composite 2D shapes
	C-4.2	Learns the Baudhayana-Pythagoras theorem on the lengths of the sides of a right-angled triangle, and discovers a geometric proof using areas of squares erected on the sides of the triangle, and other related geometric constructions from the Sulba-Sutras
	C-4.3	Constructs various designs (using tiling) on a plane surface using different 2D shapes and appreciates their appearances in art in India and around the world
	C-4.4	Develops familiarity with the notion of fractal and identifies and appreciates the appearances of fractals in nature and art in India and around the world
CG-5 Collects, organises, represents (graphically and in tables), and interprets data/information from daily-life experiences	C-5.1	Collects, organises, and interprets the data using measures of central tendencies such as average/mean, mode, and median
	C-5.2	Selects, creates, and uses appropriate graphical representations (e.g., pictographs, bar graphs, histograms, line graphs, and pie charts) of data to make interpretations
CG-6 Develops mathematical thinking and the ability to communicate mathematical ideas logically and precisely	C-6.1	Applies both inductive and deductive logic to formulate definitions and conjectures, evaluate and produce convincing arguments/ proofs to turn these definitions and conjectures into theorems or correct statements, particularly in the areas of algebra, elementary number theory, and geometry
CG-7 Engages with puzzles and mathematical problems and develops own creative methods and strategies to solve them	C-7.1	Demonstrates creativity in discovering one's own solutions to puzzles and other problems, and appreciates the work of others in finding their own, possibly different, solutions
	C-7.2	Engages in and appreciates the artistry and aesthetics of puzzle-making and puzzle-solving
CG-8 Develops basic skills and capacities of computational thinking, namely, decomposition, pattern recognition, data representation, generalisation, abstraction, and algorithms in order to solve problems where such techniques of computational thinking are effective	C-8.1	Approaches problems using programmatic thinking techniques such as iteration, symbolic representation, and logical operations and reformulates problems into series of ordered steps (i.e., algorithmic thinking)
	C-8.2	Learns systematic counting and listing, systematic reasoning about counts and iterative patterns, and multiple data representations; learns to devise and follow algorithms, with an eye towards understanding correctness, effectiveness, and efficiency of algorithms
CG-9 Knows and appreciates the development of mathematical ideas over a period of time and the contributions of past and modern mathematicians from India and across the world	C-9.1	Recognises how concepts (like counting numbers, whole numbers, negative numbers, rational numbers, zero, concepts of algebra, geometry) evolved over a period of time in different civilisations.
	C-9.2	Knows and appreciates the contributions of specific Indian mathematicians (such as Baudhayana, Pingala, Aryabhata, Brahmagupta, Virahanka, Bhaskara, and Ramanujan)

CG-10 Knows about and appreciates the interaction of Mathematics with each of their other school subjects	C-10.1 Recognises interaction of Mathematics with multiple subjects across Science, Social Science, Visual Arts, Music, Vocational Education, and Sports

3.4.1.3 Secondary Stage

CG-1 Understands numbers (natural, whole, integer, rational, irrational, and real), ways of representing numbers, relationships amongst numbers, and number sets	C-1.1 Develops understanding of numbers, including the set of real numbers and its properties
CG-2 Builds deductive and inductive logic to prove theorems related to numbers and their relationships (such as '$\sqrt{2}$ is an irrational number', recursion relation for *Virahanka* numbers, formula for the sum of the first n square numbers)	C-2.1 Extends the understanding of powers (radical powers) and exponents
CG-3 Discovers and proves algebraic identities and models real-life situations in the form of equations to solve them	C-3.1 States and motivates/proves remainder theorem, factor theorem, and division algorithm C-3.2 Models and solves contextualised problems using equations (e.g., simultaneous linear equations in two variables or single polynomial equations) and draws conclusions about a situation being modelled C-3.3 Learns Brahmagupta's quadratic formula (in both symbolic and poetic form) and its derivation, and uses it to solve some of the poetic puzzles of Bhaskara as well as modern-day problems

CG-4 Analyses characteristics and properties of two-dimensional geometric shapes and develops mathematical arguments to explain geometric relationships	C-4.1	Describes relationships including congruence of two-dimensional geometric shapes (such as lines, angles, triangles) to make and test conjectures and solve problems
	C-4.2	Proves theorems using Euclid's axioms and postulates for triangles and quadrilaterals, and applies them to solve geometric problems
	C-4.3	Proves theorems about the geometry of a circle, including its chords, subtended angles, inscribed polygons, and area in terms of π
	C-4.4	Understands the irrationality of π, the best approximations to π discovered over human history, and the first exact formula (infinite series) for π given by Madhava
	C-4.5	Specifies locations and describes spatial relationships using coordinate geometry, e.g., plotting a pair of linear equations and graphically finding the solution, or finding the area of triangle with given coordinates as vertices
	C-4.6	Understands the definitions of the basic trigonometric functions, their history and motivation (including the introduction of the sin and cos functions by Aryabhata using chords), and their utility across the sciences
CG-5 Derives and uses formulae to calculate areas of plane figures, and surface areas and volumes of solid objects	C-5.1	Visualises, represents, and calculates the area of a triangle using Heron's formula and its generalisation to cyclic quadrilaterals given by Brahmagupta's formula
	C-5.2	Visualises and uses mathematical thinking to discover formulae to calculate surface areas and volumes of solid objects (cubes, cuboids, spheres, hemispheres, right circular cylinders/cones, and their combinations)
CG-6 Analyses and interprets data using statistical concepts (such as measures of central tendency, standard deviations) and probability	C-6.1	Applies measures of central tendencies such as mean, median, and mode
	C-6.2	Applies concepts from probability to solve problems on the likelihood of everyday events
CG-7 Begins to perceive and appreciate the axiomatic and deductive structure of Mathematics	C-7.1	Proves mathematical statements and carries out geometric constructions using stated assumptions, axioms, postulates, definitions, and mathematics vocabulary
	C-7.2	Visualises and appreciates geometric proofs for algebraic identities and other 'proofs without words'
	C-7.3	Proves theorems using Euclid's axioms and postulates – for angles, triangles, quadrilaterals, circles, area-related theorems for triangles and parallelograms
	C-7.4	Constructs different geometrical shapes like bisectors of line segments, angles and their bisectors, triangles, and other polygons, satisfying given constraints
CG-8 Builds skills such as visualisation, optimisation, representation, and mathematical modelling along with their application in daily life	C-8.1	Models daily-life phenomena and uses representations such as graphs, tables, and equations to draw conclusions
	C-8.2	Uses two-dimensional representations of three-dimensional objects to visualise and solve problems such as those involving surface area and volume
	C-8.3	Employs optimisation strategies to maximise desired quantities (such as area, volume, or other output) under given constraints

CG-9 Develops computational thinking, i.e., deals with complex problems and is able to break them down into a series of simple problems that can then be solved by suitable procedures/ algorithms	C-9.1 Decomposes a problem into sub problems C-9.2 Describes and analyses a sequence of instructions being followed C-9.3 Analyses similarities and differences among problems to make one solution or procedure work for multiple problems C-9.4 Engages in algorithmic problem solving to design such solutions
CG-10 Knows and appreciates important contributions of mathematicians from India and around the world	C-10.1 Recognises the important contributions made by mathematicians (Indian and others) in the field of Mathematics (such as the evolution of numbers, geometry, algebra) C-10.2 Recognises modern contributions to Mathematics made in both India and abroad, and understands the next frontiers and next major open questions in the field of Mathematics
CG-11 Explores connections of Mathematics with other subjects	C-11.1 Applies mathematical knowledge and tools to analyse problems/ situations in multiple subjects across Science, Social Science, Visual Arts, Music, Vocational Education, and Sports

3.4.2 Rationale for Selection of Concepts

The Learning Standards — the Curricular Goals and Competencies — defined here make choices for the concepts that will be taught and learnt in each of the Stages. The key principles that underlie these choices are described here.

a. Principle of Essentiality

This principle involves three key questions: What Mathematics is essential to learn so that one can solve one's day-to-day problems, live a normal life, and ably participate in the democratic processes of the country? What Mathematics is essential to be able to adequately understand other essential school subjects, such as Science and Social Science? And, finally, what mathematical ideas are essential for developing interest in students to further pursue the discipline if one desires to do so?

b. Principle of Coherence

Concepts that are selected for each Stage must be in coherence with each other and with the overall Stage-specific Curricular Goals, Competencies, and Learning Outcomes. The goal must not be to bombard the student with all mathematical concepts at the expense of coherence.

c. Principle of Practicality and Balance

Due to a rush for completing the syllabus, the focus on building conceptual understanding often gets compromised and rote memorisation of formulae and direct use of algorithms becomes a central part of the teaching process. NEP 2020 strongly recommends reducing content to give time for discussion, analytical thinking, and fully appreciating concepts.

At each Stage, while choosing the concepts for Mathematics, emphasis has been given to the idea of balancing content load with discussion, analytical thinking, and true conceptual understanding. The selection of concepts in each Stage must aim to increase the space for balancing conceptual and procedural understanding of the concepts. This will create space for Teachers to focus more on building conceptual understanding and meaningful practice.

With this rationale, Learning Standards have been configured to give emphasis to understanding Mathematics as a discipline by the end of Grade 10, so that students can appreciate its intrinsic beauty and value and, thereby, also pursue higher education in Mathematics if they so wish. Areas and concepts that are considered useful for all students to interact with the world over their lives, or study other subjects, are covered by Grade 10, so that if they decide to drop Mathematics after Grade 10, they are still equipped with essential skills, concepts, and Competencies in Mathematics. At each Stage, all concepts are included that may be needed as prerequisites for concepts in later Stages.

Section 3.5
Content

The approach, principles, and methods of selecting content has commonalities across subjects — those have been discussed in Part A, Chapter 3, §3.2 of this document. This section focusses only on what is most critical to Mathematics Education in schools. Hence, it will be useful to read this section along with above-mentioned the section.

3.5.1 Principles for Content Selection

The following principles will be followed while choosing topics of study for Mathematics classrooms. Stage-wise principles are laid down; for each Stage, principles for the previous Stage have also been considered, wherever applicable.

3.5.1.1 Preparatory Stage

a. Plenty of space should be given to students' local context and surroundings for developing concepts in Mathematics. Case studies, stories, situations from daily life, and vocabulary and phrasing in the home language should be brought in to help introduce and unfold a concept and its sub-concepts.

b. The development of a culture of learning outside the classroom should be encouraged. More play-way methods (activities) should be included wherever possible.

c. Avenues for mathematical reasoning should be created in all activities, projects, assignments, and exercises. The content should encourage students to articulate the reasons behind their observations and guesses/conjectures and ask why a pattern extends in a certain way and what the rule behind it is.

d. The language of the content should be simple so that students can also express their thoughts using similar language; this should gradually enlarge their vocabulary and enable them to become more skilled over time in using precise mathematical vocabulary, symbols, and notation.

e. Content should encourage learning processes (meaningful practice leading to building memory and procedural fluency) and cognitive skills (reasoning, comparing, contrasting, and classifying), as well as the acquisition of specific mathematical capacities.

f. There should be consistency and coherence across the content, and the progression of the concepts should be spiral rather than linear.

g. For content selection, the focus should be on activities that are engaging and built around the daily-life experiences of students. It should cater to more than one Learning Objective/ Competency simultaneously and take into account one or more learning areas at the same time.

h. More formal definitions should naturally evolve at the end of a more informal discussion, as students gradually develop a clear understanding of a concept.

3.5.1.2 Middle Stage

a. Content should allow students to explore several strategies for solving a problem or puzzle.

b. Content should involve situations and problems that offer multiple correct answers. For this, open-ended questions should be given more space in the exercises.

c. Content should provide opportunities for students to 'talk' Mathematics. Semi-formal language used by students in discussions should be accepted and encouraged.

d. Problem posing is an important part of doing Mathematics. Exercises that require students to formulate and create a variety of problems and puzzles for their peers and others should be encouraged.

e. Content should allow students to explore, create, appreciate, and understand instead of just memorising concepts and algorithms without understanding the rationale behind how they work.

f. Content should offer meaningful practice (through worksheets, games, puzzles) that leads to working memory *(smriti)* and ultimately builds procedural/computational fluency.

g. Mathematics should emerge as a subject of exploration, discovery, and creativity rather than a set of mechanical procedures.

h. Content should give opportunities to naturally motivate the usefulness of abstraction.

Teacher's Voice 3.5i

Finding π

Ever wondered if we can find Pi (π) on our own without any computers, calculators, or any textbooks? The answer is yes! And that too, just by using a thread, paper-pencil, and a geometry box. In my class, I do this exercise when we learn the properties of circles. The activity is quite simple. We take a piece of paper and draw multiple circles using a compass of varying diameters. Then we put the thread on the outline of the circle and measure the length of that thread. This length will be the circumference of the circle. Repeat this for all the circles and note down in table like below:

#	Circumference or length of the thread (C)	Diameter (D)	Ratio of Circumference to Diameter
1			
2			
3			
4			
5			

At the end of exercise, I ask students to notice the ratio value…it is usually around 3. This is the famous constant, popularly known as the Pi, denoted by a Greek symbol 'π'.

Once we do this, we solve many more related questions, like 'If I know the radius of the circle, can we guess its circumference?' and more. Using teaching aids with such activities keeps my students more alert and interested throughout the class.

3.5.1.3 Secondary Stage

a. Content should be chosen and designed in a way that enables students to understand notions of abstraction, the axiomatic system, and deductive logic.

b. More project-based work should be designed and given space in the content so that students have opportunities to weave together several concepts simultaneously. This will help students appreciate the unity and inter-relatedness of mathematical concepts.

c. Interdisciplinary approaches should be kept in consideration while designing the content. Project-based work could be designed based on themes to ensure the integration of other subjects, e.g., linear variation and equation solving in the Science and Social Science.

d. Content at this stage should allow students to develop and consolidate the mathematical knowledge and skills acquired during the Middle Stage.

e. Students should develop necessary skills to work with tools, modern technological devices, and mathematical software useful in mathematical discovery and learning.

f. Content should highlight the history of Mathematics and how mathematical concepts have developed over time, and, in particular, the contributions of Indian and other mathematicians.

3.5.2 Materials and Resources

Materials and resources form a critical part of content. Principles for selecting content for teaching and learning Mathematics include:

a. Concrete materials: TLMs can be useful resources that make learning experiences more interesting and enjoyable. Such material can be used in understanding concepts, as well as in practice and assessment. These resources enable students to comprehend concepts more effectively, as they connect verbal instruction with real experience, concretise abstract concepts, and develop curiosity and interest in learning. Schools can establish Mathematics laboratories or corners with equipment for experimentation, exploration, demonstration, and verification of mathematical ideas. Some examples include electronic calculators, graph machines, mathematical games, puzzles, ganit malas, bundle sticks, geoboards, algebra tiles, Dienes Blocks, or flat long cards, dominoes, pentominoes, Mathematics-related videos, and inclinometers.

Box 3.5i

Incorporation of Indian Contributions to Mathematics

Mathematics has an extremely rich history in India spanning thousands of years from the ancient and Vedic times to the modern era. Some selected landmarks of mathematical discoveries in India include:

Before 2nd Millennium BCE	Names of powers of 10 up to 10^{12} in the *Yajurveda*
c.800 BCE	The first general statement of the Baudhayana-Pythagoras theorem, in Baudhayana's *Sulba-Sutra*
c.500 BCE	The concept of generative grammar is introduced, and is used to model an entire language, in Panini's *Astadhyayi*
c.300 BCE	First algorithm to represent numbers in binary, in Pingala's *Chhandashastra*
c.300	Development of the Indian system of writing numerals using the digits 0-9, as used around the world today. First known usage in the *Bakhshali* manuscript
499	Introduction of the ***sin*** (jya) and ***cos*** (kotijya) functions, thus laying foundations for trigonometry, in Aryabhata's *Aryabhatiya*
	First use of Indian numerals to perform complex computations, carried out in the context of astronomy in Aryabhata's *Aryabhatiya*
628	Introduction of zero as a number, and of negative numbers as numbers, and of the rules for arithmetical operations on them, by Brahmagupta in *Brahmasphutasiddhanta*
	First use of variables for numbers, thus laying the foundations for algebra, by Brahmagupta in *Brahmasphutasiddhanta*
	First general solution to the one-variable quadratic equation, by Brahmagupta in *Brahmasphutasiddhanta*
c.700	Introduction of the Virahanka--Fibonacci numbers 1,2,3,5,8,13,21,34, ..., in the context of poetry by Virahanka in the *Vrttajatisamucaya*
	First explicit description of Pingal's Meruprastar / Pascal's Triangle, in the context of poetry by Virahanka in *Vrttajatisamucaya*
c.1000	First known 4 × 4 magic square, inscribed at the Parshvanatha Temple in Khajuraho
1150	First complete method to solve the Brahmagupta-Pell equation $x^2 - ny^2 = 1$ (***n*** a fixed integer) in integer pairs (***x,y***), given by Bhaskara in *Bijaganita*
1360	First exact formula for **π**, given as an infinite series by Madhava
1360 to 1650	Development of the foundations of calculus, including power series and differentials, by members of Madhava's school of mathematics — in particular, by Jyesthadeva in *Yuktibhasha*
1910's	Ramanujan discovers rapidly converging series for **π**, asymptotic formulas for the number of partitions of a number, the circle method, and mock theta functions - among numerous other foundational discoveries
2002	First provably polynomial-time algorithm to determine whether a whole number is prime, in an article titled "PRIMES is in P" by Agarwal, Kayal, and Saxena at IIT Kanpur

These and other foundational mathematical discoveries in India, and the fascinating stories behind them, will be incorporated and integrated at appropriate points in the curriculum.

Part C

b. **Textbooks:** Textbooks should provide factually correct information in an accessible manner. There should be broad narratives and motivations (including those specific to a State or region) that hold the content together, so it does not read like just a collection of techniques. The development of ideas should be coherent and sequential/spiral, with concrete examples leading to abstract concepts, and new concepts growing from old ones. The language should be simple and comprehensible and should give space for students to build their own definitions, and only gradually start using more formal mathematical terms. The content chosen should be in alignment with the pedagogical instructional practices specific to Mathematics (stated in Section 3.6). Content should include first concrete representations and visual representations, and only then abstract representations. There should be a balance between content and exercises/puzzles to ensure 'learning by discovering/doing'.

c. **Workbooks:** Workbooks are a useful tool in the teaching and learning of Mathematics. Workbooks can be designed to fulfil three purposes: (a) introducing new concepts, (b) practice for consolidating the understanding of concepts, and attaining procedural and computational fluency, and (c) self-assessment tools for students to track their own understanding, and to provide the same information to teachers also. Teacher handbooks accompanying student workbooks can also be very useful.

d. **Technology:** Information and communication technologies provide additional opportunities for students to see and interact with mathematical concepts, making the teaching of mathematics more interactive and engaging. Making use of graphing calculators/software, computer algebra systems, and other digital tools allow students to experiment with and visualise mathematical objects and operations, and to explore and make discoveries through games and simulations.

Section 3.6
Pedagogy and Assessment

The approach, principles, and methods of pedagogy and assessment has commonalities across subjects — those have been discussed in **Part A, Chapter 3, §3.3 and §3.4** of this document. This section focusses only on what is most critical to Mathematics in schools. Hence, it will be useful to read this section along with the above-mentioned section.

3.6.1 Pedagogy for Mathematics

Traditional approaches to teaching mathematics directly jump into abstract symbolic manipulation. This is not very effective in making mathematics accessible to learners. There are several steps before the learner is ready for symbolic manipulations. The first step is to have concrete experiences that embody the mathematical concept involved. Once the learners have immersed themselves in this experience, discussing this experience using language is the next level of abstraction. This language use can then be represented as pictures or diagrams. Finally, these pictures can be converted into the symbols that are used in Mathematics to represent that particular concept or idea. Effective Mathematics pedagogy should take into consideration this sequence for developing a conceptual understanding of mathematics.

For students, problem-solving and problem-posing are critical steps in learning Mathematics. Practice and independent problem solving help students process and remember difficult concepts, and this should be encouraged in the classroom as frequently as possible. Students should also be encouraged to solve problems and puzzles in groups, so that they can see different approaches towards solving a problem and have conversations about mathematical concepts, thereby making them more graspable. They should also be encouraged to pose questions and come up with new problems.

Many students from the Preparatory Stage onwards enjoy learning via scientific experiments performed in laboratories. Students get to experience the following stages of scientific discovery: observing a phenomenon in nature, setting up an experiment in a lab, performing the experiment and noting down observations, trying to find a pattern, and then finally trying to explain the phenomenon. Unfortunately, current practices in Mathematics teaching does not expose students to such a journey. Mathematics is too often presented as a finished product which is purely demonstrative and formal. Guessing using increasingly developed intuition, a skill needed to discover new theorems and their proofs, is discouraged in Mathematics classes.

It is possible to show this 'experimental' nature of Mathematics using an inductive method of teaching at the Preparatory, Middle, and Secondary Stages. The idea is to develop teaching material consisting of appropriate Mathematics experiments. Students can work in groups and guessing can be encouraged. For example, an experiment could students to write down the first few even numbers as sums of two smaller numbers and lead them to observe that they can always be written as sum of 2 primes. Guidance from the Teacher should lead them to conjecture that 'any even number greater than 2 is a sum of 2 primes'. They should collect as much evidence as possible. Though this particular problem is unsolved, towards the end, each student could be given an opportunity to talk about their experiment (instead of proving/ disproving the statement). Many such experiments in number theory, geometry, and combinatorics could be prepared. Such activities have the potential to greatly enhance intuition and problem-solving ability.

Mathematics also naturally provides many opportunities for critical thinking, in the form of interrogating definitions, formulating, or choosing alternative proofs, conjectures, explanations, representations, or generalisations. Curriculum and pedagogy need to provide room and educational opportunity for such thinking. For example, working on match-stick geometry helps interrogate geometric assertions. Students should be encouraged to define their own geometric objects and classes of numbers with specific properties to encourage experimentation, creativity, discovery, and critical thinking.

3.6.1.1 Instructional Practices

a. Students should be exposed to multiple ways of seeing the same mathematical concept. This could be through pictures, symbols, different motivations or applications, and different descriptions in spoken language. Each of these provides a distinct perspective, and they together help the student form their own understanding of the mathematical concept.

b. The Teacher should encourage students to express their understanding in their own words using mathematical vocabulary and terms (including in their own home language when different from the medium of instruction). Opportunities should be created for mathematical conversations between students.

c. The Teacher should provide opportunities for students to engage in meaningful discussions involving questions that require explanations (such as 'How could you explain your thinking to someone just beginning to learn this?' or 'How do you know?'). Habits of verification should be inculcated from an early age. When a student has distributed 24 toffees among 8 students, it is important to not only ask 'Has everyone gotten an equal number of toffees?', but also to follow up with 'How do you know?'

d. The Teacher can incorporate problem-solving tasks in the classroom that serve multiple purposes. Problems can be chosen to review concepts previously studied by students and link them to new concepts. The task can be designed so that students have to reason through questions, and then justify their thinking orally or in writing.

e. Teachers can use physical models, diagrams, graphing calculators, simulations, computer algebra systems, games, and other tools to help students model situations, visualise concepts, think through a problem, and devise strategies for solutions.

f. Small-group work can be an effective way of learning Mathematics. Discussions and problem solving in groups give students the opportunity to talk about Mathematics, ask questions they may be hesitant to ask the teacher, and work on harder problems by pooling together their understanding. However, it should be of short duration to manage the groups effectively.

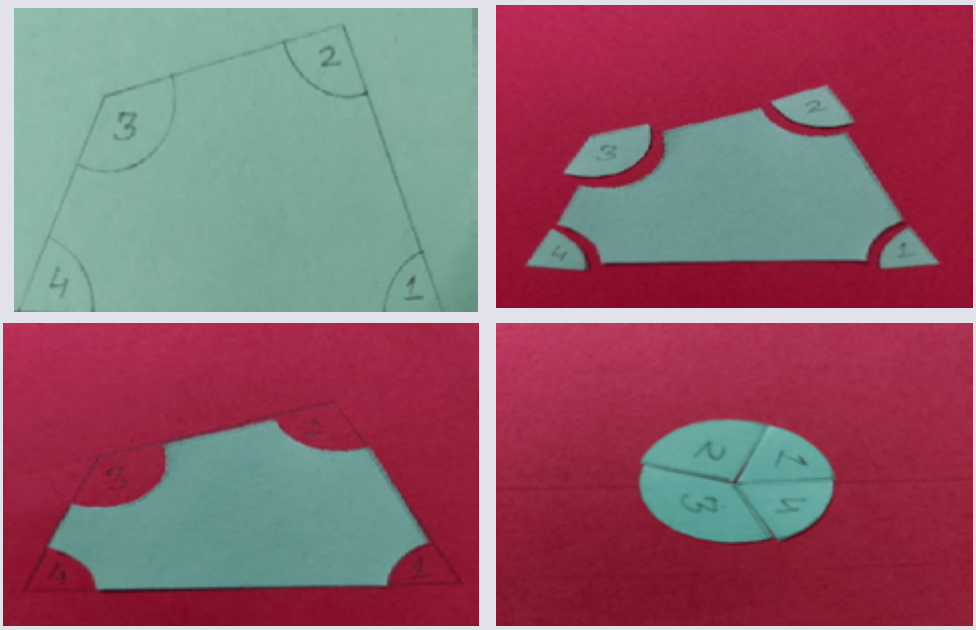
g. Meaningful practice, through worksheets, puzzles, games, mental and oral Mathematics, group work, and homework involving paper and pencil, should be an integral part of the Mathematics classroom. Practice problems should be designed so that students revisit concepts and techniques and see different situations where a certain technique can be used. When choosing problems and guiding students to solve them, teachers should ensure that students are actively learning and not just memorising techniques.

h. During the Middle and Secondary stages, opportunities should be provided for reading simple mathematical text and writing mathematical content. Mathematical communication should be explicitly signalled as an item of teaching and learning. Books and online resource material should be provided by schools for this purpose.

Teacher's Voice 3.6i

Discovering the Magic of Mathematics!

In geometry, there is a lot of learning through axioms, corollaries, and theorems which often leave students wondering 'Where did this come from!? Does it happen every time!?' So, what I do is I usually introduce such things through activities. For example, to learn that 'sum of all internal angles in a quadrilateral is equal to 360^0,' we do a simple activity. I ask students to draw any random quadrilateral and then label their internal angles as $\angle 1$, $\angle 2$, $\angle 3$ and $\angle 4$ as shown in the picture below. Next, I ask the students to measure the 4 angles to discover the sum is around 360^0. Alternatively, when one cuts these angles and join them to meet their all four vertices at a point without leaving any gap (as seen below) to form a complete angle — one discovers that the sum is 360^0.



Here, my emphasis is always on designing activities that help my students learn mathematical concepts instead of just memorising them as facts and formulae. This is an example of inductive method of teaching theorems, one could also use deductive methods to teach these theorems.

3.6.1.2 Some Suggested Methods of Teaching

a. **Play-way (activity-based) method:** In play-way or activity-based learning, students use toys, games, and puzzles to explore mathematics. This may involve physical games, or games/activities involving aids such as dice, puzzles, dominoes, and building blocks Incorporating play can help make some mathematical notions seem more natural and relevant to students, and also enables them to be creative, pose questions, collaborate with others, and use multiple senses to learn. For students who feel alienated by Mathematics, this may help them enjoy the subject and feel more confident in their ability to understand it.

b. **Inquiry-based method:** This method allows students to explore mathematical content by posing, investigating, and answering questions and sharing their findings with their peers for them to critique. Through this method, the student learns to reason and collaborate with their peers to discover mathematical patterns and truths.

c. **Problem-solving method:** Word and logic puzzles (including puzzles that use elimination grids to solve logic problems) are a fun way to teach deductive reasoning. Simple puzzles can help develop students' logical and creative thinking skills in an enjoyable manner.

d. **Inductive method:** Inductive method is based on the principle of induction. Induction is the process to establish a generalised truth by showing that if it is true for a reasonably adequate number of cases, then it is true for all such cases. Thus, the inductive method of

teaching leads us from known to unknown, from a particular case to a general rule and from concrete to abstract. When a number of concrete cases have been understood, the student is able to attempt a generalisation. Students are presented with a series of individual concrete cases, and they are expected to come up with a generalised and abstract mathematical representation of these cases. This method can help students discover patterns in numbers or geometry, which they may later encounter as theorems or formulae. Such discoveries reveal the beauty that drives many people to study mathematics.

e. **Deductive method:** Deduction is the process by which a particular fact is derived from some generally known truths. Thus, in the deductive method of teaching, the student proceeds from general to particular, from abstract to concrete, or from formula to examples. Here, a pre-established rule or formula is given to the student, and they are asked to solve the related problems by using that formula or to prove theorems using definitions, axioms, and postulates.

Each of the methods above has its own advantages and limitations. It is also true that one method does not work for all students, and so the Teacher must draw on their understanding of their class and choose a combination of methods to ensure the learning of every student. The matrix below suggests methods in rows and Stages in three columns.

Table 3.6i

Suggestive Methods	Stages		
	Preparatory	Middle	Secondary
Play-way	✓✓✓	✓✓	✓
Discovery/Inquiry	✓✓	✓✓✓	✓✓
Problem solving	✓✓	✓✓✓	✓✓✓
Inductive	✓✓✓	✓✓	✓
Deductive	✓	✓✓	✓✓✓
Recommendation on Use: ✓✓✓ — *More Often,* ✓✓ — *Often &* ✓ — *Less Often*			

3.6.1.3 Integrating Mathematics with Other Curricular Areas

An interdisciplinary approach enables students to expand their horizons by allowing them to consider and tackle problems that do not fit exactly into one subject. It also changes how students learn by enabling them to synthesise multiple perspectives, instead of driving their thoughts unidirectionally based on the understanding of one discipline. It allows students to explore and involve multiple perspectives and dimensions from different curricular areas to deal with daily life problems. Hence, integrating Mathematics with other Curricular Areas can help students develop interest in the subject and build a holistic view of different disciplines.

Mathematics learning can thus be made more meaningful and interesting by integrating it with other curricular areas. Some possibilities for doing this are described below:

a. **Integrating Mathematics and Art:** Art and Mathematics are closely linked, with both disciplines playing an important role in understanding patterns, as well as enhancing spatial abilities and visualisation. Many activities that are a part of students' lives, such as

music, dance, needlework, and rangoli naturally lead them to see patterns, which can be described and further understood using mathematical language. Integrating the Arts with Mathematics can include art and craft activities that engage students in creating visual patterns, tessellations, and geometric objects, and can include exposure to examples of artworks that contain interesting patterns. Some ideas for integrating Art in the Mathematics classroom are:

i. Creating and analysing different *rangoli/kolam* patterns.

ii. Creating origami, and using it to understand angles, symmetries, and how a 2D object can be transformed into a 3D one.

iii. Recognising geometries and symmetries in art and architecture.

iv. Symmetry can also be explored through dance and movement by assigning mirroring exercises for students. This concept can also be explored through visual games, self-designed board games, simple print-making activities based on traditional art forms like Rogan printing, and by viewing examples of architecture, painting, and sculpture.

v. Pattern activities could also include art forms, like weaving, embroidery, and bead work, where patterning is heavily reliant on mathematical precision, grids, and matrices.

vi. Ratio and proportion are fundamental to the arts. The technique of drawing the human body requires an understanding of proportion (e.g., the length of an arm is about thrice the length of the head). The study of ratios and proportions can also be related to different cultures and their canons of beauty being defined by specific ratios and proportions.

vii. Music is filled with patterns. The joy of making music lies in creating innumerable permutations and combinations of patterns by grouping notes, sounds, and beats. Tempo determines how notes can be combined and fitted into specific rhythm cycles in multiple variations. Music is an extremely useful way to understand fractions since it uses full notes, half notes, quarter notes, and one-eighth notes which also relate to tempo in terms of *ek gun, dugun, trigun, chaugun*. Improvisation in the classical forms of music require an immense alertness and ability to do mental math. For example, creating note patterns in multiples of 3, 5, or 7 in a 4-beat rhythm can be, both challenging and aesthetically pleasing.

   The way frequencies are chosen in music also involves understanding simple fractions, due to what sounds good and most resonant to the ear. For example, the ratio of frequencies of the top and bottom Sa in a *saptak* is 2:1, and the ratio of frequencies of Pa and Sa is 3:2. There are reasons from Physics (namely, the notion of resonance) as to why particular combinations of notes sound good to the ear, and the notes *(shrutis)* that are used in Indian classical music (and also in music around the world), as explained in *Bharata's Natyashastra,* is based on simple whole number ratios of frequencies.

b. Integrating Mathematics and Sports: Integrating mathematics and Sports can benefit students who enjoy sports and see the relevance of measurement, unit conversion, probability and statistics, scoring systems, and trajectories of thrown objects in the context of sports. Student projects can explore mathematical connections such as in the Fosbury Flop in high jump or the Duckworth Lewis Scoring System in cricket.

c. **Integrating Mathematics and Science.** The appearance of the Virahanka numbers and the golden angle in nature (e.g., in pinecones, sunflowers, daisies, *kaner* and *tulsi* plants) make for an excellent interdisciplinary journey of discovery.

Similarly, other Curricular Areas can also be integrated with Mathematics to understand and see more meaning of Mathematics in daily life.

3.6.2 Assessment in Mathematics

Few key principles for assessment in Mathematics are:

a. Students must be assessed for understanding of concepts and mathematical skills and capacities, such as procedural fluency, computational thinking, problem solving, visualisation, optimisation, representation, and communication.

b. Students must be assessed through a variety of ways, e.g., solving a variety of problems testing procedural knowledge and conceptual understanding in key mathematical concepts, geometric reasoning, algebraic thinking, word problems, and working in groups to solve mathematical problems.

c. Open book assessments can go a long way towards reducing anxiety in students. Examinations could provide 'fact sheets' consisting of information, such as formulae, and definitions, so that students need not memorise them but use them in actual problem solving.

A few Teacher Voices illustrate assessment in Mathematics below.

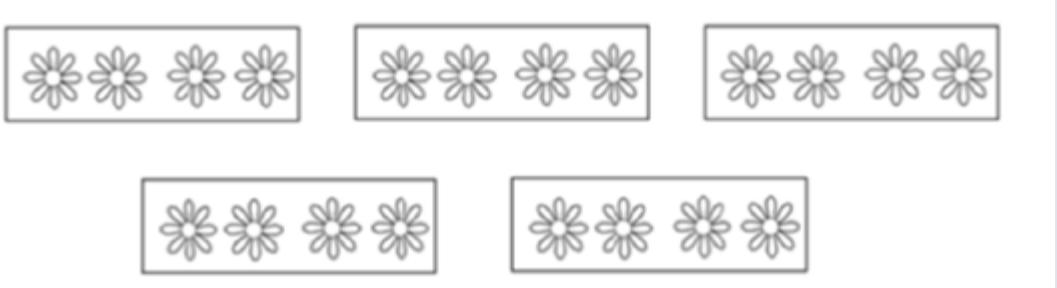
Teacher's Voice 3.6i

Multiplication as Repeated Addition

I teach Grade 4. I wanted to assess my students' understanding of multiplication as repeated addition and its application in daily life.

The question below is directly related to their conceptual understanding of multiplication as repeated addition and the ability to apply that understanding in a new situation. I preferred this to just asking them to solve questions from the textbook using vertical and horizontal multiplication.

Given below are groups of flowers. Which of the following shows the **fastest way** to find out the **total number** of flowers in the given picture?



A. 4 + 5

B. 4 + 4 + 4+ 4 + 4

C. 3 + 2

D. **5 x 4**

E. 4 x 5

I used the following marking scheme:

Marking Scheme	
Option A	*0 point*
Option B	*1 point*
Option C	*0 point*
Option D	*2 points*
Option E	*0.5 point*

Teacher's Voice 3.6ii

Percentages

I teach Grade 7. I wanted to assess my students' ability to use the understanding of percentages in solving real-life contextual word problems. Students can solve routine problems from their textbooks, but tend to stumble when they need to comprehend a word problem by themselves and use the appropriate procedure to solve it. This is what I tried.

Q: A cricket team played 20 matches in a tournament. If they lost 25% of the matches and won all the remaining matches, how many matches did the team lose?

a. 2 matches

b. 4 matches

c. 5 matches

d. 10 matches

Once the class solved this problem, I also asked my students to frame a problem on percentages where the answer would be 10 matches. Each student came up with a different word problem! This was a real test of their mathematical capacities.

Teacher's Voice 3.6iii

Multiple Methods

I teach Grade 9. I find that my students usually solve mathematical problems using only one method. They rarely use a combination of methods to arrive at a solution. This is an important capacity in Mathematics as it helps in discerning when to use which method.

So, I gave my students a problem and asked them to use at least 3 different ways of solving it. This was the problem:

There are 48 students in Grade 8 in a school. If the number of girls is three times the number of boys, then how many girls and boys are there in that class?

Solve this question using at least 3 different methods: Algebraic method, Ratio method, Section method, using patterns, or any other method.

Since students may attempt this in very many ways, I also gave them these solved answers to self-assess their work after they worked out their methods.

Correct Answer 1: Algebraic Method (1) Step 1: Number of boys = x Step 2: Number of girls = 3x Step 3: 3x + x = 48 Step 4: 4x = 48 Step 5: X = 12 Step 6: Number of boys = 12 Step 7: Number of girls = 36
Correct Answer 2: Algebraic Method (2) Step 1: Number of girls = x Step 2: Number of boys = x/3 Step 3: X + (x/3) = 48 Step 4: (4x/3) = 48 Step 5: X = 36 Step 6: Y = 12 Step 7: Number of girls = 36 Step 8: Number of boys = 12
Correct Answer 3: Using ratios Step 1: The ratio of the number of girls to the number of boys is 3: 1. Step 2: 3x + x = 48 Step 3: 4x = 48 Step 4: X = 12 Step 5: Number of boys = 12 Step 6: Number of girls = 36
Correct Answer 4: Using Section Method Step 1: Girl's section = 3/4 Step 2: Number of girls = 3/4 (48) Step 3:(3 x 48)/4 Step 4: 3 x 12 = 36 Step 5: Number of boys = 1/4 (48) = 12 or number of boys 48 - 36= 12 Step 6: Number of girls = 36

Correct Answer 5: Solving using the pattern.

Boys and Girls

1	3
2	6
4	12
8	24
12	36

Number of girls = 36

Number of boys = 12

And any pattern from which the correct answer can be drawn.

Turn around and solve questions like:

36 + 12 = 48 And write 36 = 3 x 12

So, the number of girls = 36 and the number of boys = 12.

Correct Answer 6: Using equations

Step 1: Number of girls = x

Step 2: Number of boys = y

Step 3: X + y = 48

Step 4: X = 3y

Step 5: 3y + y = 48

Step 6: 4y = 48

Step 7: Y = 12

Step 8: X= 36

Step 9: Number of boys = 12

Step 10: Number of girls = 36

Chapter 4

Science Education

Science is the study of the natural and physical world around us through a systematic process of observing, questioning, forming hypotheses, testing hypotheses through experiment, analysing evidence, and thereby continuously revising our knowledge.

The process of Science is not something that only scientists do in laboratories alone. It also develops an important set of capacities (and dispositions) essential for leading a rational and fulfilling lives. These capacities (and dispositions) help us make informed and good decisions that benefit us and our communities.

Learning Science enables us to gain valid knowledge about the world as well as acquire scientific values, capacities, and dispositions, such as curiosity, creativity, evidence-based thinking, and sound decision-making.

As a subject in schools, Science draws significantly from the disciplines of Biology, Chemistry, Physics, Earth Sciences, as well as from Mathematics, Computational Sciences, and, where relevant, from Social Science and Vocational Education, in order to provide an interdisciplinary understanding and appreciation of the role of Science in everyday life.



Good education in Science, including the development of a mindset of inquiry and research in students, is critical in addressing the challenges that India and the world face today, such as climate change, improving healthcare, technological advancement and use for sustainable development, creation of just and equitable livelihoods, and living in harmony with nature. Therefore, ensuring high quality education in Science, and its relationship with other subjects such as Social Science and Vocational Education forms a key focus of this NCF. This would help students to gain an understanding of how science and scientific research can address the central challenges faced by our society.

Children must start learning the process of science and the basics of the scientific method starting in the Foundational Stage itself. In the Preparatory Stage, they gain further experience in the process of Science and the scientific method through observing patterns and relationships in their natural environment and conducting simple hands-on experiments.

Science is introduced as a separate Curricular Area only in the Middle Stage. In this Stage, the approach integrates the disciplines of Biology, Chemistry, and Physics. This integrated approach continues in the first two years of the Secondary Stage (Grades 9 and 10). In the final two years of the Secondary Stage (Grades 11 and 12), a disciplinary approach is taken, with Physics, Chemistry, Biology, and Earth Science being offered separately. Students thereby get the opportunity to choose and understand the nature of one or more of these disciplines more deeply and develop competencies specific to each. As in the case of other Curricular Areas, Grades 11 and 12 are not dealt with in this chapter, but in *Part B, Chapter 10.*

Section 4.1
Aims

Science aims to develop an understanding of the natural and physical world through systematic inquiry. Learning Science also builds important capacities such as observation, analysis, and inference. This in turn enables the meaningful participation of individuals in society and the world of work with scientific temper, critical and evidence-based thinking, asking relevant questions, analysing practices and norms, and acting for necessary change.

Science Education aims to achieve:

a. **Scientific understanding of the natural and physical world.** Scientific understanding develops through specific observations, questions, experiments, theories, laws, principles, and concepts. An adequate knowledge of these is essential to build a systematic and verifiable understanding of the way the natural and physical world functions. In Science Education, students must thus learn the fundamental methods, concepts, and theories on which Science rests.

b. **Capacities for scientific inquiry.** The abilities to put forth hypotheses, arguments, predictions, and analyses, and to test hypotheses, evaluate situations, and draw logical conclusions, are fundamental to the learning of Science. Science Education must thus build these skills in students systematically over the Stages in school.

c. **Understanding the evolution of scientific knowledge.** There are crucial historical moments in the development of Science and scientific knowledge that could not have occurred without the efforts of various individuals and organisations over thousands of years. Understanding these key moments and discoveries will develop students' understanding of how scientific knowledge and the methods of science evolved and still evolve over time.

d. **Interdisciplinary understanding between Science and other curricular areas.** Learning in Science involves understanding interlinkages across disciplines. Concepts, principles, laws, and theories cannot be viewed as isolated, but instead they together contribute to a holistic understanding of the world. Students would learn to inquire and learn about the world through such an interdisciplinary approach.

e. **Understanding of the relationship between Science, Technology, and Society.** The contribution of Science to Society and how different societal needs led to the generation of scientific knowledge is also an important part of learning Science. Engaging with issues related to connections between Science, Technology, and Society, including the ethical aspects and implications, and appreciating the role Science plays in addressing the challenges and the world is undergoing, will add to the breadth of students' learning.

f. **Scientific temper.** Developing the capacities for critical and evidence-based thinking and freedom from fear and prejudice is central to the learning of Science. Students will imbibe scientific values and dispositions such as honesty, integrity, scepticism, objectivity, tenacity, perseverance, collaboration and cooperation, concern for life, and preservation of the environment.

g. **Creativity.** Asking good questions, observing patterns in the world around us, formulating plausible hypotheses given those patterns, and designing good experiments to test those hypotheses often requires artistry and creativity. Developing such creativity and a sense of aesthetics in the pursuit of scientific understanding and exploration is another very important but oft-ignored aim of Science Education.

Section 4.2
Nature of Knowledge

Science is an organised system of knowledge, that evolves as a result of curiosity followed by inquiry, logical reasoning, experimentation, and the examination of empirical evidence. It enables an understanding of the physical and natural environments and phenomena, the identification of meaningful patterns and relations including causes and effects, and supports the development of models, theories, laws, and principles.

a. Science is fundamentally a creative endeavour. Science involves imagining new ideas and concepts to understand the world. Creative imagination is required to engage with the concepts of Science — e.g., natural selection to explain diversity (theory of evolution), planetary models to represent the motion of planets, and atomic theory to envision the microscopic world beyond our capacity for observation. Asking questions, formulating hypotheses, designing experiments and making models all require creativity.

b. **Science provides the methods and tools necessary to explore and understand the world.** These methods and tools lead to explanations supported by empirical evidence that can be tested in a variety of diverse real-life situations against rigorous criteria (observation, rational argument, inference, replicability).

c. **Scientific knowledge keeps evolving and this is reflected in its history.** Scientific knowledge is very reliable but also subject to change when presented with new evidence or with a re-conceptualisation of prior evidence and knowledge. Science, therefore, develops an appreciation for change as well as for the rigorous process through which scientific knowledge evolves.

Section 4.3
Current Challenges

A major challenge related to Science in the school curriculum is the focus on facts and definitions, often with a neglect for the development of conceptual understanding and the capacities for scientific inquiry.

a. Science teaching-learning has traditionally been based mostly on the textbook, with a **focus on facts and definitions.** One reason for this is the curricular load, which reduces the time available for exploration and discussion. The development of conceptual understanding and capacities requires time which is currently missing due to the high content load. This challenge only increases as students move to higher grades — the demand on them increases as the curricular load becomes even greater. The need for abstract thinking also increases. It is critical that the students develop the capacities to be able to make the progression. However, the current focus on facts does not build these capacities adequately.

b. The content to be included in the curriculum is often determined by the content and demands of entrance examinations for higher education. This is not sound logic. Science content in school should be determined by the Aims of School Education and what all students should aim to learn in Science. Meanwhile, higher education entrance examinations (or other methods) must change to being competency-based rather than rote-based and 'fact recounting'.

   Content of Science syllabus must not assume that all students will pursue Science in Higher Education, as some syllabi seem to, today.

c. Another challenge is the **disconnect between the school curriculum and what students observe and experience outside school.** Students come to school with their own theories about the world. These theories develop as they observe the world around them and seek explanations for what they see. Often, these theories may conflict with what is being discussed in the classroom; common intuition and scientific theories at times may not match. Illustratively, through mere perception, it is very hard to think that the Earth is not flat.

d. While a lack of **infrastructure** is common across Curricular Areas, learning Science especially requires access to apparatus, equipment, and laboratories. Unfortunately, this remains a neglected need. Low-cost, easily available materials are also not used, since

Teachers often lack the capacity to develop such local, low-cost teaching-learning materials. At the Secondary Stage, access to a laboratory is non-negotiable — students must be able to assemble and manipulate apparatus, use materials, and design simple experiments to truly develop important competencies related to Science.

Section 4.4
Learning Standards

4.4.1 Curricular Goals and Competencies

This section lays out the Learning Standards (Curricular Goals and Competencies) for Science as an integrated Curricular Area.

In the Middle Stage and Grades 9 and 10 of the Secondary Stage, Science is taught using integrated approach. This integrated approach develops fundamental capacities related to the disciplines of Biology, Chemistry, Physics, and Earth Science while the use of connections across them helps students appreciate the interrelations between these subjects and make sense of their observations and experiences.

At all Stages, along with conceptual understanding, the capacities of scientific inquiry are developed as age appropriate. These concepts and capacities are chosen both from a disciplinary perspective and in terms of what is useful and necessary in their everyday lives. Students thereby understand the world around them with increasing depth, explore scientific questions at different levels through discussion and experimentation, and learn to communicate this understanding in different ways.

It is important to note that the Curricular Goals are interdependent, and not separate curricular pieces of study. For example, the Curricular Goals CG-1 (explore matter) and CG-6 (how to do Science) given in the Middle Stage would need to happen together, say through a project, for a student to attain both Goals.

4.4.1.1 Middle Stage

CG-1 Explores the world of matter and its constituents, properties, and behaviour	C-1.1 Classifies matter based on observable physical (solid, liquid, gas, shape, volume, density, transparent, opaque, translucent, magnetic, non-magnetic, conducting, non-conducting) and chemical (pure, impure; acid, base; metal, non-metal; element, compound) characteristics C-1.2 Describes changes in matter (physical and chemical) and uses particulate nature to represent the properties of matter and the changes C-1.3 Explains the importance of measurement and measures physical properties of matter (such as volume, weight, temperature, density) in indigenous, non-standard and standard units using simple instruments C-1.4 Observes and explains the phenomena caused due to differences in pressure, temperature, and density (e.g., breathing, sinking-floating, water pumps in homes, cooling of things, formation of winds)
CG-2 Explores the physical world in scientific and mathematical terms	C-2.1 Describes one-dimensional motion (uniform, non-uniform, horizontal, vertical) using physical measurements (position, speed, and changes in speed) through mathematical and diagrammatic representations C-2.2 Describes how electricity works through manipulating different elements in simple circuits and demonstrates the heating and magnetic effects of electricity C-2.3 Describes the properties of a magnet (natural and artificial; Earth as a magnet) C-2.4 Demonstrates rectilinear propagation of light from different sources (natural, artificial, reflecting surfaces), verifies the laws of reflection through manipulation of light sources and objects and the use of apparatus and artefacts (such as plane and curved mirrors, pinhole camera, kaleidoscope, periscope) C-2.5 Observes and identifies celestial objects (stars, planets, natural and artificial satellites, constellations, comets) in the night sky using a simple telescope and images/ photographs, and explains their role in navigation, calendars, and other phenomena (phases of the moon, eclipse, life on earth)

CG-3 Explores the living world in scientific terms	C-3.1 Describes the diversity of living things observed in the natural surroundings (insects, earthworms, snails, birds, mammals, reptiles, spiders, diverse plants, and fungi), including at a smaller scale (microscopic organisms) C-3.2 Distinguishes the characteristics of living organisms (need for nutrition, growth and development, need for respiration, response to stimuli, reproduction, excretion, cellular organisation) from non-living things C-3.3 Analyses patterns of relationships between living organisms and their environments in terms of dependence on and response to each other C-3.4 Explains the conditions suitable for sustaining life on Earth and other planets (atmosphere; suitable temperature-pressure, light; properties of water)
CG-4 Understands the components of health, hygiene, and well-being	C-4.1 Undertakes a nutrition-based analysis of food components with special reference to Indian culinary practices and modern understanding of nutrition, and explains the effect of nutrition on health C-4.2 Examines different dimensions of diversity of food — sources, nutrients, climatic conditions, diets C-4.3 Describes biological changes (growth, hormonal) during adolescence, and measures to ensure overall well-being C-4.4 Recognises and discusses substance abuse, viewing school as a safe space to raise these concerns
CG-5 Understands the interface of Science, Technology, and Society	C-5.1 Illustrates how Science and Technology can help to improve the quality of human life (health care, communication, transportation, food security, mitigation of climate change, judicious consumption of resources, applications of artificial satellites) as well as some of the harmful uses of science in history C-5.2 Shares views on news and articles related to the impact that Science/Technology and society have on each other

CG-6 Explores the nature and processes of Science through engaging with the evolution of scientific knowledge and conducting scientific inquiry	C-6.1 Illustrates how scientific knowledge and ideas have changed over time (description of motion of objects and planets, spontaneous generation of life, number of planets) and identifies the scientific values that are inherent and common across the evolution of scientific knowledge (scientific temper, Science as a collective endeavour, conserving biodiversity and ecosystems) C-6.2 Formulates questions using scientific terminology (to identify possible causes for an event, patterns, or behaviour of objects) and collects data as evidence (through observation of the natural environment, design of simple experiments, or use of simple scientific instruments)
CG-7 Communicates questions, observations, and conclusions related to Science	C-7.1 Uses scientific vocabulary to communicate Science accurately in oral and written form, and through visual representation C-7.2 Designs and builds simple models to demonstrate scientific concepts C-7.3 Represents real world events and relationships through diagrams and simple mathematical representations
CG-8 Understands and appreciates the contribution of India through history and the present times to the overall field of Science, including the disciplines that constitute it	C-8.1 Knows and explains the significant contributions of India to all matters (concepts, explanations, methods) that are studied within the curriculum in an integrated manner
CG-9 Develops awareness of the most current discoveries, ideas, and frontiers in all areas of scientific knowledge in order to appreciate that Science is ever evolving and that there are still many unanswered questions	C-9.1 States concepts that represent the most current understanding of the matter being studied — ranging from mere familiarity to conceptual understanding of the matter as appropriate to the developmental stage of the students C-9.2 States questions related to matters in the curriculum for which current scientific understanding is well-recognised to be inadequate

4.4.1.2 Secondary Stage

CG-1 Explores the world of matter, its interactions, and properties at the atomic level	C-1.1 Describes classification of elements in the Periodic Table, and explains how compounds (including carbon compounds) are formed based on atomic structure (Bohr's model) and properties (valency) C-1.2 Investigates the nature and properties of chemical substances (distillation, crystallisation, chromatography, centrifugation, types and properties of mixtures, solutions, colloids, and suspensions) C-1.3 Describes and represents chemical interactions and changes using symbols and chemical equations (acid and base, metal, and non-metal, reversible, and irreversible)
CG-2 Explores the physical world around them, and understands scientific principles and laws based on observations and analysis	C-2.1 Applies Newton's laws to explain the effect of forces (change in state of motion — displacement and direction, velocity and acceleration, uniform circular motion, acceleration due to gravity) and analyses graphical and mathematical representations of motion in one dimension C-2.2 Explains the relationship between mass and weight using universal law of gravitation and connect it to laws of motion C-2.3 Manipulates the position of object and properties of lenses (focus, centre of curvature) to observe image characteristics and correspondence with a ray diagram, and extends this understanding to a combination of lenses (telescope, microscope) C-2.4 Manipulates and analyses different characteristics of the circuit (current, voltage, resistance) and mathematises their relationship (Ohm's law), and applies it to everyday usage (electricity bill, short circuit, safety measures) C-2.5 Defines work in scientific terms, and represents the relationship between potential and kinetic energy (conservation of energy) in mathematical expressions C-2.6 Demonstrates the principle of mechanical advantage by constructing simple machines (system of levers and pulleys) C-2.7 Describes the origin and properties of sound (wavelength, frequency, amplitude) and differences in what we hear as it propagates through different instruments

CG-3 Explores the structure and function of the living world at the cellular level	C-3.1 Explains the role of cellular components (nucleus, mitochondria, endoplasmic reticulum, vacuoles, chloroplast, cell wall), including the semi-permeability of cell membrane in making cell the structural basis of living organisms and functional basis of life processes C-3.2 Analyses similarities and differences in the life processes involved in nutrition (photosynthesis in plants; absorption of nutrients in fungi; digestion in animals), transport (transport of water in plants; circulation in animals), exchange of materials (respiration and excretion), and reproduction C-3.3 Describes mechanisms of heredity (in terms of DNA, genes, chromosomes) and variation (as changes in the sequence of DNA)
CG-4 Explores interconnectedness between organisms and their environment	C-4.1 Applies the knowledge of cellular diversity in organisms along with the ecological role organisms play (autotrophic/ heterotrophic nutrition) to classify them into five-kingdoms C-4.2 Illustrates different levels of organisations of living organisms (from molecules to organisms) C-4.3 Analyses different levels of biological organisation from organisms to ecosystems and biomes along with interactions that take place at each level C-4.4 Analyses patterns of inheritance of traits in terms of Mendel's laws and its consequences at a population level (using models and/or simulations) C-4.5 Analyses evidences of biological evolution demonstrating the consequences of the process of natural selection in terms of changes — in allele frequency in population, structure, and function of organisms
CG-5 Draws linkages between scientific knowledge and knowledge across other curricular areas	C-5.1 Explores how literature and the arts have influenced Science C-5.2 Examines a case study related to the use of Science in human life from the perspective of Social Sciences and ethics (e.g., Marie Curie, Jenner, treatment of patients with mental illness, the story of the atomic bomb, green revolution and GMOs, conservation of biodiversity) C-5.3 Applies scientific principles to explain phenomena in other subjects (sound pitch, octave, and amplitude in music; use of muscles in dance form and sports)

CG-6 Understands and appreciates the contribution of India through history and the present times to the overall field of Science, including the disciplines that constitute it	C-6.1 Knows and explains the significant contributions of India to all matters (concepts, explanations, methods) that are studied within the curriculum in an integrated manner
CG-7 Develops awareness of the most current discoveries, ideas, and frontiers in all areas of scientific knowledge in order to appreciate that Science is ever evolving, and that there are still many unanswered questions	C-7.1 States concepts that represent the most current understanding of the matter being studied — ranging from mere familiarity to conceptual understanding of the matter as appropriate to the developmental stage of the students C-7.2 States questions related to matters in the curriculum for which current scientific understanding is well-recognised to be inadequate
CG-8 Explores the nature of Science by doing Science	C-8.1 Develops accurate and appropriate models (including geometric, mathematical, graphical) to represent real-life events and phenomena using scientific principles and use these models to manipulate variables and predict results C-8.2 Designs and implements a plan for scientific inquiry (formulates hypotheses, makes predictions, identifies variables, accurately uses scientific instruments, represents data — primary and secondary — in multiple modes, draws inferences based on data and understanding of scientific concepts, theories, laws, and principles, communicates findings using scientific terminology)

4.4.2 Essential Concepts

There is a general agreement that the processes of Science are equally important to learn as the concepts. But usually, this does not seem to get translated into our classrooms. There is a tendency to treat Science as merely a 'bunch of facts'. This approach assumes that there are certain concepts, theories, facts, and information that students must know, and once acquired, they have knowledge of Science. However, the knowledge base of Science known today is vast and continues to grow at an unprecedented rate. This implies that no matter how many 'facts of Science' we learn, it will never be enough.

The question that this throws up is — what are the essential concepts that students must learn in Science at the school level?

Even though it would be clear that this is not complete 'knowledge of Science', this 'essential set' could be decided based on the following criteria:

a. It provides adequate knowledge of the world for that age group.
b. It provides the base and platform for further learning of scientific ideas.
c. It provides adequate 'material' for developing the capacities and values related to Science Education.
d. It provides sufficient scope for inquiry and development of capacities for scientific inquiry.

In addition, whatever concepts are chosen, they should be interesting, challenging, and intelligible for young minds.

At the same time, students must develop capacities for scientific inquiry and the ability to communicate scientific questions and ideas aligned with each Stage. These are addressed in the Curricular Goals and Competencies for both the Middle and Secondary Stages.

The Learning Standards must make a judicious choice of content on the basis of these principles to reduce the 'content load' on the students.

4.4.2.1 Middle Stage

Curricular Goals at the Middle Stage are based on the concrete experiences of students. They are based on how the Science curriculum can respond to the following questions:

a. What do students see around them?
b. What are the common observations they make?
c. What are the aspects of Science and Technology that are part of their daily lives?
d. What are their immediate concerns related to their own selves?
e. How can they start making sense of multiple aspects of their environment — How can they start learning to abstract 'Science' as the explanation of their observations and experiences?
f. How do students learn best? What capacities enable them to learn at this Stage?
g. What are the scientific values and dispositions that must be developed at this Stage?

Essential concepts selected on the basis of these questions include those that can build on students' observations of their immediate environment and help them find scientific explanations (e.g., characteristics of matter, changes in matter, diversity of living things, magnets, path of light and how it changes as it reflects from different surfaces). They are intended to enable the students to see differences and relationships between different parts of their environment (e.g., characteristics of living and non-living things, relationship between living organisms and their environment). They are related to aspects of their daily life that are of immediate interest and concern (e.g., nutrition-based analysis of food, substance abuse, the role of Science and Technology in improving their lives).

These concepts will provide a base for interested students to explore other scientific concepts and take up hobbies related to Science. Further, the concepts selected help students engage with the nature and processes of Science and develop scientific values and dispositions (including through examining the lives and works of scientists, and the development of scientific knowledge) that will enable them to take decisions in their daily lives as well as participate in larger society.

4.4.2.2 Secondary Stage

Curricular Goals at the Secondary Stage move from the concrete nature of the Middle Stage towards abstraction - from perceptual and practical concepts to theoretical concepts. This abstraction could be in the nature of exploring what cannot be seen or in terms of more abstract representations (e.g., using a circuit diagram instead of drawing the components of a circuit). They help students extend their understanding with increasing complexity and abstraction. The effort is to continue with the concepts discussed in the Middle Stage; a few new concepts are also introduced. The questions the curriculum must respond to at this Stage are:

a. Is there something happening around us that we cannot directly observe?

b. Why do events and phenomena repeat themselves? What are the general principles that govern the world?

c. What are the reasons for the diversity around us?

d. What is the role of Science and Technology in Society?

e. What is the contribution of India to scientific knowledge?

f. How can Science be applied in other areas?

g. What are the connections between other areas and Science?

h. How should Science be practised?

i. What are the scientific values and dispositions that must be developed at this Stage?

At this Stage, essential concepts selected on the basis of these questions include those that help students develop foundations of key ideas in Science that have wider application (e.g., origin, properties and propagation of sound introduce students to the idea of waves) and help students explain processes and materials around them in scientific terms (e.g., nature and properties of chemical substances used in daily life, work and energy). At this Stage, students must begin to engage with what they cannot 'see' to provide explanations for what they can observe (e.g., atomic structure and valency, cellular processes) and be able to represent the world in scientific terms, draw inferences, and make predictions (e.g., representation of simple chemical interactions and changes). They must be able to see scientific patterns and relationships (e.g., Periodic Table, classification of living organisms) and formalise their observations and understanding in the form of generalisation and mathematisation (e.g., Newton's laws, Mendel's laws of inheritance, natural selection and evolution). They must be able to identify and manipulate variables to develop causal relationships (e.g., manipulation of object and lenses and image characteristics).

Students must develop an interdisciplinary understanding of Science, and its linkages with other curricular areas, as well as the connection between Science, Technology and Society (e.g., how literature and art have influenced Science). Students must also understand the contribution of India to the world's scientific knowledge (e.g., indigenous practices related to health and medicine).

Students must also be enabled to conduct scientific inquiry independently and connect their findings to their understanding of scientific concepts, laws, and principles, as well as communicate their findings in different modes with accuracy and creativity.

Section 4.5
Content

The approach, principles, and methods of selecting content have commonalities across subjects - those have been discussed in Part A, Chapter 3, §3.2 of this document. This section focusses only on what is most essential to education of Science in schools. Hence, it will be useful to read this section along with the above-mentioned section.

Concepts by themselves are abstract. They need to be presented to students through content that helps them connect the concept with their previous knowledge as well as with their observations and experiences in the real world. For example, simply stating the rectilinear propagation of light is insufficient. This concept must be demonstrated to students, or they should be able to conclude that light travels in a straight line through observation or manipulation. Without suitable content, we reduce Science to mere facts. To extend the example of rectilinear propagation of light, students can observe this through the formation of shadows, or the simple manipulation of cardboard sheets with small holes in front of a candle, or using a pinhole camera/periscope made in the classroom. Thus, content is extremely important and must be selected carefully.

With the above in mind, the principles for content selection are:

a. Content should be connected to the students' lives and surroundings to the maximum possible extent.

A student in Andaman and Nicobar Islands and a student in Jharkhand will observe different kinds of plants and animals around them. But they should also understand the role of environmental factors. This generalisation will require them to understand environments they may not have experienced as well as some abstract ideas (e.g., temperature, precipitation).

Light and its use is also all around us — we use mirrors, we see rainbows, we see the sun, and other sources of light. Light reflects off different surfaces in different ways. When we see objects in water, they get distorted. The content must encourage students to question and inquire about these phenomena, which will lead them to explore scientific ideas related to light. Thus, they will engage with a critical area that shows the progression of concepts (from the representation of the behaviour of light through a simple ray diagram in the Middle Stage to the representation of the behaviour of plane waves in the Secondary Stage) as well as the advances in Science and Technology (from the use of lenses and mirrors, to optic fibres in telescopes).

b. Content should enable scientific inquiry for the progression of concepts across Stages.

For example, in the earlier Stages, students explore ideas of floating and sinking by making simple observations of different objects and making inferences about common properties. In the Middle Stage, students identify and measure the physical properties and determine the mathematical relationship between physical properties (e.g., relationship between mass, volume, and density and how this relates to floatation). They understand the concepts and represent diagrammatically the states of float and sink. They measure displacement of liquid and relate it to density. They may design simple experimental designs (e.g., clay boats of

different shapes, weight) using instruments for measurement (measuring jar and overflow jar). Given data about the density of liquids, they make predictions about the state of float and sink of objects in them (relative density). They communicate their inferences in different modes (oral, mathematical, diagrammatic, in words). Thus, from verifying similar properties at earlier Stages, they progress to making quantitative predictions and measurements to arrive at theories about floatation. At the Secondary Stage, they can arrive at the conclusion that the density of water is 1 and they engage with the idea of buoyancy through quantitative measurements.

In this approach, students are active participants in the learning process as opposed to passive receivers of information.

c. Content should allow a comprehensive assessment of capacities of scientific inquiry at each Stage.

Content must be chosen to allow students to use the range of capacities in an observable manner so that Teachers can assess these capacities explicitly. This is aligned with the approach of defining competencies related to capacities of scientific inquiry under separate goals. Student achievement related to these capacities should be recorded explicitly.

This means making a choice between the presentation of a concept versus ensuring students 'do' something to attain the understanding of the concept. On the other hand, content can offer tasks (e.g., activity, experiment, writing task) that are observable and provide scope for interpretation and understanding by students. For example, the effect on the time period of the pendulum on changing the length of the thread and mass of a simple pendulum can be discussed through a description and presentation on the blackboard/textbook. On the other hand, students can make simple pendulums using different, easily available materials and record their observations. Their conclusion may not be entirely perfect compared to a well-designed pendulum, but they can draw inferences, which lead to constructing theory (e.g., the relationship between mass and length of thread and time period). The content selected changes from 'time period of a simple pendulum' to 'investigating factors affecting the time period of a simple pendulum'.

Content of this nature enables self-reflection. If the experiment is not proceeding well (e.g., the bob swings wildly), the student must examine what needs to be done. This is relevant for each Stage and ensures the progression of the attainment of the capacities of scientific inquiry across Stages. This also enables students to take up collaborative as well as independent study.

d. Content should enable an adequate sense of achievement at each Stage. While concepts become complex across Stages, milestones can be defined for subsidiary concepts that are complete and whole.

For example, we introduce students to plane mirrors, then spherical mirrors, and then lenses and system of lenses. They build a progressive understanding of reflection and image characteristics at each Stage in a complete manner.

Similarly, in the Preparatory and early Middle Stage, observing the diversity of living organisms and classifying them based on the observable characteristics allows students to make sense of the living world around them. In the later part of the Middle Stage and the

Secondary Stage, when microscopes are introduced, they make observations of living organisms and their cellular organisation which allows the students to re-classify or comprehend other ways of classifying the organisms based on the nature of their cellular organisation such as the five-kingdom system. At each Stage, different scales of complexities of living organisms are observed and understood. Thus, at each Stage, the criteria for classification are valid while providing scope for expanding these criteria with newer concepts.

e. Content should provide opportunities for students to engage in extended durations of inquiry.

Content should lead to extended, long-term inquiry beyond the classroom engagement. This can be in the form of long-term projects such as documenting the cycle of food production over a season. It can also be a recording of simple observations over a period of a month or so to understand a concept better, such as drawing the phases of the moon on a classroom calendar. Or it can be a short observation, such as fermentation by yeast to make a bread. Students could monitor the life cycle of mosquitoes, butterflies, or moths; they could also grow fruit flies to observe organisms around them. This encourages students to go into the depth and breadth of a concept. It also connects concepts to real life situations.

f. Content should cater to the diverse needs of students.

The content should cover a range of concepts that are interesting for all students. They must have opportunities to engage with the concept in different ways. For example, if a student is struggling to represent a concept in mathematical terms, they can start with representation through a simple working model, diagram, or verbal description and progress from there.

Students with disabilities should be included in the process of learning as far as possible. In this context, a range of materials and technology (simulation, audio-video resources) is necessary. For example, a force diagram can be made using tactile materials and detailed descriptions of the force diagram can be made available.

g. Content must develop the ability to use the language of Science.

Communicating scientific ideas is critical — for this, both representation of the world as well as the development of a scientific vocabulary are critical. While the development of the scientific vocabulary progresses as engagement with scientific ideas increases, content must enable representation of natural phenomenon — from simple diagrammatic representations (evaporation, solar system, structure of plants) to more complex representations (atomic structure, structure of the cell) and abstractions that make understanding easy (forces acting on a body) to mathematical representations (laws of motion, vectors).

h. Content should prepare students to engage with life as responsible members of the community.

Science Education at the school level should enable the students to use available scientific evidence to make decisions and choices of their everyday lives, such as decisions to vaccinate oneself, make healthier eating choices, examine media claims critically, or contribute to an inclusive society by critically examining one's beliefs, and so on.

i. Content should enable students to examine and practise scientific values and other human values.

Content must also demonstrate scientific values (integrity, honesty, transparency, pluralism, objectivity acceptance of uncertainty) and enable processes of rational thinking that will help the individual take a position on societal issues.

For example, examining how the geocentric conceptualisation of the universe shifted to the heliocentric conceptualisation (established beliefs) and observations of the orbit of Pluto eventually led to it being classified as a dwarf planet (Middle Stage and Grades 9 and 10). The journey of these scientific ideas reflects the changing nature of scientific theories and the tenacity of scientists.

Also, studying heredity, evolution, and biological diversity can lend itself to an examination of how long-held beliefs were challenged by Science based on evidence — e.g., the superiority of humans (anthropocentricism) or assumptions regarding the notion of 'races' and their 'superiority' — leading to an understanding of how every life matters for the symbiotic existence of every other life and of the similarity of the origins and beginning of life despite later diversity of physical characteristics.

j. Content must enable integration across and within curricular areas.

Learning about Science can be enhanced through integration with other curricular areas. For example, playing with different musical instruments allows students to understand frequency and amplitude. Games allow students to develop concepts related to motion; examining play on the moon helps them engage with concepts of gravity and force. The use of muscles while playing, stretching, is related to both science physical education, e.g., in understanding which muscles are used for different purposes and what each muscle's use is in the body.

Section 4.6
Pedagogy and Assessment

The approach, principles, and methods of pedagogy and assessment have commonalities across subjects — those have been discussed in **Part A, Chapter 3, §3.3 and §3.4** of this document. This section focusses only on what is essential for Science Education in schools. Hence, it will be useful to read this section along with the above-mentioned section.

4.6.1 Pedagogy for Science

Learning Science involves not just learning theories and facts of Science, but also making connections between conceptual learning and real life, acquiring the capacities of scientific inquiry, and most importantly, applying these to understanding the world.

Students like to explore the world around them and understand why and how things happen. In this process of exploration, they use trial-and-error methods to test their hypotheses and reach possible conclusions. This exploration need not take place individually - students learn Science best through engaging with peers and adults.

Students have theories about why things happen, patterns they see around them, and about cause-and-effect relationships. As they learn about Science in a more formal set-up, these ideas get tested. Some concepts fit into the students' current understanding, while others require a shift in thinking. If there is an alignment between current ideas and what is discussed in classrooms, ideas get strengthened.

At the same time, some concepts do not fit into the students' current thinking. If not addressed, they can turn into alternative conceptions. For example, heavy objects fall faster, plants are non-living because they don't move, or heavy/ big objects always sink in water. If these ideas are not challenged and suitably modified through investigation, they can turn into alternative conceptions which may persist as students move through school.

Apart from these theories, students also bring with them the ability to reason, understand, and explain relationships between cause and effect. These capacities serve as the basis for developing scientific reasoning. Opportunities, therefore, to inquire are important, as opposed to being 'told'.

Scientific values, such as honesty and integrity, also develop through 'doing Science'. For example, while demonstrating an experiment on the boiling point of water, we should write the reading on the thermometer accurately, even if the water is not boiling at 100 degrees.

The role of the Teacher in aligning pedagogy and assessment with how students learn Science is critical. Teachers must build an environment that promotes natural curiosity, encourages questions, gives maximum possible opportunities for hands-on activities, and gives ample space to discuss ideas. Opportunities for students to express their understanding through different modes and formative assessments to track growing understanding are also key to learning Science.

4.6.1.1 Pedagogic Principles

Science pedagogy across stages must be informed by the following principles:

a. Learning Science requires an active engagement of students with the world around them to understand it. Science pedagogy achieves this through:
    i. Simulating the processes of Science such as asking questions, hypothesising, observing, testing, finding evidence, collecting data, analysing, modifying conclusions, communicating, and re-questioning.
    ii. Exposing students to a variety of aspects of learning Science in varied settings — the laboratory, classroom, and field — through approaches such as inquiry, discovery, didactic, hands-on Science.
    iii. Encouraging and sustaining curiosity by providing varied experiences that may challenge students' existing notions and ideas.

b. Learning Science requires communication and sharing of ideas and observations. Science pedagogy achieves this through:
    i. Using scientific vocabulary during instruction and creating a variety of contexts and situations for students to communicate their understanding, ideas, and observations.
    ii. Peer and collaborative learning.

c. Learning Science requires a gradual increase in the capacity to engage with complex and abstract ideas, aligned with the cognitive and procedural capacities of students. Science pedagogy achieves this by building on students' existing knowledge and using multiple representations (mathematical, graphical, diagrammatic, and models).

d. Learning Science requires making linkages between knowledge for the holistic and multidisciplinary learning emphasised in NEP 2020. Science pedagogy achieves this through:

   i. Connecting scientific knowledge inside and outside the classroom.

   ii. Horizontal connections with other curricular areas.

e. Learning Science enables the development of certain values, such as collaboration, sensitivity, empathy, equality of opportunities, respect for diversity, and other values mentioned in NEP 2020. Science pedagogy must facilitate this process.

4.6.1.2 Recommended Pedagogical Approaches and Settings

The same pedagogical approach can be used across the three settings most suitable for learning Science - the classroom, the field, and the laboratory. This section recommends pedagogical approaches across a variety of settings in detail. The following is a list of considerations based on which Teachers can choose pedagogical approaches and settings:

a. The nature of a concept should guide the decision regarding the approach and setting. For example, speed can be discussed in the playing field, but the structure of a cell requires a microscope.

b. The approach and setting chosen should enable the attainment of learning outcomes and competencies.

c. Each of the recommended approaches and settings must be selected at least once in an academic year, if not more. This will ensure exposure to varied approaches and settings.

d. Even when Teachers choose a didactic approach, areas that students could have potentially inquired about or discovered should be highlighted.

a. Hands-on Science

The most important part of learning Science is actually 'doing Science' through hands-on experiential learning. 'Doing Science' can range from trial and error, using materials around them, or using basic scientific instruments (measuring instruments), and laboratory apparatus. In this process, students gain conceptual understanding and develop capacities through manipulating, designing, and building experiments and demonstrations.

b. Discovery approach

Students explore the natural world following their own interests and discover patterns of how the world works during their explorations. Teachers may also create opportunities or draw attention to natural phenomena that students can explore further. Often, this discovery is followed by other, more structured approaches to ensure learning. For example, the Teacher draws the attention of the students to changes in the length of the shadows as the day progresses or to the venation patterns of the leaves of different plants. Students' observations on shadows are then connected to scientific concepts such as the path of light, and the venation pattern is connected to the shapes of the leaves.

c. Inquiry approach

The inquiry approach allows students to navigate through unknown questions and explore solutions on their own. It allows students to work in the same way as scientists. The inquiry approach engages students with systematic observation, visualising, experimenting, inferring, communicating, and discovering relations. This approach allows Teachers to choose the appropriate type of inquiry with respect to the concept and to scaffold (support as per need) students' learning. For example, students could explore questions such as: How do the image characteristics vary with the relative position between lens and object? How does the surface area of the reactants affect the rate of reaction? How does the intensity of light affect the rate of photosynthesis?

d. Project-centred approach

This approach allows learning within the classroom to continue outside the classroom and extend over a period of time. For example, observing the changes in the moon over a month to understand the phases of the moon. In this process, connections to daily life are also made. The project-centred approach allows students to develop artefacts/products (charts, presentations, speeches) that reflect and communicate their emerging understanding. It also allows the integration of concepts across different curricular areas. For example, visits to the sites of local professional communities and interactions with the people engaged there, such as potters, weavers, craftspersons, farmers, blacksmiths, carpenters, and electricians would enable integrating concepts from vocational education and art with Science.

e. Didactic approach

Often, teaching Science involves communicating certain important information in the form of scientific terms, phenomena, and the historical development of concepts and ideas. In this approach, the Teacher largely regulates the direction and flow of the lesson. For example, after students have discovered changes in the length of the shadows throughout the day, the Teacher can explain the effect of the position of the sun on the length of the shadow and how students can use it to keep track of the time as well.

f. Demonstration

The Teacher demonstrates the working of certain instruments or outcomes of experimental set-ups to draw the attention of the students to relevant concepts. These demonstrations enrich students' learning experiences of the concepts.

These approaches can be implemented in a variety of settings. A combination of the recommended pedagogical approaches and settings is also often needed to be used for teaching a concept.

The box below illustrates a Science class that uses some of these pedagogical approaches within a laboratory setting in the voice of a Teacher.

Teacher's Voice 4.6i

Demonstrating Osmosis in Living Cells

For my Grade 9 students, I planned a demonstration of osmosis in living cells. They already are familiar with the concept in form of daily life examples such as what causes pruning of our fingers if kept in water for long, but in this session, we go a level deeper to observe the process in living cells under the microscope.

We will have a total of 90 minutes to perform this. Hence, I prepare the material such as common salt (NaCl) solution and cut onion pieces and equipment such as glass slides, forceps, and microscopes. Students work in multiple groups. Hence, I prepare as many instruction/observation recording sheets.

On that day, I begin by demonstrating the experiment — I prepare three slides A, B and C, add drops of solution in varying quantity, place coverslip, and then observe under the microscope what is happening to the cells in the onion peel on the slide.

Then all groups repeat this same set of actions and record their observation by drawing on the sheet provided. Post this, we discuss whatever we observed. After the students discuss possible inferences, I introduce the term 'osmosis' to the class, using the concept to explain their observations and share more daily life examples where we see this phenomena — for example, in the process of pickling.

4.6.1.3 Horizontal Connections

a. Horizontal connections with other curricular areas are necessary for the holistic and multidisciplinary learning emphasised in NEP 2020. Some curricular goals and competencies in both the Middle and Secondary Stage are designed to ensure horizontal connections between Science and other curricular areas. At the same time, pedagogy must be designed so that these connections are made in the classroom.

b. Pedagogic approaches and methods such as inquiry and projects, by their nature, provide scope to utilise concepts and capacities that cut across the disciplines of Science — for example, a project on investigating the sound produced by different musical instruments, and how this sound can be varied. Qualities and properties of sound produced both in terms of aesthetics, physics concepts involved, mathematical patterns, and human perception lead to a holistic appreciation and integration of competencies across curricular areas.

c. Pedagogic methods such as surveys and field-based methods enable students to see concepts through socio-cultural, economic, emotional, and scientific lenses — for example, a survey of traditional medicinal and cooking practices and their connection with the seasons.

4.6.1.4 Resources in Science Teaching

Science laboratories are essential for a good Science Education class. However, there are no separate rooms for Science laboratories in the majority of Middle schools currently, although

Science kits are provided. In this situation, Teachers can use their classrooms or any open space for conducting experiments. The following must inform the use of resources:

a. The materials and equipment should be simple and easy to use. This makes it more likely that they will be used in classrooms by Teachers. At the Middle Stage, Science kits available at most schools provide a good start.

b. However, teaching should not be restricted to the Science kits. The more materials students use, the more opportunities they get to do Science and hence learn Science. Improvised apparatus can be made using inexpensive materials to extend the use of materials beyond the Science kit. For example, a measuring jar can be made out of discarded transparent glass bottles, - using measuring cups (that usually come with syrup bottles) and syringes for calibration.

c. At this Stage, if the school can provide dedicated lab space, with adequate space for simple materials and resources, it must be done.

d. At the same time, doing Science must not be restricted to Science laboratories or Science kits. Classrooms, especially in the Middle Stage, must allow the doing of Science. At the same time, all safety considerations must be kept in mind.

e. Tinkering laboratories – informal spaces where students can 'play' with simple scientific materials and equipment independently – can be set up in any room within the school. This will help students strengthen design thinking, creating, and experimental capacities. Initially, students would have to be supported by the Teacher.

f. Students at the Secondary Stage would require standard scientific equipment and apparatus and basic infrastructure in which they can perform experiments with convenience and safety. Therefore, Secondary schools should have well-equipped, resourceful, and spacious Science laboratories to conduct Science experiments and investigations.

g. If a school has a laboratory but the number of students is large, the Teacher can either allow students to do the experiments in groups or ask students to perform the experiments on alternate days.

h. Budgets for Science in the Middle and Secondary Stages are limited, so Science equipment and materials should be inexpensive. However, if the equipment is of inferior quality (e.g., weak magnet, cheap microscope with plastic lens), it may not be worth using.

i. Alternatives can be used. For example, in case of unavailability of litmus paper, a Teacher can use turmeric solution or turmeric paper strips for identifying the acidic and basic characteristics of the substances. For this, the Teacher can take turmeric (powder or solid) and add it on a paper or in a glass cup containing water. This solution can be used for the identification of acids and bases. The Teacher can also make wet paper strips dipped in turmeric solution. Students can be asked to do the following — dry these paper strips, prepare solutions of each substance in water, dip the strip in the solution, and check the colour change of the turmeric paper strips. Could you make a list of changes in the colours of these substances?

4.6.1.5 Classroom Management

Classroom environment plays a vital role in student's learning. An ideal classroom of Science is one which has sufficient space and flexible seating to enable both small group work and whole class seating. The flexibility of the classroom is key in terms of allowing enough space to accommodate a wide range of activities.

The displays, charts, and other TLMs in the classroom should change and get renewed in sync with the concepts being dealt with in the classroom. Some storage space in the room makes it easier for the Teacher to have materials handy.

Classroom arrangement should complement instructional strategies – one way to ensure this is to have the same classroom for Science lessons, with students coming to the room. Having a dedicated Science classroom for Middle and Secondary Stages will also help in managing the resources efficiently and reduce the operational load for the Teacher. Bringing materials together and ensuring they are replaced, arranging the classroom to enable students to work in groups, access to simple equipment that students may want to use (e.g., magnifying glass in a lesson on magnets in case students want to examine the surface of the magnets), and so on will be taken care of with ease in case of a dedicated classroom.

4.6.2 Assessment in Science

The following principles must inform assessment in Science across Stages:

a. Students must be assessed for understanding of concepts and for the ability to use the scientific method, i.e., observe, ask questions, hypothesise, predict, experiment, collect data, infer, predict, analyse, decide, and evaluate.

b. Students must be assessed through a variety of ways, e.g., answering good questions, designing, and conducting experiments, developing models, and participating in debates and discussions.

A few Teacher Voices illustrate assessment in Science below.

Teacher's Voice 4.6ii

Conditions Suitable for Life

I teach Grade 8. I wanted to assess my students' understanding of the connection between conditions suitable for life (in this case, bacteria) and the processes of food preservation.

I didn't want to ask them to simply state the conditions for sustaining life and why they are needed, or the steps for food preservation. These questions can be answered using rote memory.

I tried something different. I asked the question below, which is directly related to their everyday lives and requires an application of chemistry and biology to processes they see all the time.

Question:

Mohan is about to pickle lemons. He plans to take the following steps to do this:

1. Make a mixture of salt, red-chilli, and carrom seeds.
2. Cut the lemons and rub the spice mixture into them.
3. Put the lemons in a clean glass jar and close the lid tightly.
4. Place the jar directly under the sun for a few hours.
5. Open the jar, add a lot of salt and some lemon juice to the jar.
6. Cover the mouth of the jar with a clean cloth and close it tightly with the lid.
7. Shake the jar vigorously and place it under the sun for a few days.

Why do you think Mohan follows all these steps? Please select the most appropriate option amongst the ones given below.

a. Reason 1: Adding salt draws out water from the lemons so that harmful bacteria cannot grow.
b. Reason 2: The combination of salt, red chilli, and carrom seeds prevents the growth of mould.
c. Reason 3: The sunlight prevents growth of mould and yeast that would spoil the pickle.
d. Reasons 1 and 3 are correct.
e. Reasons 2 and 3 are correct.

I used the following marking scheme: 2 marks for choice D, 1 mark for choice A or C, and no marks for choice B or E.

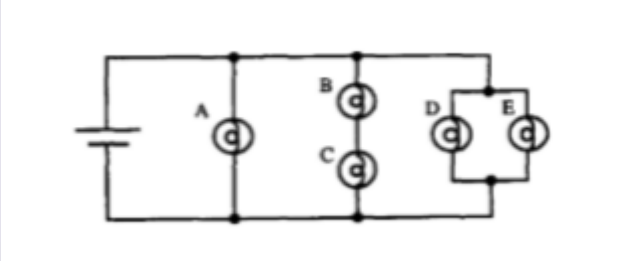
Teacher's Voice 4.6iii

Circuits

I teach Grade 9. I wanted to assess my students' ability to apply their understanding of current, voltage, resistance, energy, circuits in an unfamiliar situation. Students tend to associate circuits with a very specific representation which is usually seen in textbooks. This question presents a different arrangement.

Question:

Arrange the bulbs in the following circuit diagram in decreasing order of their brightness, by choosing the most appropriate among the options given below.



1. A=D=E>B=C
2. B=C>A>D=E
3. A>B=C>D=E
4. A=B>C>D=E

Only students who chose option 1 were able to apply their understanding of these concepts and got marks for this question.

Teacher's Voice 4.6iv

Experiment: Hot Container

I teach Grade 7. I find experiments very useful for a comprehensive assessment of both conceptual understanding, its application, and the ability to use the scientific method.

The following experiment enables assessment of students' understanding of measurement, and the properties of matter, especially the specific property that is causing the phenomenon observed in the experiment and their ability to extend it to real life situations. It also enables assessment of skills such as safe and accurate use of equipment, data collection

and interpretation, verification of scientific ideas, and communication of observations and conclusions along with use of scientific vocabulary.

Hot container activity

You have been provided with three containers — a paper cup, a metal can, and a ceramic mug, three thermometers, and a stopwatch.

Your challenge is to determine which of the three containers will keep a hot drink warm for the greatest length of time. Your experiment will last ten minutes, and you are expected to keep a record of your observations.

Gently place a thermometer in each container and ask your Teacher to pour hot water into each of them. Measure the temperature of the water in the container. Decide how you will gather your data and record it in the table. Please add rows as necessary.

S. No	Time	Cup A	Cup B	Cup C

After collecting data for 10 minutes, please answer the following questions.

a. According to your data, which container has kept the water warmer compared to the others over the period of 10 minutes? What do you think are the reasons for this?

b. Which container do you think will be the best for keeping ice cream cold? Give reasons for your answer.

I used the following criteria to grade my students' performance:

Criteria for assessment	Grade C	Grade B	Grade A
Handling equipment	Needs assistance with using the thermometer	Needs assistance with reading the thermometer	Uses thermometer properly and safely without any help
Recording data	Records data at the beginning and end of 10 minutes	Records data accurately over 10 minutes at arbitrary intervals	Records data accurately at preset intervals over 10 minutes
Interpreting data	Unable to make a clear choice based on data	Explanations focus on data related to only the chosen container	Explanations contrast chosen container with the other two based on data
Application of conceptual understanding	Does not connect explanation to container's properties in response to questions	States the properties of the containers without extending the explanation to both hotness and coldness	Compares properties of all containers and extends the argument to both hotness and coldness in response to questions
Communication	Responds to questions based on observations and does not provide explanations	Provides written explanations using accurate scientific vocabulary	Uses a visual representation to show relationship between time and temperature for different containers to provide explanations using accurate scientific vocabulary

Chapter 5

Social Science Education

Social Science is the systematic and scientific study of human societies that explores the relationship between the individual and society, social institutions, and organisations. In this NCF, the term Social Science is also used to include those branches of the Humanities that involve the more qualitative study of human society, culture, thoughts, creations, development, and actions in the past and present.

The purpose of Social Science Education is to help students learn about the society in which they live – how members of their society live, interact, behave, eat, speak (and in what languages), express themselves through art, the traditions they follow, the clothes they wear, and their aspirations. It also helps students in understanding their origins, their ancestors, their culture, their neighbours, and consequently, themselves. Social Science Education introduces students to people whom they have never met, places that they have never been, stories that they have never heard, and new ideas that that they have never conceived, thereby expanding their horizons and opening their minds to new possibilities. Finally, Social Science Education helps students develop pride in their culture and their country, with a forward-looking spirit to continuously improve – as individuals, as a society, and as a nation.



As a subject at school, Social Science draws significantly from the disciplines of History, Geography, Civics, Political Science, and Economics, and, also where relevant, from Psychology, Anthropology, Philosophy, Law, and others, thereby aiming to provide an interdisciplinary understanding.

The approach to the study of Social Science in this NCF is to develop an interdisciplinary perspective rooted in disciplinary knowledge that enhances the student's understanding of social processes in a holistic manner.

Social Science is first studied as a separate subject in the Middle Stage. In this Stage, the study of Social Science will be largely thematic. Each of the themes would be studied through an integrated view of History, Geography, Political Science, Economics, and other disciplines where relevant, such as Psychology, Philosophy, Anthropology, and Sociology. Also, each such theme with this integrated multidisciplinary perspective will be studied at the local, regional, national, and global levels.

In Grades 9 and 10 of the Secondary Stage, the study of Social Science is organised within the disciplines of History, Geography, Political Science, and Economics. Thus, the concepts and content are chosen to develop an in-depth understanding in that discipline, including its methods. However, at the level of detail of these particular concepts or topics, a complete picture is attempted by ensuring that the same concept is also considered through the lenses of other disciplines in an integrated manner. This approach builds disciplinary depth while ensuring a holistic interdisciplinary perspective.

In Grades 11 and 12, students have the option to go deeper into disciplines that they choose from the range of disciplines that constitute the Social Sciences, such as History, Geography, Political Science, Philosophy, Economics, Psychology, Sociology, and Anthropology. Grades 11 and 12 are dealt with in Part C, Chapter 10.

Box 5i

While the entire NCF needs to be used and implemented in an integrated manner, it is important that this chapter be read along with Part A of the NCF document. The Curricular Aims and the Learning Standards in this chapter are in continuity with Part A, Chapter 3. Similarly, the sections on pedagogy, content, assessment, and TLMs in this chapter must be read with the corresponding chapters and sections in Part A, because what is common across curricular areas on these matters has been pulled together in the relevant sections of Part A to avoid repetition across multiple chapters. Thus, reading this chapter in isolation will convey an incomplete picture.

Section 5.1
Aims

Social Science plays an important role in developing an integrated understanding of the human world and its functioning, including its deep interrelationships with nature and the environment in the quest to continuously improve as a society. In the study of this subject, students learn methods of observing and interpreting the human world, which helps them lead their own lives and also contribute as members of a society. Social Science also helps in developing some of the Values and Dispositions that are essential for democratic participation — building and sustaining cooperation among communities that strive for peace, harmony, equity, and justice for all.

Social Science Education in schools must aim to achieve:

a. Understanding how society functions: Learning Social Science leads to the understanding of how societies function through the interplay of historical, geographical, social, cultural, economic, political, environmental, and other factors. Students will develop an awareness and understanding of:

i. Continuity and change in human civilisation and their causes and effects

ii. The interaction between nature, natural resources, and human beings, including the spatial and temporal patterns arising out of this interaction, its effect on human life, and the impact of human activity on nature

iii. The commonness and diversity among people and their practices in different societies, regions, and cultures within societies

iv. Various social, political, and economic institutions, their origins, functioning, and transformations over time till today

b. Capacities for inquiry in Social Science: Students will develop capacities for carrying out and applying the methods of inquiry available in Social Science, including:

i. Sourcing, verifying, and cross-validating evidence through multiple sources, interpreting this evidence, and constructing coherent narratives

ii. Recognising features of the physical world, spatial and temporal patterns, map reading, analysis, and interpretation of various interconnected concepts and processes

iii. Creative and critical thinking, forming informed opinions, demonstrating logical decision making, and having a problem-solving disposition.

iv. Collecting, organising, analysing, and representing data and information on various issues — historical, geographical, cultural, economic, environmental, and socio-political

v. Proposing meaningful responses to contemporary concerns of society based on these methods of inquiry

c. **Responsible human beings and contributing citizens:** NEP 2020 states:

> *The purpose of the education system is to develop good human beings capable of rational thought and action, possessing compassion and empathy, courage and resilience, scientific temper, and creative imagination, with sound ethical moorings and values. It aims at producing engaged, productive, and contributing citizens for building an equitable, inclusive, and plural society as envisaged by our Constitution.*
>
> *[NEP 2020, pages 4-5]*

Social Science can play a unique role within the school curriculum to enable the Knowledge, Capacities, and Values and Dispositions that underpin this purpose of education as committed to in NEP.

Section 5.2
Nature of Knowledge

The nature of knowledge of Social Sciences may be understood as follows:

a. **Evidence-based, empirical, and verifiable:** Valid knowledge in and of Social Science relies on accepted norms of inquiry and verifiability of evidence, not on speculation. Verifiability is based on the corroboration of multiple sources of evidence, which are available in many forms, including oral narratives and traditions, performing and visual arts, literature, other texts, archaeological and other artefacts, physical and biological features, scientific investigations and experiments (both natural and conducted, such as astronomy-related, climatic, and seismic phenomena, or carbon dating), and numerical and qualitative data on the lives of people. Multiple sources are ideally used to cross-validate evidence to establish something as true and valid; corroborating evidence from multiple sources leads to better explanations and conclusions.

b. **Social Science is often interpretive:** While based on verifiable evidence, Social Science is nevertheless interpretive. Given the dynamism and complexity of human nature and cultures, and the real constraints in securing comprehensive, complete evidence for all aspects and for every level of any phenomenon, the same set of evidence often lends itself to different interpretations. The strength of growing evidence may eventually support a particular interpretation. However, this interpretive nature does not make Social Science unreliable or arbitrary in its claims, but rather a dynamic subject that constantly evolves and responds to the latest challenges and evidence.

c. **Social Science is value-laden:** Since Social Science is interpretive, it also reflects the values and the worldview of the interpreter. This manifests not only in different interpretations and explanations that can be drawn from the same set of verified evidence, but sometimes also in methodological issues, such as the weight to be given to various kinds of sources of evidence (e.g., surveys versus experiments) and which questions to seek answers to. Thus, in the study of Social Science as a subject, it is important to include a plurality of plausible interpretations, all arrived at with diligent and rigorous methods, and also an expanding range of questions with nuances. The awareness of students of this particular nature of Social Science must be developed, and therefore, a disposition of continuous inquiry, tentative explanations and conclusions, and avoidance of subjective value judgements should be encouraged.

d. **Social inquiry:** Knowledge in Social Science helps us understand the relationships and interaction between social processes and social facts (values, cultural norms, social structures); this also enables a sense of 'social inquiry and criticality', in other words, seeking answers to questions and issues that could help improve society. The awareness of students of this particular nature of Social Science also must be developed.

e. **Social Science is multidisciplinary and requires an interdisciplinary approach:** It is a complex task to understand human beings and human societies, and this requires an interdisciplinary approach informed by and based on multiple disciplines, such as Geography, Political Science, History, Economics, Sociology, Anthropology, Psychology, Philosophy, Culture (including literature, art, traditions), and more. For practical purposes, up to Grade 10, the first four of these disciplines would mostly constitute the subject of Social Science, while not missing the relevant and important contributions of the other disciplines. **Geography** studies the physical features of an area and human relationships with their natural environment; **History** traces the journey of continuity and change from the past to the present of human life, and the major events that have impacted society and culture; **Political Science** deals with the socio-political existence of human beings; and **Economics** analyses economic activity and its impact on social and behavioural changes of human beings.

f. **Social Science is sensitive to context:** Socio-cultural beliefs and values are subject to their context, including historical, cultural, geographical, economic, and political. To understand any society holistically, Social Science evaluates the events and issues in keeping with the context of that time and space.

Section 5.3
Current Challenges

Social Science teaching and learning faces a few challenges in schools at present. The NCF attempts to address these systematically. Some of the key issues are as follows:

a. Social Science is usually taught as a subject that focusses **predominantly on memorisation of facts**, such as dates in history, names of geographical features across the globe, the listing of fundamental rights and duties, and naming of economic institutions. The effort to understand, discuss, and appreciate concepts is often missing in Social Science classrooms. This, in turn, makes students lose interest in the subject.

b. Social Science is **often divided into watertight compartments** of History, Geography, Political Science, and Economics too early on in an extremely rigid manner. Students are rarely exposed to comprehensive engagement with any particular social phenomenon and usually learn to look at it through the lens of only one discipline. Therefore, the interdisciplinary thinking that students require to understand society is often not developed.

c. Information in the chapters is too often transacted in the classroom with little or **no connection to the life of students**. Since the subject is not made relevant or interesting to the students, it often ends up being boring, passive, or unrelatable.

d. The content in some books (including textbooks) is sometimes **not based on verified evidence** and arises from inadequate inquiry, lopsided interpretations, entrenched stereotypes, or specific biases.

Section 5.4
Learning Standards

Social Science as a separate subject begins at the Middle Stage. It builds on the capacities built in the Preparatory Stage, primarily through the study of the subject The World Around Us. In the Middle Stage, these general capacities of observation, data collection, and the basic understanding of social life are further sharpened to enable methods of inquiry and understanding of conceptual structures within Social Science. While in the Middle Stage, understanding and capacities are developed in an integrated manner, in the Secondary Stage (Grades 9 and 10), students more formally enter the disciplinary domains of History, Geography, Economics, and Political Science. This enables them to develop disciplinary rigour in both, the methods and concepts of Social Science. Students get adequate exposure to Social Science as a discipline and with this understanding, they can make informed choices about pursuing Social Science as a specialisation in Grades 11 and 12.

5.4.1 Curricular Goals & Competencies

5.4.1.1 Middle Stage

CG-1 Comprehends and interprets sources related to different aspects of human life and makes meaningful interpretations	C-1.1 Collects and interprets multiple sources of information (primary and secondary) to understand the historical, cultural, geographical, and socio-political aspects of human life C-1.2 Represents and analyses data related to various aspects of human life given in the form of text, tables, charts, diagrams, and maps
CG-2 Explores the process of continuity and change in human civilisations through specific examples from their context and a few historical episodes	C-2.1 Explains and analyses major changes in the past and their impact on society C-2.2 Recognises elements of the continued prevalence of certain beliefs, relationships, practices, and activities in human society, notwithstanding major changes in society
CG-3 Draws connections between the causes and effects of different social and historical events or episodes and connects them with the overall impact on human life	C-3.1 Analyses the effect of various changes in early human society from nomadism to settled life and early civilisation (such as the emergence of agriculture, changes in food habits, basic technologies like construction, transport, pottery, metallurgy), and changes in human habitation, family structures and relationships, the nature of work, people's sociocultural beliefs and concepts over time (e.g., ahimsa, and the fallout of major wars or invasions) that significantly impacted human societies C-3.2 Identifies reasons behind harmony and conflict among social groups and communities, in their region and in other parts of the world, and their impact on human societies

CG-4 Understands the functioning of social, cultural, and political institutions and their impact on society, and the way individuals and collectives shape these institutions	C-4.1 Collects, organises, and interprets information about various social, cultural, economic, and political institutions in their vicinity and region, and realises its significance for human society C-4.2 Assesses the influence of social, cultural, and political institutions on an individual/ group/ community/ society in general
CG-5 Understands various forms of inequality and prejudice in society — from those prevalent in a family to those at a community/ regional/ national level — and also the initiatives and efforts at various levels to address these issues	C-5.1 Identifies, explains, and raises questions about different forms of inequality, prejudice, and discrimination prevailing in one's own family, locality, region, and national and global levels C-5.2 Identifies, explains, and appreciates efforts (being) made at different levels through various (including social, cultural, economic, and political) mechanisms and institutions, and what individuals can do, to address these to ensure equity, inclusion, and justice
CG-6 Understands the spatial distribution of resources (from local to global), their conservation, the interdependence between natural phenomena and human life, and their environmental and other implications	C-6.1 Explains key natural phenomena such as climate, weather, ocean cycles, soil formation, the flow of rivers, and how they are spatially distributed C-6.2 Identifies the distribution of resources such as water, agriculture, raw materials, and services across geographies C-6.3 Analyses Indian perspectives on and efforts towards conservation and sustainability in society, and advocates the importance of the same, and what more needs to be done in these directions including in the context of global climate change C-6.4 Correlates the existence of different patterns of livelihoods with different types of landforms, availability of resources, and climatic conditions and changes (in local, regional, national, and global contexts)
CG-7 Appreciates the importance and meaning of being Indian *(Bharatiya)* by understanding (a) India's rich past and present including its glorious cultural unity in diversity, pluralism, heritage, traditions, literature, art, architecture, philosophy, medicine, science, and other contributions to humanity, and (b) other integrating factors despite the geographical diversity of India	C-7.1 Explains India's unity in diversity by recognising commonalities in its rich and diverse cultural elements, languages, art, philosophical ideas, values, clothing, cuisines, traditions, festivals, trade, commerce, and health practices including *ayurveda* and yoga C-7.2 Discovers the topographical diversity of the Indian landmass – from the semi-arid zone in the west and the areas of heavy rains in the north-east to the long coastal areas in the south and the snow-clad mountains in the north, as well as the rich biodiversity of the country C-7.3 Appreciates India's tradition of inclusion across communities and social groups, and its influence in vast parts of the world through its cultural elements

CG-8 Understands and appreciates the process of development of the Constitution of India and upholds its importance to promote democratic values in Indian society	C-8.1 Understands the need for a constitution for any country during the last few centuries – especially in a country such as India – and its deeper objectives C-8.2 Explains the process of formation of the Indian Constitution and understands the ideas and ideals of the Indian national movement enshrined in it as well as those drawn from India's civilisational heritage C-8.3 Explains the working of the three tiers of local self-government and appreciates its significance in upholding democracy at the grassroot level
CG-9 Understands the processes of economic activities (production and consumption, trade, and commerce)	C-9.1 Explains the key elements of trade and commerce (commodity, production, consumption, and capital) and its impact on individual life and society
CG-10 Understands and appreciates the contributions of India through history and in the present times, to the overall field of Social Science, including the different disciplines that constitute it	C-10.1 Knows and explains the significant contributions of India to all matters (concepts, explanations, methods) studied within the curriculum, in an integrated manner along with the particular matter – illustratively, understands the strengths of India's democratic traditions through its history
CG-11 In the curricular goals CG-1 to CG-10, there is a basic and adequate understanding of the history, geography, and culture of the locality, region, and country	***Note:*** *Competencies for this Curricular Goal have already been incorporated under CG-1 to CG-10*

5.4.1.2 Secondary Stage (Grades 9 and 10)

CG-1 Understands and analyses the important phases in Indian history and draws insights to understand present-day India	C-1.1 Explains historical events and processes using different types of sources, with specific examples from Indian history C-1.2 Explains and analyses the chronology of human life on the Indian subcontinent, from prehistory to its civilisational beginnings and beyond, and its relations with other civilisations over time such as those in Mesopotamia, Greece, Central Asia, China, Southeast Asia, Arabia, and Eastern Africa. C-1.3 Traces aspects of continuity and change in different phases of history across the Indian subcontinent (including cultural trends, social and religious trends and reforms, and economic and political transformations) C-1.4 Explains the growth of new indigenous ideas across India including in Mathematics, Philosophy, Science and Technology, Medicine, Architecture, Agriculture, Literature and Art, and Social Science (such as zero and the Indian number system, *ahimsa,* the six systems of Indian philosophy, *Ayurveda,* yoga, the 22 *shrutis* of Indian music, horticulture, use of herbs and spices, etymology, meters, and grammar) and how they affected the course of Indian and world history
CG-2 Analyses the important phases in world history and draws insights to understand the present-day world	C-2.1 Explains historical events and processes with different types of sources, with specific examples from world history C-2.2 Explains and analyses the chronology of human life from its beginnings to nomadism to settled life and other phases of human civilisation C-2.3 Traces aspects of continuity and change in different phases of world history (including cultural trends, social and religious reforms, and economic and political transformations) C-2.4 Explains the growth of new ideas and practices across the world (including humanism, mercantilism, industrialisation, scientific developments and explorations, imperialism, colonialism, the rise of new nation-states across the world, and various technologies including the most current) and how they affected the course of world history C-2.5 Recognises the various practices that arose, such as those in C-2.4, and came to be condemned later on (such as racism, slavery, colonial invasions, conquests, and plunder, genocides, exclusion of women from democratic and other institutions), all of which have also impacted the course of world history and have left unhealed wounds
CG-3 Understands the idea of a nation and the emergence of the modern Indian Nation	C-3.1 Analyses the meaning of nation and how the concept evolved over time across the world and in the specific context of India, including its roots in the rich civilisational history of the Indian subcontinent C-3.2 Identifies and analyses important phases of the Indian national freedom struggle against British colonial rule, with special reference to the movement led by Mahatma Gandhi and other important figures as well as those that led to independence, and understands the specific Indian concepts, values and methods (such as *Swaraj, Swadeshi*, passive resistance, fight for *dharma*, self-sacrifice, *ahimsa*) that played a part in achieving Independence

CG-4 Develops an understanding of the inter-relationship between human beings and their physical environment and how that influences the livelihoods, culture, and the biodiversity of the region	C-4.1 Locates physiographic regions of India and the climatic zones of the world on a globe/map C-4.2 Explains important geographical concepts, characteristics of key landforms, their origin, and other physical factors of a region C-4.3 Draws inter-linkages between various components of the physical environment, such as climate and relief, climate and vegetation, vegetation, and wildlife C-4.4 Analyses and evaluates the inter-relationship between the natural environment and human beings and their cultures across regions and, in the case of India, the special environmental ethos that resulted in practices of nature conservation C-4.5 Critically evaluates the impact of human interventions on the environment, including climate change, pollution, shortages of natural resources (particularly water), and loss of biodiversity; identifies practices that have led to these environmental crises and the measures that must be taken to reverse them C-4.6 Develops sensitivity towards the judicious use of natural resources (by individuals, societies, and nations) and suggests measures for their conservation
CG-5 Understands the Indian Constitution and explores the essence of Indian democracy and the characteristics of a democratic government	C-5.1 Understands that the Indian Constitution draws from the great cultural heritage and common aspirations of the Indian nation, and recalls India's early experiments with democracy (assemblies in Mahajanapadas, kingdoms and empires at several levels of the society, guilds, *sanghas* and *ganas*, village councils and committees, Uthiramerur inscriptions) C-5.2 Appreciates fundamental Constitutional values and identifies their significance for the prosperity of the Indian nation C-5.3 Explains that fundamental rights are the most basic human rights, and they flourish when people also perform their fundamental duties C-5.4 Analyses the basic features of a democracy and democratic government – and its history in India and across the world – and compares this form of government with other forms of government C-5.5 Analyses the critical role of non-state and non-market participants in the functioning of a democratic government and society, such as the media, civil society, socio-religious institutions, and community institutions

CG-6 Understands and analyses social, cultural, and political life in India over time – as well as the underlying historical Indian ethos and philosophy of unity in diversity – and recognises challenges faced in these areas in the past and present and the efforts (being) made to address them	C-6.1 Understands how the Indian ethos and the cultural integration across India did not attempt uniformity, but respected and promoted a rich diversity in Indian society, and how this harmonisation and unity in diversity, with a historical respect for all cultures, women have counted among India's great strengths by promoting peaceful coexistence C-6.2 Understands that, despite C-6.1, forms of inequality, injustice, and discrimination have occurred in different sections of society at different times (due to internal as well as outside forces such as colonisation), leading to political, social, and cultural efforts, struggles, movements, and mechanisms at various levels towards equity, inclusion, justice, and harmony, with varying outcomes and degrees of success C-6.3 Analyses aspects of differential treatment or discrimination that may exist in Indian society, based on, e.g., socio-cultural background, region, language spoken, and what individuals and societies can do to eradicate such differential treatment C-6.4 Understands that a progressive society and nation such as India is one that recognises not only its civilisational strengths but also its socio-economic, cultural, and political challenges and continuously makes efforts to address those challenges to become ever more prosperous, inclusive, just, and harmonious
CG-7 Develops an understanding of the economy of a nation, with specific reference to India	C-7.1 Defines key features of the economy such as production, distribution, demand, supply, trade, and commerce, and factors that influence these aspects (including technology) C-7.2 Evaluates the importance of the three sectors of production (primary, secondary, and tertiary) in any country's economy, especially India C-7.3 Distinguishes between 'unorganised' and 'organised' sectors of the economy and their role in production for the local market in small, medium, and large-scale production centres (industries), and recognises the special importance of the so-called 'unorganised' sector in Indian economy and its connections with the self-organising features of Indian society C-7.4 Traces the beginning and importance of large-scale trade and commerce (including e-commerce) between one country and another – the key items of trade in the beginning, and the changes from time to time
CG-8 Evaluates the economic development of a country in terms of its impact on the lives of its people and nature	C-8.1 Gathers, comprehends, and analyses data related to income, capital, poverty, and employment in one's locality, region and at the national level C-8.2 Understands and analyses the concepts and practice of the range of economic systems – from free market to entirely state-controlled markets C-8.3 Understands these features in the context of ancient India, with its thriving trade, both internal and external, and its well-established trade practices and networks, business conventions, and diverse industries, all of which made India one of the world's leading economies up to the colonial period C-8.4 Describes India's recent path towards again becoming one of the three largest economies of the world, and how individuals can contribute to this economic progress C-8.5 Appreciates the connections between economic development and the environment, and the broader indicators of societal well-being beyond GDP growth and income

CG-9 Understands and appreciates the contribution of India through history and present times, to the overall field of Social Science, and the disciplines that constitute it	C-9.1 Knows and explains the significant contributions of India to all matters (concepts, explanations, methods) studied within the curriculum, in an integrated manner

Section 5.5
Content

As mentioned in the beginning, the approach, principles, and methods of selecting content have commonalities across subjects — those have been discussed in Part A, Chapter 3, §3.2 of this document. This section focusses only on what is most essential to education of Social Science in schools. Hence, it will be useful to read this section along with the above-mentioned section.

5.5.1 Principles of Content Selection

The content selection in Social Science must fulfil the Curricular Goals, account for the nature of knowledge, and should systematically address the current challenges of Social Science teaching and learning.

These considerations inform the principles below, which should be used while selecting the content:

a. **Content must be adequate to develop relevant knowledge and capacities:** The topics chosen should together be able to help achieve the relevant knowledge and capacity goals of the curriculum. At the same time, there must not be **content overload**, which has been a significant cause of ineffective Social Science teaching and learning. This balance of having appropriate amount of content is one of the key challenges in developing Social Science curricula.

b. **Content must be based on verified evidence and narratives:** A good Social Science study of any concept or event requires engaging with evidence from a range of sources, references, and consequent interpretations and narratives. The range of what is admissible evidence for Social Sciences will draw from the socio-cultural contexts of India and from multiple pieces of evidence verified rigorously from various sources; it should give a sampling of differing interpretations or narratives (if justified by verified evidence) of a single event or phenomenon. For example, good understanding of the Gandhian philosophy of non-violence should be accomplished through the readings of multiple writers, or the usefulness and limits of markets should be seen from varied perspectives.

c. **Content must be interdisciplinary in approach:** Social Science, by its very nature, is an interdisciplinary subject. The discipline-wise division of History, Geography, Political Science, and Economics, and others such as Anthropology, Philosophy, Psychology, and Sociology cannot be seen as separate areas in isolation. None of these disciplines can be

taught (or understood) without referring to another. For example, the concept of India's cultural unity in diversity cannot be taught without introducing the student to India's geographical unity in diversity, or to its shared philosophical and political concepts. Students should learn to investigate a concept from multi-dimensional and cross-disciplinary perspectives to develop an expansive view.

d. **Concepts must be built from the simple to the complex:** The content in Social Science should be organised, with simpler concepts leading to more complex ones, enabling the construction of whole meaning with building blocks. This must be done progressively, including by considering the developmental trajectory of cognitive capacities of students. For example, for teaching historical inquiry in the Middle Stage, the content would first focus on the identification and differentiation of sources of information or evidence, taking a local case study as starting point where possible. As a second step, students should interpret the evidence to draw meaning out of it. Third, where possible, they should attempt to collect and analyse evidence from multiple sources for a single event, engaging in discussions if such evidence at times appear to point to differing conclusions. And finally, where possible, they should do a comparative analysis between two or more similar events based on findings made through multiple sources. Such an exercise can be done at a basic level, to familiarise the student with the methodology in a light way.

e. **Content to progress from local to global:** As much as possible, conceptual understanding should start from the local context. For example, understanding geography is best achieved by first engaging with local terrain (streams, lowlands, uplands) in the locality, and then moving to features of the regional and national terrains. The same method is applicable to History and to other areas of Social Science.

f. **Content to include real and diverse experiences of people:** As Social Science deals with human beings and society, the study is incomplete with just theories and concepts. Without references to the real-world experiences of people, past or present, concepts do not 'come to life'. For example, the concept of an uprising against colonial rule cannot be grasped without an appreciation for the courage of the people through a few first-hand accounts or testimonies; or discrimination and efforts to address it cannot be taught without introducing the students to accounts of people who have faced it personally and those who have been helped by measures taken at various levels. Real experiential accounts also help develop values and dispositions such as empathy, sensitivity, and pride in our heritage.

g. **Content must enable development of capacities:** Social Science aims at developing decision-making and problem-solving capacities in the social context to enhance social, cultural, and environmental harmony, which involves the interpretation of facts, relying on evidence, and connecting concepts to form rational and forward-looking opinions. The content in Social Science should not merely present facts but also help develop these capacities and enable inference, analysis, and a grasp of the complex, integrated nature of human life and society while being open to other perspectives.

h. **Content must enable the development of values and dispositions:** The choice of content in Social Science and its tone of presentation should have both implicit and explicit influence on the values and dispositions of students. While the overall content must be valid and adequately representative of a range of perspectives, it should also be deeply informed by the values and dispositions that it will foster.

5.5.2 Choice of Topics and Optimal Curricular Load

The 'topics' chosen to be studied as content must together enable the learning of relevant curricular goals of knowledge and capacity development.

In Social Science, perhaps more than any other subject, such a consideration leads to massive content overload. This is understandable because the scope and range of the subject is the entire range of human activity, phenomena, and society.

However, this content overload is self-defeating. It leads to students finding Social Science boring, with little relevance to their lives, and a mere memorisation of facts and figures. It also leaves no room for development of needful capacities.

Therefore, one of the most important matters in Social Science curricula is to have just the adequate 'amount of content'. The key matter is 'How can we arrive at this 'adequate' content?' This NCF suggests the following basic principles to be used for designing such content:

a. **Topics should be selected for development of capacities:** The focus must be on the selection of topics (and also of pedagogy, assessment, and timetable space) that would help develop capacities, such as sourcing evidence, analysis, and framing questions. This is because no amount of content can be enough to build adequate knowledge in Social Science. However, if the capacities are developed, students can start gathering and developing their own knowledge base.

b. **Address all relevant aspects:** Choice of topics must cover all key relevant aspects of Social Science, including economic activity, cultural norms, and historical causes of a phenomenon. All (or even a significant part) of 'knowledge' must not be attempted to be covered, but all aspects should be touched upon so that students can subsequently use their capacities to continually build their knowledge base.

c. **Make things interesting:** Topics chosen must make study of Social Science interesting and also demonstrate its usefulness in the lives of people. This is what will motivate students to develop their capacities and use them. A variety of pedagogical tools must be deployed for the purpose *(see §5.6.1)*.

5.5.3 Rootedness in India

While the entire Social Science curriculum would be strongly rooted in India, from the local to the national level, CG-10 (Middle Stage) and CG-9 (Secondary Stage) requires that the students must learn and understand the significant contribution of India and Indians to the concepts and methods in Social Science and the disciplines within as these are studied.

5.5.4 Content for Middle Stage

5.5.4.1 Summary of Approach

a. **Based on themes:** In the Middle Stage, the approach is largely based on studying 'themes'. Themes form the content of study; 'topics' are sub-parts of the themes, which may be used for practical purposes of drawing boundaries for a particular discussion/inquiry. Each Grade would have all the chosen themes.

b. **Study themes from all perspectives:** For all themes (or the topics within), study must happen from the angles and lenses of all relevant disciplines. This must cover historical, geographical, economic, and political science perspectives, as also anthropological, philosophical, psychological, sociological, cultural, and other perspectives. It is particularly important to note that:

   i. Such study should be undertaken through real-life, relatable questions – and not be classified into disciplines – the disciplinary angles must be embedded within the questions/study. The students would not be told/instructed that such and such question is from such and such discipline.

   ii. One question may embed and involve multiple disciplines.

c. **All themes should be studied at four levels in each Grade** – Local, regional, national, and global. At each level, the questions/study should be from the entire range of lenses from various disciplines.

d. **Teaching-Learning Materials** (including textbooks), pedagogy, assessment, and timetable must support this entire approach.

5.5.4.2 'Themes' for Holistic Real-life Perspective Building

To develop an interdisciplinary, holistic perspective in the Middle Stage, the study of Social Science is largely based on themes rather than disciplines.

In essence, a 'theme' is any rich and complex human phenomenon that pulls together the lenses of multiple disciplines which in turn help obtain a good understanding of the phenomenon. For example, the concepts of continuity and change, governance, or migration are the sort of ideas that are so rich in nuances and so complex in multiple ways that a reasonable understanding requires the lenses of History, Geography, Political Science, Economics, and also Philosophy, Psychology, Anthropology, and more. Such concepts can be used as 'themes' in the study of Social Science.

a. It is useful and important to note that themes are likely to have related but different characteristics across different levels of human aggregation, implying that any of these themes, when studied at the very local community level as compared to the regional, or national, or global level, will have particular and different characteristics and dynamics. For example, the political and economic aspects of governance are vastly different at the local community level and at the national level.

b. Therefore, the themes should be studied at all four levels – local, regional, national, and global – with appropriate weightage given to each level in terms of the proportion of content. Needless to say, the study of all the themes at every level will be carried out with the same integrated multidisciplinary lens.

c. Within each of the themes (and for any of its constituent matters, which may be called 'topics') study must be done using the lenses of all relevant disciplines.

The list of themes in 5.5.4.5 is useful for such an approach for studying Social Science. It needs to be noted that while this list of themes is useful and important, *it is not comprehensive*, and **curriculum developers may choose other themes as well.** The key criteria for choosing the themes are described below.

5.5.4.3 Criteria for Choosing Themes

Below is a set of criteria that can be used to choose themes. These have been used to select the themes used in the document. Other themes may be chosen by curriculum developers using these criteria.

a. The human phenomenon (or idea or concept) being chosen as a 'theme' must have the complexity that requires multiple disciplines for its study. For example, 'the flow of rivers' is not a phenomenon requiring multiple disciplines to study, as it is primarily a matter of Geography. However, 'rivers and human life' needs the perspectives of multiple disciplines and therefore could be a suitable theme within this approach.

b. The matter being chosen as a theme must be relatable in the context of the immediate environment of the student. This is not only important to develop an understanding of one's own community and locality, but it is also important pedagogically to have a relatable understanding because students learn more deeply when they can relate to things with their own lives.

c. At the same time, the matter for a theme must be such that it has a regional, national, and global dimension and relevance and is not limited to only one or two levels.

d. The overall set of themes chosen should enable the development of a syllabus and content that is sufficient to achieve the Curricular Goals in that class and of that Stage.

5.5.4.4 Themes Cutting Across Four Levels — Local, Regional, National, and Global/International

The themes should span from local to regional to country and then the world. Themes should be equally relevant and useful at all these levels.

This approach helps make the learning of Social Science observable, real-world, relevant, interesting, and connected to day-to-day occurrences for Middle Stage students, drawing them into thinking and talking about these occurrences while connecting them to the more expansive world. This would also give students a sense of their location in the world and the interconnections of matters between different levels of human aggregation.

For each of the Grades 6-8, the relative proportion of the content and of timetable space of the different levels are mentioned below. Within each level the themes should have roughly equal proportion of content. These are not tight rules, but directional guidance, and the exact proportions may vary reasonably based on other considerations.

a. Content for the local level would be 20% of the Social Science curriculum. Students will explore various facets of their locality in terms of historical context, geographical variations, and its socio-political, cultural, and economic life in an integrated manner. This will be done through collecting information/data from multiple sources, comparing data, making meaning out of it, doing analysis, and learning how social scientists build knowledge about a society based on empirical evidence. This local level should:

   i. Build familiarity with the methods relevant to Social Science and develop the related capacities.

   ii. Make the subject relatable to real life.

b. **Content for the regional level would be 30%.** The understanding and capacities developed by the local level content would be built upon to deal with content at the regional level. In this, a deeper interdisciplinary perspective would be acquired by the students, by identifying interconnections, similarities, and differences between their locality and the region. The 'region' must be chosen thoughtfully, it must of course be the region around the 'local' area; but it may be a part of the state where that locality is, or multiple states, or the entire state itself.

c. **Content for the national level would be 30%.** Students are expected to learn the national context through a similar approach, including active engagement with secondary sources. This content could include a general survey of the relevant Indian history and geography. The unity in diversity of our people and the richness of our cultural heritage, and the relevant concepts of Indian ethos, must also be introduced and studied here.

d. **Content for the global level would be 20%.** An understanding of the culture and society of other countries would help students widen their worldview. Students can build a comparative understanding of life in other countries in relation to their own. This would lead to a sense of pluralism and appreciation of various cultures around the world. A comprehensive understanding of any three countries that meet the following (or similar) criteria may be chosen:

    i. The three countries must be from different continents with different socio-cultural and civilisational histories,

    ii. One country that has geographical challenges and has gone through rapid growth after struggling through challenging times in its history (e.g., Japan, South Korea),

    iii. One country that has geographical diversity, has been a colony, and has struggled through foreign rule and internal difficulties (e.g., South Africa, Nigeria),

    iv. One country that has grown rapidly and is influential in the global economy, with multi-ethnic composition (e.g., the United States of America, Australia, Germany).

Along with other TLM, content for the local level should be in the form of workbooks, specifically designed such that, Teachers themselves should be able use it for their locality. On the other hand, the regional, national, and global level, content(s) may be covered through textbooks.

5.5.4.5 Themes Used in this Document

The themes chosen for illustration using the criteria mentioned earlier in § 5.5.4.2 are – People and Cultures, Livelihoods of People, Human-Environment Interconnectedness and Interaction, and Democracy and Governance.

A brief description for each theme, in the form of some key questions that form the rationale, is given below. Under each theme, illustrative topics are also given to help curriculum, syllabus, and content developers relate to the approach.

a. **People and Cultures:** The first step of Social Science is to study the people around us and what shapes their lives. There are multiple factors – geographical, historical, economic, cultural, psychological, and political – that enable and influence building a society and result in certain socio-cultural practices and norms in that society. These norms not only

influence individuals' lives, but also explain the functioning of group dynamics within a society. They enable us to understand the factors that influence coming together of people, or even the differences that may exist. The broader areas which this theme would cover are: What factors influence the coming together of people (trade, ideas, socio-cultural influences, people movements – whether due to pilgrimages or deliberate/forced migrations) across time and their current practices? What has changed and what has remained constant over time? What are the political, economic (education of people, clothing, livelihood), and social-cultural (language, festivals, practices) components of cultures and what are shared? What positive effect does cultural interaction have? Answers to these questions cannot be sought in isolation, and hence the other themes must also be studied in conjunction.

Illustratively, working on this theme for Grade 6, the topics may cover the following content at local and regional level:

i. Topics that can be covered at local level:

   1) What kind of changes have happened in the cultural life of the family and community in last three to four decades and what has continued? What are the reasons behind these changes and continuity? Such a topic could lead to a discussion of the role and importance of the family unit in Indian society.

   2) What kinds of differences are observed in the beliefs and practices of members of the family? What is the basis of these differences?

   3) What has been the migration pattern in the family over three to four decades? Who has migrated and where? How has it impacted the basic structure of the family?

ii. Topics that can be covered at regional level:

   4) What are the major characteristics of the culture of the people of one's own region?

   5) What were the cultural practices of the people of the region in ancient times? What has continued over this period of time?

   6) Which types of festivals are prominent in the region? What is its historical significance? What is the importance of festivals in bringing people together from different sections of society?

b. Livelihoods of People: Livelihoods remain at the centre of day-to-day activities of people and are also drivers of the cycles of interdependence in society. This in turn proceeds in defining the market dynamics, feeding the loop of demand and supply. For example, what goods and services does a society produce? Who controls the wealth and resources of a society? How and why have these changes occurred across time? What is the nature of the different markets (e.g., *Haat, Bazaar,* and *Mandi*)? Is it conceptually relevant to put Melas (fairs) as a form of market in India? How does the market influence the lives and occupations of the people? What and how are natural resources used and what is their effect on nature? What kind of governmental matters are linked to livelihood? This theme, thus, aims at enabling students to understand and interpret the dynamic relationship that the livelihoods of people have with the types of structures and institutions in the world, and their evolution. Finally, all of this must be understood in the context of the culture, aspirations of people, political environment, and more.

Working on this theme for Grade 8, the topics may cover the following content at regional and national level:

i. Topics that can be covered at regional level:

1) What do we mean by cottage, small-scale, and large-scale industries? How do geographical conditions define the possibilities of small-scale and large-scale industries in the region?

2) What is the share of small-scale and large-scale industries in economy of the region? How does it impact the standards of people's lives?

3) How has industrial development taken place in the region in the last 30-40 years and what are the major reasons behind this change? How have traditional ways of conducting business been affected by this change?

4) What is the role of the state government in addressing the unemployment and poverty in the region?

ii. Topics that can be covered at national levels:

1) How do the climatic zones affect people's lives and play a role in determining their livelihood in a particular zone?

2) Which types of agricultural practices and local industries develop in different climatic zones? How does it influence the livelihood of people?

3) What type of power sharing mechanisms and control over resources have developed over time in different regions of the country?

4) What are the impacts of globalisation on people's lives? What kinds of changes can be seen in occupations and livelihood patterns?

5) Which types of occupations have emerged over a period of time? What is its impact on society? What is the role of different sections of society in economic activities?

c. **Human-Environment Interconnectedness and Interaction:** Individuals are shaped by and are an integral part of their social and physical environment. Everything that happens in society is influenced by its surroundings and its features, from what one wears, to what one eats, to what livelihoods thrive on. It is therefore important to know: How do humans adjust to the climate and terrain in which they live? How have changes in the natural world forced people to change their behaviour and practices? What positive and negative changes have people made to their environment? How has all this changed with time? What cultural factors have played a role and how? How are collective issues resolved? These questions are some of the key components for understanding the human-environment interaction.

Working on this theme for Grade 6, the topics may cover the following content at local and regional level:

i. Topics that can be covered at local level:

1) What are the key physical features of one's locality? Is it a plain, mountainous, plateau, or coastal area? How do the physical features of a place influence the living conditions of its inhabitants?

2) Understanding the relation between crop patterns in one's locality and the physical features of that place.

3) How are land and resources distributed among the people in the locality? What are the reasons behind the disparity in the distribution of resources, if any? For example, in access to safe drinking water and school education.

4) What is a map? What are the key components of a map? What different kinds of maps are commonly made and consulted? What is the significance of a map in the lives of people? How do we make a map of one's own locality?

ii. Topics that can be covered at regional level:

1) What are the key physical features of a region? What are the climatic conditions of the region and how do they shape the lives of the people in terms of occupation and livelihood?

2) What are the natural resources found in the region?

3) What are the major crops and horticulture of the region? What are the major flora and fauna of the region and their interconnectedness with the lives and cultures of the people in the region?

4) How does the environment affect people's behaviour, such as language, food, clothing, and what is the kind of diversity found in different regions?

d. Democracy and Governance: Having understood human settlement and the multiple factors influencing the way people live, a certain kind of social and political order is required for a stable society. Governance attempts to ensure social order in society, along with taking care of the availability of resources and services for each member in the society. Democratic governance is one such form of a political structure that aims towards the inclusive and harmonious co-existence of diverse people in the society. Governance is shaped by the past experiences of the people. It is influenced by and influences social and cultural forces and trends and is deeply interconnected with economic well-being and the terrain of the place being governed. This theme focusses on understanding democracy and governance, how they have changed over time, and how this change has influenced and been influenced by technology and the economy.

Illustratively, working on this theme for Grade 8, the topics may cover the following content at national and global level:

i. Topics that can be covered at national level:

1) What is the process of government formation at union level? What are the roles and responsibilities of union government? What is its relationship with people?

2) How did India emerge as a modern democratic State? What are the values and principles that bind us together in the historical process? How does the Constitution of India address the aspirations of people and respects communities' beliefs and practices?

3) What are the types of challenges that have been faced by Indian societies across periods of time? What are the processes, policies, and mechanisms developed by the government over the period of time to deal with these challenges?

4) What types of challenges are being faced by Indian democracy in recent times? How does the government tackle these challenges to bring social and economic prosperity in society?

ii. Topics that can be covered at global level:

1) What are the key features of U.S. democracy? How is it different from Indian democracy?

2) How has democracy evolved in the U.S. from its first freedom struggle to the civil war of the 1860s?

3) What are the major issues of American society and how has economic development shaped its society?

5.5.5 Content for Secondary Stage (Grades 9 and 10)

In Grades 9 and 10 of the Secondary Stage, the study of Social Science is organised within the disciplines of History, Geography, Political Science, and Economics. To operationalise the curriculum for the Learning Standards, the topics would be chosen in a manner as to develop depth in that discipline, including its methods.

Equally, the Learning Standards, Content, and Pedagogy will also ensure that at the level of detail the actual study of these particular concepts or matters, a complete picture is built by ensuring consideration from the lenses of other disciplines, including Anthropology, Sociology, Philosophy, Psychology, Linguistics, and others**. This approach will build disciplinary depth alongside interdisciplinary, holistic perspectives, from granular details to an integrated worldview and the capacities to grow this worldview**.

The content in **History** should guide the student to understand the evolution of human society. Content must be aimed at developing a holistic view of the human past by interpreting primary and secondary sources. The content must be based on different sources and is expected to help students arrive at various plausible interpretations backed by cross-validated evidence about a particular event or period. It must cover important phases of the past which have shaped the present. In addition, the content must familiarise the student with and explain the concept through multiple valid narratives.

For example, in Grade 9, while covering the topic 'Nomadism to Settled Life in India and the World,' it may cover core historical questions along with the related questions from other disciplines, such as:

a. Questions related to History:

iii. How did early humans live across the world? Which types of tools did they use?

iv. How did early humans transform from being hunter gatherers to living in a settled agrarian society?

v. What type of continuity and changes can be seen in the social structure from the beginning over different phases of history?

vi. How did the cultures of different regions interact? What are some items that cultures have passed on to each other over different phases of history?

b. Questions related to Geography:

i. How did early humans adjust to the climate and terrain where they lived? What were the geographical features which favoured the early agrarian settlements?

ii. How did the agrarian societies change their natural world?

iii. What positive and negative changes occurred to the environment with settling down of societies?

c. Questions related to Political Science:

i. What were the major factors behind one society heading their way to conquer the land and people of another society? How did one society gain control over others? How did a dominating society control and rule its subjects? What were the effects on conquered societies?

ii. How did the group or person in power keep or lose their power?

d. Questions related to Economics:

i. What were the types of changes seen in the production of goods and services with the shift from hunting and gathering to agrarian and settled society?

ii. Who had the control over the wealth and resources in nomadic society? Which types of new economic activities emerged in agrarian society and how did it change the relationship of humans with nature?

Certain issues of history specific to the Indian context will need to be understood and discussed, often in an open-ended manner as they may not always lead to clear-cut answers, but always insisting on clarity of the concepts involved. For example:

iii. What are the different ideas of a nation?

iv. How does the ancient Indian concept of a *desha/ rashtra/ mandala* compare with the modern nation-state?

v. In the context of India, how relevant are the concepts of a nation or of a civilisation? What role does cultural continuity play in the concept of civilisation?

vi. How to distinguish between political integration and cultural integration in the course of Indian history?

vii. In what ways did the British invasion and colonisation destroy India's pre-colonial industrial and economic strength, and its indigenous educational and administrative systems? In what ways did it cause or greatly compound the severity of famines? How did it affect the vibrancy of India's rich culture, including India's languages, literature, art, philosophy, and heritage? Altogether, how did the British rulers, finding in the 17th century a culturally and economically prosperous India, leave it two centuries later in a weakened and impoverished condition? How has India recovered (and still is recovering) from this colonial experience and exploitation, economically and culturally, and what should India do to ensure its cultural (in terms of languages, literature, art, philosophy, heritage) and economic re-emergence?

In **Geography**, the content must focus on highlighting the interrelationship of human beings with their geographical environment and other life forms. Concepts highlighting the interdependence between humans and nature need to be at the core. The connection between various geographical phenomena and their socio-cultural effects must also be included.

Knowing about, for example, various climatic zones across the world in Grade 10, questions from both Geography and other disciplines may be explored to understand the human-environment relationship. It can be done in the following manner:

a. Questions related to Geography:

i. What are the main factors that determine the formation of climatic zones on Earth?

ii. What are the characteristics and distribution of tropical, subtropical, temperate, and polar climatic zones, and how does this shape people's lives and cultures?

iii. Discuss the role of latitude in shaping climatic zones and provide examples of how it affects temperature and precipitation patterns.

iv. How does human activity contribute to climate change? Provide specific examples of human activities that release greenhouse gases into the atmosphere.

b. Questions related to History questions:

i. How have climatic/environmental changes influenced the rise and fall of civilisations throughout history? Explain how climatic changes were initially mostly natural, while environmental changes were either natural (e.g., caused by a long drought) or anthropogenic (e.g., caused by over-exploitation of natural resources in a given region). Provide examples of historical events where climatic/environmental factors played a significant role.

ii. How have human societies adapted to or mitigated the impacts of climatic zones throughout history? Discuss specific strategies or practices employed by civilisations in response to changing climatic conditions. Include cases where attempts at mitigation were unsuccessful, leading, for instance, to major social or political reorganisation or upheaval.

c. Questions related to Political Science

i. How does climate change influence international relations and diplomacy? Discuss the political dimensions of climate change negotiations, agreements, and conflicts over resources.

ii. Explain how political decisions and policies can shape the adaptation and mitigation strategies related to climatic zones. Provide examples of government policies or initiatives that address climate change and its impacts.

d. Questions related to Economics

i. Explain the economic implications of climatic zones on agriculture, tourism, and natural resource-based industries. Provide examples of how climatic conditions affect economic activities in different regions.

ii. Discuss the role of climate change in shaping global trade patterns and economic relationships between countries. How do changing climatic conditions impact international trade and economic agreements?

In **Political Science**, the content should include an in-depth understanding of the subject of Political Science in India's history, from the Arthashastra of Kautilya to the modern Constitution of India. It should include democracy, its various definitions in ancient and modern times, and democratic life as the main concepts, while also familiarising students with other kinds of political structures and lives across the world. It should include the current-day, post-independence working of the Government in India through its network of social and political institutions. It should also include an understanding of inequity and discrimination in society, and its reasons, alongside the progress that has been made and the ways and efforts that have been made towards inclusion and justice and its successes, failures, and challenges. Students are

expected to explore probable solutions to these challenges, including what people can do individually to address these issues. The importance of Constitutional values and our democratic commitment to ensure a dignified life for all in society should be highlighted. Along with it, the presence of other disciplines would ensure that the student understands an issue in an in-depth manner.

For example, while studying about the Constitutional provisions for ensuring equality in India in Grade 10, the following questions across disciplines may be dealt with:

a. Questions related to Political Science:

i. What are the varying inequities, social disparities, and harmful social practices prevalent in society based on identity? What are the reasons behind these?

ii. What have been the measures in our country to address these issues, and how successful have we become?

iii. What are the challenges in front of us for addressing such issues as a nation?

b. Questions related to Economics:

i. Is there any relationship between social inequities and disparities and economic status?

ii. What could be the Constitutional ways to address these gaps, which can lead to improvement in the economic status of these sections of society?

iii. Does the identity of a person influence the nature of livelihood and occupations they practice?

c. Questions related to History:

i. What Indian philosophical, historical, or ethical concepts have sought to counter inequities? What have been the major successes of these concepts in Indian society?

ii. Despite these successes, what are the causes of some of the inequities that currently exist in Indian society?

iii. What have been some of the measures that have been taken and can be taken, by individuals, society, and the nation, to address these issues?

d. Questions related to Geography:

i. What is the habitation structure of societies (rural, urban) where identity-based clusters are formed?

In **Economics**, an introductory understanding of economic activities and the interrelatedness of these activities with human life, the market, and money should be included. The content areas encourage the students to understand, observe, and interpret economic life in their immediate environment. With this, they would be able to make sense of the economy in India and in the global world. Aligning with the interdisciplinary approach, understanding economics through the lens of other disciplines would add to the knowledge of the student. Illustratively, while studying about the three sectors (primary, secondary, and tertiary) and organised and unorganised sector in Grade 9, questions from core Economics and other disciplines can be explored in the following manner:

a. **Questions related to Economics:**
   i. What do we understand by primary, secondary, and tertiary sectors of an economy?
   ii. How is each sector dependent on each other, contributing equally for running of the economy?
   iii. What is the difference between organised and unorganised sectors?

b. **Questions related to History:**
   i. What are the changes that have happened over time in trade patterns? (Will cover not only how initial trade was between primary products, but also how industrial revolution changed things at large)
   ii. How did the difference between organised and unorganised sectors emerge historically? What has been and still is the special importance in India of the unorganised sector, both socially and economically?

c. **Questions related to Political Science:**
   i. What is the role of the government to regulate and secure the running of the market?
   ii. How does the government protect people in the unorganised sector through social welfare schemes?

d. **Questions related to Geography:**
   i. How does a product reach you?
   ii. What are trade routes and how are they decided?
   iii. How does geography influence the nature of occupation of the people?

5.5.6 Materials and Resources for the Content

A Social Science classroom should include a variety of TLMs in addition to the textbook. Students must be exposed to social and cultural phenomena across time and space through sources such as local literature, folk songs, stories from one's region, ancient monuments and documents, magazines and newspapers, films and documentaries, autobiographies, biographies, memoirs and travelogues, audio-visual aids, and maps of all kinds. They must make sense of their own lives, the society they live in, and its institutions.

a. **Textbooks:** Social Science textbooks should be made interactive by including reflective prompts for the students. These prompts must help with connecting concepts with the current lives of the students and suggest activities they can do to explore the ideas in their immediate surroundings. Textbooks must have a large number of illustrations and activities that make students think deeply. The textbooks must refer to some original sources that students should examine. Also, by design, they must use and link multiple other learning resources. The current, sharp distinction between textbooks and workbooks must be avoided.

b. **Digital material:** Content for Social Science should not be restricted only to textual forms. Students can engage with a concept through other mediums (songs, movies, documentaries, audio clips). Such diversity in content makes the class enjoyable through an enriched medium of learning. Unfamiliar content becomes easier to understand this way, and it becomes possible to give students access to a distant world (in time and space) virtually.

c. **Maps and atlases:** A geographical basis for understanding any social event makes the learning of Social Science rooted in the physical world. A Social Science classroom should always have maps, globe, and atlases available for students to refer to. The collection of maps should have physical maps, political maps, along with thematic maps (population density, distribution of minerals). These should be of the locality, region, country, and the world.

d. **Literature:** Works of literature (fictional and non-fictional) are a very good source for a Social Science classroom. Literature that is representative of identities, cultures, phases of history, personalities and forms, such as historical accounts, diary records, and folktales can be used to the advantage of the class. Oral traditions and narratives can be another rich form of literature.

e. **Sources from the visual and performing arts:** Art forms which depict culture and traditions are good sources of information and conversation in a Social Science classroom. These would enrich class discussions. In addition, field visits or digital content can be used to introduce the students to the arts related to Social Science ideas.

Teacher's Voice 5.5i

Past-Present-Polity

I teach Social Science to 36 students in Grade 6. It is easier to teach this subject if students are able to relate the content to their experiences/observations from life around them and establish connections between topics of different disciplines. Somehow understanding the interconnectedness of various parts of this subject makes it even more interesting!

Hence, when we were working on a topic of History in which we were discussing about various 'Sources in History' and how we use them to understand the past and present and the concept of 'continuity and change'; I planned a small discussion activity, keeping in mind the following objectives:

a. The students should be able to interpret the sources keeping in mind the context of the society the source represent

b. The students should be able to build a comparative understanding about past and the present and identify what things have continued from the past and what has changed.

With these objectives in mind, I gave a small excerpt about the administrative system of Gram Sabha in Chola period in India. The excerpt highlights the qualifications a person must have, to be a member of the Gram Sabha. Along with the excerpt, a set of questions were also given. The students first had to work on those questions individually and then a classroom discussion was done around the questions.

The excerpt:

Who could be a member of a Sabha?

The Uttaramerur inscription lays down: All those who wish to become members of the Sabha should be owners of land from which land revenue is collected. They should have their own homes. They should be between 35 and 70 years of age. They should have knowledge of the Vedas. They should be well-versed in administrative matters and honest. If anyone has been a member of any committee in the last three years, he cannot become a member of another committee. Anyone who has not submitted his accounts, and those of his relatives, cannot contest the elections.

Set of questions:

a. The record mentions the qualifications of the members of the Gram Sabha. Why do you think such expectations were posed for a member to qualify for Gram Sabha?

b. There is no mention of electing common people and women as members. What would have been the reason for this?

c. Interact with the members of your Gram Panchayat and find out what kind of qualifications are currently prescribed for the election of members?

d. Which of these qualifications are such that cannot be applied to today's Gram Sabha members and why?

This activity took three periods to complete. In the first period I discussed what the students have to do and then gave time to read and respond to the first two questions. In the next period, a few members from Gram Panchayat were invited for a discussion in the classroom, in which the students had to come prepared for their questions about the present structure and rules of Gram Sabha. This discussion helped the students to discover the answers for the third and fourth questions. It was only in the third period that an elaborate class discussion was held and a shared understanding was built. We could draw some interpretations as a team about the Gram Sabha system in the Chola period, and how the concept of Gram Sabha has still **continued,** but the qualification expectations for joining the Gram Sabha have **changed.**

Section 5.6
Pedagogy and Assessment

The approach, principles, and methods of pedagogy and assessment has commonalities across subjects – those have been discussed in **Part A, Chapter 3, §3.3 and §3.4** of this document. This section focusses only on what is most essential for Social Science and humanities. Hence, it will be useful to read this section along with the above-mentioned section.

5.6.1 Pedagogy for Social Science

Social Science is often taught as a fixed set of facts without an understanding of how interpretations play a role in its construction. This has pushed students towards memorising facts and figures from a textbook, which is not an actual learning of Social Science. A Social Science classroom must be participatory and interactive in nature. It is only when students are allowed to immerse themselves in the process of Social Science thinking that they learn the subject better.

5.6.1.1 Pedagogical Considerations

The following pedagogical considerations should be kept in mind while planning for Social Science classes:

a. **Classroom transactions should help students engage with the method of doing Social Science** so that learners can appreciate the methods for knowledge creation in Social Science. For instance, students may be encouraged to notice patterns in the distribution of different forms of government, such as democracies, monarchies, and dictatorships across the globe and propose reasons (historical, geographical, socio-political, and economic) for the existence of those patterns.

b. **Classroom teaching should inculcate an awareness and appreciation of normative concerns.** Students should be given opportunities to reflect on various social and environmental issues in their own environment. This should lead to thinking and discussing of meaningful responses to these challenges.

c. **Multidisciplinary thinking should be encouraged and supported** to ensure that students develop a holistic and integrated understanding of concepts as they appear in society. Any event in history needs to be interpreted in the socio-political or economic contexts of its origin; any geographical phenomena should be evaluated from its impact on space and human lives and its influence on the economy and society. Similarly, any economic concept needs to be understood from its historical and socio-political contexts.

d. **A Social Science classroom should be a place for contesting ideas, debating, and arguing with empathy and care.** Students must be encouraged to share their diverse experiences and reasoning without the fear of being judged or ridiculed. The Teacher must refrain from imposing their own beliefs and biases on the students and should train students towards looking at one issue from several viewpoints. The entire pedagogy in a Social Science classroom should be an attempt to reveal newer dimensions of social reality and work towards creating self-awareness and introspection among Teachers and students.

e. **Facts and concepts in Social Science should be made relevant to the students' contexts and experiences.** Such sharing and interactions must be respectful of the cultural and socio-economic differences and multiple perspectives among students.

f. **Concepts in Social Science need to be clarified with adequate depth and rigour:** In a Social Science classroom, adequate time and attention should be given to concept formation and clarity. For example, students need to understand the processes of weathering and erosion to see their impact on topography and human civilisation; they must engage with the meaning of different types of sources of evidence to frame meaningful interpretations of historical events; and develop a comprehensive understanding of concepts of plurality and

democracy to appreciate the values enshrined in the Constitution and those stressed upon in NEP 2020. The overall classroom environment should encourage academic rigour in acquiring knowledge.

g. **The opportunity to engage with various social-political and environmental matters** through investigating and interpreting multiple sources of evidence available, such as documentaries, literature (books, local stories, travelogues), newspaper reports, and relevant films should be undertaken. Selecting materials that are relatable to students and help in developing curiosity about the discipline should be prioritised. At the same time, care should be taken to ensure that materials are taken from reliable sources of information and do not depict biases for or against a particular thought, philosophy, group, or people.

h. **Authentic tasks/performance-based tasks, such as project-based learning activities and assignments, should be incorporated** to give learners an opportunity to develop different types of capacities such as surveying, data analysis, problem solving, and collaborative skills to validate and investigate their assumptions and beliefs.

5.6.1.2 Pedagogical Strategies

To design lessons around these considerations, there are many strategies that Teachers can deploy. Illustratively:

a. **Inquiry**: Inquiry-based methods help students understand how social scientists generate knowledge. For instance, students can make and test hypotheses about factors that influence migration in their locality or region, the genesis of various settlement patterns in their region, why specific types of occupations are more prevalent in specific regions, and so on.

b. **Issues-based learning**: Issues-based learning can be a conducive tool for acquainting students with various aspects of social realities, integrating perspectives from different disciplines in investigating the causes of problems, and thinking about relevant social action. As a subject addressing normative concerns, it is also vital that students learn much of the Social Science content by engaging with real issues in their immediate/related context. For instance, students may consider the problem of drinking water shortage in their area, which may involve engaging with questions such as – What are the available sources of water? How does water consumption differ across different parts of the region/locality? Are there wastages that can be avoided? How is water being made accessible to all sections of society? Is there unequal distribution? What steps are being taken to purify water? How is it being made available to the poorer sections of society?

c. **Conversations, discussions, and debates:** Conversations are extremely vital in a Social Science classroom. These conversations should lead to focussed discussions on concepts, ideas, belief systems, and value claims. Sometimes these discussions may turn into debates in the classroom. It is important to encourage such debates, as it provides students with the opportunity to put forth their perspectives, resolve conflicts, iron out contradictory ideas, and learn from each other. However, care must be taken that such discussions and debates do not hurt the sentiments of any social group. Some common topics for discussion could be on climate change, diversity in clothing and types of food as per historical and geographical reasons and practising democratic processes in schools.

d. **Role plays and simulations**: Role plays and simulations may help students explore decision-making processes and find means for conflict resolution. For instance, role plays of the Gram Panchayat/Corporation may be used as a vehicle to explain the functioning of a democratic institution.

e. **Community service and field excursions:** Community service is yet another engaging strategy in a Social Science classroom. It not only involves concrete experiences for learning concepts from the curriculum, but also enables students to develop the desired values. Students may take up various projects to work with local government agencies to acquire first-hand experience of issues and work with people in need. Similarly, field excursions are meaningful ways of engaging with the content, e.g., nature walks, heritage walks, food walks, and visits to police stations, museums, post offices, planetariums, and government and digital archives.

f. **Reflective essays:** Students can write reflective essays on various topics related to the curriculum. These essays can also be used by Teachers to assess the extent to which students have learnt the desired concepts and skills. For instance, a reflective essay topic could be, 'How will dams transform agricultural productivity in India?', 'What are the issues and opportunities of linking rivers?', 'What sustainable agricultural strategies could a region adopt if its main river turns seasonal or dries up?', or 'Is waste management and disposal the sole responsibility of municipalities and other government agencies?

g. **Project work**: Effective Social Science teaching happens when students collaborate for a project or a specific task. These could be conducting surveys and interviews (e.g., household surveys, interviews with stakeholders of the society such as village sarpanch), drawing a map of their classroom, investigating historical sources in their region, tabulating the types of *bazaars*/marketsSuch projects should be collaboratively designed along with students with sufficient time given to collect data, analyse it, and present it in the classrooms.

h. **Some specific opportunities for projects to create models and artefacts:** Students should be given opportunities where they can apply their knowledge to create models and artefacts. These could be in the form of poster-making, collections (old coins, newspapers, stamps, types of rocks, leaves, flowers, photographs, pamphlets), models (2-dimensional or 3-dimensional, e.g., monuments, volcanoes, still scenes), videos of rallies/*haat bazaars*/ book fairs/any social events in their surroundings.

5.6.2 Assessment in Social Science

Some of the key principles having particular relevance to Social Science

a. Students must be assessed for their understanding of core ideas, facts, and concepts in Social Sciences and their ability to demonstrate an integrated understanding of how society functions through an interplay of historical, geographical, social, cultural, economic, political, and other factors. The ability to look forward and think out possible strategies to tackle current or future social, political, environmental issues should also be evaluated (not for the effectiveness of those proposed strategies, which often cannot be assessed, but for the thinking processes the students engage in and their use of a range of materials, factors).

b. They should be assessed on the skills and dispositions that foster inquiry in Social Sciences, e.g., sourcing and interpreting evidence, tracing continuity and change, recognising spatial patterns, respect for diversity.

c. Students must be assessed through a variety of ways, e.g., answering questions using reasoning and evidence, conducting field surveys, map reading and interpretation, developing geographical models, participating in debates and discussions.

A few Teacher Voices below illustrate assessment samples for Social Science.

Teacher's Voice 5.6i

Different Types of Farming

I teach Grade 7. I wanted to assess my students' understanding of the difference between types of farming practised in India. Usually, I would ask my students to simply state the features of subsistence farming, commercial farming, plantation farming, and shifting cultivation, and their key differences. Both questions can be answered using rote memory. I tried something different this time. The question below is directly related to their understanding of types of farming, their differences, and how they appear in real-life situations.

Read the information below and answer the question;

Meena and Ravi are friends. Their families practice farming in the following ways. Please read below:

Meena	Ravi
• Owner of 1 hectare of land and grows rice; also works as a labourer on someone else's land. • All farming activities are done manually by Meena and her family members. • Yield from her land is low. • Whatever rice is grown is consumed by her and her family members.	• Owner of 5 hectares of land and grows rice. • Most of the farming activities are done with the help of machines. • Uses good quality seeds and fertilisers and the yield from the land is high. • Takes his produce (rice) to the wholesale market and gets a good price for selling them.

Identify the type of farming practiced by Meena and Ravi from the options given below.

a. Meena practises commercial farming while Ravi practises subsistence farming

b. Meena practises subsistence farming while Ravi practises plantation farming

c. Meena practises shifting cultivation while Ravi practises commercial farming

d. **Meena practises subsistence farming while Ravi practises commercial farming**

e. Both Meena and Ravi practise commercial farming

Teacher's Voice 5.6ii

Applying Constitutional Provisions

I teach Grade 8. I wanted to assess my students' ability to apply their understanding of Constitutional provisions in an unfamiliar situation. Students tend to rote memorise and reproduce the conditions for contesting elections as seen in textbooks. This question presents a real-life situation where students must apply their knowledge.

Read the following passage carefully.

Ravi is 24 years old and comes from a poor family. He is a graduate and a citizen of India. He does not hold an office of profit under the Government of India or a State Government. He is physically and mentally fit and is planning to contest in the Lok Sabha elections. He filed his nomination papers for the election. However, his application has been rejected.

From the above passage, why do you think Ravi's candidature was rejected?

a. He comes from a poor family

b. He is just a graduate

c. **He is 24 years old**

d. He does not hold any office of profit

Teacher's Voice 5.6iii

Field Survey – Knowing your Local History

I teach Grade 9. I find field surveys very useful for a comprehensive assessment of engaging with the history of one's locality and using the process of inquiry in Social Science.

The following survey enables the students to acquire first-hand experience using skills, like observing, recording, collecting sources, documenting, comparing, evaluating, and drawing conclusions. Working in groups also nurtures skills of communication, collaboration, and teamwork.

Activity: I used the following instructions to describe the field survey tasks to my students:

I used the following instructions to describe the field survey tasks to my students:

a. Identify at least 2 popular historical sites in your village or town e.g., temple, mosque, church, gurudwara, well, bavar/bawri, palace, ruins, other places of historical importance.

b. Collect information about these 2 sites using the following sources:

   i. Speak to at least 2 members from your family/neighbourhood about these sites — When was it built? What was it used for? Is there anything special about this site?

And so on.

ii. Visit these 2 sites in groups of 4. Observe and record the following: shape and form of the structure, type of materials used, anything special/peculiar about the site, e.g., inscriptions, carvings, folktales.

c. After collecting information, I asked students to prepare a project report in the following way:

Project Title: Use any imaginative title as per your group's choice.

Sites visited: You can provide photographs/sketches of the sites along with description.

What did you learn about these 2 sites from the people you spoke to and your visit?

Site 1:

Site 2:

What does this tell you about the history of your locality? Write down at least 3 conclusions based on the information collected.
Write any funny incident/story/fact that you learnt about this site which is memorable to your group.
I used the following rubrics to grade my students' performance:

Criteria	Grade A	Grade B	Grade C
Followed appropriate survey process	Information collected from at least 4 sources All suggested questions from the task were answered in depth Responses were documented neatly Student added more questions to get in-depth understanding of the sites	Information collected from at least 3 sources. Attempted to answer all questions from the task. Reponses from survey were sketchy in few places No new questions were added by the group	Information collected from one or two sources. Details from the survey were inadequate to present a complete picture of the sites visited
Quality of project	Project title was catchy/ creative Complete description of the sites visited using multiple evidence - such as sketches. Photographs, maps, anecdotes History of the 2 sites was adequately constructed using multiple evidence from the survey Personal anecdotes/ reflections were included in the project	Project title was clear. Description of the 2 sites using 1-2 evidence History of the sites was attempted-but the narrative lacked coherence and completeness Personal anecdotes were missing	Project title was clear Descriptions of the sites and evidence were inadequate Conclusions about the history of the place were missing

Chapter 6

Art Education

The Arts are a vast range of creative activities carried out by people in all cultures and societies. They involve innovative and imaginative ways of expression in different forms using a variety of materials and media. When people work with the arts, they not only create artwork, but also enjoy the experience of viewing and responding to many forms of cultural expression. The Arts can broadly be classified into the Visual, Literary, and Performing Arts.

In the school curriculum, Art Education deals with developing creativity, aesthetic sensibilities, and cultural literacy in all students. Being culturally literate means having familiarity with the significant events, figures, and works of literature, Visual Arts, and Performing Arts that have shaped a society or have had a lasting impact on its development. This is done through various forms of Visual Arts, a variety of crafts (local living traditions), digital art, as well as Performing Arts such as storytelling, puppetry, dramatics, music, dance, and movement. The range of genres could include traditional, classical, folk, popular, and contemporary styles of creative expression.

Art Education in schools should give all students adequate opportunities to openly express their ideas and feelings through a variety of art forms. When they create artwork together and work collaboratively, they recognise one another's strengths and develop deeper connections with the world around them. Such a process nurtures empathy, appreciation, cooperation, and trust, all of which are fundamental for developing social and human values, such as *ahimsa*, love, compassion, friendship, and peaceful co-existence.



Section 6.1
Aims

Art in school education helps every student develop creative thought and expression. This involves three important processes—*making artwork*, *thinking creatively in the Arts*, and *appreciating all forms of artistic expression*.

The Arts are known to enable socio-emotional well-being. Exposure to art and the experience of producing art can improve cognition and significantly impact individuals in their emotional awareness and regulation.

Through a complete engagement of the mind and body, the Arts have the potential to create immersive experiences. Such immersive experiences have a positive and long-lasting impact on the development of aesthetic sensibilities, expression, imagination, observation, crafting skills, creativity, and students' overall confidence in their own abilities. They learn to find diverse ways of persisting and solving problems. All these are important for individual growth and contribution towards society.

By working with the Arts, students connect with their culture and appreciate the diversity of artistic expression in other cultures. As a common language, the Arts bring people together and lead them to develop acceptance, understanding, and mutual respect.

Through a good, effective Art Education programme, schools must aim to achieve:

a. **Joy in exploring and creating artwork:** This would mean gaining a variety of aesthetic experiences and deriving joy from all forms of art.
b. **Imagination and creativity:** Acquiring and applying creative thinking and artistic capacities through experimentation and sustained practice in the Arts is at the heart of Art Education.
c. **Empathy and sensitivity:** Meaningful experience in the Arts has great potential to nurture empathy and sensitivity towards the expressions of others.
d. **Understanding of connections with other disciplines:** The Arts teaches appreciation of beauty in nature and the observation of details and patterns. This approach to the understanding of disciplines makes for aesthetic experiences in themselves.
e. **Sense of belonging:** Through artistic engagement, students will find connections to their own culture and traditions, as well as learn an appreciation for India's multicultural diversity and knowledge of contemporary artists and art practices.

Section 6.2
Nature of Knowledge

Artistic work involves perceptual, procedural, and conceptual knowledge: The Arts strongly rely on perceptual knowledge, which is about experiencing the world through all the senses of our body. The Arts also connect emotions and sensory experiences. Procedural knowledge in the Arts is largely associated with the process of making or creating artwork. This requires us to know how to use materials such as tools and mediums of expression and how to apply artistic concepts while creating artwork. Conceptual knowledge in the Arts is to know about space, colour, form, movement, narration, materials, tools, balance, proportion, beauty, harmony, and other elements and principles.

Yatho hasta tatho drishti

Yatho drishti tatho manah

Yatho manah tatho bhaava

Yatho bhaava tatho rasa

- *Verse from the Natyashastra*

Translation:

Where the hand (action) goes, there follows vision

Where the vision goes, there follows the mind (thought)

Where the mind goes, there follows feeling (emotion)

Where the feeling goes, there follows aesthetic pleasure

'Making' is at the centre of artistic work: The above verse in Sanskrit captures the essence of making art, where the creative process begins with making. It is then followed by thinking, feeling, experiencing, and appreciating. The concrete experience of 'making' or 'doing' is central to the Arts. Along with this, 'how something is done' defines its artistic nature, e.g., one can play with utensils to either make disturbing noises or create soothing music.

Art inspires new ways of looking: We are creatures of habit and adapt easily to routine and repetition. We enjoy the Arts because it brings about a change in our routine ways of thinking and working. The Arts give a sense of 'newness' by inspiring us to experience the world differently, in ways that are unique, enjoyable, and thought-provoking. Such experiences are referred to as *rasa* or the aesthetic experience.

Art reflects human aesthetic sensibilities: Aesthetic sensibility is the ability to perceive beauty, arrive at considered judgements regarding the good and beautiful, and strive towards a sense of refinement in the art-making process. Art is a form of understanding beauty, shape, symmetry, pattern, and movement to express ideas and evoke feelings.

Artistic creativity follows and expands rules and conventions: As with languages, the Arts also have rules and grammar that are evolving and being redefined with time. For instance, the creative exploration of *raagas* in classical Music follows some basic rules while allowing for

exploration and creativity. Instead of viewing these rules of form as constraints, artists use these as opportunities to challenge their own imagination and push the boundaries of creativity towards newer forms of expression.

There are differences in the natures of Visual and Performing Arts: The Visual Arts typically offer 'static' experiences to viewers. For instance, paintings and sculptures are viewed as completed artwork and do not undergo changes while viewing. The Performing Arts on the other hand, offer 'dynamic' (time-based) experiences to their audiences. For example, Music, Dance, and Theatre are dependent on the passage of time for their audience to experience a completed work. Some Art forms might offer a combination of both static and dynamic experiences, e.g., a tradition such as *Patachitra* combines aspects of painting and performance when the artist sings and narrates the story depicted in the scroll painting.

Art is a holistic engagement: The Arts involve a holistic engagement of the mind and body through which ideas, expressions, and responses are communicated. Playing the flute not only produces an aesthetic experience (*rasaanubhava)* but learning to play it also develops an understanding of materials, sound, and its production. Theatre and the Dramatic Arts are by nature holistic knowledge systems that combine Literature, Music, Movement, Visual Arts, and Crafts.

Section 6.3
Approach to Art Education

NEP 2020 mentions that

> *...no hard separation among 'curricular', 'extracurricular', or 'co-curricular', among 'Arts', 'Humanities', and 'Sciences', or between 'Vocational' or 'academic' streams. Subjects such as Physical Education, Arts and Crafts, and vocational skills, in addition to Science, Humanities, and Mathematics, will be incorporated throughout the school curriculum.*

This NCF, therefore, places the Arts as one of the main Curricular Areas. It recognises the vast diversity of cultural expressions that exist across the length and breadth of India. **Local art and cultures would be the starting point for Art Education in all Stages of school education.** This approach aims to develop an understanding among Teachers and students that the Arts are around us as an integral part of our lives and an essential subject for students of all Stages of education.

6.3.1 Stages of Aesthetic Development

Development of Aesthetic Sensibilities: At all Stages of Art Education, students learn to express their views on what is 'aesthetic' and describe the characteristics of things they find beautiful. While subjective interpretations are encouraged, it is also important for students to assess the aesthetic qualities of artwork based on the commonly accepted criteria in the Arts. These criteria are established through the art form as well as society and culture. For example, when proportion is chosen as one of the common criteria in the Visual Arts, what is considered a beautiful proportion may vary from one culture to another. It could also depend on the context, genre, or theme of the artwork. Making these connections is important for evaluating artwork

and validating aesthetic choices. Students imbibe their aesthetic sensibility from the cultures that they are frequently exposed to. Art Education helps them examine their aesthetics closely and expand their 'tastes' by participating in art processes.

Aesthetic Development in Stages: In the Foundational Stage, children are encouraged to express their views while responding to artwork, and they share their personal preferences. By the end of the Preparatory Stage, students can be expected to distinguish artwork by quality and level of completion. In the Middle and Secondary Stages, students should be able to reflect on their aesthetic choices and not blindly conform to trends and cliques because of social acceptance. In these Stages, they can learn to evaluate their aesthetic choices through gradual steps of inquiry, rigorous exploration, and practice. As students mature, their observation and sensitivity to detail develop, and this enables them to appreciate well-crafted objects and acquire sophistication in their artistic expressions. They develop aesthetic judgement and an ability to evaluate artwork based on common criteria.

All creative processes that take place in the Art classroom need to encourage the pursuit of aesthetic qualities. This in turn reflects in their art-making process by setting higher benchmarks for creative refinement in thought, expression, and technical skills.

6.3.2 Art Integration

In addition to teaching and learning the Arts as a subject, the Arts must also be integrated into the classroom practices of all other subjects. According to NEP 2020:

> *Art-integration is a cross-curricular pedagogical approach that utilises various aspects and forms of art and culture as the basis for learning concepts across subjects. As a part of the thrust on experiential learning, art-integrated education will be embedded in classroom transactions not only for creating joyful classrooms but also for imbibing the Indian ethos through the integration of Indian art and culture in the teaching and learning process at every level.*

Teachers of all subjects can explore Art integration in their classes. It provides experiential and joyful learning opportunities for students by focussing on meaningful linkages between knowledge of the Arts and the knowledge of other subjects.

Art integration works well when Teachers collaborate. When Teachers of other subjects collaborate with Arts Teachers, they share the responsibility of ensuring that every student understands concepts through various modes of engagement. This also helps students express their curiosity, inquiry, and creativity in multiple forms.

Art integration works well when it addresses the Goals and Competencies of Art as well as other subjects. From the processes of planning, through classroom practices and to assessment, Teachers must ensure that the goals of all subjects involved, including the Arts, are given equal importance.

Art integration identifies select concepts that are shared across subjects. For example, patterns and tessellations are common to Visual Arts and Mathematics, symmetry is common across Visual Arts, Performing Arts, and Mathematics; Music, sound, and acoustics can be linked through Physics, Biology, and Performing Arts; properties of materials and chemical reactions can be linked through pottery, textiles, Physics, and Chemistry; Literature and History can be linked across Drama, Visual Arts, Music, Dance, Language(s) and Social Sciences.

Concepts and processes are emphasised in Art integration. It is important to understand that not all activities that involve drawing and construction can be presumed to fulfil Art goals. For example, copying a science diagram from a book is not Art integration. Furthermore, the ability to observe, visualise, draw well, or build something is as much a desirable capacity in the Sciences as it is in the Arts.

Arts integration cannot be a replacement for dedicated Art classes in the school curriculum. The Arts have their own content, skills, methods, and processes that require dedicated space and time for developing knowledge and practice. This document focusses on Art Education specific to knowledge of the Arts, along with Learning Standards in the Visual and Performing Arts. This would not only guide Teachers in teaching the Arts as a subject, but also find meaningful connections with other subjects to integrate concepts, content, pedagogy, and assessment practices.

6.3.3 Emphasis on Process, not Product

Process, more than the product, is central to learning the Arts. Art curricula across the world have recognised the educational value of developing frameworks for Art Education which focus on artistic processes, such as ideation, creation, production, performance/presentation, response, review, and making connections. This ensures that Teachers and students focus on all aspects of development (cognitive, affective, psychomotor, socio-emotional, and language) while learning the Arts. Accordingly, the Learning Standards integrate the thinking, making, and appreciation processes that are fundamental to Art Education.

Thinking processes refer to a wide range of cognitive activities while working in the Arts. The first is the process of generating ideas and innovating while creating artwork. The second is understanding and applying the elements of various Art forms (line, form, colour, space, texture, and value in the Visual Arts; pitch, rhythm, volume, tempo, movement, speech, voice, story, and role in the Performing Arts). The third is inquiry and critical probing into art practices and aesthetic experiences. The fourth is to attempt newer, reasonable interpretations while working in the Arts. The fifth is to connect the Arts with other knowledge as well as one's own experiences.

Making processes are related to the execution and production of artwork. These processes engage the mind and body for expressing ideas and feelings. This includes various body movements and the use of materials, instruments, tools, and other resources. The making processes also focus on exploring techniques, refining skills, and practising creative improvisation while producing artwork.

Appreciation processes begin with the exposure to a wide range of art forms, artists, and their practices through structured Art sessions or through the local environment and culture. This develops an awareness of how the Arts communicate a variety of expressions. Furthermore, the process reveals how these expressions are interpreted differently by every individual. While viewing Art, one also needs to consider the social, historical, and contextual background of an artwork and its viewers. Responding to art also requires the ability to describe aesthetic experiences and share personal interpretations or viewpoints. The capacity to assess artwork and develop aesthetic judgement is also an important part of the appreciation processes.

All these processes are interlinked and cannot be addressed in isolation if a meaningful and complete art learning experience is desired.

Section 6.4
Current Challenges

The status of Art Education in schools is troubled by several challenges, some of which are as follows:

a. Lack of time, resources, and seriousness given to the Arts

Art activities are often limited to fun and entertainment during occasions and cultural events at schools. Art education is either not timetabled at all or is stopped before and during exams. Time allocated for Art classes is often taken away for exam preparation or syllabus completion in other subjects. There is often little/no physical space allocated for art activities and a rare utilisation of art resources in most schools. Added to this, there is rarely any planning, organising, assessment, and review in art teaching. There are no textbooks/handbooks to guide the Art Teacher and there is no serious assessment of learning in the Arts.

b. Reinforcing stereotypes and meaningless ideas

In the name of Art, students are mostly made to admire and reproduce stale and unoriginal images, e.g., drawings of landscapes with triangular mountains, a semi-circular sun, and a few trees, regardless of whether the student has witnessed such a landscape. Similarly, in Dramatic Arts, students often perform morally heavy plays based on themes with which they have no personal connections or dance to the tunes of popular songs that further reinforce social stereotypes. Art is reduced to occasional entertainment characterised by pomp and spectacle.

c. Acute shortage of well-prepared Art Teachers

Schools across the country need to recruit many more Art Teachers. Art teaching needs preparation. Artists, craftspeople, and performers cannot simply become Teachers. Becoming an Art Teacher requires an understanding of educational perspectives, a capacity for educational judgement, as well as initial guided practice in Art teaching. Teacher Education programmes do not have an appropriate Art orientation for all Teachers or an initial preparation of specialised Art Teachers. As a result, Art Teachers struggle to understand the requirements of Art Education and end up imposing inappropriate expectations on students. In cases where Teachers of other subjects show an interest in the Arts and an inclination to teach the Arts, it is neither appreciated nor supported.

d. Social aspirations

There is a general lack of interest in Art Education in society since people lack awareness about its educational value in developing aesthetic, creative, and cultural capacities in students. The wide scope of pursuing the Arts as a career also remains unknown to many.

Box 6.4i

Addressing the Constraint of Teacher Availability

Many schools do not have dedicated Art Teachers or adequate space and materials for the Arts. In such cases, schools could choose from various forms of visual and Performing Arts that are already practised in the region, identify ***local artists who could be resource persons, and use natural materials and local resources*** *for Art facilitation. Local potters, toymakers, basket weavers, painters (including Gond, Warli, Madhubani,*

Maandana), sculptors, photographers, book illustrators, and muralists in the locality could be invited to the school to lecture-demonstrate. With some education and initial support in learning pedagogical practices, these artists may even be employed as part-time or full-time Teachers by schools. However, until such an arrangement happens, Teachers need to ensure that Art Education aligns with the core principles mentioned in this document by being the primary facilitators. The role of the resource person is to introduce technical aspects of the Arts processes during their interactions with students.

In the Foundational and Preparatory Stages, Art ***classes may be facilitated by any Teacher in the school who has a basic orientation to Art Education*** *for the respective Stages, or with the assistance of local resource persons. They must encourage students to openly express their ideas and emotions and playfully experiment with a range of materials in the form of Visual Arts (rangoli, drawing, painting, textile arts, puppetry, sculpture, pottery).*

By the Middle Stage, ***schools must prioritise recruiting at least one exclusively assigned Art Teacher*** *who is familiar with any art form and is trained to facilitate the Visual Arts and Performing Arts. A Teacher for the Middle Stage should have the capacity to provide appropriate encouragement and inputs to nurture the individual creativity of all students and stretch their artistic explorations.*

In the Secondary Stage, schools need to ideally ***recruit one Teacher for the Visual Arts and one Teacher for the Performing Arts*** *who have adequate knowledge of the Arts, as well as the education perspectives that are required for teaching the Arts at the Secondary Stage. Until this is done, schools could collaborate with Art organisations and the local art communities to fulfil the Art Education needs of the curriculum.*

School libraries should ***include a wide range of books and audio-visual resources****. These could be museum/exhibition catalogues with images of artwork, books on artists, art magazines/periodicals related to the Visual and Performing Arts, children's literature with artistic illustrations, and so on. Songbooks with musical notations or literature for Drama could also become important reference material for students and Teachers.*

Section 6.5
Learning Standards

In the Foundational Stage, the Arts contribute towards the sensorial, physical, socio-emotional, aesthetic, and cultural development of young children. They use the space around them freely and imaginatively while creating body movements, sounds, and images to express themselves in various art forms. They experiment with objects, materials, and tools playfully and instinctively. They also express their responses to the arts in various verbal and non-verbal ways.

In the Preparatory Stage, students continue their own artistic explorations while also developing a curiosity towards local art forms and artists. They learn to exercise their choice of materials, tools, and themes for creative expression. In this Stage, they are initiated into the processes of ideating, reviewing, editing, rehearsing, and completing artwork while working individually and collaboratively.

The objective of Art in the Middle Stage is that students develop an appreciation for the artistic and cultural diversity of their region and other parts of India. They are introduced to basic concepts, techniques, and processes across the Visual and Performing Arts, as well as local Art

traditions from different parts of India. Through regular Art practice, students in this Stage are expected to enhance their imaginative and creative capacities, as well as their appreciation of effort, originality, and refinement in artwork.

In Grades 9 and 10 of the Secondary Stage, students develop an awareness of the wide scope of applications in the Visual and Performing Arts. Along with the rigorous practice of fundamental techniques and processes, students develop the capacity to interpret and evaluate artwork. The larger objective at this Stage is to inspire meaningful connections between the Arts and their own lives through a deeper engagement with diverse artistic expressions.

Across the Stages, the Arts nurture creativity and aesthetic sensibilities in all students. At every Stage, collaborative work provides opportunities for developing mutual appreciation, respect, love, compassion, patience, persistence, and hard work. Most importantly, the Arts focus on instilling joy and pride in India's rich artistic and cultural diversity.

The Learning Standards in this section are for the Visual Arts, Theatre, Music, and Dance and Movement. All schools must aim to provide maximum opportunities for students to explore any form of Visual Arts and any form of Performing Arts (Music, Theatre, Dance, and Movement) across all the Stages. The art forms that are chosen by the school should be appropriate, accessible to all students, and have relevance in their contexts. Based on the art forms that a school chooses, the relevant Learning Standards specific to the Visual Art form or Performing Art form can be applied. Teachers need to understand the importance of process in all Art forms and ensure that students develop the necessary Competencies by the end of every Stage.

A 'Nested' Design of Learning Standards: As mentioned in Part A, Chapter 3, § 3.1, giving due consideration to the time schools might require in the implementation of Art Education as a full-fledged subject across the Stages (for example, appointment of Teachers, acquisition of resources), this document contains **'Nested Learning Standards'** for Art Education, wherein Learning Standards have two sets which have been detailed. The first set, called **Learning Standards - 1** details the full range of Curricular Goals and Competencies across the Visual and Performing Arts. These should be accomplished by all schools as soon as they add the required resources for Art Education. Nested within this is a subset called **Learning Standards - 2**. These should be accomplished by all schools from the very initiation of the implementation of this NCF.

6.5.1 Preparatory Stage

6.5.1.1 Learning Standards-1

Visual Arts	**CG-1** Develops confidence to explore, depict, and celebrate human experience through the Arts	C-1.1	Expresses enthusiasm to create a variety of images that depict their everyday life, emotions, and imaginations
		C-1.2	Discusses a variety of ideas and responses while working collaboratively in the Visual Arts
	CG-2 Exercises their imagination and creativity freely in the Arts	C-2.1	Creatively uses different combinations of visual elements (line, form, colour, space, texture) while depicting their everyday observations, personal experiences, and feelings
		C-2.2	Compares and contrasts the visual elements, themes, and expressions of artwork shared in the classroom

Visual Arts	**CG-3** Explores basic processes, materials, and techniques in the Arts	C-3.1 Makes choices while working with materials, tools, and techniques used in the Visual Arts C-3.2 Practises steps of planning, executing, and presenting while creating visual artwork individually and collaboratively
	CG-4 Explores beauty in their surroundings, and develops an interest in a variety of local Art forms and cultural practices	C-4.1 Recognises visual elements in nature and describes their artistic qualities C-4.2 Demonstrates curiosity towards local Art forms and culture
Theatre	**CG-1** Develops confidence to explore, depict, and celebrate human experience through the Arts	C-1.1 Expresses enthusiasm to depict a variety of objects, people, situations, and experiences in Drama activities C-1.2 Discusses own thoughts and responses while working collaboratively in the Dramatic Arts
	CG-2 Exercises their imagination and creativity freely in the Arts	C-2.1 Creates and performs Drama in the classroom based on everyday events, by combining various characters, roles, situations, spaces, and basic props C-2.2 Compares and contrasts themes and elements of Drama, and related artistic expressions created in the classroom
	CG-3 Explores basic processes, materials, and techniques in the Arts	C-3.1 Makes choices while working with materials, tools, and techniques used in the Dramatic Arts C-3.2 Practises steps of planning, executing, and presenting while creating Drama individually and collaboratively
	CG-4 Explores beauty in their surroundings, and develops an interest in a variety of local Art forms and cultural practices	C-4.1 Recognises elements of Drama and Movement in nature and describes their artistic qualities C-4.2 Demonstrates curiosity towards local Art forms and culture
Music	**CG-1** Develops confidence to explore, depict, and celebrate human experience through the Arts	C-1.1 Expresses enthusiasm to practice and perform Music that is familiar to them C-1.2 Discusses own thoughts and responses while working collaboratively in Music

Music	**CG-2** Exercises their imagination and creativity freely in the Arts	C-2.1	Practises and performs songs and rhythms in a variety of musical arrangements (arrangement of vocal, instrumental, solo, duet, ensemble/group)
		C-2.2	Compares and contrasts musical elements *(Laya, Taala, Sur, Bhaava),* lyrics, and expressions in a variety of musical styles introduced in the classroom
	CG-3 Explores basic processes, materials, and techniques in the Arts	C-3.1	Makes choices while working with voices, instruments, and arrangements used in Music
		C-3.2	Contributes ideas while selecting Music for performance and participates in rehearsals
	CG-4 Explores beauty in their surroundings, and develops an interest in a variety of local Art forms and cultural practices	C-4.1	Recognises musical elements in nature and describes their artistic qualities
		C-4.2	Demonstrates curiosity towards local Art forms and culture
Dance and Movement	**CG-1** Develops confidence to explore, depict, and celebrate human experience through the Arts	C-1.1	Expresses enthusiasm to practise and perform Dance and Movement that is familiar to them
		C-1.2	Discusses ideas and responses while working collaboratively in Dance and Movement
	CG-2 Exercises their imagination and creativity freely in the Arts	C-2.1	Creates and practises Dance and Movement sequences based on everyday actions and personal experiences
		C-2.2	Compares and contrasts movements, rhythms, postures, themes, and expressions in a variety of Dance and Movement styles introduced in the classroom
	CG-3 Explores basic processes, materials, and techniques in the Arts	C-3.1	Makes choices while working with movement steps, instruments, costumes, and arrangements used in Dance and Movement
		C-3.2	Contributes ideas while selecting Dance and Movement sequences for performance and participates in rehearsals
	CG-4 Explores beauty in their surroundings, and develops an interest in a variety of local Art forms and cultural practices	C-4.1	Recognises elements of Dance and Movement in nature and describes their artistic qualities
		C-4.2	Demonstrates curiosity towards local Art forms and culture

6.5.1.2 Learning Standards-2

CG-1 Develops an enjoyment of the Arts and exercises their creativity and imagination in Visual and Performing Arts activities	C-1.1	Creates and presents a variety of artwork to communicate their ideas and emotions in any of the Visual and Performing Art forms (emphasis on variety in Music, painting, drawing, crafts, Drama, Dance and Movement, and local Art forms)
	C-1.2	Describes the varied materials, tools, and processes used in the Visual and Performing Arts and demonstrates familiarity with some of these in their own artwork [e.g., identifies and names some musical instruments and demonstrates simple beats on a *dholak*, *khanjira*, bells, utensils, or one's own body (clapping, tapping, making different sounds using mouth and voice)]
	C-1.3	Creates artwork collaboratively and shares own thoughts and feelings while responding to Arts and culture in their surroundings

6.5.2 Middle Stage

6.5.2.1 Learning Standards-1

Visual Arts	**CG-1** Develops openness to explore and express themselves through various Art forms	C-1.1	Expresses confidently their personal and everyday life experiences through various Visual Art forms
		C-1.2	Demonstrates flexibility in the process of collaboratively developing Visual Arts practice
	CG-2 Applies their imagination and creativity to explore alternative ideas through the Arts	C-2.1	Creates visual artwork based on situations or stories that challenge stereotypes observed in their surroundings (such as gender roles)
		C-2.2	Connects visual imagery, symbols, and visual metaphors with personal experiences, emotions, and imaginations
	CG-3 Understands and applies artistic elements, processes, and techniques	C-3.1	Demonstrates care and makes informed choices while using various materials, tools, and techniques in the Visual Arts
		C-3.2	Refines ideas and techniques of visual expression from the stage of planning to the final presentation, and reviews the entire process
	CG-4 Acquaints themselves with a range of aesthetic sensibilities in regional Arts and cultural practices	C-4.1	Demonstrates familiarity with various local and regional forms of Art
		C-4.2	Describes the life and work of a few visual artists in their region and across India

Theatre	**CG-1** Develops openness to explore and express themselves through various Art forms	C-1.1 Expresses their personal and everyday life experiences through various Drama activities confidently C-1.2 Demonstrates flexibility in the process of collaboratively developing Drama
	CG-2 Applies their imagination and creativity to explore alternative ideas through the Arts	C-2.1 Creates and performs Drama based on situations/stories that challenge stereotypes observed in their surroundings (such as gender roles) C-2.2 Connects elements of Drama, themes and symbols with personal experiences, emotions, and imaginations
	CG-3 Understands and applies artistic elements, processes, and techniques	C-3.1 Demonstrates care and basic stage etiquette; and makes informed choices while using various materials, tools, and techniques of Dramatic Arts C-3.2 Refines ideas and techniques from the stage of planning to the final presentation in Drama for external audiences, and reviews the entire process
	CG-4 Acquaints themselves with a range of aesthetic sensibilities in regional Arts and cultural practices	C-4.1 Demonstrates familiarity with various local and regional forms of Theatre C-4.2 Describes the life and work of a few Theatre artists and performers in their region and across India

Music	**CG-1** Develops openness to explore and express themselves through various Art forms	C-1.1 Expresses confidently their personal and everyday life experiences through a variety of musical activities C-1.2 Demonstrates flexibility in the process of collaboratively developing Music practices
	CG-2 Applies their imagination and creativity to explore alternative ideas through the Arts	C-2.1 Creates and performs songs and musical compositions that challenge stereotypes observed in their surroundings (such as gender roles) C-2.2 Connects elements of Music (lyrics, *raagas*, rhythms, volume, tempo and patterns) with personal experiences, emotions, and imaginations
	CG-3 Understands and applies artistic elements, processes, and techniques	C-3.1 Demonstrates stage etiquette and care for musical instruments and makes informed choices while using resources and techniques in Music C-3.2 Refines ideas and methods of musical expression from the stage of planning to the final performance, and reviews the entire process

Music	**CG-4** Acquaints themselves with a range of aesthetic sensibilities in regional Arts and cultural practices	C-4.1 Demonstrates familiarity with various local and regional forms of Music C-4.2 Describes the life and work of a few local musicians and performers in their region and across India
Dance and Movement	**CG-1** Develops openness to explore and express themselves through various Art forms	C-1.1 Expresses confidently their personal and everyday life experiences through a variety of Dance and Movement activities C-1.2 Demonstrates flexibility in the process of collaborating and developing Dance and Movement practices
	CG-2 Applies their imagination and creativity to explore alternative ideas through the Arts	C-2.1 Creates and performs Dance and Movement sequences that challenge stereotypes observed in their surroundings (such as gender roles) C-2.2 Connects elements of Dance and Movement (*mudras,* gestures, and postures) with personal experiences, emotions, and imaginations
	CG-3 Understands and applies artistic elements, processes, and techniques	C-3.1 Demonstrates stage etiquette and care for stage equipment, props, and costumes, and makes informed choices while using Dance and Movement techniques C-3.2 Reworks ideas and methods of expression used in Dance and Movement from the Stage of planning to the final performance and reviews the entire process
	CG-4 Acquaints themselves with a range of aesthetic sensibilities in regional Arts and cultural practices	C-4.1 Demonstrates familiarity with various local and regional forms of Dance and Movement C-4.2 Describes the life and work of a few local dancers and movement artists in their region and across India

6.5.2.2 Learning Standards-2

CG-1 Develops knowledge about various Art forms of the region/ state and develops artistic processes and skills in some of the Art forms they are exposed to	C-1.1	Demonstrates basic skills in the Arts they are exposed to and creates own variations (e.g., *Mandana/alpana/kolam/ aipan,* narrating stories from the Panchatantra using local forms of puppetry, performing folk songs/dances of their region)
	C-1.2	Describes the different materials, tools, and techniques used in local art forms in their region/state, and uses them with care while creating their own artwork (e.g., describes the process of natural dyeing used in Kalamkari, and experiments with creating artwork using colours sourced from natural materials around them, such as plants, vegetables, charcoal, soil, brick)
	C-1.3	Recognises multiple viewpoints and shares own thoughts and feelings while responding to a variety of Arts and cultural practices from their region/state (e.g., watches a traditional folk-dance performance specific to their state/ region either live or online, shares their responses and interprets meanings and emotions conveyed by different movements and rhythms)

6.5.3 Secondary Stage

6.5.3.1 Learning Standards-1

Visual Arts	**CG-1** Develops an understanding of their interest and aptitude in the Arts	C-1.1	Evaluates own interest in Visual Art forms by considering its scope of practice and application (Fine Arts, crafts, applied art/ design, Art research and management)
		C-1.2	Initiates discussions and takes steps to find more information and resources to pursue their interest in the Visual Arts
	CG-2 Extends creative practices and artistic expression in different aspects of their life	C-2.1	Applies the elements and principles of Visual Arts into their artwork and incorporates these into their routine life
		C-2.2	Analyses the development of visual expression across a series of works
	CG-3 Develops their Art practice through the knowledge of a wide range of Indian art forms	C-3.1	Extends explorations and refines techniques in the Visual Arts through regular practice
		C-3.2	Incorporates ideas and elements from various genres of Indian Visual Arts (traditional, popular, contemporary) into their artwork

Visual Arts	**CG-4** Appreciates the commonality, interconnectedness, and diversity of aesthetic sensibilities across Indian and global Art practices and cultures	C-4.1 Analyses commonalities and differences among diverse forms of Visual Arts, cultures, and aesthetic sensibilities in India and the rest of the world C-4.2 Evaluates artwork based on creative expression, artistry, and social context
Theatre	**CG-1** Develops an understanding of their interest and aptitude in the Arts	C-1.1 Evaluates own interest in Dramatic Arts by considering its scope of practice and application (acting, direction and design, story/playwriting, backstage, research and stage management) C-1.2 Initiates discussions and takes steps to find more information and resources for pursuing their interest in Dramatic Arts
	CG-2 Extends creative practices and artistic expression in different aspects of their life	C-2.1 Applies the elements and principles of Drama into their performance practices and incorporates these into their routine life C-2.2 Analyses the development of Drama process and performance across a series of work
	CG-3 Develops their art practice through the knowledge of a wide range of Indian art forms	C-3.1 Extends explorations and refines techniques in Drama through regular practice and rehearsals C-3.2 Incorporates ideas and elements from various genres of Indian Dramatic Arts (traditional, popular, contemporary) into their own Drama work
	CG-4 Appreciates the commonality, interconnectedness, and diversity of aesthetic sensibilities across Indian and global Art practices and cultures	C-4.1 Analyses commonalities and differences among diverse forms of Theatre, cultures, and aesthetic sensibilities in India and the rest of the world C-4.2 Evaluates Drama and Theatre performances based on creative expression, artistry, and social context
Music	**CG-1** Develops an understanding of their interest and aptitude in the Arts	C-1.1 Evaluates own interest in Music by considering its scope of practice and application (performance, composing, production, sound arts and design, recording, Music research and management) C-1.2 Initiates discussions and takes steps to find more information and resources to pursue their interest in Music

Music	**CG-2** Extends creative practices and artistic expression in different aspects of their life	C-2.1 Applies the elements and principles of Music into their musical works and incorporates these into their routine life C-2.2 Analyses the development of musical expression across a series of musical projects
	CG-3 Develops their Art practice through the knowledge of a wide range of Indian Art forms	C-3.1 Extends explorations and refines techniques in Music through regular practice and rehearsals C-3.2 Incorporates ideas and elements from various genres of Indian Music (traditional, popular, contemporary) into their own musical work
	CG-4 Appreciates the commonality, interconnectedness, and diversity of aesthetic sensibilities across Indian and global Art practices and cultures	C-4.1 Analyses commonalities and differences among diverse forms of Music, cultures, and their aesthetic sensibilities in India and the rest of the world C-4.2 Evaluates musical work based on creative expression, artistry, and social context
Dance and Movement	**CG-1** Develops an understanding of their interest and aptitude in the Arts	C-1.1 Evaluates their interest in forms of Dance and Movement by considering its scope of practice and application (performance, choreography, production, recording, Dance and Movement research and management) C-1.2 Initiates discussions and takes steps to find more information and resources to pursue their interest in Dance and Movement
	CG-2 Extends creative practices and artistic expression in different aspects of their life	C-2.1 Applies the elements and principles of Dance and Movement into their performance work, and incorporates these into their routine life C-2.2 Analyses the development of expression in Dance and Movement work across a series of Movement projects
	CG-3 Develops their Art practice through the knowledge of a wide range of Indian Art forms	C-3.1 Extends explorations and refines techniques in Dance and Movement through regular practice and rehearsals C-3.2 Incorporates ideas and elements from various genres of Indian Dance and Movement (traditional, popular, contemporary) into their own artwork

Dance and Movement	**CG-4** Appreciates the commonality, interconnectedness, and diversity of aesthetic sensibilities across Indian and global Art practices and cultures	C-4.1 Analyses commonalities and differences among diverse forms of Indian Dance and Movement, cultures, and their aesthetic sensibilities C-4.2 Evaluates dance/movement work based on creative expression, artistry and social context

6.5.3.2 Learning Standards-2

CG-1 Develops capacities in any one form of Visual or Performing Arts and develops an appreciation for diverse Art practices and traditions in India	C-1.1 Demonstrates rigour and regularity in art-making processes, rehearsals, and performance/displays at the school level and inter-school events (e.g., regularly practises Drama or Music and rehearses specific pieces for performance at an event, allocates a few hours a week to practise vocal/instrumental techniques, and rehearses group song with peers) C-1.2 Imaginatively applies artistic techniques, tools, and materials to express their ideas and feelings while working in the Visual or Performing Arts (e.g., experiments with a variety of threads, needles, and stitch patterns in embroidery; experiments with found materials to create musical instruments) C-1.3 Appreciates diverse forms of artistic expression on the basis of artistic qualities and social context (e.g., appreciates the different forms of classical dance practised in India)

Section 6.6
Content

The approach, principles, and methods of selecting content has commonalities across subjects – those have been discussed in Part A, Chapter 3, §3.2 of this document. This section focusses only on what is most critical to education of Art in schools. Hence, it will be useful to read this section along with the above-mentioned section.

6.6.1 Principles for Content Selection

The selection of content for Art Education should take into consideration the following principles:

a. **Ensure age-appropriate content:** While choosing themes or tools and techniques for Art activities, the students' age group, developmental stage, and diverse learning abilities must be given consideration.

b. **Include a diversity of context, resources, and artistic genres:** Starting with the familiar and local for the younger age groups, content could gradually expand to examine the diversity in regional, linguistic, national, and international contexts. As the content progresses in the different Stages, it must cover a breadth of genres, which include classical, folk, tribal, popular, and contemporary forms of Art. Materials and resources that are locally or naturally available must be prioritised.

c. **Uphold the dignity of all types of work**: Content should not reflect any hierarchies among Art processes. It must give equal importance and value to all kinds of physical, intellectual, and emotional work. Similarly, the content should present a wide scope of skills (Ranging from simple to complex) and in roles (ranging from minor to major). For example, the role of a stage designer in the Performing Arts cannot be undermined by the role of actors.

d. **Include traditional and contemporary practices in the Arts**: Students are exposed to a variety of Art forms through their local culture and traditions, as well as entertainment channels in the media and the internet. Therefore, the content in Art Education must consider what students are already exposed to and know and provide opportunities to discuss and reflect on emerging trends and practices in the cultural space.

e. **Encourage questioning and critical reflection**: Although the Arts can be subjective in nature, artistic expression and discussion should encourage students to reason their choices, compare and analyse the processes, and connect them with their aesthetic preferences.

f. **Uphold values:** The chosen content must teach students an appreciation for multicultural diversity and inclusion, concern for democratic values, respect, and compassion for a variety of artistic expressions, and an interest in working towards justice through creative modes, peaceful dialogue, and cooperation. Dialogues around art and aesthetics must aim to develop multiple perspectives and respect diverse viewpoints.

6.6.2 Organisation of Content

6.6.2.1 Elements and Principles of Art

There are several approaches and traditions of teaching and learning the Arts. Most approaches introduce students to the fundamental elements and principles related to the art form that is being taught. **The framework of elements and principles is widely accepted for creating and evaluating artwork.** The elements of various art forms, as well as the methods and aesthetic principles have also been systematically codified in ancient Indian texts, such as the *Natyashastra, Abhinaya Darpanam, Shilpashastra,* and *Chitrasutra*. While some of these (e.g., *bhaava* or emotion) may be common across different art forms, some elements are specific to the Visual Arts and others to the Performing Arts.

Students need to know the fundamental elements and principles of various Art forms while creating artwork. It also helps them **develop an Art vocabulary** to describe, discuss, and evaluate works of Art.

The following table is a suggested illustration of the elements and principles of the Visual Arts and Performing Arts, which could be introduced at every Stage. This is informed by the developmental stages that occur in students. **Elements introduced in the early years will continue to be applicable in the later years, with a gradually increasing level of complexity.**

Table 6.6i

Progression of Elements and Principles across the Stages		
Visual Arts		
Preparatory	**Middle**	**Secondary**
Space, Line, Shape, Form, Colour, Texture, Pattern, Focus, Emphasis (creating visual importance to any one part of an artwork to draw viewers' attention), Emotion, Narrative	Light, Shadow, Contrast, Value (colour tonality), Perspective (creating the illusion of three-dimensional space in a two-dimensional artwork), Ratio and Proportion, Likeness, Form and Function, Symbols, Icons, Metaphors	Compositional structure (e.g., symmetric/ asymmetric composition), Visual balance, Visual Aesthetics
Music, and Dance and Movement		
Naada (Sound and volume) *Shruti/ Sur* (Pitch) *Swara/ Swar* (note) *Laya/ lay* (tempo) *Taala/ taal* (rhythm) *Gaayan* (vocals) *Vaadan* (instrumentals) *Nritya* (Dance and Movement) *Alankaara* (Elaboration, melodic variations, decoration)	*Laya/ Lay* (tempo) in the commonly performed speeds of *Vilambit/Vilamba-kaala (slow tempo)* and *dhrut/ madhyama-kaala (medium-fast tempo)* or *gati* in dance *Matra Bol, Theka, Sam, Khaali, Laghu, Dhrutam, Anudhrutam, Aavartam* in *Taala/taal* *Saptak (Mandra, Madhya, Taar)* (Scale) *Aaroh, Avroh* (ascending and descending sequence of musical notes)	*Gamak, Meend, Tihai* in musical compositions *Samay of Raaga* *Navarasa* (Nine Aesthetic experiences) *Rasika* (audience/connoisseur) Choreography *Nritta* (pure abstract movement in dance) *Naatya* (abstract movement and *abhinaya*), Harmony
Saahitya (Lyrics or literature) *Bhaava* (emotion) *Mudra* (hand gestures, symbols) Body Parts, Postures, Sides, Positions, Upper body, Lower body Levels (High, Middle, Low)	*Raaga* (basic *raagas* used in the musical forms of the region) *Sāhitya* (Literature) Composition *Abhinaya* (action, movement, and expression) *Tatkar/ Adavu/ Chali* (fundamental movement steps in classical dance)	*Gamak, Meend, Tihai* in musical compositions *Samay of Raaga* *Navarasa* (Nine Aesthetic experiences) *Rasika* (audience/connoisseur) Choreography *Nritta* (pure abstract movement in dance) *Naatya* (abstract movement and *abhinaya*), Harmony
Theatre		
Audience, Action, Emotion, Movement, Plot, Story, Posture, Rhythm, Role, Character, Setting, Place, Situation, Sound, Music, Space, Voice	Climax, Conflict, Convention, Dramatic Moment, Energy, Mood, Atmosphere, Relationships, Time, Timing, Tension	Contrast, Focus, Emphasis, Language, Text, Dramatic Metaphor, Spectacle, Structure, Symbol, Theme

6.6.2.2 Materials, Tools, and Techniques

Materials, tools, and techniques play a critical role in every Art form and even shape traditions, styles, and genres. **The focus of Art Education is to provide wide exposure to a range of materials, techniques, and tools before developing excellence in any one Art form or process.** Therefore, an age-appropriate introduction to materials, tools, and techniques must be followed across all Stages. A premature introduction to advanced tools or an overemphasis on technique alone can prevent a student from enjoying the explorative and innovative aspects of creating artwork.

a. Materials

Materials could be chosen based on the school's geographical location (weather conditions, native flora/fauna), local culture, and locally available resources. **Schools can, like many traditional art practices, conscientiously source materials and tools from nature.** It is recommended that all schools avoid purchasing plastic, Styrofoam, and thermocol as materials and explore recycling the same from used packaging, if necessary. Safety and hygiene should be prioritised in all situations when students use recycled material. Processes such as creating art using papier mache can be introduced as sustainable alternatives to recycling paper for creative use in the Arts.

Examples of materials sourced from nature

Natural elements, such as water, air, and light, play an important role in many material transformations and processes. Other natural materials could be soil, sand, mud, clay, pebbles, rocks, stone, minerals and metals, sticks, dried logs, wood, brick, charcoal, seeds, seed pods, leaves, stems, flowers, fruits, vegetables, natural rubber, natural gum, grains and their powder, shells, feathers, and natural fibres (cotton, jute, palm, wool).

Teacher's Voice 6.6i

Art from Natural Materials



My students in Grade 5 know and tell many stories, and they have even written and created their own illustrated stories. This time, I decided to assign a task that is related to story illustrations that would not be on paper or in the form of a book. In fact, it would be impermanent. They had to work in groups and create outdoor artwork in which they used only natural materials or found objects sourced from the school campus. Of course, they were also given the condition that they could not harm plants by plucking flowers and had to source material from what had fallen on the ground.

During the activity, each group selected a story and decided on a scene that they would depict in their artwork. Once outdoors, they quickly got to work as they picked stones, pebbles, twigs, leaves, flower petals, and so on. They busily discussed their ideas as every material triggered their imaginations to improvise on the spot, make changes to their visuals, and even come up with their own

stories. The students had to think differently and be creative to find the objects to convey the shapes, forms, colours, and ideas they had in mind. One group decided to use a drinking water tumbler with a little water to become a well in their artwork. The time limit to complete their work in one period also made them be mindful of their plan, and they worked energetically and efficiently. Some groups borrowed ideas from others as they saw them using different materials.



When all groups completed their artwork, each group presented their story along with the artwork and the others responded to their artwork by telling them what they found interesting in their use of materials, how their compositions conveyed different ideas and stories, and what they each learnt from the process. The groups also reflected on their collaborative experiences within their groups.

Examples of materials available in stores

Chalk, crayons, pastels, paints (watercolour, poster colour, tempera, acrylics), inks, *rangoli* powder, a variety of fibres and threads for textile arts (cotton, nylon, wool, silk), gums and adhesives, paper and cardboard in various sizes and thicknesses, fabric in a variety of textures, prints, and patterns; rubber, wooden boards and blocks (in smooth, textured, and carved variants), plates and sheets of different metals varying in lustre and thickness; beads, wires, straws, and rods made of different materials.

b. Tools

While selecting tools and instruments across the Arts, the student's age group, their prior knowledge, and exposure to various tools and instruments need to be considered. Students learn the knowledge of:

i. Appropriate selection of tools and instruments.

ii. Grasping, holding, and operating tools and instruments.

iii. Safety precautions in using the tools and instruments.

iv. Care for the tools and instruments.

Examples of Tools and Instruments used in the Visual Arts

Pencils, pens, markers, brushes, rollers; erasers, sponges, palettes, sharpeners, scissors, cutters, scrapers knives, needles, pliers, punch, potter's wheel, wooden modelling tools, spoons, spatulas, palette knives, carving tools, hammer/mallet, chisels, files, saw, hand drill, measuring instruments (such as measuring tape, scales, compass, protractors, weighing scales), recording equipment (such as cameras), digital software, and applications. Sewing machines can be introduced at the Secondary Stage.

Examples of Tools and Instruments used in the Performing Arts

Natural materials, pitch pipes, tuners, traditional, electronic, or digital forms of *surpeti/shruti-box, tanpura/tambura,* metronome, tabla and other *taala* aids*, ektara,* a variety of percussion instruments, selected string instruments, wind instruments, harmonium, keyboards, bells, *ghungroos,* lighting equipment for stage, sound equipment (such as microphones, amplifiers, mixers, speakers), recording equipment for video and audio, costumes, jewellery, make-up, stage props, and sets.

c. Techniques

All art forms can be introduced to students across Stages with age-appropriate techniques and relevant adaptations in materials and tools. **Teachers must choose techniques and processes that are suitable for students based on their age, attention span, interest, prior knowledge, and experience.** They would also have to consider knowledge, skills, and dispositions that are desirable at every Stage. For example, the technique of working on a potter's wheel requires a variety of motor skills and strength, which may be more appropriate for students in the later Middle or Secondary Stages. At the Preparatory Stage, students can be introduced to pottery techniques that do not require a wheel, such as pinch pottery or coil pottery techniques. As a precursor to the technique of weaving, students in the Preparatory Stage can be introduced to the techniques of braiding using palm fronds or thick jute ropes. In the Middle and Secondary Stages, students can learn to make simple handheld looms, weave with wool and jute and try basket weaving too.

Examples of Techniques and Processes used in the Visual Arts

Drawing, sketching, journalling, painting, dyeing, printing, pottery and ceramics, photography, film and video, animation, collage, assemblage, construction, building, modelling, carving, engraving, etching, embossing, digital fabrication, braiding, weaving, knitting, cutting, sewing, and embroidery.

Examples of Techniques and Processes used in the Performing Arts

Warm up games, exercises, and activities for voice, instruments, and body movement; brainstorming, mind mapping; noting and visualising ideas on the board; Drama games, image making, or tableaux (motionless individuals making a still scene), improvisations and their different variations, scene work, stagecraft, rehearsal techniques, run throughs, techniques for ensemble/group performance, solo performance, movement choreography, composing Music, reading and writing poems, stories, scripts, and musical notation.

6.6.2.3 Artists and their Practice

Students must learn about the lives and Art practices of various artists. Along with this, they also need to learn about the various environmental and social factors that support artists. These inquiries can enhance their appreciation for the Arts and sensitise them to cultural issues. Schools can organise lecture demonstrations by various artists (men, women, and transgender) who are known locally, regionally, nationally, and internationally to inspire students to engage with the Arts.

6.6.2.4 Art Etiquette and Ethics

Students of all Stages must be introduced to Art etiquette and ethics, e.g., conventions of salutation, bowing to the audience, acknowledging all the people involved in the production, and participating as a respectful and appreciative audience. In the process of making artwork, students must be taught about copyright laws, fair use, the ethics of sharing Art content, and the practice of including credits of people and other resources that were involved in production. Students must also practise the habits of cleaning and caring for Art equipment and spaces.

6.6.2.5 Familiar Themes

Familiar themes make the thinking, making, and appreciation of art more accessible to students. Examples of themes could be the life and work of people, traditions and cultures, characteristics and arrangements of objects, living beings in the natural environment, stories, folk tales, myths, legends, poetry, and other forms of literature; values, such as love, friendship, equality, and justice; and concepts, such as war, peace, education, and health.

6.6.2.6 Interdisciplinary Practice

Learning the Arts very often overlaps with knowledge from other disciplines. The Social Sciences and the Arts are closely interlinked. History, Art, archaeology, architecture, conservation, contemporary crafts traditions, and contemporary Art practices can all be explored while learning about art and society. Similarly, Language, literature, and Art are to be viewed as different forms of cultural expression and human communication. Concepts such as symmetry can be explored through the Visual Arts, crafts, Dance, Movement, and Mathematics. Sound and its properties can be studied through Music, Drama, Physics, Biology, and Language. Colour can be explored through Visual Arts and craft practices such as natural dyeing, Geography, Chemistry, Physics, Biology, and Political Science (issues of race and colour). More such content can be chosen for Art integration practices.

6.6.3 Content Packages for Students and Handbooks for Teachers

Art Education will require the thoughtful designing of content that encourages creative exploration and Art appreciation. The conventional format of a textbook may need to be reimagined to suit the nature of art and its related activities. All art forms would require a well-organised **archive of resources** (online and offline versions) that contain good quality images, audio, and videos that are adequately supported by text/audio information to describe the artwork. Content in the archives must represent the artistic and cultural richness of every region in the country, from the past to contemporary. Such archives could be used for designing modules for each art form while allowing room for the local Art too.

Content packages for students must include exploratory exercises that encourage them to interpret artwork, experiment with materials and tools, exercise their imagination, and express their ideas and feelings openly. All content should be inclusive and accessible to students with disabilities. Active student exploration, engagement, guided and independent practice, reflection, reattempting expression, and building aesthetic capacities across age groups are the spirit and vision of Art Education. Content packages must reflect these demands.

Visual Design must be given utmost importance while creating content packages in the Art. Resource materials and books that are well designed can themselves model aesthetic principles and instil artistic sensibilities in Teachers and students.

Well-designed **handbooks and other supportive Art resources would be required for Teachers** of every Stage. These resources would help them develop their understanding of the Aims, Learning Standards, and appropriate content and pedagogy for Art Education through illustrative classroom examples. They could include suggestive lesson plans, pedagogic illustrations, and assessment frameworks for various art forms. Pre-service training and in-service training can orient Teachers to meaningfully use the content and methods suggested in the handbooks and other Art resource materials.

Section 6.7
Pedagogy and Assessment

The approach, principles, and methods of pedagogy and assessment have commonalities across subjects – those commonalities have been discussed in **Part A, Chapter 3, §3.3 and §3.4** of this document. This section focusses only on what is most critical to Art Education in schools. Hence, it will be useful to read this section along with the above-mentioned section.

6.7.1 Pedagogy for Art Education

For an effective pedagogy for Art Education, it is important to know how students learn the Arts across various age groups. The following are some things to keep in mind in this regard.

a. **Developmental stages in children correlate to their aesthetic development.** Recent research has found that very young children make free associations with art based on their own experiences, without much external influence. As they grow, they develop a preference towards realism and appreciate the artists' technique, skill, patience, and hard work. In their adolescent years, they begin to value originality, emotional expression, and creativity. These phases of artistic development can be observed across the Visual and Performing Arts. The ages are not absolute and valid for each student, as some may skip individual phases in the development of their artistic expressions or, at times, fall back on an earlier one.

b. **All students, regardless of their differing abilities, can engage in Art activities.** They must be encouraged to openly exchange ideas and express themselves. Art classes must foster peer learning and an appreciation of diversity. Exploring and building on capacities must be the essence of art classes.

c. Art Education not only develops skills/craft of making/performance, but also parallelly develops broader creative thinking capacities. This allows for expression of emotions and aesthetic sensibilities. Therefore, the Art Teacher needs to have a deep knowledge of the Arts and of how students learn and respond to artwork. The approach to teaching the Arts should focus on all these skills, and not driving all students to become professional artists themselves.

Box 6.7i

Teaching Art

*An **Art Teacher in the Preparatory Stage** must have a clear understanding of the Aims of Education and the aims of Art Education. They should be familiar with the Curricular Goals for each Stage, Competencies for each Stage described in this NCF, and related Learning Outcomes. They need to have a basic understanding of the nature of art forms as areas of knowledge, and a high inclination towards continuous self-study in the Arts.*

*Added to the expectations mentioned for teaching in the Preparatory Stage, an **Art Teacher for the Middle Stage** must have an awareness of local art and cultural practices. They must have the ability to connect local art and cultural practices with the stage-specific Competencies of Art Education. Teachers for this Stage should help students develop respect towards multiple art forms and cultural practices from their region and across the country.*

*A **Secondary Stage Art Teacher** must have disciplinary specialisation and a rigorous understanding of the Arts. They must be able to develop an interest amongst students in any one form of Visual or Performing Arts and develop an appreciation for diverse art practices and traditions in India. They must demonstrate rigour and regularity in Art practice as a part of their teaching methodology (rehearsals, performances, preparing for exhibitions and displays at the school level, and inter-school events). They should be able to motivate students to imaginatively apply Art knowledge in a variety of contexts. Art Teachers for this Stage should have the ability to create an environment of respect for multiple viewpoints. They should also have a good understanding of art-historical contexts and spend their time with students looking at and engaging with a variety of artwork from across the country and the world.*

d. Content and pedagogic processes are effective when they are Stage-specific. For example, in the Preparatory Stage, the emphasis would be on expression and communication, whereas by the time they reach the Middle and Secondary Stages, they would be introduced to specific skills in the thinking, making, and appreciating processes.

Based on this understanding of children learning the Arts, some common underlying pedagogic principles applicable across all Stages of school education are below:

a. Art Education must be primarily process focussed: The products of Art and performances are organic consequences of the various artistic processes that are enjoyable and become markers of learning achievement. A Teacher would, therefore, need to closely observe every student's involvement in the processes of thinking, making, and appreciating artwork while giving the final products of Art and performances their 'smaller' due place.

b. Pedagogy must be driven by students' experiences and collaboration: When students' expressions become the starting point in art classes, they would be able to connect Art concepts more meaningfully. This provokes them to discover new ways of understanding their own experiences. Art activities lend themselves well to dialogue and collaborative work, where the sharing of ideas nurtures care and concern for multiple viewpoints and expressions. For example, the chances of students identifying and using different shapes in their artwork are greater after the group discusses the variety of organic and geometric shapes seen in embroidery patterns, rangolis, or architectural details, than when the Teacher draws a triangle on the board and tells students to use it in their artwork.

c. **Variety and variations must be encouraged:** It is important for students to seek variety and create variations even while repeating or reproducing tasks in Art. The focus of the Arts is to discover newness even in the most familiar experiences. Art pedagogy should, therefore, encourage students to stretch their imagination to find multiple ways of looking at the world, and multiple ways of expressing their ideas and emotions in all aspects of their lives.

d. **Pedagogy that connects multiple Art forms:** Drama and Theatre by nature are composite Art forms that include knowledge and processes of Visual Arts, crafts, design, Literature, Music, Dance, and Movement. It is important for students to not only learn specific Art forms in a focussed manner, but also discover the connections among various Art disciplines. For example, the connection between Dance and Music is commonly known. However, students are very rarely encouraged to perform music themselves for a dance performance instead of playing a readily available recording. The potential for exploring multiple Art forms within a single production or artistic project needs to be consciously encouraged.

e. **Local resources, Art, and culture must be emphasised:** The inclusion of local culture in Art pedagogy could provide variation in perspective to counter popular culture while also making room for inquiry, analysis, and critical appreciation. NEP 2020 suggests:

> *...the hiring of outstanding local artists, writers, crafts persons, and other experts as master instructors in various subjects of local expertise; accurate inclusion of traditional Indian knowledge, including tribal and other local knowledge, throughout the curriculum, across Humanities, Sciences, Arts, crafts, and sports, whenever relevant;*

Schools could invite local artists, crafts persons, and performers, as well as archaeologists, museum curators, and other relevant Art administrators to share their work through lecture-demonstration workshops and art melas in schools. These programmes or interactions need to be planned and mediated by the Art Teacher or any of the other Teachers in the school.

f. **Many opportunities for Art exposure and aesthetic appreciation must be made:** The larger aim of developing aesthetic sensibilities and cultural literacy can only be achieved when students are sufficiently exposed to good examples of Art from different parts of India and the world. Within the school, students could be shown appropriate examples of film, video, animation, photography, and images of original works of the Visual Arts and the Performing Arts. All viewing sessions require time for discussion and reflection. In higher Grades, students can be encouraged to write art reviews and include them in the *Deewar Patrika* (wall newspaper) or a monthly school magazine. Assemblies and cultural events must also be seen as opportunities for constructively reviewing performances. They must also be encouraged to review and critique the aesthetic arrangements and visual presentation. Besides classroom teaching, Art pedagogy could include workshops, projects, exhibitions, visits to archaeological sites, monuments, museums, galleries, local art centres, and performance events. The Teacher should plan specific activities and learning projects for students to work on-site during such exposure visits. They can also be given assignments and projects that can be done after such visits.

g. **Students with disabilities must be included:** Students with disabilities must be given equal opportunities and access to participate in all Art activities. Their participation and engagement will depend on the level and severity of the disability. Focusing on what they

'can do' independently rather than what they 'cannot do' would empower them as learners. They should be given the choice of mediums and levels at which they can engage with the activity with adequate encouragement and support from the Teacher. For example, some suitable Visual Art activities for them might include clay work to build dexterity, dabbling with paints, blending to create new colours, cutting shapes and pieces out of different materials to glue and form abstract patterns, tracing along the outer edges of stencils (as tracing along the inner edges might be difficult for them), and painting with fingers, if holding the brush is a problem. Some suitable Performing Arts activities could include listening to different kinds of music that they are interested in, playing musical instruments such as any kind of drum, or encouraging them to create free-form Dance and Movement to Music. Students with disabilities must be included in all art processes, including discussions. Their responses could be verbal or non-verbal, and these must be acknowledged, appreciated, and included in the pool of responses and opinions in the classroom.

h. **The physical space, materials, and resources must be prepared before class:** Teachers need to ensure that the materials and the space where Art activities are conducted are prepared and safe for all students. For example, in the Visual Arts, clay may need to be prepared in advance so that it can be shaped or modelled into different forms. The Teacher can either choose to prepare this themselves or, in the case of Middle and Secondary Stages, teach the students to prepare clay. In schools where there may be limited space for the Performing Arts, the Teacher could think of moving furniture around to make space for Movement activities. Time must also be allocated for students to clear the space, clean the used tools, and put away their materials after work.

i. **Teachers' preparation should reflect their knowledge of effective pedagogic strategies in the Arts:** Being a good artist does not automatically imply being good at teaching art. However, a Teacher who may not have specific art skills can facilitate interesting and effective Art sessions for students if they have the required knowledge of Art pedagogy and the relevant pedagogic skills. For example, if a Teacher wants students to achieve variety and variation in their artistic exploration while also learning a specific process or technique, they can choose to introduce only the essential steps or skills and not reveal the end product. After that, based on the different learning abilities of students, they can set different targets and challenges for different groups of students. The students can be asked to explore and build further on the technique or process they are introduced to, incorporating their own expressions.

Box 6.7ii

Pedagogic Illustration – Theatre Teaching Plan for the Preparatory Stage

Improvisation is a method used in the Dramatic Arts. It involves spontaneous, unscripted action or role play based on any given location or situation during practice. This illustration shows how this method can be introduced at Preparatory Stage. The corresponding Curricular Goals, Competencies, and Learning Outcomes are also indicated to map the pedagogy.

Curricular Goal	*CG -2 Exercises their imagination and creativity freely in the Arts*
Competencies	*C-2.1 Creates and performs Drama in the classroom based on everyday events, by combining various characters, roles, situations, spaces, and basic props*
Learning Outcome(s)	*Improvises situations in role play by expressing various ideas and moods of the characters, e.g., improvises actions in a scene with humour by sitting down and extending laughter for a longer duration; adds own lines while playing a role*
Content	*Introduction to Improvisation*
Activity	*On-the-spot improvisation for group role play and situation building based on given locations*
Learning Objectives	*To understand roles and characters in different situations for Drama work*
Considerations	***Developmental stage of students*** *– their improved capacity to imagine and role play characters according to given situations* ***Group size*** *– 5 to 7 students per group* ***Time*** *– 10 counts, as facilitated by the Teacher* ***Elements of Drama being explored*** *– Character and situation* ***Orientation of exploration*** *towards peer groups in the classroom*

Activity Process followed at the Preparatory Stage

1. ***Group size:*** *The Teacher divides the whole class into 6 sub-groups of 5 students each*
2. ***Time:*** *One by one, each group comes to the area marked as the performing space in the classroom*
3. ***Elements of Drama being explored:*** *The Teacher assigns three locations to each group for them to imagine and develop a situation/scene involving different characters and actions through role play. Locations could be home, railway station, sabzi mandi (vegetable market), Principal's room, hospital, Panchayat Bhawan, playground, and so on.*
4. ***Orientation of exploration:*** *In 10 counts given by the Teacher, the students discuss the characters, fix their roles, and start playing the situation immediately, spontaneously. The students must go on playing until the Teacher says 'freeze' to stop the role play.*
5. ***Developmental stage of students:*** *After the presentation of each group, the Teacher can lead the session for reviewing the exercise with the following suggested questions:*
   - *What did you do in this exercise?*
   - *What did you like in this exercise?*
   - *What did you achieve through the exercise, as a team and as an individual?*
   - *How did you decide the characters and situation?*
   - *What were the challenges you faced while discussing and playing the situation?*

   The review can be done by the Teacher from two points of view: i.e., own review of the performing groups and that of other groups as an audience.
6. *The Teacher writes the reflections of the students on the board while also introducing details of the technique of role play and situation building.*

6.7.2 Assessment in Art Education

Assessment in Art Education must be approached with the fundamental belief that all students can be creative.

Assessment of learning in Art Education needs to be based on evidence from the students' art-making processes, creative thinking processes, and their capacity to respond to and appreciate the Arts within and beyond the school context.

A few Teacher Voices to illustrate different kinds of assessments are given below.

Teacher's Voice 6.7i

Art portfolio



All students in our school have an individual folder in which they store their artwork, which are in the form of drawings, collages, paintings, and fabric artwork. I also take photographs of their three-dimensional artwork in clay and paper and have a digital folder on the school computer. At the end of every term, I devote one or two classes for students to manage and consolidate their folder of drawings. They check that the artwork is properly dated and has their name on it. In case they have forgotten to write the date, they check with their peers and write it down. While they do this, I have individual conversations with some of the students to review their work and reflect on the changes that they observe over time. I have found that most students are able to self-assess and express what they have learned and what they can do better. I take notes during this process. In the higher Grades, students are asked to select artwork from their folder to present in an informal classroom exhibition. They also include any artwork of pottery, sculpture, textile Art, story illustrations, posters, and so on that they have created during the term. Some students also write about their art and art processes. If possible, we invite students and Teachers from other Grades to view the exhibition and provide their feedback. The students enjoy the process since they don't see it as an 'exam' and are enthusiastic to exhibit their artwork and share it with a larger audience.

I used four criteria and a four-scale rubric to assess their work, as given below.

Criteria	Grade D	Grade C	Grade B	Grade A
Originality/ Uniqueness of ideas	Conventional, stereotypical, or repetitive	Repetitive with few instances of originality	Shows considerable instances of originality	Completely unconventional, unique, and innovative
Sophistication of technique	Demonstrates little control of materials and tools and requires support in completing artwork	Demonstrates some control of materials and tools and completes artwork	Demonstrates considerable control of materials and tools and completes artwork	Demonstrates exceptional control of materials and tools, as well as refinement in completed artwork
Variety in expression	Demonstrates a limited range of expressions in artwork	Explores some variations in expressions based on familiar examples	Demonstrates considerable variety of expressions in artwork	Demonstrates a wide variety of expressions in artwork
Aesthetic sensibility	Communicates aesthetic preferences only as likes or dislikes	Communicates a few varying degrees of aesthetic preference (good, better, best)	Compares and connects ideas and aesthetic experiences of different artworks	Appreciates a variety of aesthetic experiences and art forms

Teacher's Voice 6.7ii

Group Performances

I teach music from Grade 1 to Grade 8. In Grade 7, I wanted to assess my students' group performances. I had informed the students which day the assessment would take place so that they had time to form their groups, choose a musical piece, and practise it. I usually ask them not to exceed the number in each group beyond 7, so that it is easier to observe all students during the performance.

The assessment usually takes about 2 periods to cover all the groups in the class. I prepare a list of criteria that would form the basis of assessment for group performance and share the same with the students for them to assess their peers.

Each group had 3 to 5 minutes for their presentation. The students were briefed about the criteria and their respective indicators. I clarified their questions and doubts. While every group performed, the remaining students and I observed their performances, made notes, and graded them according to the criteria.

We also had a brief review after each performance, and a few words of appreciation and suggestions were shared by the students who were in the audience.

The following criteria was used to assess the students:

Criteria for assessment	Grade C	Grade B	Grade A
Choice of musical composition	Chooses musical composition by random selection	Chooses musical composition based on abilities of all members of the group	Chooses musical composition based on group ability as well as the context of time/ season/ occasion/ event

Presentation	Performs only the first few lines of the musical composition fluently and in unison	Performs considerable portions of the musical composition fluently and in unison	Performs the complete musical composition in unison and demonstrates coordination among all members of the group
Creativity	Reproduces existing songs and musical compositions without adding own ideas or expressions	Demonstrates uniqueness in one or two aspects of performance (choice of music, arrangement of vocals/ instruments, generation of unusual sounds and patterns)	Demonstrates uniqueness in many aspects of the performance (choice of music, arrangement of vocals/instruments, generation of unusual sounds and patterns)
Performance skills (pitch, tempo, audibility, vocal/ instrumental technique, remembering the lyrics)	Demonstrates few performance skills inconsistently	Demonstrates basic performance skills consistently through the musical composition	Demonstrates basic performance skills consistently as well as a few advanced skills in the musical composition
Bhaava or expression	Performs musical compositions without feeling and emotion	Performs some parts of the musical composition with feeling and emotion	Performs the entire musical composition with feeling and emotion

Teacher's Voice 6.7iii

Creativity and Imagination

I teach language and the Arts in Grade 5. I decided to assess the creativity and imagination of students in my class through a reading comprehension task. Through this activity, I planned to teach students self assessment. I provided students with a story from the textbook that they hadn't read yet and asked them to read the story and work in groups to present it through any Art form. They were given a day to prepare.

One group chose to dramatize the story and develop a short play. Another group created a visual storyboard, and the third group chose to create simple puppets for the main characters as they narrated the story.

I observed that every group visualised the story in their own unique way. The group that created storyboards showed their creativity by writing the names of characters in place of facial features. This gave it an unusual look and served the purpose of identifying the characters. The group that presented the drama used interesting props to show the locations of scenes and suggest animal characters. The group that created puppets used everyday materials and discarded cardboard to create their own colourful puppets. They also made an effort to modulate their voices and express different moods and emotions in the story. Although the students worked in groups, I could observe their individual participation and engagement in the creative process. The students used the following rubrics that I designed to assess their own learning.

Criteria	*Grade C*	*Grade B*	*Grade A*
Visualisation	*Visualises the main characters and sequence of events as given in the text*	*Adds a few details from their own imagination while visualising characters and sequence of events of the given story*	*Imagines and creates multiple possibilities while visualising characters and sequence of events of the given story*
Collaboration	*Has difficulty sharing ideas and materials while working with peers and shows limited participation*	*Gives suggestions and shares materials with peers but has difficulty accepting or considering the ideas of others*	*Demonstrates openness to receiving and giving ideas; and shares materials with peers*
Presentation	*Presents work in partial completion with limited technique and skill*	*Presents complete work with considerable technique and skill*	*Presents complete work with exceptional technique and skill*

Chapter 7

Education in Interdisciplinary Areas

Of the important thrusts of NEP 2020, two matters have a deep underlying alignment. First, the importance of interdisciplinary learning and study. Second, developing the sensitivity, capacities, and understanding for living in harmony with nature, including the range of urgent issues around climate change and the environment.

This NCF gives specific emphasis to developing interdisciplinary knowledge and capacities, as also their use for development of values and dispositions, including those related to the environment.

All subjects would include this interdisciplinary approach and aspects of living in harmony with nature, and these would be addressed appropriately at each Stage.

a. In the Foundational Stage, Curricular Goals are organised around the domains of development, and not specific curricular areas/subjects. Therefore, interdisciplinarity is inherent at this Stage.

b. In the Preparatory Stage, The World Around Us (TWAU) is designed as an Interdisciplinary Area, specifically meant to help students observe, engage with, and understand their immediate social and natural environment.



c. At the Middle Stage interdisciplinary Curricular Goals are embedded within specific curricular areas. Interdisciplinary learning, including learning about the environment, is developed through specific Goals and Competencies in the Learning Standards, and all the related curricular arrangements for achieving those — from content, and pedagogy, to assessment.

d. In the Secondary Stage, a specific Curricular Area called Interdisciplinary Areas is introduced to promote interdisciplinary knowledge, capacities, and thereby values and dispositions.

   i. In Grades 9 and 10, the following essential subjects will be offered under Interdisciplinary Areas:

      1) Individuals in Society (developing moral and ethical reasoning) in Grade 9.

      2) Environmental Education (EE) in Grade 10.

   ii. In Grades 11 and 12, Interdisciplinary Areas will include a range of subjects, illustratively, Sustainability and Climate Change, Public and Community Health, Media and Journalism, Legal Studies, Commerce, Family and Community Sciences, and Indian Knowledge Systems. The list and offering of subjects would depend on other practical considerations, such as availability of Teachers and interests of students. The specific aims of each Interdisciplinary Area subject would be to develop an integrated understanding of the chosen subject matter, while developing interdisciplinary capacities.

This Chapter deals with The World Around Us in the Preparatory Stage, and the two essential subjects — Individuals in Society and Environmental Education in Grades 9 and 10 of the Secondary Stage.

Section 7.1
Aims

The study of Interdisciplinary Areas develops interdisciplinary thinking, which in turn prepares students for responding effectively to real-life problems since real-life situations are interdisciplinary.

Interdisciplinary Areas in schools should aim to achieve:

a. Holistic understanding through interdisciplinary thinking: The study of Interdisciplinary Areas must teach students the ability to view their natural and social environment, and related issues and events, in an integrated manner. Developing the capacity to use knowledge and methods of inquiry from more than one discipline to analyse any phenomena with multiple perspectives will enrich students' approach to understanding the world. Interdisciplinary Areas should break down the silos of disciplines which often render knowledge gained within disciplines unrelatable to the real life of the individual.

b. Living in harmony with nature: An interdisciplinary approach must form the foundation for understanding nature and learning to live in harmony with it.

i. **Sensitivity towards and appreciation of the environment:** Interdisciplinary Areas should help students see the connections between the natural environment and social processes. They must develop an awareness and appreciation of the interdependence between the natural and humanmade environments and the various economic, sociocultural, political, historical, ethical, and aesthetic dimensions of human societies. The need for balance between the environment and human society will be part of this learning.

ii. **Environmental literacy:** Interdisciplinary Areas should develop an understanding of ecological systems, natural resources, environmental issues, and interconnections between human activity and the environment. This will enable students to make intelligent and informed decisions about individual and collective work to solve current problems and prevent new ones.

c. Ethical and moral reasoning: Key ethical and moral questions based on a comprehensive understanding of issues or events are integral to Interdisciplinary Areas. Students must learn to reason the ethical and moral dimensions of an issue or event in the light of the human and Constitutional values mentioned in NEP 2020. They must develop the ability to take informed positions based on evidence and reason and advocate suitable action.

Box 7.1i

Environmental literacy prepares students for active participation in dealing with environmental issues. An environmentally literate person is someone who, individually and collaboratively, makes informed decisions concerning the environment; is willing to act on these decisions to improve the well-being of other individuals, societies, and the global environment; and participates in civic life. Environmentally literate individuals possess the knowledge and understanding of a wide range of environmental concepts, capacities, dispositions, and values that enable environmentally responsible behaviour in a range of environmental

contexts. It requires going beyond fragmented thinking about the environment and thinking in terms of interactions of human and natural systems. The production of environmentally literate citizens through formal education will enable the knowledge, cognitive capacities, and attitudes acquired in the classroom to be transferred to the decision-making process of students throughout their lives.

Section 7.2
Nature of Knowledge

In the Preparatory Stage, knowledge in The World Around Us is concrete and related to the real world. It is situated in exploration, discovery, dialogue with peers and adults, visits and excursions, observations, and creating artefacts, as well as stories, poems, folklore, and other forms of arts and literature.

The World Around Us brings together the understanding of different aspects to derive generalised concepts related to students' immediate environment. These concepts are largely around patterns, processes (social and natural), and interconnections between the environment and human society. Through this Curricular Area, students develop capacities of inquiry that are useful to make sense of and interact with the immediate natural and social environment.

In the Secondary Stage, the knowledge base of both Individuals in Society and Environmental Education is interdisciplinary, and rooted in knowledge, capacities, values, and dispositions developed across subjects.

A comprehensive understanding at this Stage requires being able to apply understanding, values, and dispositions, from other subjects. An understanding of events in the local community, State, nation, and world in terms of priorities and concerns (in the context of Individuals in Society and Environmental Education), as well as along multiple dimensions (social, moral, ethical, political, economic),comprises this comprehensive understanding.

Importantly, an appreciation of the fact that there are no definitive answers to many human issues is required — different interpretations and actions could be appropriate when seen from different perspectives, or when placed in different contexts.

These subjects provide the opportunity to critically explore and analyse the co-existence of multiple truths and realities. They offer multiple interpretations of a situation or an event, which must converge into equitable, just, and sustainable solutions.

Section 7.3
Potential Challenges

Given that this is a new Curricular Area, challenges can only be anticipated. Primary among them is Teacher preparedness. This challenge has been already manifested in the teaching of Environmental Science (EVS) in Grades 3-5 as per the existing curriculum. As there is no formal structure to prepare Teachers for EVS, they often tend to focus on concepts related to their subject specialisation (e.g., Language, Mathematics). Presently, there are hardly any courses on Environmental Education, and none that prepare Teachers for this subject. The case is similar with Individuals in Society.

It has also been generally observed that content related to the natural environment is managed with greater ease by Teachers, but they find issues connected to the social environment challenging.

While the capacity development of Teachers is critical, until pre-service Teacher education makes the necessary transitions, the capacity for academic support in institutions will also need to be developed (in terms of both the understanding of people and the building of resource material,) particularly for the Secondary Stage.

Section 7.4
Preparatory Stage — The World Around Us

Young children are intuitively inclined to observe their natural and social environments. They interact with family members and neighbours, and with the living and non-living world around them. They observe adults and develop the necessary understanding and skills required for them in their specific contexts.

The World Around Us curriculum uses this natural curiosity of students to help them gain a more systematic understanding of the natural and social environment in their immediate context.

As students engage with their environment, they represent and express their understanding in different ways. This helps them develop Competencies related to the other subjects of Language, Mathematics, and Art as well.

7.4.1 Approach

The approach will be to focus on the immediate environment of students, with gradual progression of some aspects beyond the city/town/village at the end of the Preparatory Stage, in order to gain foundational knowledge of Science and Social Science as well as a grounding in Environmental and Vocational Education. The interdisciplinary approach taken will reflect the lives of students. This will also ensure that students develop a holistic view of the world, with an understanding of relationships and interdependencies.

Knowledge, values, and dispositions will be developed through various sources from the locality, region, and country. Focus will be on stories, poems, narratives, folklore, histories, and games from diverse sources.

Vocational Education will be integrated in The World Around Us through the development of prevocational capacities. Capacities related to understanding the occupations around them, observing, and engaging with animals and plants, and creating simple objects lay the foundation for development of vocational capacities in the Middle Stage. The pedagogy at this Stage will also lend itself to the development of prevocational capacities, e.g., maintaining flowerpots/kitchen gardens, clay modelling, and dialogue with shopkeepers during visits to the local markets.

7.4.2 Learning Standards

The Curricular Goals and Competencies for The World Around Us indicate the expectations from students related to understanding of the social and physical environment at this Stage. A structured exploration of this environment develops understanding, as well as the capacities to deepen and extend this understanding.

7.4.2.1 Curricular Goals & Competencies

CG-1 Explores and engages with the natural and socio-cultural environment in their surroundings	C-1.1 Observes and identifies the natural (insects, plants, birds, animals, geographical features, sun and moon, stars, planets, natural resources) and social (houses, relationships) components in their immediate environment C-1.2 Describes relationships (including between humans and animals/nature) and traditions (art forms, celebrations, festivals) in the family and community C-1.3 Asks questions and makes predictions about simple patterns (season change, food chain, phases of the moon, movement of stars and planets, shapes of trees, plants, leaves, and flowers, rituals, celebrations) observed in the immediate environment C-1.4 Explains the functioning of local institutions (family, school, bank/post office, market, and *panchayat*) in different forms (story, drawing, tabulating data, reports), and analyses their roles C-1.5 Uses local materials to create simple objects (family tree, envelopes, origami animals) on their own for display or use in classroom processes
CG-2 Understands the interdependence in their environment through observation and experiences, developing the basis for appreciation of the idea of *'Vasudhaiva Kutumbakam'*	C-2.1 Identifies natural and humanmade systems that support their lives (water supply, water cycle, river flow systems, seasons, life cycle of plants and animals, food, household items, transport, communication, electricity in the home) C-2.2 Describes the relationship between the natural environment and cultural practices in their immediate environment (nature of work, food, festivals, traditions) C-2.3 Connects changes in the environment and the lives of their family and community, as communicated by elders and through local stories (changes in occupation, food habits, resources, celebrations, communication)

CG-3 Explains how to ensure the safety of self and others in different (normal as well as emergency) situations	C-3.1 Describes the basic safety needs and protection (health and hygiene, food, water, shelter, precautions, awareness of emergency situations, abuse, and unsafe situations) of humans, birds, and animals C-3.2 Discusses how to prepare for emergency situations (smoke, fire, small injuries, burns, electrical safety, unseasonal rains, fallen trees) based on discussions with family and community, or personal experiences C-3.3 Develops simple labels and slogans, and participates in roleplay on safety and protection in the local environment to be displayed/done in school and locality
CG-4 Develops sensitivity towards social and natural environment	C-4.1 Observes and describes diversity among plants, and birds and animals in their immediate environment (shape, sounds, food habits, growth, habitat) C-4.2 Observes and describes cultural diversity in their immediate environment (food, clothing, games, different seasons, festivals related to harvest and sowing) C-4.3 Describes usage of natural resources in their immediate environment C-4.4 Demonstrates how natural resources can be shared, maintained, and conserved (trees, use of rainwater, benefits of millets) C-4.5 Identifies needs of plants, birds, and animals, and how they can be supported (water, soil, food, care) C-4.6 Identifies the needs of people in different situations – in terms of access to resources, equal opportunities, work distribution, and shelter C-4.7 Learns about basic social and behavioural norms, values, and dispositions that benefit our social and natural environments and that help our society function smoothly (using dustbins, standing in queues, conserving water, using public transportation, keeping one's environment clean, always helping others in need regardless of background)
CG-5 Develops the ability to read and interpret simple maps	C-5.1 Explains a line drawing of their school, village, and ward C-5.2 Draws a sketch of their school, village, and ward using symbols and directions C-5.3 Reads simple maps of city, state, and country to identify natural and humanmade features (well, lake, post office, school, hospital) with reference to symbols and directions
CG-6 Uses data and information from various sources to investigate questions related to their immediate environment	C-6.1 Performs simple inquiry related to specific questions independently or in groups C-6.2 Presents observations and findings through different creative modes (drawing, diagram, poem, play, skit, oral and written expression)

CG-7 Gains foundational familiarity with basic concepts and methods from the natural sciences (life sciences, physical sciences, and earth and space sciences) and engineering	C-7.1 Gains familiarity with using the scientific method in investigations, as well as familiarity with other crosscutting concepts such as energy, matter, and systems that apply across the domains of science and engineering C-7.2 Gains familiarity with disciplinary core ideas in the natural sciences, as well as in engineering, technology, and applications of science, which reflect the content that will be learned across subject areas in later Grades

7.4.3 Content

The approach, principles, and methods of selecting content have commonalities across subjects — those have been discussed in **Part A, Chapter 3, §3.2** of this document. This section focusses only on what is most critical to The World Around Us. Hence, it will be useful to read this section along with the above-mentioned section.

7.4.3.1 Principles of Content Selection

The following principles will inform the selection of content for The World Around Us.

a. Content selected must enable the development of essential process capacities (observation, making hypotheses, experimentation to test hypotheses, data collection and analysis, discussion). For example,
   i. Assign tasks based on the natural curiosity of students with reference to specific questions/assumptions/hypotheses– they could be asked to observe and record the growth of plants from seeds under different conditions (in different kinds of soil, under different amounts of sunlight).
   ii. Extend this experience to students' own lives and ask them to describe their observations and hypotheses on how crops/plants grow in pots. They can discuss the various uses of plants
   iii. Organise visits to local markets, fairs, museum, and monuments, and share observations and experiences throughout the processes using different modes
   iv. Conduct hands-on experiments to test hypotheses and make informed conclusions. Experiments can be conducted in groups to encourage collaboration, teamwork, and social interaction

b. Content selected should enable maximum possible social interaction, and interaction with the natural environment. For example,
   i. Identity and relationships within family and community; plants and animals; own body; geographical features; transportation and communication; local institutions; migration of families; different habits in different communities (food, practices, traditions); food habits and shelter of animals; various local traditional art forms; festivals and celebrations; community melas and marriage celebrations; day and night, time of sunrise and sunset, patterns; sun, moon, stars, and planets

c. Content selected should reflect diversity and must be inclusive while developing sensitivity and breaking stereotypes. For example,

i. Diversity of geographical characteristics, flora, and fauna around them
ii. Impact of hot weather or excessive rain on plants and animals
iii. Practices related to work especially with reference to gender – division of labour at home, food distribution in families, understanding the context of migrant labourers.

d. Content must move from the local context to an understanding of social and natural environments beyond the immediate environment as students progress across grades.
   i. Content should be contextual and related to the immediate environment in lower grades of this Stage.
   ii. Gradually increasing exposure to other contexts through comparison and analogy is important — multiple geographies, genders, communities. For example, if the concept of 'Transport' has to be discussed, content can include the pictures in the textbook, discussion of modes of transport in the community, sharing of narratives of travel by students, local news reports related to transportation, instances of use of these roads by the local community, videos of modes of transport that are not available in the locality (e.g., understanding trains in a school in the upper Himalayas).

e. Content selected should be such that it can be presented in multiple ways, which go beyond the textbook. For example, students should have the opportunity to explore the same content in various modes as indicated below:
   i. Case studies
   ii. Visual representation through pictures and simple maps
   iii. Using ICT-based resources – videos to give evidence for discussions and/or support discussions on specific issues
   iv. Poems, stories, plays, games, and news stories
   v. Folklore, folk songs, oral histories, and oral narratives
   vi. Visual art projects
   vii. Building of models, scientific tinkering, and engaging in hands-on experiments to test hypotheses

f. Environmental values and dispositions must be integrated in the content and should enable pedagogy that is not didactic/prescriptive. For example,
   i. Judicious use of water
   ii. Dignity of all living beings
   iii. Impact of humans on the environment
   iv. Needs of plants and animals

g. Content must incorporate Indian knowledge and local culture. For example,
   i. Food preservation
   ii. Processes to conserve resources, including local wells and stepwells
   iii. Local literature – alignment with contemporary knowledge, natural disasters, and human-nature conflicts

7.4.4 Pedagogy and Assessment

The approach, principles, and methods of pedagogy and assessment have commonalities across subjects – those have been discussed in Part A, Chapter 3, §3.3 and §3.4 of this document. This section focusses only on what is most critical to The World Around Us. Hence, it will be useful to read this section along with the above-mentioned section.

7.4.4.1 Pedagogy for The World Around Us

Environment, for students in the Preparatory Stage, is what is immediately around them and affects their lives. Students learn about the environment through structured interaction with their natural and social environment, exploration, discussion of experiences and observations, interaction with adults and peers, exemplars, task-oriented activities, structured observations, experiments, surveys, and visits.

This engagement with the immediate environment provides a base for moving into exploring larger systems (from locality to district to region to state to nation to world), broader issues (from home to community to larger society), and an expanding understanding of concerns, connections, and consequences. Thus, students' engagement with their immediate environment leads them to an understanding of distant environments — they are able to apply their understanding from 'near' to 'far', and vice versa.

Values and dispositions — e.g., collaboration, respect for diversity, inclusion, scientific temper, sensitivity towards the social and natural environment are best developed if they are demonstrated — by adults in the school. Students must also get the opportunity to practise them in their interactions.

7.4.4.1.1 Pedagogical Approaches

Students' questions and experiences — related to the social and physical environment, and of social processes around them (including schools and family) — must be given space. This establishes trust and empathy between the Teacher and students.

Teachers need to help students develop conceptual understanding instead of accumulating facts. This implies that sufficient time must be provided for surveys, exploration, visits to institutions, excursions (including within the school campus), observation, experiments, simple inquiry, dialogue with Teachers and peers, role play, questioning, and the communication of ideas.

Task-oriented work, wherein they take up some small tasks, helps students connect learning to doing. Through the creation of simple models and toys, they can communicate their understanding and make learning concrete in the process. Allowing students to take the lead in material development, through a variety of modes like art and craft, story, drama, and hands-on experiments provides space for them to be involved in several small-scale and large-scale assignments and projects. This is also invaluable for the development of prevocational capacities.

Teachers must also be aware of values and dispositions that can be developed through activities, and plan deliberately to offer students experiences. They should also make the values and dispositions explicit for students by drawing attention to them. They should also make them explicit for students by drawing attention to specific values and dispositions (e.g., collaborative learning, developing a scientific temper, working in diverse groups, analysing work distribution at home, caring for the environment, cleanliness, standing in queues).

Teacher's Voice 7.4i

Bal Shodh Mela

I teach Grades 3, 4, and 5 in a rural school. Over the years, Bal Shodh Melas have become an integral part of my pedagogy to give my students an interdisciplinary exposure. Bal Shodh Melas or Children's Research Festivals are intended to encourage students' inherent sense of curiosity and interest in exploring their surroundings, and excitement to engage with new learning. Bal Shodh Melas encourage students to engage in research.

I scaffold them to conduct simple inquiries on local issues/topics by formulating questions, collecting data, and drawing conclusions. The process encourages creative expression, and independent reading and writing, as well as collaboration among students. It is also a wonderful way for me to strengthen relations with the community, since community members are also invited to the mela organised to close the process. Through this process, learning happens in an integrated way – capacities developed across subjects are used by students, and learning is concretised within their own contexts.

A few illustrative topics that my students have taken up for research are – my house; the history of our village/area; the geographical and natural location of our area; trees and vegetation around us; business and work, birds, and animals around us; means of transport; demography of our village/ward; local folklore and folk tales; folk sayings and phrases.

I have fellow Teachers who use this even in crowded urban contexts as there is plenty of scope for exploration there too. For example, towns and cities go through a tremendous change and usually have people from diverse communities living there, not all of whom are originally from there. So, students can collect stories such as – when was a shop set up; where is the shopkeeper originally from; what conditions prompted them to migrate, and so on. After all, the objective is to collect stories – and what can be more interesting than the stories of the people around us?

7.4.5 Assessment in The World Around Us

A few key principles of assessment are:

a. Students must be assessed for understanding of concepts and for the ability to demonstrate capacities particular to this subject, e.g., observation, making hypotheses, testing hypotheses via suitable experiments, identification, and classification.

b. Students must be assessed using oral, written and other performance tasks in a variety of ways, e.g., answering good questions, making presentations based on group work, creating artefacts, designing or replicating experiments, analysing data and results, and participating in discussions.

A few Teacher Voices illustrate different kinds of assessment below.

Teacher's Voice 7.4ii

Types of Shelters

I teach Grade 5. I wanted to assess my students' understanding of types of shelters and why different regions need different kinds of shelters. Instead of asking students the usual kind of question on the types of houses in different regions, I tried something different.

The question below has an illustration that helps students visualise a house with a particular kind of roof and why it does so. Even if they do not recall that rainy and snowy areas have houses with sloping roofs, they are able to logically deduce the reason for this kind of roof from amongst the given answer choices.

In places with heavy rainfall, houses have sloping roofs because such roofs:

a. Protect the house from strong sunlight.

b. Protect the house from wind and dust.

c. Provide more storage space in the house.

d. Prevent rainwater from collecting on the roof.



Teacher's Voice 7.4iii

Prevocational Capacities

I teach Grade 4. The task below is intended to assess both students' prevocational capacities as well as students' understanding of environmental concerns. This is instead of simply asking them to respond to a direct question on how the planet can be kept healthy.

1. You have been given chart paper, crayons, pencil, sharpener, rubber, scale, *bindis,* coloured paper and glue.
2. Create a poster on the theme 'Grow plants to keep the planet healthy'.

I used the following criteria to grade my students:

Criteria	Grade C	Grade B	Grade A
	Uses only a few materials	Uses most of the materials	Uses all materials in a meaningful way
Understanding of the task	Creates a drawing that does not convey the theme	Creates a drawing according to the theme	Creates a thematic representation to convey the theme
Cleaning up after completion of task	Leaves materials lying around	Puts materials together in one place	Differentiates between waste and reusable material and places material in appropriate places

Teacher's Voice 7.4iv

Signs and Symbols on the Road

I teach Grade 5. The following question assesses students' understanding of signs and symbols encountered during road travel, as well as their ability to interpret them. Instead of asking them directly about different types of milestones, this question gives them visual clues that can be used to respond to the question.

Imagine you are travelling to Raipur from Surat. You will see many milestones on the way. Given below are two milestones, both showing the distance to Raipur, but are different. One is painted yellow and white, while the other is painted green and white.

A. What does the yellow and white milestone tell us?

B. What does the green and white milestone tell us?

Marking Scheme – Total 5 points		
Question	**Response**	**Points**
Question A (Total 3 points)	Yellow and white milestone tells us we are on a National Highway	1
	The yellow and white milestone tells us that we are on National Highway 53	1
	The yellow and white milestone tells us we are at a distance of 85 km from Raipur	1
Question B (Total 2 points)	The green and white milestone tells us that we are on a State Highway	1
	The green and white milestone tells us we are at a distance of 30 km from Raipur	1
Note: Students do not need to respond in the exact words given in the marking scheme – the idea should be the same. No points should be deducted for aspects like grammar and spelling.		





Section 7.5
Secondary Stage (Grades 9 and 10)

The Secondary Stage would introduce Interdisciplinary Areas as a Curricular Area. In Grade 9, the subject Individuals in Society would aim to develop capacities for ethical and moral reasoning, and in Grade 10, the subject Environmental Education would then further develop and apply these capacities in the context of Environmental awareness.

7.5.1 Grade 9: Individuals in Society

Ethical and moral reasoning involves thinking about fundamental questions related to everyday events – What is right or wrong? Can right or wrong be identified? What actions are justified? What is the 'right' thing to do? What are the reasons that justify the 'right' thing? This type of reasoning is necessary for responding rationally to situations, instead of impulsively or instinctively.

For example, the instinctive reaction to some situation may be driven by short-term self-interest. But the process of ethical and moral reasoning enables determining the right actions, not only for oneself but also for others in the same situation.

These questions are equally applicable across common situations that we encounter in real life. For example, on one hand a road may bring material prosperity to a village, but on the other hand it may affect the natural environment and influence the cultural community – what is the right thing to do? Tourism will alleviate poverty in a region, and also permanently change the area and its inhabitants – so what should be done? Can a war be termed just if it is fought to protect the interests of the disadvantaged?

Responding to these questions requires systematic reasoning in the following way:

a. To begin with, it requires an awareness of events – the context, the factors affecting it, and the people involved
b. Second, it requires identification of ethical and moral questions – whether there is violation of basic human and Constitutional values or any danger of the well-being and/or rights of any individual or community being affected
c. Third, arguments need to be constructed for and against possible actions.
d. Fourth, deciding what is the 'right' thing to do, the evidence used to make this claim, and how the action(s) will be carried out
e. Finally, identifying possible consequences of the proposed actions and what other steps can be taken to counter these

These capacities cannot be developed in a vacuum. Socio-cultural, economic and political issues, and current affairs are best suited to meet the aim of developing them.

Ethical and moral reasoning in this context requires the application of understanding gained from multiple subjects, as well as the moral and ethical values that are developed as a part of other Curricular Areas. Therefore, this subject is a part of Interdisciplinary Areas.

7.5.1.1 Learning Standards

In the Middle Stage, students develop multiple capacities, including values and dispositions related to human and Constitutional values. They engage with various concepts, particularly those related to science, social science as well as the environment.

Individuals in Society is intended to enable students to use these capacities and understanding in an interdisciplinary manner in the Secondary Stage. Through this, they will develop the capacity for ethical and moral reasoning in the context of issues/events with a wide impact and current affairs.

7.5.1.1.1 Curricular Goals & Competencies

CG-1 Develops capacity for ethical and moral reasoning	C-1.1 Examines an issue/event from multiple perspectives – socio-cultural, economic, political, and environmental C-1.2 Articulates ethical and moral questions on an issue/event C-1.3 Identifies different positions related to an issue/event, and provides arguments supported by rationale for each C-1.4 Identifies the human values, including those from Indian cultural heritage .and the Indian Constitution, relevant to an issue/event
CG-2 Develops capacity to analyse current affairs from multiple perspectives	C-2.1 Uses authentic sources of news, views, and opinions to develop an understanding of current affairs, particularly current affairs in India C-2.2 Communicates and advocates opinions and alternatives through a variety of modes (writing, speaking, debates, discussions)
CG-3 Applies ethical and moral reasoning to engage with current affairs related to the local community, State, nation, and the larger world	C-3.1 Identifies and explores issues/events within the community from multiple perspectives (historical, social, cultural, economic) C-3.2 Discusses issues/events at the district, State, national and international level

7.5.1.2 Content

The approach, principles, and methods of selecting content has commonalities across subjects – those have been discussed in Part A, Chapter 3, §3.2 of this document. This section focusses only on what is essential for Individuals in Society. Hence, it will be useful to read this section along with the above-mentioned section.

To meet the Curricular Goals, the content must draw from all the important domains of an individual's participation in larger society. While these domains can be categorised as socio-cultural, economic, and political, specific focus on the environment is also necessary. Therefore, students must gain adequate exposure to issues/events within all the following domains:

a. Socio-cultural domain

b. Economic domain

c. Political domain

d. Environmental domain

All issues/events will fall primarily within these domains. At the same time, these domains are not watertight – some issues/events may have dimensions falling within one or more of the domains.

7.5.1.2.1 Principles of Content Selection

Two sets of content will be required for this subject.

a. Content related to existing issues or events with wide-reaching impact

The purpose of this first set will be to help students engage with specific issues/events that reflect larger concerns, which may have been persisting for a long time (even centuries), through case studies, short films, and documents.

The reason for the inclusion of this content is to simulate the process of exploring multiple perspectives, identifying core issues/events, the debates that arose, and how they were resolved or remain yet to be resolved. Students will be able to understand the long-term consequences of these events and appreciate the importance of taking moral and ethical positions. This content will help them strengthen their own values and principles, and also help them experience the process of reasoning that is necessary for taking an informed position.

The principles that will inform the selection of this content are:

i. Sufficient content should be available, with information, opinion pieces, data, debates, news reports, and similar material, to enable an understanding of multiple perspectives.
ii. The content should make these moral and ethical questions explicit and offer well-rounded arguments based on evidence and reasoning for responding to each of these questions.
iii. There should be a sufficient record of actions, consequences, and positive changes. There should be scope to examine different perspectives for change and the consequences of these changes.
iv. Even if the matter under discussion is not recent, there should be sufficient material to evolve ethical and moral questions, and how they have been addressed explicitly (e.g., concerns related to the environment).

Illustratively, gender inequality, unequal access to resources, debates related to the role of science and technology, political participation, and environmental concerns could be some areas around which materials could be made available.

b. Content related to current affairs

The second set of content is related to current affairs. This set will be dynamic – it will be selected by the Teacher and students based on their interest in current affairs. This content will integrate the learning of students in several curricular areas and help them apply the capacities developed through engaging with the first set of content. It will comprise two kinds of content – (i) news reports, articles, clippings of TV news, videos on social media, and data, and (ii) interviews with community members and reports of surveys within the community.

The reason for inclusion of this content is to develop among students interest and understanding to engage with current affairs.

The following set of principles will inform this choice:

i. Content should be related to all four domains. Illustratively,
   1) Content from the socio-cultural domain could be around gender, class, sports, and media
   2) Content from the economic domain could be around public investment, wealth gap, employment, and schemes
   3) Content from the political domain could be around rights and duties, civic engagement, democratic processes, crime, safety, and security
   4) Content from the environment domain could be around health and hygiene, climate change, pollution, and biodiversity

ii. Content should enable students to engage with different dimensions and allow greater scope for ethical and moral reasoning. Illustratively,
   1) Whether the acquisition of agricultural land for developing airports is justified by the increased livelihood opportunities and improved access to other cities

iii. Content should be close to the students' life and experiences, and current learning across disciplines. Illustratively,
   1) Students may find it difficult to relate to mass shootings in other countries. On the other hand, effect of long-term use of chemical fertilisers in rural settings, and the rich-poor divide in urban settings can be taken up.

iv. Content selected should not lead to confrontation among students or lead to backlash from the community. Illustratively,
   1) Content that touches religious sentiments.
   2) Content related to an area that has already polarised communities and is likely to excite passions

v. Content should be of various kinds – digital, text, readings, opinion pieces, newspaper reports, Parliamentary debates, research reports, data, as well as discussions with community members.

vi. In this age of information overload and fake news, it must be ensured the material is from a reliable and valid source. Illustratively, content must be from
   1) Reliable magazines and newspapers/their websites
   2) Videos of acknowledged experts in the field
   3) Websites of reliable agencies or government departments or institutions/ universities

7.5.1.3 Pedagogy and Assessment

The approach, principles, and methods of pedagogy and assessment have commonalities across subjects – those have been discussed in Part A, Chapter 3, §3.3 and §3.4 of this document. This section focusses only on what is most essential for Individuals in Society. Hence, it will be useful to read this section along with the above-mentioned section.

7.5.1.3.1 Pedagogy for Individuals in Society

The Curricular Goals of this area will be best met through giving students the opportunity to engage with different content in different ways.

To this end, the pedagogical principles should be:

a. Students must be supported through the process of engaging with an issue/event before they work independently. This must be done through a set of questions and ongoing discussions to help them examine content from different perspectives. The process itself – how students engaged with content, how they identified what was important, how it made them feel, the questions they felt the need to reflect on/discuss, how they looked for answers to these questions, whether they satisfied with the answers, how they chose a view/opinion and why – must be discussed.

b. Students must be encouraged to look for information to answer any questions they may have, or for supplementary materials. Illustratively, they can ask community members, Teachers, any experts they know, or they can visit the local library, and search the Internet.

c. Students should engage with as much content as possible, and with different kinds of content. They should explore this content independently or in groups.

d. Students must present not only their learning but also their opinions on what they have read. For example, if they have read a case study on biodiversity collapse, they must present both what they have learnt, and also their opinions on how this collapse can be managed in their locality.

e. Students must have the opportunity to present opinions that may differ, and learn the process of listening to each other, put forth well-thought arguments, and be able to 'agree to disagree'.

Teacher's Voice 7.5i

Mission to Mars

One of my students brought a newspaper clipping on a manned mission to Mars to class. I asked her to read it out to the other students. There was a lot of excitement – I have tried to capture the conversation below.

Student A: I don't think humans can live on Mars! In our science class, Madam was saying that the conditions on Mars are not alright for human life.

Student B: They will not be able to live like we do on Earth! They will have to live inside something like tents. But how will the tents be kept cool? How will they get water? How will they get electricity?

Student C: The report says it will take seven months to reach Mars. What if an astronaut gets sick on the way? Will they come back? Even if doctors are on board, what if they need specialised equipment?

Student A: The report says the trip will cost billions of dollars. That is many 100 crores of rupees!

Student D: Don't we have many other things to spend the money on? And the astronauts will be in danger. And what will they do on Mars?

Student E: But going to Mars is like what travelling the seas was for ancient travellers! If they had thought about dangers and stayed at home, imagine what the world would be like! Maybe we wouldn't have invented airplanes because everyone was happy to stay at home.

At this point, I thought this would be a good area to explore. I asked students 'What if we try to answer the question: Is such a mission to Mars important for humankind?'

The students were excited about the idea. I asked them to think about the following questions, and any others they could think of –

a. What is the manned mission to Mars? Who planned it? Why has it been planned? Who is paying for it? Who will be going on this mission? When is it expected to take off? What are the challenges? Any other questions?

b. Do you see any challenges related to the well-being of the astronauts? How will they and their families deal with the separation? Will their sacrifice be worth it? Can the money being spent on this mission be used elsewhere to improve human existence? We have seen that human entry into space has created space debris – has space exploration affected the environment in any other way? Any other questions?

c. What are the arguments for and against a manned mission to Mars? Any other questions?

d. What do you think is the right thing to do? Why do you feel this is the right thing? Any other questions?

e. What will happen if your position is accepted? What will be the results? Are there any other steps that can be taken? Any other questions?

7.5.1.3.2 Assessment in Individuals in Society

A few key principles for assessment are:

a. Students must be assessed for understanding the context of a situation or event, the ability to identify ethical and moral dimensions, and the ability to recommend actions based on sound rationale and awareness of the consequences of the action.

b. Assessment of engagement with current affairs must never be only on the basis of general knowledge. It must be assessed with reference to specific situations or issues students are made aware of.

c. Assessment must be based on specific situations, issues, or caselets.

A few Teacher Voices illustrate different kinds of assessments below.

Teacher's Voice 7.5ii

Real vs. Fake News

I teach Grade 9. The question below assesses students' understanding of how to verify whether a particular piece of news is real or fake. It provides a specific situation as a context, instead of simply asking them about different ways of verifying news as real or fake.
While reading the newspaper today, you came across an article that surprised you. It said that it will be mandatory for citizens to file their income tax returns twice a year instead of once a year. This is to make the process more manageable for the Income Tax Department.

How can you verify this news? Please choose the most appropriate option.

a. You can check if other newspapers and television are carrying the same news.

b. You can check if there is a notification regarding the same on the IT Department website.

c. What are the arguments for and against a manned mission to Mars? Any other questions?

d. You can carefully check who has written the article and the sources cited.

e. A and B

f. **All of the above.**

I used the following marking scheme: A-1, B-1, C-1, D-0, E-4

Teacher's Voice 7.5iii

Analysing a Case

I teach Grade 9. The question below assesses students' capacity to identify what is right or not in the context of a specific case. The questions do not have just a single correct answer. Students are required to pick what they think is the most appropriate choice. I feel that asking them to weigh choices is better than asking them to state responses directly.

In May 2016, the government had passed the Real Estate Regulatory Authority (RERA) Act to ensure safe and transparent transactions related to private and commercial properties. While several reforms have been made, issues still persist, particularly in urban areas. Of late, news related to demolition of illegally constructed multistorey buildings or of construction being stopped due to legal issues in urban areas have appeared. For example,

- In January 2021, the Supreme Court ordered demolition of four tower blocks that violated environmental norms in Kochi. About 350 families were displaced after years of uncertainty while the case was being heard in various courts.

- In June 2022, the National Consumer Disputes Redressal Commission (NCDRC) ordered a real estate development company to halt construction of an eleventh tower, for which the builder did not have permission, in its residential project in Gurugram. Flats in the tower had already been sold. About 50 families who had invested in flats in the illegal tower have been affected, after more than a year of uncertainty.
- In August 2022, two 40-storey towers were demolished on the orders of the Supreme Court in Emerald Court, Noida, as the builders had violated building norms. About 600 families were affected, after years of uncertainty while the case was being heard in various courts.

1. Why do you think the Supreme Court and NCDRC took this position? Choose what you think is the most important reason.
   a. They are bound to go by the law and the rules for building.
   b. If they allow violations, other builders will also not obey the rules.
   c. Violations are dangerous as they affect the strength and stability of structures.
   d. All builders must be aware of rules for multistorey buildings.
2. What do you think was the impact on families who bought the flats? Choose what you think is the most important impact.
   a. They suffered monetary losses as they had to stay on rent while having paid for a flat.
   b. They suffered loss of time as they had to keep going to Court and to meet the builder.
   c. They suffered mental harassment due to uncertainty from the long waiting period.
   d. Their rights as consumers were violated as the builder failed to meet the contract.
3. People say that while buying flats from builders, homebuyers should be more alert. Whose responsibility is it to ensure homebuyers have all the information they need before investing in a flat?
   a. It is the responsibility of the homebuyers themselves to check whether the builder has all necessary approvals.
   b. The website of the RERA must carry information regarding approvals for all building projects in simple words.
   c. It is the responsibility of the builder to give all information in writing and provide updates.
   d. It is the responsibility of the state government to ensure the builder has all necessary permissions.

The marking scheme that I used was as follows:

Question 1	Question 2	Question 3
A: 1	A: 1	A: 0
B: 1	B: 1	B: 2
C: 2	C: 1	C: 1
D: 1	D: 2	D: 0

Teacher's Voice 7.5iv

Multiple Perspectives

I teach Grade 9. The following question assesses students' understanding of what is right and why, of multiple perspectives related to a single issue, and their ability to identify actions at multiple levels and provide a rationale for these actions.

Panchmura village, near Bishnupur, Bankura District, is one of the main hubs of terracotta in West Bengal. Terracotta came into existence in Bengal due to the unavailability of stones and large endowments of alluvial soil left by the main rivers in the Bankura district: Damodar, Dwarakeshwar and the Kangsabati. Thus, the soil gets a perfect blend and high density for it to be crafted intricately and fired in order to produce the required terracotta products.

Terracotta is of high interest in both the national and global markets. However, the artisans face issues of equipment, transportation, and other logistical problems. There is lack of interaction between the artisans and the urban consumers in Kolkata, and the artisans are mostly dependent on local patronage. Since they are not able to make much money, capital for further investment in tools and materials is limited. Further, sluggish marketing and falling demand are causing these marginalised artisans to become extinct; the lack of interest from the new generation further add to the woes.

The terracotta temples in Bishnupur show a much better quality and precision than the artefacts being produced today. For example, the details on the terracotta tiles used in the temples are much more intricate and portray a more complex network of lines, curves, and dots. With the improvement in technology and instruments, how is this possible?

Extinction of skill-specific labour is the answer to this. According to the locals, previously, the process of terracotta production in Bankura included three major classes of workers: the clay collectors and seivers, who would give a fine texture to the clay; the artisans who would add the intricate details, and finally the market traders. There is no specific class of labour anymore for each of these three roles. Also, Bankura artisans gradually scattered to different parts of the country, especially with young people moving to Kolkata to earn money. The remaining few of Panchmura are still struggling to keep this art form alive.

Source: Adapted from: Bhowmick, Soumya. (2019). Bankura's terracotta: Can timely measures facilitate socio-economic revival of potters' community? Observer Research Foundation.

Based on the passage above, please respond to the following questions:

1. Why do you think it is important to keep the art of terracotta alive?
2. Should the artisans of Panchmura continue to struggle to keep their art alive? Give reasons for and against their doing so.
3. If you were in a position to do so, what would you advise the artisans of Panchmura, and why?
4. If you were in a position to do so, what would you advise the Government of West Bengal and the Development Commissioner of Handicrafts, Ministry of Textiles, and why?

I used the following criteria to mark my students performance:

Student's responses	
Question 1	
Gives reasons based on the passage	1
Goes beyond the reasons given in the passage, including preservation of socio-cultural traditions,	2
Question 2	
States a few reasons for artisans to persist and face the challenges	1
Argues reasons for and against the artisans to persist based on reasons given in response to question 1	2
Question 3	
Suggestions are given without rationale	1
Provides concrete suggestions (e.g., setting up self-help groups, approaching the government for support) and how these will help overcome the challenges faced by the artisans	2
Question 4	
Suggestions are given without rationale	1
Provides concrete suggestions (e.g., facilitation of participation in crafts mela, setting up funds for preserving traditional crafts) and how these will help overcome the challenges faced by the artisans	2

7.5.2 Grade 10: Environmental Education

In Grade 10, students will engage with Environmental Education as a separate subject. They will focus on a holistic understanding of key concerns and issues related to Environmental Education through drawing upon their understanding across areas, and the capacities developed in Grade 9.

At this Stage, students will deepen their environmental knowledge, assess issues, and analyse their causes across various areas, make informed judgements on statements and debates in media and society, and use a range of techniques developed in earlier grades to investigate, analyse, synthesise, question, critique, and draw their own conclusions. They will use multiple perspectives to develop an integrated understanding, and advocate actions at multiple levels.

While it is important that students in this Stage acquire a conceptual understanding of environmental issues and challenges, as well as an appreciation of the magnitude of the problem, it is equally important to ensure they do not get discouraged or despair for their future. The intent is not to scare students or pin responsibility on them to respond to the crises. Therefore, the presentation of alternatives through examples of actions taken to reverse or at least contain environmental damage must be ensured. At the same time, it is important to emphasise that the onus for mitigation cannot be solely on the individual, and the whole community and society must be mobilised for this.

7.5.2.1 Learning Standards

All students must be aware of what is happening around them related to the environment to be able to advocate and participate in necessary action. Environmental Education intends to develop the environmental understanding necessary in all citizens, as well as the methods and capacities they must employ as ordinary citizens (e.g., problem identification, causes, future impact visualisation, prediction, policy actions, societal actions, as well as actions at the level of individuals, and the ability to critique specific actions and their impact).

7.5.2.1.1 Curricular Goals & Competencies

CG-1 Understands key issues and challenges related to climate change, pollution, and biodiversity collapse	C-1.1 Explains how climate change, pollution, and biodiversity collapse affect human well-being (economic activity, migration, cultural practices) and the well-being of plant and animal species C-1.2 Understands connections between and the causes underlying pollution, climate change, and biodiversity collapse
CG-2 Appreciates the need for interconnectedness, balance, and harmony between human society and nature – the essence of *'Vasudhaiva Kutumbakam'*	C-2.1 Describes the place of humans within ecosystems, and illustrates how humans and natural ecosystems are interconnected and must co-exist C-2.2 Illustrates actions at the individual, local, community, national, and international level towards mitigation of issues related to environmental damage C-2.3 Identifies actions that can be taken at the level of the school or local community to counter environment-related concerns

7.5.2.2 Content

The approach, principles, and methods of selecting content have commonalities across subjects — those have been discussed in **Part A, Chapter 3, §3.2** of this document. This section focusses only on what is most essential for Environmental Education. Hence, it will be useful to read this section along with the above-mentioned section.

7.5.2.2.1 Principles of Content Selection

The following principles must inform content selection for Environmental Education at the Secondary Stage.

a. Content must reflect indigenous and global perspectives, and reflect actions and potential actions of individuals, bodies/institutions, and nations; it must develop the understanding

that collaborative and sustained local and global solutions are needed. For example:

i. The scientific basis and causes of climate system and climate change; causes of biodiversity collapse and its impact; causes and impact of pollution; interrelationships among them

ii. Vulnerability of socio-economic and natural systems to climate change, consequences of climate change and options for adapting to it

iii. Use of natural resources like petrol across the globe and how it has affected economies and cultures; loss of glacial ice; climate change and rising sea levels; flooding due to heavy rains; soil erosion in islands; shrinking of rivers

iv. Measures taken to address these changes and sustainable practices

v. Local and global efforts towards mitigation of/adaptation to climate change – United Nations Framework Convention on Climate Change; Kyoto Protocol (carbon credits, Emissions Reduction Purchase Agreement); Conferences of Parties; Cancun Agreement; Durban Platform for Enhanced Action

b. Content must present strong qualitative case studies and quantitative data that indicate the impact of events and phenomena and enable analysis of contemporary impact. It should enable a holistic study, through offering multiple perspectives, and include stories of successful transformations. These case studies should be local – which can be selected by the State curriculum developers or Teachers — national and international. For example,

i. Jal Jeevan and projects to clean rivers, Swachh Bharat Abhiyaan

ii. Sustainable homes with natural materials and cooling/heating systems in India

iii. Astro-tourism for sustainable rural development in Ladakh and Africa

iv. Developmental needs versus conservation of environment

v. Disposal of e-waste, biowaste, medical waste (including radioactive materials)

vi. Case studies of work and impact of grassroots individuals and organisations

c. Content should represent inter-and-intra-nation ethical dilemmas and conflicts related to the environment and cultures/countries, as well as indicate how these have been/can be resolved. For example,

i. Sharing of river waters

ii. Carbon credits/offsets

iii. Displacement, environmental refugees

iv. Benefits for privileged groups versus vulnerable groups

v. Shrinking space for animals leading to human-animal conflict

d. Content should incorporate Indian and local knowledge and perspectives. It must engage the student with indigenous knowledge and viewpoints and enable them to present their analysis and findings through different mediums and perspectives. For example,

i. Cropping pattern

ii. Reviving lost crops

iii. Sustainable practices that have both evolved historically but have been lost in the country such as drainage, cooling, water systems; cultural traditions related to agriculture, forests, flora, and fauna

iv. Stepwells, sacred groves

v. Animal rights; rights of other entities within nature; nature as our home and our caregiver whom we must respect and protect; indigenous perspectives

vi. Organic agriculture

e. Content must enable school-based actions. It should enable advocacy at different levels and through different means. For example,

i. Use of creative media that can enable recording of environmental issues, challenges, and positive actions and stories (e.g., videos)

ii. Development of materials (e.g., newsletter, scripts for motivation, articles) for dissemination in the community

f. Content must enable informed and well-researched group discussions and debate. Debates that are topical and pertinent should be included – particularly around balancing development with preservation of the environment. For example,

i. Older and contemporary environmental debates; development versus environmental preservation; movement from cities for sustainable living

7.5.2.2.2 Recommended approach

Students will take up specific issues and examine their impact using an interdisciplinary lens. They will discuss root causes, impact, and mitigation of these environmental issues. While the approach can be varied, it is recommended that the triple planetary crisis – biodiversity collapse, pollution, climate change – comprise the themes to be taken up during the Secondary Stage.

To ensure a holistic understanding of all aspects with the required depth, it is recommended that experiential learning be enabled through case studies, site explorations, projects, guided readings, and other similar approaches. Whichever approach is taken, students should be able to examine the issue locally, and then extend their understanding into regional, national, and international concerns and actions. The underlying principle is to provide evidence-based understanding of both the crisis and its mitigation. Another principle is to ensure a holistic understanding as opposed to a fragmented understanding of perspectives from science, social science, human rights, politics, ethics, and justice. This principle is operationalised through approaching the content using a social-environmental systems framework.

Box 7.5i

A social-environmental systems framework: *provides a useful conceptual frame for understanding the interlinkages between society and nature that have implications for sustainability. The framework lays emphasis on interdisciplinarity, integrating conceptual frameworks and methods from the natural and social sciences for a holistic understanding of sustainability challenges. Central to the social-environmental systems framework are ideas of equity, environmental justice, and human well-being fundamental to the development of sustainable societies.*

The implications of the social-environmental systems framework in the school curriculum are to help students develop awareness of and concern about interdependence between the natural and humanmade environments and the various dimensions (economic, socio-cultural, political, historical, ethical, and aesthetic) of human societies. They also appreciate the need for balance between the environment and human society.

These three selected themes – biodiversity collapse, pollution, and climate change – are central to the current planetary crisis and provide a comprehensive understanding of issues as well as mitigation. It may be important to highlight other issues as well. However, it is strongly recommended that the approach given below is followed. This approach balances all aspects while providing a comprehensive understanding of local and regional issues.

a. Students should be able to gain an understanding of the causes and history of each of the themes and key issues related to each of the three through case studies, guided readings, site explorations, projects, and similar approaches.

b. It is preferred that the content should be contextual (located in the community, region, or State where the school is located). If this is not possible, it must be ensured that at least a part of content students engage with is contextual.

c. Content being used should offer rigour while being simple. Teachers should refer to similar issues (which can be included in the textbook) to ensure a broader understanding.

7.5.2.3 Pedagogy and Assessment

The approach, principles, and methods of pedagogy and assessment have commonalities across subjects – those have been discussed in **Part A, Chapter 3, §3.3 and §3.4** of this document. This section focusses only on what is most essential for Environmental Education in schools. Hence, it will be useful to read this section along with the above-mentioned section.

7.5.2.3.1 Pedagogy for Environmental Education

Students must examine environmental issues not only from a scientific/technological lens but also from the lens of the social sciences and humanities. They must examine how the actions of individuals, communities, and nations – both historical and contemporary – can have far-reaching consequences. Pedagogy must, therefore, be informed by the following:

a. Teacher must deliberately plan for the development of environmental values and dispositions. They should be made explicit for students by drawing attention to environmental values embedded in case studies and narratives.

Box 7.5ii

Environmental values encompass sensitivity towards social, political, economic, cultural, and natural environment and phenomena, and the ability and motivation to identify and raise questions related to dignity, justice, and rights. They also include aesthetic appreciation of surroundings including diversity of the physical and socio-cultural environment.

Environmental Education critically addresses, both social and natural concerns. Social concerns include issues of gender and marginalisation, equity, justice and respect for dignity and rights. It also encourages students to develop knowledge about indigenous practices for prevention of environmental degradation. Natural concerns include issues related to survival of animal species and animal rights, and sustainable use of resources, like forests and rivers. Therefore, Environmental Education enables in students a well-developed set of environmental values as well as the capacity to participate and initiate actions to remediate or prevent further degradation of the environment and promote sustainability.

b. Much of the content should be presented through debates and discussion and not as a definitely concluded position.. This allows for the opening of possibilities and developing abilities for critical engagement. These abilities must be developed through investigation, analysis and problem solving, and similar strategies that are relevant to their own communities.

c. Debates around historical and contemporary issues in education enable the development of the ability to take actions through critical engagement with theory and practice.

d. Students must identify how they can express their understanding in the community, whether through advocacy or simply through dialogue.

e. Students must get as much exposure as possible at this Stage – through books, media, films, dialogue among peers and elders, interaction with peers from other schools, video conferencing with experts and peers outside the State or country.

f. Teachers must not consider self and textbook as the only sources but enable interaction with other persons and/or media to expand students' learning. Teachers must have a resource pool of persons who can support their learning.

g. A significant platform must be provided to students to share their experiences, findings, and reflections (school newsletter, seminars, publications, TV interviews, social media).

h. For continued learning throughout the year, students can take up a project or participate in an ongoing project (e.g., cleaning rivers, community projects, sustainable school practices, green school, volunteering for local organisations dedicated to environmental causes).

i. Students must be encouraged to read materials on the environment, and present synthesis of readings; reviews of relevant books and films, videos, programmes, and reflections can also be shared.

Teachers Voices - 7.5v

Case Studies

When I think about what I want my students to learn about the environment, I realise the question is difficult. They must be aware of the danger the world is in because of environmental degradation. However, the future seems so dismal that I don't want them to think that their lives hold no hope. My responsibility deepens because of this dilemma.

I plan to share the realities of the triple planetary crisis with them but also provide them with details of initiatives taken by individuals and communities to make small changes that have a positive impact on the environment. I also want to help them develop a sense of how to respond as members of a community to decisions and policies made by governments related to the environment.

I think the best way to achieve these goals is to give them detailed case studies to read. These case studies must help students understand not only the context and specific issues, but also actions taken to address these issues. There are several instances in our country of people who have revived traditional practices of conservation or used simple technology to devise solutions and alternatives. Reading these case studies will not only help students adopt a positive, solution-oriented attitude; it will also help them see how communities can take action at a local level.

7.5.2.3.2 Assessment in Environmental Education

A few of the key principles for assessment in Environmental Education are:

a. Students must be assessed for understanding of environmental issues and concerns, as well as their ability to identify actions that can be taken to mitigate these issues.

b. Assessment must be based on the context of a situation/event or use caselets.

A few Teacher Voices below illustrate the different kinds of assessments.

Teacher's Voice 7.5vi

Animal-Human Conflict

I teach Grade 10. The following question assesses students' understanding of animal-human conflict. Instead of directly asking them about the effect of shrinking spaces for animals, it refers to a recent event and assesses their ability to identify the most viable solution i.e., wildlife corridors.

A tiger was captured on CCTV cameras on the night of May 7, 2023, in Mhow, near Indore in Madhya Pradesh. It was captured again on the night of May 10, 2023, by CCTV cameras. Despite an intensive search, including through the use of drones, the tiger was not located. No attack on any human or animal was reported. Forest department officials say that in 2019-20, pug marks had been seen in Mhow, although no tiger was spotted. They confirmed that tigers have been spotted in the forests close to the town. Experts say that the tiger may have wandered into the town looking for a partner or maybe migrating to establish its own habitat.

What can be done to protect the persons living in the town while ensuring tigers are also allowed to thrive? Please choose the most appropriate option(s).

a. Forests near the town should be fenced in completely to avoid movement of tigers outside the protected areas

b. People living in the town should avoid going out at night and keep domestic animals safely locked in shelters

c. Lots of shrubs and trees should be planted in pieces of unused land between areas that are more thickly forested

d. Cages should be set up to trap tigers, that can then be released into protected forest areas

e. Other

I used the following marking scheme: A-0, B-0, C-4, D-0, E-0

Teacher's Voice 7.5vii

Biodiversity Collapse

I teach Grade 10. The following question assesses students' understanding of an environmental issue and strategies developed for mitigation. Instead of a direct question, students are asked to think of the case studies they have engaged with and choose one to elaborate. It also assesses students' holistic understanding of, both the issue, and why specific strategies work in that context.

Using any example, describe how biodiversity collapse affected a specific community. Illustrate how local action by the community helped mitigate the impact of the collapse. Why do you think their strategy/strategies are important?

This is the marking scheme that I used:

Student's responses	
States the aspect of the biodiversity collapse that was addressed by the community	1
Describes the social implications	1
Describes the environmental implications	1
Explains the strategy/strategies for mitigation	1
Explains why the strategy/strategies were identified	1
Explains how the strategy/strategies were implemented	1
States the result of implementing the strategy/strategies	1
Provides reasons for the success of the strategy/strategies	1
States why they chose to describe the strategy/strategies	1
Explains how the strategy/strategies can be used in other places	1

Teacher's Voice 7.5viii

Revival of Lakes

I teach Grade 10. The following question assesses students' capacity to synthesise various aspects of a situation and come up with possible actions based on a sound rationale. Instead of asking students to recall and state the strategies needed for revival of a lake, the question provides a specific context. Students can draw on this context, as well as their broader understanding, to propose specific strategies.

Read the following extract and answer the questions below.

Najafgarh Lake: Despite a mention in the Delhi Gazetteer of 1883 and the Survey of India Map of 1911, currently the Delhi Government says that the Najafgarh Lake (Lat. 28°36'38.67"N, Long. 76°59'12.18"E, Alt. 216 m) no longer exists in Delhi.

Prior to the 1970s, Najafgarh Lake in South-West Delhi occupied more than 300 sq. km and was a biodiversity hotspot, home to various water birds and local wildlife. The fact that a vast lake ever existed here in the region comes as a surprise to most residents of the area and the need for resurrecting it is not a popular topic of discussion.

Status of Najafgarh Lake: Currently the lake stands as a topographical depression brimming with overgrown grass and garbage. As of 2015, the erstwhile lake has been removed from Delhi's map instead of reviving it. The lake's disappearance, and its use as a dumping ground has raised health concerns for the local population who are migrants from neighbouring states of Delhi.

The land owned by Delhi Development Authority (DDA) has been loaned to the Government Girls Senior Secondary School (II) in Dharampura with intentions to convert it into a park. Despite erection of benches and swings and placement of a fence around the area, the land suffers from poor maintenance. Pollution is rampant in the area and the Najafgarh drain, previously known as Sahibi River with its origin near Najafgarh lake, is now one of the most polluting sources, contributing to the degradation of the river Yamuna.

Lowering of the ground water table, encroachment, and concrete constructions have led to the lake drying up due to absence of proper water resource planning and scientific management by involved authorities. Residents reported the presence of fish up until 10 years ago and said the lake dried up 5 years ago.

Plans for revival: In 2019, the Delhi government announced a plan to revive Najafgarh lake and declare it a notified wetland. The government hopes that the lake's revival will help address water needs in south-west Delhi. However, not all residents are pleased with the idea, since they are apprehensive it will cause floods in the vicinity in the monsoon. Elders narrate stories of the troubles they faced due to flooding of the lake every monsoon. People who have encroached on the riverbed are also angry since they feel their homes are threatened. Some persons have even started farming on parts of the riverbed, and feel their livelihood is threatened.

Experts cited a Central Ground Water Board report in favour of the lake's revival. As per the report, water table in south-west Delhi is in the 'semi-critical' category. 'The presence of a large water body in the area would bring down the temperature by a few degrees. Once the water body is revived the soil in that area would be able to hold more moisture, which would, in turn, help the growth of trees. It would also help to prevent runoff during heavy rains and prevent flooding,' said environmentalist CR Babu.

Sources: Rustogi, Paridhi & Singh, S.K. (2017). Revival and Rejuvenation Strategy of Water Bodies in a Metropolitan City: A Case Study of Najafgarh Lake, Delhi, India. International Journal of Advanced Research (IJAR), Pg 189-195.

Roychowdhury, Adrija. (2019). Villagers divided over revival of Najafgarh lake. Hindustan Times, New Delhi.What strategies would you recommend to the Delhi government to make the lake revival project a success? Give reasons for choosing the strategies.

The marking scheme that I use is as follows:

Student's responses	
Picks only a few unrelated points from the passage	1
States one strategy without giving a reason	2
States more than one strategy with no reason	3
States multiple strategies with supporting rationale from the passage	4
Selects multiple strategies and states rationale based on a generalised understanding of the issue	5

7.5.3 Teachers

At the Preparatory Stage, we need Teachers who have specific capacities — illustratively, pedagogical approaches informed by an understanding of the context, of students' ability to evolve understanding through discussion, and of the use of multiple methods; capacities like observation and experimentation; ability to connect beyond specific themes; and environmental awareness and sensitivity. Teachers of either Science or Social Science can teach The World Around Us till pre-service programmes start offering this specialisation, provided they undergo well-designed in-service modules.

At the Secondary Stage, the Social Science Teacher should teach Individuals in Society and the Science Teacher should teach Environmental Education.

In Grade 9, there will be a need for Teachers who are aware of issues/events in the four domains that must be covered. Teachers of Social Science will be best placed for teaching Individuals in Society. Training modules must focus not only on content but must also require Teachers to examine their personal moral and ethical frameworks. At the same time, Teachers within the school must meet regularly to discuss current affairs, and strengthen their own capacity for discussion and debate, and the application of ethical and moral reasoning, as well as applying interdisciplinary understanding. This will also help ensure inclusion of different perspectives, and subject-related expertise.

In Grade 10, the Science Teacher should handle Environmental Education, as content at this Stage would include scientific concepts and ideas. If the Science Teacher is not available, the Social Science Teacher can take up this subject. However, the Teacher should be cautious to not overemphasise content or capacities that are more aligned to their own subject of specialisation and bring in elements as needed from the other area. The Teacher of Environmental Education should combine relevant understanding of both Science and Social Science at the school level and be able to draw linkages between the two in the context of the subject. The pre-service curriculum must have Environmental Education as a compulsory component. Student Teachers can also undertake projects and small research studies related to Environmental Education aligned to those expected from school students. Until this transition is made, well-designed training modules will be needed to capacitate Teachers.

Chapter 8

Physical Education and Well-being

Physical Education and Well-being in school aims to help students learn to lead a physically active, vigorous, and healthy life. In this NCF, the term 'Physical Education' (or PE) has been used in the place of 'Physical Education and Well-being'. Physical Education consists of **movements, drills, exercises, yoga, games, sports, and other activities that promote mind-body wellness.** Physical Education should provide a wide range of age-appropriate and level-appropriate physical activities that develop knowledge of the body and of games and sports, together with a disposition towards perseverance, teamwork, and sportspersonship.

KRCR 2019 states the role of Physical Education thus:

Physical Education is important for both physical and mental health and development. It helps improve a child's muscular and cardiovascular strength, flexibility, endurance, motor skills, and mind-body connection and wellness. It gives students the opportunity to set and strive for personal and achievable goals. Moreover, playing sports also helps students develop the qualities of teamwork, cooperation, problem-solving, discipline, perseverance, and responsibility. In general, physical activity is well established to be among the best releases for tension and anxiety and facilitates emotional stability and resilience. All these qualities and benefits are also relevant to success in the classroom; studies show that students who stay physically active are more successful with other schoolwork as well. Finally, people who are physically active as young people tend to stay more fit as adults as well, leading them to lead longer, healthier, and more productive lives.



Section 8.1
Aims

Physical activity is integral to human life and, therefore, integral to the school curriculum. For the individual student, sports and physical activities teach important motor skills, practices of physical fitness, socio-emotional awareness and regulation, associated cognitive abilities, as well as the values of hard work, teamwork, and a gracious acceptance of one's strengths and vulnerabilities.

Various forms of physical activities have unified people across the world over shared common interests and spirits, be it global sporting events or the spread of yoga. Sports, games, yoga, and other such rigorous physical activities have allowed humanity to enjoy shared experiences, emotions, and excitement.

India has long recognised the centrality of a healthy body as part of any educational experience. A very rich heritage of physical activities and games such as yoga, wrestling, *malkhamb*, and archery indicate this connection between body, health, and the holistic development of a human being.

A good Physical Education program is therefore considered important for everyone, regardless of the field of interest one wants to pursue in life.

Physical Education in schools must aim to achieve:

a. **Appreciation for physical activity/sports.** Sports and physical activities should be valued for the opportunities it provides for good health, enjoyment, self-reflection, and social interaction.

b. **Capacities for skilful engagement in physical activity/sports.** Physical Education should develop knowledge and capacity to execute different kinds of skills and movements of the human body and participate in and enjoy a variety of activities, games, and sports.

c. **Resilience.** Physical Education must develop resilience, tenacity, and an interest in the pursuit of excelling in physical capacities.

d. **Empathy and Cooperation.** Physical Education must nurture empathy, cooperation, fair play, and fraternity, which are relevant throughout one's life to be a good human being and a contributing member of society and learn to meet winning and losing with grace.

Box 8.1i

Yoga

The origin of all forms of yoga practised today is in the Yoga Sutras, a collection of aphorisms written over 2,000 years ago by Patanjali. The tradition has been passed on through generations and is in the form we see today. Yoga is not just a physical practice of Asanas (postures) but is much more than that. Patanjali enumerates 8 limbs of yoga (Ashtanga yoga). They are Yama (universal moral commandments), Niyama (self-purification by discipline), Asana (Posture), Pranayama (rhythmic control of breath), Pratyahara (withdrawal and emancipation of the mind from the domination of the senses and external objects), Dharana (concentration), Dhyana (meditation), and Samadhi (a state of super consciousness brought about by profound meditation).Yama, Niyama, and Asana are the 3

stages of outward quests (bahiranga sadhana). Yama and Niyama aim to control student's passions and emotions to stay in harmony with fellow human beings. Through the practice of Asanas, student keeps the body and mind healthy, strong, and in harmony with nature. These are largely the same aims as that of Physical Education in our school curriculum. We want students to be healthy, strong individuals who are in harmony with their surroundings and are contributing members of the community. Thus, the teaching of yoga is an integral part of the Physical Education program. Yoga Asanas and practices like pranayama appear at multiple points in this document.

Source: Light on Yoga by BKS, Iyengar

Section 8.2
Approach

In this NCF, Physical Education is seen as an important Curricular Area and not just an extracurricular activity. It has its own set of Learning Standards, content, appropriate pedagogies, and assessments. This curricular imagination is informed by some core principles that have been outlined in this section.

a. Schools must have Physical Education classes for all Stages

Students in the Preparatory Stage enjoy *free play* and want to participate in most games. We should encourage free play, creative manipulation of rules, and local games at this Stage. In the Middle Stage, students should continue to play local games but should get oriented towards more widely practised games. They should also actively participate in competitive sports events. Students at the Secondary Stage should be encouraged to choose one sport/game/activity and develop proficiency to compete at a high level. All students across the Stages must have a compulsory Physical Education class as part of their timetable. In instances where certain students at a very young age become interested in participating in different interschool, local, State, national, and international competitions, schools must make reasonable accommodations so that they can pursue their interests. The Additional Enrichment Period on the timetable or a similar after-school program should be used for this.

b. Schools must ensure adequate resources for Physical Education

In cases where schools have no playground, they must ensure access to nearby public grounds/spaces for students. In instances where this is not possible either, schools must develop ways to conduct physical activities that do not require much space, such as yoga, static exercises/movements, table tennis.

Similarly, until a PE Teacher is appointed, other Teachers must be educated to conduct physical activities under the guidance of any PE Teacher available in the school complex, school cluster, or nearby schools.

In case of limited availability of equipment, the choice of games/sports/physical activity must be made accordingly. The non-availability of a playground, PE Teachers, or use-worthy equipment should not be considered as limiting factors in the education and engagement of students in physical activities.

c. Schools must give equal importance and status to the subject of Physical Education

Health and Physical Education in schools have received lower importance as compared to other Curricular Areas. NEP 2020 recognises this and emphasises that it should be given equal importance and treatment in the curriculum. Physical Education is equally important for all students, and we must create enabling conditions for it in our curriculum, infrastructure, and school operations, including appropriate time in the school calendar and Teacher preparation.

d. Schools must ensure equal opportunity for all students in Physical Education

i. **Students of all levels of interest, inclination, and ability must engage in Physical Education.** Like all other Curricular Areas, some students may be more inclined towards Physical Education than others. This curriculum, therefore, suggests two modes for imparting Physical Education:

   1) **The compulsory PE class:** All students must attend the regular PE classes on the timetable. Activities in this class can be different for various groups based on their capacity and level of appropriateness. All students in schools will be part of this class and receive equal attention and support for learning, which means equal access to PE Teacher's time, equipment, and opportunities to play.

   2) **The optional Physical Education after-school program:** Those students who wish to engage in physical activity and sports on a deeper level can be part of this program. Schools may organise special skill-building classes, provide Physical Education Teacher support, and access to equipment before or/and after school hours. Such an arrangement must be considered as part of the curriculum and not as preferential treatment, as this opportunity should be available for all students who show interest.

ii. **Students of all genders should regularly play together across all age groups**, keeping in mind safety considerations. Students become accustomed to playing together and grow in their maturity to play comfortably in mixed-gender groups over time. Therefore, this approach is best introduced as early as possible, right from the Foundational Stage. Schools can make choices about having mixed teams in contact sports like kabaddi based on the socio-cultural attitudes in their locality/region.

iii. **Schools must ensure the participation of students with disabilities in Physical Education to the extent that is possible for them.** This requires adapting play conditions through thoughtful accommodation or modification to enable them to participate. For example, accommodation can be made by increasing the time to finish a run and/or allowing for individual differences in the skill levels expected of students with disabilities. Similarly, modifications can be made to the game rules that would ensure that students play cooperatively with differently skilled students and/or plan a different game/sport altogether (e.g., wheelchair race).

e. Schools must teach cooperation and teamwork through Physical Education

Sports, particularly team sports, give opportunities for working together towards a specific goal. Participants must cooperate to improve the overall team's performance and individual capacities that contribute to the team's performance. This cooperation is facilitated through

dialogue (especially while strategizing before a game or reviewing after a game) based on questions such as – 'How did I behave when my competitor got injured?', 'How do we construct teams when we know different team members have got different abilities and each one is better than the others in one or two aspects?', 'Why are some abilities seen as more important?', 'How does one feel when they lose?', 'How must we react in such situations?', 'What were the few crucial moments of the game when the team was competing and lost the advantage?'

f. Schools must ensure healthy competition and use it to explore personal capacities and limits

The Physical Education curriculum aims to nurture empathy, cooperation, fair play, and fraternity. Healthy competition in the context of Physical Education needs to be viewed as a means to enable the holistic development of students. Students must be taught to compete without compromising the values of sportspersonship and positive regard for others. They must be encouraged to pursue excellence and perfection in practice and performance for their own sake rather than to defeat and overpower peers. The key is to challenge oneself to grow into the next level of competence. There are several implications for this position.

i. Students must be grouped in teams with due consideration given to special needs such that it does not develop feelings of inferiority or superiority, as both have serious negative consequences.

ii. Values such as empathy, cooperation, fair play, and fraternity must be promoted and celebrated each time there is a competitive event.

iii. Winning or losing a game should be seen as an opportunity to help students reflect critically on feelings of undue pride, or embarrassment/distress, the effectiveness of the strategy.

iv. The selection of students for interschool competitions must be fair and transparent.

Section 8.3
Nature of Knowledge

a. 'To do' is 'to know': Physical activity squarely falls under the category of practical knowledge, where 'to know' is acquired only by doing the activity. One cannot claim to know swimming without doing it. Once an individual has performed the activity, they can reflect, observe, and explain how the activity is done. But it is not useful to reverse the sequence of this progression.

b. Regular progressive practice and layered learning leads to proficiency: Physical activities are learned over a period of time. One must perform an activity multiple times before gaining basic proficiency in it and to do it well. For example, to do *Tadasana* properly, the toes should be spread out evenly, the weight should be balanced equally between the right feet, left feet, forefoot, and heel, the tailbone should be tucked in, and the shoulders should be pushed back. It might take weeks of training to get these aspects right before moving on to others. It will involve a large element of muscle memory, so after a few weeks, these aspects are almost automatic. The instructor can then move on to other aspects of *Tadasana.*

c. **Teaches awareness of body and space:** Learning awareness of how the body can move in space in different contexts of sport and physical activity is an integral part of Physical Education. This 'embodied awareness' is about recognising what is happening in one's body, expanding the field of awareness around oneself, and having an alertness towards others in the context of sports and physical activity. Along with this kind of embodied awareness, learning to strategize before and during a game and a wide range of skills in the use of equipment are also integral to playing well. For example, in cricket, the bowler bowls to the field, and the batsmen find gaps in the field to hit their shots. In team sports like football and hockey, the players train in spatial patterns so that they know where their teammates are without looking.

d. **Learning is remembered for a very long time:** Another aspect of physical activity is that once learned, the knowledge stays with an individual for a long time and is like second nature. It is difficult to forget completely how to swim or hit a topspin shot with a table tennis racket once you have mastered it. One might be out of touch with these activities for years but can restart with some practice. In this sense, the knowledge of physical practice is embodied and stays with us.

e. **Enables understanding of physical and emotional limits and skills in working together:** This aspect of the nature of physical activity can be categorised into three components.

   i. **Knowledge of physical self and capacities:** A person who is regularly engaged in physical activities will have a better understanding of the body's capabilities and limitations. For example, someone who lifts weights regularly will know how much weight they can lift in a real-world scenario (a sack of rice) against someone who does not. People who engage in physical activities regularly are likely to be more sensitive to changes in their body in the short-term (need for rest or sleep, knowing when they are overeating) and in the long-term (improving their appetite, changing their sleep cycle).

   ii. **Knowledge of mental and emotional capacities:** Through regular participation (and reflection) in sports, a person also learns about how they feel and react under different circumstances. For example, one learns about how assertive they are, how they perform under pressure, how strongly they feel about an unfair situation, and how they react to it and so on.

   iii. **Knowledge of social surroundings and how to work with them:** Team sports require all the individuals in the team to understand each other, communicate at different levels (before, during, and after play), build common strategies, and play different roles required within the team, teaching skills of being social and working together.

Section 8.4
Current Challenges

a. **Status of Physical Education in schools and community:** Physical Education in schools is mostly considered as a subject to engage students during leisure time, recess, or when a subject Teacher takes leave. It is feared that playing too much (sports, games, or other physical activities) will badly impact students' education. Schools lack an understanding of teaching and learning Physical Education. Whatever body of knowledge exists so far is more about the rules of games, playground dimensions, physiology of the body, and nutritional requirements only.

b. **Lack of infrastructure and resources:** Physical Education requires open spaces, indoor facilities, specific exercises, and sufficient sports equipment to provide a better quality of learning. The lack of adequate infrastructure and resources is a huge challenge in most schools.

c. **Lack of availability of PE Teachers in schools:** In a vast education system like India, the availability of Teachers has always been a challenge, particularly in subjects such as Art, Physical Education, and Vocational Education. Currently, we have very few good education institutions providing education programs and training for Physical Education Teachers and Teacher educators.

d. **Inadequate scholarly literature in Physical Education:** 'What do we know?' and 'How do we know?' are perennial questions in the field of Physical Education. The lack of sufficient region-wise studies, research, and academic literature on Physical Education in India is not helpful for young scholars and researchers to pursue this area further. This is an area that would require sustained efforts and far more academic interest and work.

e. **Absence of school-wide Physical Education curriculum and focus on theoretical aspects:** In the absence of a well-defined curriculum till Grade 10 with specific Learning Outcomes and even lesser clarity on assessment possibilities, Physical Education has faced a serious pedagogical challenge. In schools, students are taken outside the classroom to perform activities or engage in playtime without structured and progressive guidance or Learning Standards. To worsen the issue, there is too much focus on theoretical aspects of sports, sometimes students are taught about the dimensions of a football/cricket ground/ tennis courts rather than playing the sport.

f. **Inadequate nutrition for physical activities and sports:** For many students across India, the Mid-day Meal is the only substantial meal available for the day. This means their nutritional needs are grossly unfulfilled, and this often compromises their ability to participate in many planned and rigorous physical activities.

Section 8.5
Learning Standards

Learning Standards for Physical Education across Stages flow across four core areas: motor and movement skills to participate in different physical activities, appropriate personal and social behaviours, mental engagement in physical activities, and setting and achieving goals/targets. They progress in complexity and diversity along these four core areas across Stages.

For example, movements and skills start with learning basic skills such as kicking, hitting, catching, and throwing, which progress to the next level by combining them with movements, e.g., throwing while running. This further progresses to the next level by combining more than one movement with skills, e.g., running, jumping, and catching simultaneously or anticipating, diving, and catching the ball on the move.

Similarly, personal and social behaviour ranges from simply observing and following rules at the Preparatory Stage to regulating one's own and teammates behaviour.

Mental engagement spans around observing and finding patterns at the Preparatory Stage and runs into game strategies by the end of the Secondary Stage. Setting targets and recording progress begins with simple things like being able to just record your progress against a target set by the Teacher and goes on to assessing progress in terms of efforts, processes, and outcomes.

By the end of the Secondary Stage, all this ultimately leads to every student being able to:

a. Demonstrate skills and knowledge to participate in diverse physical activities and at least play/perform one sport/physical activity well.
b. Develop resilience, tenacity, and interest in the pursuit of excellence.
c. Nurture empathy, fair play, and cooperation.

A 'Nested' Design of Learning Standards: As mentioned in **Part A, Chapter 3, §3.1**, giving due consideration to the time schools might require in the implementation of Physical Education as a full-fledged subject across the Stages (for example appointment of Teachers, acquisition of resources), this document contains **'Nested Learning Standards'** for Physical Education, wherein Learning Standards have two sets which have been detailed. The first set, called **Learning Standard —1 (LS —1)** details the full range of Curricular Goals and Competencies across Physical Education. These should be accomplished by all schools as soon as they add the required resources for Physical Education. Nested within this is a subset called **Learning Standard —2 (LS —2). These should be accomplished by all schools from the very initiation of the implementation of this NCF.**

8.5.1 Preparatory Stage

By the end of the Foundational Stage, most students would be able to demonstrate basic movements, motor skills, awareness of rules, and participation in activities and games. The emphasis in the Preparatory Stage would be to build on this to develop skills such as rolling, throwing, catching, dribbling, kicking, and striking. The focus should remain on basic skills, the joy of playing, and the ability to display appropriate behaviours and attitudes during activities. Students should recognise the value of rules, fair play, safety, and respect for others. At this Stage, local games must be preferred and encouraged.

8.5.1.1 Learning Standards – 1

CG-1 Demonstrates the use of basic skills (running, jumping, catching, throwing, hitting, and kicking) to participate in different physical activities/games/sports	C-1.1	Practises a combination of movement, motor skills, and manipulative skills (catching, throwing, kicking, hitting a ball towards a target while moving, focussing on visual cues to hit the target)
	C-1.2	Moves purposefully their body to a beat/rhythm/music
	C-1.3	Demonstrates coordination abilities with a partner and objects (e.g., being able to move in coordination with a partner in three-legged race, hand-eye coordination while bowling, throwing)
	C-1.4	Demonstrates basic warm up exercises and stretching to develop strength and flexibility in the body
CG-2 Develops an awareness of their personal and social behaviour towards themselves and others	C-2.1	Demonstrates the ability to play games and activities which require and emphasise teamwork, cooperation, personal responsibility, and communication of ideas
	C-2.2	Creates group norms and rules of the game/activity before playing and reviews them regularly
	C-2.3	Exhibits sensitivity to injuries of others and acts empathetically when the other player is physically injured, emotionally stressed, or feeling unwell
	C-2.4	Practises care and responsibility towards physical activity material, playground, and facilities
	C-2.5	Identifies characteristics of safe/unsafe touch in the context of physical activity and describes ways of reporting them
CG-3 Demonstrates mental engagement in physical activity/game situations	C-3.1	Explains the concept of some games, their rules, playing positions, and basic moves
	C-3.2	Expresses their emotions and thinking process during the game

CG-4 Develops an understanding of the need to develop themselves and self-assess their progress	C-4.1 Sets simple personal goals/targets and records progress (e.g., throwing a ball at 25 m, then 30 m, then 40 m; Jumping 1, 2, 3 feet high/long)

8.5.1.2 Learning Standards – 2

CG-1 Learns the use of basic skills (running, jumping, catching, throwing, hitting and kicking a ball) to participate in different physical activities/games/ sports	C-1.1 Practises a combination of movement, motor skills, and manipulative skills (e.g., catching, throwing, kicking, hitting a ball towards a target while moving, focussing on visual cues to hit the target) C-1.2 Demonstrates coordination abilities with a partner and objects (e.g., being able to move in coordination with a partner in three-legged race, hand-eye coordination while bowling, throwing) C-1.3 Demonstrates basic warm up exercises and stretching to develop strength and flexibility in the body
CG-2 Exhibits awareness of personal and social behaviour towards themselves and others	C-2.1 Demonstrates the ability to play games and activities that require and emphasise teamwork and cooperation C-2.2 Creates group norms and rules of the game/activity before playing and reviews these regularly C-2.3 Exhibits sensitivity to injuries of others and acts empathetically when the other player is physically injured, emotionally stressed, or feeling unwell C-2.4 Practises care and responsibility towards physical activity material, playground, and facilities C-2.5 Identifies characteristics of safe /unsafe touch in the context of physical activity and describes ways of reporting them
CG-3 Demonstrates mental engagement in physical activity/game situations	C-3.1 Explains the concepts of some games, their rules, playing positions, and basic moves C-3.2 Expresses their emotions and thinking process during the game

8.5.2 Middle Stage

In this Stage, students are in their adolescence, and differences in physical appearance, weight, height, and gender-related experiences become pronounced. Preoccupation with appearance and self-image provides Teachers with opportunities to talk about health and the need for physical activity. Physical Education classes provide an ideal setting for adolescents to learn and practise skills of social and personal responsibility while following rules, regulations, and safety procedures. It provides ground for students to perform, gain and give respect, and build self-confidence. Cooperation is an important social skill for this age group and students must be taught to cooperate with their peers and accept responsibility for their behaviour. For this age group, winning becomes important, so Teachers would need to emphasise that participation and playing well with the group as perhaps more important. Students also learn to refine, combine,

and apply a variety of movement and motor skills in different physical activity settings. Games that promote all students playing together should be encouraged. It is recommended that students continue to play local games at this Stage, and, at the same time, get introduced to popular competitive games/sports.

8.5.2.1 Learning Standards – 1

CG-1 Demonstrates intermediate body movements and motor skills to participate in different physical activities/games/sports and develop their understanding	C-1.1 Develops power, speed, strength, balance, flexibility, judgement, and reflexes in motor movements (running and jumping with various speeds and in various directions, rolling and zigzag movements, catching a moving object coming with speed or throwing/hitting a ball far with precision) C-1.2 Demonstrates rhythmic movement skills (locomotor, and non-locomotor) such as smoothly moving, balancing, and transferring weight with intentional changes in direction, speed, tempo, and flow C-1.3 Performs two or more fundamental movements at the same time as receiving and passing the ball against a defender C-1.4 Exhibits manipulation of space and equipment in the context of a game C-1.5 Recognises correct warm up and cool down exercises to avoid injuries and long-term effects C-1.6 Works on strength, endurance, flexibility, and agility through exercising and training with and without apparatus
CG-2 Exhibits sensitivity in their personal and social behaviour towards themselves and others	C-2.1 Reflects on their personal reactions during an interaction/activity with others C-2.2 Demonstrates supportive behaviour in helping others during emotional setbacks and physical injuries C-2.3 Creates and teaches the rules of game to others C-2.4 Creates and applies safety rules and protocols for physical activity C-2.5 Puts the larger interest of the team first, treats individuals as equals, makes ethical decisions, and takes responsibility for their mistakes C-2.6 Identifies characteristics of bullying and mental and sexual harassment and describes the protocol to report it to the right person
CG-3 Demonstrates and practises physical movements, motor skills, social sensitivity, and mental engagement in physical activity/game situations	C-3.1 Designs multiple strategies for a game and chooses strategies according to the context C-3.2 Demonstrates calmness and courage in difficult situations

CG-4 Plans and achieves personal physical fitness goals with little help from Teachers	C-4.1 Identifies physical activity and fitness goals, such as improving a shot or breaking their own 100-metre record
CG-5 Learns the connection between physical activity with health, enjoyment, challenge, expression, and social interaction	C-5.1 Discusses activities that bring personal satisfaction C-5.2 Identifies different cultures with special reference to dance, physical activity, local games, and spaces to interact C-5.3 Identifies the relationship between rhythmic movement and their aesthetic value

8.5.2.2 Learning Standards – 2

CG-1 Demonstrates intermediate body movements and motor skills to participate in different physical activities/games/sports and develop their understanding	C-1.1 Develops power, speed, strength, balance, flexibility, judgement, and reflexes in motor movements (running and jumping with various speeds and in various directions, rolling and zigzag movements, catching a moving object coming with speed or throwing/kicking/hitting a ball far with precision) C-1.2 Performs two or more fundamental movements at the same time as receiving and passing the ball against a defender C-1.3 Recognises correct warm up and cool down exercises to avoid injuries and long-term effects
CG-2 Exhibits sensitivity in their personal and social behaviour towards themselves and others	C-2.1 Reflects on their personal reactions during an interaction/activity with others C-2.2 Demonstrates supportive behaviour in helping others during emotional setbacks and physical injuries C-2.3 Creates and teaches the rules of a game to others C-2.4 Creates and applies safety rules and protocols for physical activity C-2.5 Puts the larger interest of the team first, treats individuals as equals, makes ethical decisions, and takes responsibility for their mistakes C-2.6 Identifies characteristics of bullying and mental and sexual harassment and describes the protocol to report it to the right person
CG-3 Demonstrates self-awareness and mental engagement in physical activity/game situations	C-3.1 Designs and executes simple strategies for a game C-3.2 Demonstrates calmness and courage in difficult situations

8.5.3 Secondary Stage (Grades 9 &10)

Students experience numerous physical and physiological changes during these years. Boys typically experience a period of rapid growth around Grade 9 or until about 14 or 15 years of age. On the other hand, in Grade 9, girls experience a slower rates of growth. Overall, by Grades 10 or higher, most students start experiencing a relatively slower rate of growth. This slowdown in growth rate, along with increases in the length and breadth of muscles, produces a higher level of motor ability and fitness. By this Stage, students are able to select activities they would like to pursue and they should be able to identify one sport/game in which they would like to excel and build proficiency to participate at a high level.

8.5.3.1 Learning Standards – 1

CG-1 Demonstrates high level of competence in the understanding of movement concepts, strategies, and principles while engaging in and performing physical activities including sports and dance	C-1.1	Exhibits proficiency in all movement and motor skills required to participate and excel in at least one sport /yoga/or any other physical activity (team, dual, individual)
	C-1.2	Explains role of rhythmic drills to improve their game
	C-1.3	Exhibits the ability to use complex movement concepts and principles to develop and refine their game/sports skills
	C-1.4	Exhibits and explains manipulation of space and equipment in the context of a game
	C-1.5	Applies knowledge and understanding of movements and skills to develop a physical activity plan for themselves, follow a routine, and assess independently
CG-2 Exhibits sensitivity and learn to manipulate their personal and social behaviour towards themselves and others	C-2.1	Reflects upon their and other's behaviour before, during and after the physical activity in the long term. This may include different but related behaviours, including emotional state of mind, physical fitness, fatigue, fair play, biases, personal interests
	C-2.2	Articulates the importance of emotional and mental support to others as well as improving performance and encouraging others to do so (by analysing the behaviour of student when someone is emotionally or physically hurt and how their support may improve the others performance)
	C-2.3	Modifies/creates new games and rules that are more inclusive in nature
	C-2.4	Creates and applies safety rules, protocols for physical activity, and visualises how they can be applied outside the field as well
	C-2.5	Demonstrates fairness, and responsible behaviour in tough contexts and situations
	C-2.6	Exhibits modesty after an exceptional performance, accepts defeat gracefully, and enjoys the game

CG-3 Demonstrates social sensitivity and mental engagement in physical activity/game situations	C-3.1	Designs and uses multiple strategies in a game and has the ability to make new strategic moves in challenging game situations (e.g., a student's plan A and B both failed and strategizes a plan C during the game)
	C-3.2	Understands and deals with their own and others' emotions and the thinking process during the game
	C-3.3	Demonstrates calmness and courage in difficult situations and is able to calm their teammates
	C-3.4	Regulates the intensity in different situations
CG-4 Plans personal physical fitness goals independently and monitors them	C-4.1	Sets multiple physical activity and fitness goals such as improving multiple shots or their overall match performance
	C-4.2	Assesses their progress in terms of efforts, processes, and outcomes
	C-4.3	Prepares, plans, and schedules their own exercises and warmups in consultation with their teacher to get maximum benefits
CG-5 Learns about the value of physical activity for health, enjoyment, challenge, expression, and social interaction	C-5.1	Illustrates the role of Physical Education for positive social interaction while discussing physical activity throughout history and culture
	C-5.2	Examines the role of physical activity in improving self-confidence and self-esteem
	C-5.3	Appreciates the aesthetic appeal of a performance such as someone's classy straight drive, a beautiful freekick, effortless smashing of the ball, well-placed drop shot, speedy smash
	C-5.4	Expresses self through dance, gymnastics, or any physical activity
CG-6 Assesses their own growth and development	C-6.1	Examines the role of different factors which affect growth and development such as heredity, immediate environment, diet, diseases, state of mind, and physical activity
	C-6.2	Analyses the relationship of nutrition, physical activity, and mental health with skeletal health, muscles, strength, endurance, flexibility, and agility
	C-6.3	Classifies the common injuries of bones and muscles and describes protocol for seeking medical help for themselves and others in that situation, like providing first aid in such situations
	C-6.4	Outlines and challenges the societal beliefs and taboos associated with different aspects of growth and development at adolescent age
CG-7 Learns about tournaments at the international, national, state, district, and block levels	C-7.1	Charts the various tournaments at international, national, State, district, and block levels
	C-7.2	Describes the participation criteria and rules of tournaments
	C-7.3	Summarises the support or organisational structures to participate in tournaments
	C-7.4	Explains the different forms and procedures for participating in tournaments

8.5.3.2 Learning Standards – 2

CG-1 Demonstrates competence in the understanding of movement concepts, strategies and principles while engaging in and performing physical activities, including sports	C-1.1	Exhibits all movement and motor skills required to participate and play in at least one sport /yoga/or any other physical activity (team, dual, individual)
	C-1.2	Exhibits the ability to use complex movement concepts and principles to develop and refine one's own game/sports skills
	C-1.3	Applies knowledge and understanding of movements and skills to develop their own physical activity plan, follows a routine, and assesses independently
CG-2 Exhibits sensitivity and learns to regulate their personal and social behaviour towards themselves and others	C-2.1	Reflects upon their own and others' behaviour before, during, and after the physical activity (This may include different but related behaviours, including emotional state of mind, physical fitness, fatigue, fair play, biases, personal interests)
	C-2.2	Articulates the importance of a team-member's support to improve performance in the game (by analysing the behaviour of students when someone is emotionally or physically hurt and how their support may improve the performance of the others)
	C-2.3	Modifies/creates new games and rules that are more inclusive in nature
	C-2.4	Creates and applies safety rules and protocols for physical activity and visualises how they can be applied outside the field as well
	C-2.5	Demonstrates fairness and responsible behaviour in tough contexts and situations
	C-2.6	Exhibits modesty after an exceptional performance and accepts defeat gracefully and enjoys the game
CG-3 Demonstrates social sensitivity and mental engagement in physical activity/game situations	C-3.1	Designs and executes multiple strategies for the game
	C-3.2	Understands and deals with their own and others' emotions and the thinking process during the game
	C-3.3	Demonstrates calmness and courage in difficult situations and can calm their teammates
CG-4 Learns to connect physical activity with health, enjoyment, challenge, expression, and social interaction	C-4.1	Discusses activities that bring personal satisfaction
	C-4.2	Identifies diverse cultures with special reference to dance, physical activity, local games, and spaces to interact
CG-5 Learns about tournaments at the international, national, State, district, and block levels	C-5.1	Charts the various tournaments at international, national, State, district, and block levels
	C-5.2	Describes the participation criteria and rules of tournament
	C-5.3	Summarises the support structure or organisational structure to participate in tournaments
	C-5.4	Explains the different forms and procedures for participating in tournaments

Section 8.6
Content

The approach, principles, and methods of selecting content have commonalities across subjects – those have been discussed in Part A, Chapter 3, §3.2 of this document. This section focusses only on stage-specific variations that a Teacher needs to keep in mind in the teaching and practice of the Physical Education curriculum in schools. Hence, it will be useful to read this section along with above-mentioned section.

8.6.1 Stage-specific Considerations

8.6.1.1 Preparatory Stage

At this Stage, the students will spend most of their time in free play and only a little time in structured sessions. Free play allows students to use their imagination and develop creativity. It is widely known and accepted that free play develops many important skills for students in the Preparatory Stage. Not only do they learn physical capacities such as gross and fine motor skills, auditory perception, and visual perception, but also individual capacities such as language development, problem solving, independence, and social capacities such as communication, collaboration, negotiation, and empathy to name a few.

For free play to be effective and challenging for the students, the school can provide materials which allow students to creatively utilise objects and materials around them that are easily available in the neighbourhood. Objects such as different sized of softballs and bats, tyres, small spades (blunted), any kind of toy, clay, colours (crayons, sketch pens), boards, chart paper, and musical objects. Having a sand pit and access to a small water source can also be considered. The objective is to provide students with enough objects and spaces to play different kinds of games either independently or in groups.

The Teacher allows free play, but with some agreed-upon ground rules (boundary of the play area, hygiene, harming others, safety-related rules). Free play is not guided but is monitored. Teachers and facilitators need to be present and keenly observe all the students throughout the duration.

Planned sessions for the Preparatory Stage can use a range of local games. At this Stage, planned sessions need to be fluid and not based on strict rules. The Teacher can introduce simple games which do not require a lot of explanation and are intuitive. Planned sessions can also be used for specific purposes, such as building motor skills, but it needs to be 'gamified'. The facilitator can either create or find games which are linked to specific skills that need to be taught. For example, jumping and hopping can be done through animal movement games like frog jumps, and running and dodging can be done through a game of tag or dodgeball. *Gilli danda* can be used for hand-eye coordination.

8.6.1.2 Middle Stage

In the Middle Stage, students continue to play local games, but have more structured sessions. By this Stage, students have higher proficiency with simpler games and can be introduced to popular sports gradually.

In the structured sessions, the Teachers need to gradually bring in an understanding of more rules that will need to be remembered while playing. Specific skills needed to play popular regional sports can also be introduced. Both objectives can be met through simpler versions of the sport to begin with, and with each Grade, more skills and rules of the sport can be introduced. For example, for 'invasive games' (games where one team has to cross over to the other team's territory) such as hockey, football, basketball, and ultimate frisbee, simpler games involving just kicking/hitting/throwing on targets can be introduced (only playing penalties for football and hockey). For 'field-based games' such as cricket, only bowling to a wicket/wall, only batting, or only catching/fielding-based games can be used. For 'net-based games', such as badminton, volleyball, and table tennis, simplification can be achieved by games in which players need to learn to hit the ball/shuttlecock with the right technique (keeping the shuttlecock/volleyball/TT ball from falling by hitting it again and again into the air).

Slowly, the complexity can be increased by playing mini versions of the sport with most of the rules in place, while also building individual capacities such as observation, reflection, emotional regulation, expanding spatial awareness and peripheral vision, and making quick judgements based on gameplay. Simultaneously, social capacities such as effective communication, collective decision making, working together towards a common goal, and other such capacities also need to be taught.

The students at this Stage will learn more about their bodies and learn individual practices, such as yoga and strength exercises, in greater detail. They will learn to create their own warm up and cool down routines.

Emphasis also needs to be given to students taking more responsibility for building a culture of inclusive sports at school. They need to play an active role in ensuring all students feel safe, motivated, and encouraged to play. This can be a challenge to achieve for students in this Stage, but it needs to be worked on by the Teacher through 'circle time,' where students get the space to express and reflect on their actions.

Box 8.6i

Circle Time: A Way to Ensure Values and Disposition in Physical Education

All the students sit in a circle and set some ground rules with the help of the Teacher. Some essential ideas are:

1. *Everyone in the circle is equal; no one is more important than the others (It reflects in the seating as well. It is a circle, and everyone is sitting at the same level.)*
2. *Everybody should respect each other and their feelings.*
3. *No one should interrupt while another person is talking and give their complete attention.*
4. *Everyone in the circle should get the opportunity to talk, and others should encourage it.*

With the ground rules set – the Teacher can guide the session by asking everyone to share simple thoughts after any session. An easy method is to ask everyone to share a 'star' and a 'wish'.

A star is something that the student really enjoyed in the session. It could be something they/a team did, or any occurrence that positively affected the student.
A wish is something that the student wish had happened in the session. It could be something you wish something that they/their team had done better. It could also be an activity they wish to be included or more time to play.

Every student can share a star and a wish, and 'tag' (pass the chance on to) another student (other than their close friends) to to share. The process continues till all the students have shared.
This star and wish can be modified over a period to different abilities we want the students to pick up. This can be modified over a period to get students to observe themselves, their actions and feelings, and those of others. Sharing in this manner regularly with the Teacher with the basic etiquette observed can create a safe learning space for students. Some pertinent and powerful questions can be brought into this space to discuss – Are we biased towards our friends when we play? Do we pass the ball equally to everyone? Are we including everyone equally in a game or are some people not having as much fun? and so on.

8.6.1.3 Secondary Stage

At this Stage, students can be given a choice to engage with certain sports more seriously (and build specific skills for them) than others, and for students to play multiple sports at the same time. The sport can be played with all the international rules and with all its complexity.

Students who choose a sport more seriously can train more rigorously through sports-specific drills. Playtime for students needs to be balanced with drills based on student interest. Those who are not keen on building superior skills should be allowed 'free play' of different sports and not be forced to pick one sport.

There should also be sufficient focus on building strength and flexibility through Yoga and strength conditioning. Students must be taught about common injuries and how to avoid them through practice.

The emphasis on circle time and building a culture of sport must increase at this Stage. Students should be encouraged to discuss their emotional States while playing more openly with each other. Circle time at this Stage can be used to talk about many things that are commonly seen in sports and are unhealthy. For example, a discussion on how different people feel when a captain or a coachshouts at their players, how decisions are taken in a team of students, or do team members have a say in who gets to bat or bowl first, and so on, would be valuable educational conversations.

Students in the Secondary Stage must be taught to set the right example for younger students and in helping the Teacher with organising school sports events. For example, senior students

can help organise athletic events on campus. They could also be referees or umpires for games conducted for younger students. Secondary students can be given leadership roles, which will help build their skills too. For example, a student can be asked to facilitate circle time, with the instructor only participating as an observer.

Box 8.6ii

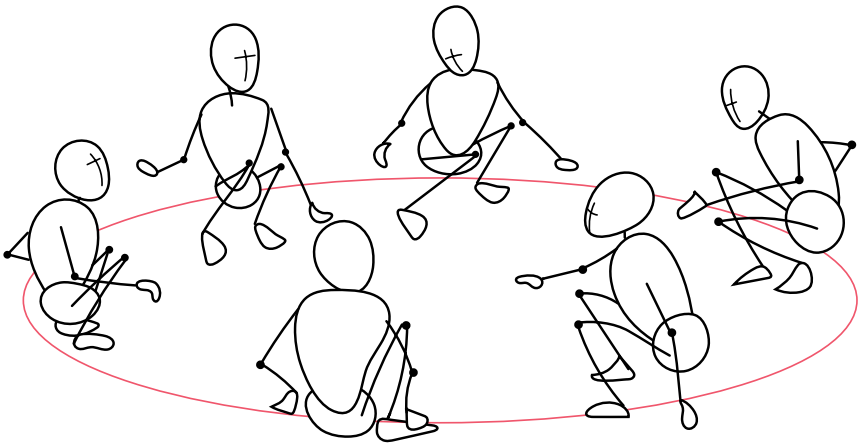
Weather Conditions

Physical Education classes could be particularly challenging in tough or extreme weather conditions. India has very diverse weather conditions. Extreme cold, hot, and rain are witnessed in several regions. The following suggestions can help in such cases
Timetabling: *Areas which witness tough (not extreme) hot and cold weather conditions can consider working on rearranging their timetable. For example, in hot climates, the Preparatory and the Middle Stage students play in the morning and the Secondary Stage students play in the afternoon. In cold weather, the reverse can be done.*

Indoor Activities: *In extreme weather, when playing outside is not possible at all, Indoor Physical Education classes must be organised. Physical activities such as yoga, static movements, dance, theatre, High Intensity Interval Training (HIIT) and Medium Intensity Intermittent Training (MIIT) workouts can be considered. To enable more space per student, schools should make provision for access to a big hall in the school or in the vicinity which can enable these activities.*

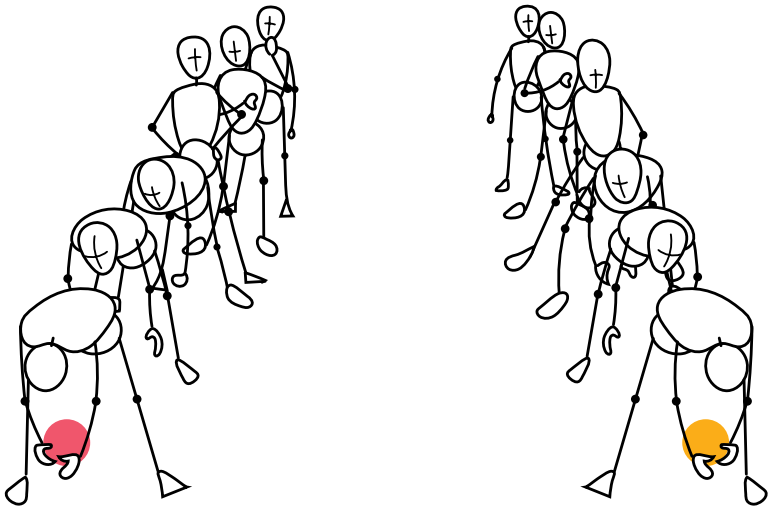
Few examples of games popular in India are given below.

1. Fugdi



- **Region:** Chhattisgarh, India
- **How to Play:** As the game begins, all the students sing a song (*gobar de bachharoo gobar de cahron khunta la leepan de*…) in unison. Four, six, or more students gather, sitting on their legs, keeping balance, and alternately moving their feet back and forth. The student who gets tired and stops moving is eliminated. The student who plays for the longest time is the winner.
- Social Media Reference: https://www.youtube.com/watch?v=l7ol99k5EO0

2. Tunnel Ball



- **Region:** Across the world
- **How to Play:** Two teams are formed, with a minimum of 8 players in each team. Both teams stand in a different queue, 10-15 metres apart, facing the same direction. Each player in a queue should be at least 1 metre apart, and this can vary depending on the difficulty level of the game. The players form a tunnel by spreading their feet apart; the first player passes the ball from under the tunnel, and the last player standing in the queue catches it. After that, the player with the ball comes running, stands in front of the line, and passes the ball. The game continues until one team finishes first.
- **Social Media Reference:** https://www.youtube.com/watch?v=qP05ssHZGP8

Section 8.7
Pedagogy and Assessment

The approach, principles, and methods of pedagogy and assessment have commonalities across subjects – those have been discussed in **Part A, Chapter 3, §3.3** and **§3.4** of this document. This section focusses only on what is most critical to Physical Education in schools. Hence, it will be useful to read this section along with above-mentioned section.

8.7.1 Pedagogy for Physical Education

Several research studies confirm how students learn Physical Education. The following key ideas are useful to know how to teach the subject.

a. **Physical Education follows the same teaching-learning principles that promote a students' learning in other subjects**. Giving space to students' context, respecting students as individuals, providing them opportunities, connecting to their lives, giving them level-ap-

propriate tasks, deciding content based on Learning Outcomes, understanding the learning levels of students, and providing periodic assessment and feedback are effective teaching-learning practices in Physical Education too.

b. **Physical Education requires Teachers to demonstrate** so that students can observe, practise those skills/moves, and learn. This is because physical activities fall under the category of practical knowledge, where 'to know' is acquired only by doing the activity.

c. **Providing time for interactions before and after the activity** improves the development of cognitive concepts, values, and dispositions. Such interactions must be moderated by Teachers, and students should be encouraged to voice their opinions freely.

d. **Students learn best when they have a diverse set of activities** to choose from and equal opportunities. The practice of motor skills in diverse ways is fundamental to fitness and mastery of movement in Physical Education. This means designing a range of activities and sports for all students, including those with disabilities.

e. **Encouraging sportspersonship, avoiding personal comparisons, and focussing on skill acquisition will make Physical Education effective**. Teachers should implement methods to define skill attainment in terms of proficiency rather than comparison to others. A motivating environment and a focus on personal improvement rather than personal comparison of students provide students with a positive and satisfying learning experience.

f. **Planning and instructions**: Concrete planning of the Physical Education class is the key to one's instructions. Some aspects of planning to consider while planning the sessions are:

   i. Planning to avoid injuries through warm up and cool down activities and ensuring safety in the use of equipment and space.

   ii. Planning to be effective through Teacher demonstrations and modelling.

   iii. Planning for the right levels of challenge for different groups of students.

   iv. Planning should be focussed on the learning outcomes that need to be achieved.

g. **Participation and inclusion**: Participation of students in all activities is the responsibility of the Teacher. Some students tend to be overenthusiastic about playing, and the Teacher must ensure that all students get their turn to participate. Games and activities must be chosen so that students of all genders and abilities can participate.

h. **Motivation**: Not all students will be enthusiastic about taking part in sports, particularly if they fear that they will not be good. Students may be kept motivated by Teachers themselves demonstrating excitement and enthusiasm in the Physical Education sessions. Teachers must encourage active involvement, support students to acquire skills, acknowledge and appreciate growth and improvement rather than mere outcomes, instruct clearly, give everyone a chance to participate, be sensitive to students' feelings of pressure or anxiety, and treat every student fairly. All this would go a long way towards motivating students to give their full participation in the classes.

i. **Safety:** A safe environment in Physical Education has two components — the physical and the psychological. The physical refers to the need to ensure students do not get injured, and that facilities and equipment are safe, teacher preparedness to handle emergencies with access to a doctor and proper supervision of all physical activities. The psychological compo-

nent refers to the need to ensure that students feel emotionally and socially safe and receive respectful treatment, encouragement, support, and fair redress of grievances during a Physical Education class.

Box 8.7i

Safeguarding Against Sexual Harassment and Bullying

The sports and games field is a place of learning about capacities related to the body, its limits, working together with others as a team, and sportspersonship. However, it is also a place where certain kinds of aggression and uncharitable behaviour also show up. Given that students will be organised to engage in sports, games, and related physical activity in a mixed-gender and mixed-abilities format, they must be explicitly educated about patience, sensitivity, and care for physical boundaries. This would include formally teaching them about forms of sexually demeaning and harassing behaviour, ways of identifying them, and empowering them with protocols and means to report such behaviours to their Teachers and the Principal.

Teacher's Voice 8.7i

Learning a new game

My students in Grade 6 are very enthusiastic when it comes to sports, and most of them are eager to play a new game. I decided to introduce them to a new game, Handball, and instead of directly going to the field, we began with a small discussion around it. As we discussed the history, rules, and regulations of the game, the students showed keen interest by listening and sharing information about similar activities they engage in within their communities. The students also shared the local games they play, and the rules they follow while playing them.

In the field, we began with practicing skills like dribbling, passing, movement, throwing, and catching, along with some basic warm ups. Initially, the students practised it individually, and then in groups. During the practice session, the students struggled working in pairs, and groups as they complained about their partner not doing the drill properly. Most of the students struggled to catch the ball. I explained and demonstrated how the arms should be released while catching the ball. I also asked them to throw the ball in a direction that would be easier for their teammates to catch. It was a productive practice session, as it helped enhance their techniques.

To play a game of Handball, four teams were formed, and a 10-minute match was conducted between the two teams. Initially, the students struggled with coordination among the team members. They were encouraged to coordinate their movements and pass the ball effectively. Additionally, they were challenged to change direction while passing the ball, further enhancing their coordination skills and adaptability on the field.

Through consistent practise and guidance during the sports period, the students showed remarkable improvement and were able to overcome their challenges. The students who initially struggled to hold or throw the ball showed significant progress. The students also actively engaged in discussions and strategies after the match, fostering effective collaboration and communication.

8.7.2 Assessment in Physical Education

The following principles must inform assessment in Physical Education and Well-being across Stages:

a. Students must be assessed primarily through demonstrated performance. Performance can be best assessed through observation of students during field activities, drills, and games against clear criteria for marking.

b. Values and dispositions must also be assessed through demonstrated performance.

c. Written tests can be used for assessment of specific Competencies, e.g., knowing your body, growth, and development, the rules and regulations of games/sports, knowledge of tournaments.

d. Other tools include records maintained by Teachers, reflective journals maintained by students, self-assessment, and a viva voce to understand the students' thinking and understanding.

A few Teacher Voices illustrate different kinds of assessments below..

Teacher's Voice 8.7ii

Safety

I teach Grade 9 students. It is important for my students to understand precautions related to risk and safety while playing games/sports. I find that their understanding related to this aspect is more about not physically hurting others and themselves, and obeying rules and regulations while playing. They often neglect to warm up appropriately before the game in their hurry to start playing. Therefore, I decided to assess how many of them are actually aware of this aspect. Instead of asking them to simply state safety precautions, I decided to create a multiple-choice question.

Which of the following rules is the most important for managing risk and safety in any game/sport:

a. Number of participants and their roles

b. Clothing and footwear

c. **Warming up appropriately**

d. Fair competition

Teacher's Voice 8.7iii

Dodge Ball

I teach Grade 5 students, and I know they love playing dodge ball! I decided to use this game to assess my students' progress towards attaining the Competencies of the Preparatory Stage. I decided to observe them while they played and assess them against a marking scheme that I developed.

I was conscious that I had to observe all eight players for the 30 minutes that the game would be played. I devised a system wherein I would focus on one player for about 4 minutes for the duration of the game in two sets – that is, 2 minutes at a time. Of course, this was a rough approximation, but it helped me to distribute my attention across all the students.

I used the following grading scheme to assess the students

Rubric for Dodge Ball.

Criteria	Grade A	Grade B	Grade C
Throwing a ball with force	Throws the ball with the required force with few exceptions	Assesses force required to throw the ball most of the time	Is not able to assess the force required to throw the ball
Throwing a ball to the desired spot	Makes the ball reach the target with few exceptions	Makes the ball reach the target most of the time	Is not able to make the ball reach the target
Catching the ball	Catches the ball when it comes towards them with few exceptions	Assesses the force of the ball as it comes towards them, and catch it most of the time	Gets hit by the ball soon after the game starts
Shows team spirit	Leads coordinated attacks on the opposing team	Shouts out instructions/ advice to team members when appropriate	Sole focus is on protecting self
Shows qualities of a sportsperson	Discusses the important points of the game with the other team and share tips	Is polite with members of the opposing team	Does not interact with members of the opposing team
Care for safety of others	Guides other team members on safety rules	Maintains appropriate distance from others Warms up adequately before the game and keeps moving during the game	Is not able to assess appropriate distance from others Warming up is inadequate and movement during the game is not constant

Teacher's Voice 8.7iv

Viva-Voce

I teach Grade 7 students. I conduct a viva voce for students, choosing questions from a game of their choice, since I feel it is a good supplement to a written test and the observation of a game/sport. It gives me an opportunity to assess the Competencies and Learning Outcomes that I have not been able to address through other means and gives students the opportunity to demonstrate their learning in an area of their choice. I assess student responses using a marking scheme I have prepared. Since there are so many students to be covered, I spend 10 minutes with each student. I usually try to keep it in the format of a discussion, so that students feel comfortable.

Please respond to the questions I will ask you related to a game/sport of your choice. Please take your time to respond.

Why did you choose this game for discussion? What do you like about it or why do you think it is important?

a. How do you prepare for the game? What do you do or think about before you start playing the game?

b. Why do you think rules and regulations are important? What would happen if there were no rules and regulations?

How do you think the person playing against/the opposing team should behave? Why do you think so?

Marking scheme

Criteria	Descriptors & points
Understanding of chosen game/sport	Understands only the rules of the game/sport – 1 point Understands rules and techniques/skills of the game/sport – 2 points Understands effective game-playing strategies (individual or group) – 3 points
Understanding of preparation for game/sport	Preparation is limited to clothing and equipment – 1 point Preparation includes warm up – 2 points Preparation includes warm up and discussion with team mates/coach and meeting opponent(s) – 3 points
Understanding of rules and regulations	Understanding is based only on own experience of game/sport – 1 point Has an adequate understanding of the game/sport – 2 points Has an adequate understanding and is able to communicate why they are important – 3 points
Understanding of sportpersonship	States expectation of behaviour in general – 1 point States expectation of behaviour with reference to rules and regulations of the game/sport – 2 points Goes beyond the 'written' rules to the 'unwritten rules' such as integrity, care and concern, sensitivity – 3 points

Chapter 9

Vocational Education

Vocational Education prepares students for different kinds of 'work'. It enables the learning of specific knowledge, capacities, and values, such that the students upon finishing school, are ready to work in a vocation of their choice, and to deal with the day-to-day practicalities of life. School education must provide both possibilities to all students – to join the workforce or to pursue higher education.

Work provides not only economic sustenance for the individual and contribution to the economy but is also a significant part of a meaningful and dignified life for human beings.

In the Foundational and Preparatory Stages, multiple capacities will be developed through play and other activities, which will subsequently be useful in vocations. These capacities are termed prevocational capacities.

In the Middle Stage, exposure to a wide range of work will be given to students. This will equip them to achieve capacities (including specific skills) in a vocation of their choice in the Secondary Stage and help them progress towards gainful employment and contribute meaningfully to the economy.



Section 9.1
Approach to Vocational Education

Schools must provide students with a broad and experiential introduction to different kinds of work and develop a deep and defined set of practical Competencies. Students must also learn to value all types of work based on the inherent dignity of all work, and the social hierarchies of work need to be eliminated.

Vocational Education will also draw from and build on the Competencies developed in other Curricular Areas. For example, Mathematics for calculations and estimations, Social Science to understand the place of work in society and production chains, and Science to understand how things work and how their functioning can be improved. Thus, it is complementary to and builds on other Curricular Areas and is not an isolated area.

9.1.1 Objectives of Approach to Vocational Education

The approach to Vocational Education in this NCF aims to achieve the following objectives:

a. Vocational capacities, knowledge, and relevant values will be developed for all students, and this will create the possibility of their joining the workforce after school if they choose to.

b. Provide the possibility of learning range of vocations – ones that are aspirational, as also those that are most relevant locally and contextually (if different), also new and emerging vocations.

c. Provide exposure to various types of work to all students establishing the dignity of work.

d. Should be implementable with the current reality and resourcing of our schools, while providing a pathway to the future.

e. Must value the work that many of the children of India already do in their homes and communities.

While the first of the above stated objectives will be elaborated through this chapter, the other four objectives are described below:

9.1.1.1 Aspirational to Locally Relevant; and for the Future - Education for a Range of Vocations

Given the extraordinary range of vocations that are available today and also the new vocations being created, the choice of 'which vocations to educate for' is very important.

Schools and the education system must be able to address different kinds of demands which would inform this matter. Some vocations are more **aspirational** than others. On the other hand, some vocations may have greater opportunities for employment around. Often, the aspirational vocations are different from the ones that may have greater **employment opportunities** locally or in the vicinity.

Hence, the choice of which vocations to educate for must be made at the local level, perhaps the school or the district – considering these factors. **The NCF enables these choices to be made appropriately by considering all the relevant factors for a school, including resourcing.** Such an enabling framework also gives the flexibility to add new vocations as they emerge.

9.1.1.2 Dignity of Work and Wide-Ranging Exposure

While in the Secondary Stage students must learn specific vocations to get employed if they so choose, the earlier Stages must build the **foundation for a range of vocations**. This will be enabled by ensuring that all students are exposed to the entire range of vocations from the primary sector including agriculture to machines and manufacturing, to various services including community health. Such wide exposure not only creates the base for the choice of vocations subsequently **but also establishes the dignity of all types of work.**

Such wide exposure is also important because, for many students, experience of work is very limited to what they see around them. For example, in many rural areas, they will have no exposure to machines or services. On the other hand, children in large cities will have no exposure to land-based vocations.

9.1.1.3 Valuing Students Existing Work Experience

Millions of our children are already engaged in some kind of work. This is often within their homes and/or in their communities. They help on the farms or in the orchards or help with the care of their siblings or cook at home. Such life experience is invaluable and must find its due place in the school. Students who are already engaged in such work would benefit substantially more if School Education provides them exposure to other kinds of work. The knowledge and capacities that such students bring to the classroom can be used as a resource.

9.1.1.4 Implementable in Current Reality

As per NEP 2020, vocational education is to be integrated into School Education. This NCF enables that by providing an approach such that vocational education can be **integrated within schools within the constraints of existing Teacher force and resources.**

For this, the NCF has developed appropriate Learning Standards which can be transacted by existing Teachers (who currently teach Mathematics, Science or Social Science) with appropriate training and handbooks. They will also be trained to use the support of people from local communities who have expertise in certain vocations. In the secondary stage, specialised Teachers will be required depending on the vocations that the schools want to teach.

9.1.2 Distinguishing between Vocational Education and Skills Training

As mentioned earlier in the NCF capacities are broader, deeper, and more complex human abilities, while skills are narrower and more focussed.

Most **capacities are constituted by many skills.** In other words, many skills are required to develop a capacity. For example – critical thinking is a capacity, while sorting data is a skill which is part of critical thinking. Appropriate irrigation of crops is a capacity, which requires the skills of reading the landform and its slopes, trenching and constructing channels, and understanding how much and when to water.

Vocational Education focusses on capacities relevant to particular vocations, however, a **vocation requires more than capacities,** which is why vocational education is also about developing the appropriate **knowledge base and values**. For example – the vocation of 'grooming and personal

care' requires not only the skill of haircutting or pedicure, but also requires the knowledge of different kind of hairstyles and their trends, and methods of pedicure, and the sources of knowledge for all these. It also requires a disposition of serving with dignity.

Thus, school education focusses on Vocational Education while the large skills training system complements it by focussing on skills.

Box 9.1i

Capacities and Skills

In this NCF, we are distinguishing capacities from skills by the level of breadth and complexity. Capacities are broader human abilities that combine a variety of skills in a coherent manner to accomplish a complex job. Skills, on the other hand, are narrower know-how to complete a specific task. For example, cooking is a capacity, while cleaning, cutting, frying, and sauteing are skills.

9.1.3 Typology of Vocations for this NCF: 'Forms of Work'

The NCF has to reconcile two requirements. One, it must not (and cannot) determine which vocations must be taught and learnt in a particular school or set of schools – because there are too many vocations and too many considerations at the local level. Two, it must be able to provide a framework to educate students for Vocational Education.

This reconciliation is possible with a valid and useful typology of work, which in this NCF is called **'forms of work.'**

- The vocations that have some fundamentally common elements are grouped together into the same type.
- They require similar or overlapping capacities and knowledge. New vocations that are created of the same type will continue to require similar capacities and knowledge.

This grouping would help develop a broad base of capacities for productive work from Grades 3-8, with greater specialisation in Grades 9-10 and specialised occupational capacities in Grades 11 and 12.

This NCF uses ***'forms of work'*** as a guiding concept for designing the curriculum.

Productive work at its most fundamental level can be divided into three categories – work with life forms, work with materials and machines, and work on providing human services.

a. **Work with Life Forms:** Right from the time of hunting and gathering to a more settled life of animal husbandry and agriculture, human beings have used their capacities to work with life forms to not just survive, but also to produce an adequate surplus to live a life of thought and reflection. Thus, the capacity to do productive work with plants and animals is fundamental to human survival and flourishing.

b. **Work with Materials and Machines:** The second significant achievement in human progress is our ability to use materials and machines in simple to very sophisticated ways. Be it for food, clothing, and shelter to meet our basic necessities or for far more complex

ways to satisfy our curiosity and creativity, we have developed tools and machinery. Thus, the capacity to do productive work with materials and machines is fundamental to engaging with complex modern life.

c. **Work in Human Services**: Starting from trade and transport to media and entertainment, we have created different services that have allowed us to cooperate well beyond our kinship groups. These services have improved our lives tremendously well beyond what agriculture or industry could provide. Thus, the development of capacities to work in human services is truly relevant in this age of global exchange.

The school curriculum at the Preparatory and Middle Stages would endeavour to build relevant capacities in these three *forms of work.* As we can easily observe, these forms of work not only provide the necessary breadth in capacities for productive work, but they also become the foundation for developing capacities in vocations in primary, secondary, and tertiary sectors of the economy, thus meaningfully contributing to the aim of economic participation.

In the Secondary Stage of four years, the first two years would be towards consolidating these capacities to develop transferable skills that serve students well in any vocation. In the last two years of schooling in the Secondary Stage, students will be given opportunities to specialise in specific vocations of their choice.

In addition, the skill training ecosystem should take off from where the schools leave. This ecosystem should ensure that a wide variety of skills courses are available for those students who want to enter the job market immediately after school certification.

It must be noted that the capacities (and embedded skills) for Vocational Education must be deeply integrated with the other capacities, knowledge, and values that school education develops. For example, critical thinking, communication, and learning-to-learn – capacities that overall school education is to develop – are equally important in the world of work.

In fact, in the unfolding scenario of ever more rapid changes across the world, not only in employment opportunities, but in the very nature of work, these fundamental capacities and knowledge base gained from school education must form the foundation for lifelong learning, which is what will enable a lifetime of gainful and fulfilling employment.

9.1.4 Other Specific Considerations

Along with the choice of vocations to be offered, the resources and materials required, and pedagogical and assessment approaches, the following are some important considerations for the Vocational Education curriculum.

a. **Age-appropriate:** The approach to Vocational Education must be age-appropriate. It will start from developing general capacities for work (or prevocational capacities) and move to more specific capacities for particular kinds of work. To elaborate, in the Foundational Stage, students will experience immersion in work through 'doing' and 'creating.' In the Preparatory Stage, this approach will continue, but students will also become familiar with local occupations, and factors related to participation and equality. In the Middle Stage, this understanding will become formalised with the introduction of a separate Curricular Area. At this Stage, students will develop capacities in different forms of work. In the Secondary Stage, students will have opportunities to choose one or more vocations for specialisation.

b. **As localised as possible:** As far as possible, the content, materials, and machinery necessary for developing vocational capacities must be relevant to the local context and be locally available.

c. **Aspirational:** At the same time, students' aspirations must also be met through helping them learn vocations beyond those currently available in their village/town/city. This would require a range of vocations to be offered to meet the changing needs of both the economy and the aspirations of young adults.

d. **Exposure to different kinds of work:** Students must be deliberately exposed to the different forms of work so that they have the basic capacities for work in breadth. This makes them adaptable to the changing needs of the economy. Schools must also take into account the work that students do at home and ensure that they get exposure to other kinds of work not available in their home contexts (e.g., if a student works on land at home, the school must ensure that she spends most of her time in engaging with manufacturing and services).

e. **Equity considerations:** Existing social inequities must be consciously addressed. The school should avoid identifying particular types of work to specific communities or gender. Instead, the school must encourage engagement with different types of work for all students, irrespective of their home background and gender.

f. **Value for working with hands:** Vocational Education offers an opportunity for all students to learn how to 'do' something with their hands and learn to value it. Education is incomplete without these experiences. So far, opting for a vocational course has meant that the student is either economically 'poor' or a 'poor performer' in school. This will change with this NCF – with all students participating in Vocational Education, school education will function as an equaliser, and not a reproducer of inequity.

Section 9.2
Aims

Work is an important part of life. It prepares individuals to deal with practical things related to daily life and economic participation. Vocational Education enables students to develop basic capacities in different kinds of work to identify what they would like to pursue in order to lead a meaningful and fulfilling life. It prepares them to contribute meaningfully to the economy while providing for themselves livelihoods and sustenance. It also equips them to contribute effectively to work at home.

KRCR 2019 states that



This policy aims to overcome the social status hierarchy associated with vocational education and requires integration of vocational education programmes into mainstream education in all educational institutions in a phased manner. Beginning with vocational exposure at early ages in middle and secondary school, quality vocational education will be integrated smoothly into higher education. It will ensure that every child learns at least one vocation and is exposed to several more. This would lead to emphasising the dignity of labour and importance of various vocations involving Indian art and artisanship.

[KRCR 2019, 16.4]

With this context, the aims of Vocational Education are:

a. **Developing understanding and basic capacities for different forms of work:** Students will develop a broad-based understanding of different forms of work, which will equip them to successfully manage their personal affairs. This will also equip them to identify, create, and initiate business, work, and community opportunities.

b. **Preparation for specific vocations:** Students will develop capacities to be gainfully employed in one or more specific vocations after leaving school.

c. **Respect for the dignity of labour and all vocations:** Students will develop respect for the dignity of labour through the acquisition of positive attitudes towards work and the workplace.

d. **Developing values and dispositions related to work:** Students will develop persistence and focus, curiosity and creativity, empathy and sensitivity, and collaboration and teamwork. They will be willing to do physical work and will pay keen attention to details.

Through these aims, schools will develop vocational knowledge, capacities, and dispositions in students, giving them livelihood opportunities, as well as enabling them to contribute and participate in the economy of the country.

The aims of many other subjects, for example, Language , Physical Education and Well-being, Science and Social Science, and Mathematics, are directly complementary to the aims of Vocational Education, and these form the larger set together, thus enabling a lifetime of fulfilling work.

These complementary aims, for all these subjects together and independently, include the development of critical thinking, capacity for inquiry, scientific temper, the capacities for communication and collaboration, creativity, adaptability, learning to learn, emotional and ethical capacities, initiative and resilience, a strong work ethic, sound knowledge of the immediate physical and social world, and more.

It is useful to note that many of these capacities and dispositions are sometimes referred to as '21st Century Skills', and in other contexts as 'soft skills.

Section 9.3
Stage-wise Design

9.3.1 Foundational and Preparatory Stages — Developing Prevocational Capacities

In the Foundational and Preparatory Stages, the focus is on developing prevocational capacities and not on the needs of specific jobs.

9.3.1.1 Foundational Stage

a. In this Stage, an integrated approach has been taken where 'work skills' (e.g., children learn to complete their tasks, children learn to take care of the material they use) are learnt through the regular classroom process.

b. The focus on physical development and motor skills through movement and exercise, working and completing a task, and play-based education enables the development of age-appropriate prevocational capacities in the Foundational Stage.

c. One of the important Curricular Goals at this Stage is also for children to develop a positive attitude towards productive work and service or *Seva*.

9.3.1.2 Preparatory Stage

a. Vocational Education is integrated into The World Around Us through the inclusion of prevocational capacities. Competencies related to students' understanding of occupations around them, observing, and working with animals and plants, and creating simple objects lay the foundation for the development of vocational capacities in the Middle Stage. Activities suitable for The World Around Us also lend themselves to the development of prevocational skills, e.g., maintaining flowerpots/kitchen gardens, clay modelling, and dialogue with shopkeepers during visits to the local markets.

b. 'Work allocation' in school will also be a part of preparing the ground for Vocational Education in the next Stage (e.g., taking care of the plants in class, putting away books, and helping with cleaning after the Mid-Day Meal). All students must be allocated responsibilities equally for all tasks.

Box 9.3i

Vocations and Professions

There is no categorical difference between 'vocations' and 'professions'. While the general usage of the two words in India tends to give 'higher social status' to 'professions' and 'professional education,' it is 'vocation' that has the connotation of 'higher calling.' The NCF does not differentiate between vocations and professions.

9.3.2 Middle and Secondary Stages — Developing Vocational Capacities

In the Middle and Secondary Stages, students begin a formal engagement in developing vocationally relevant capacities. In the Middle Stage, students develop breadth in vocational capacities in the three forms of work, while in the Secondary Stage, students specialise in one or more vocations.

Given the wide range of vocations, there is a need to organise the curriculum so that students receive adequate exposure while schools can manage within their constraints.

The NCF will address this concern by identifying three forms of work that include a wide range of vocations with some commonalities within them.

9.3.2.1 Forms of Work

As mentioned in the previous section, the guiding principle for the Vocational Education curriculum is *'forms of work.'*

Different forms of work exist worldwide, distinguished by their operational characteristics, historical practices, and the usefulness of skills and values. As a result of this, different vocations and services emerge, such as agriculture, textiles, and commercial art. Therefore, it is important to understand the different forms of work in order to comprehend how vocations and services are mapped from their respective forms.

These forms of work will ensure that all students experience work in varied contexts. For example, students in rural areas are exposed to the vocation of agricultural practices much more than students in urban areas, while those in rural areas may not be adequately exposed to the services sector.

Providing opportunities for all students to learn across all categories of forms of work will enable equality of status and opportunity for all forms of work. Specific vocations within these forms of work will be as contextualised as possible. **This study within this categorisation would be aligned with the NSQF.**

a. Working with life forms

Working with Life forms involves developing capacities to do productive work that involves plants and animals. For example, a school could choose to develop a vegetable garden or a chicken coop as part of this category in the Middle Stage, and floriculture, dairy farming, sugarcane cultivation, or natural farming in the Secondary Stage. The abilities required for such work involves both practical skills as well as some knowledge of the biology behind these life forms, thus making school knowledge in Science relevant and practical.

b. Work with machines and materials

Working with machines and materials involves comprehending how any machine or tool works. It incorporates the processes and tasks that lead to tangible outputs. Students can be involved in this form of work by introducing handicraft work using various materials such as paper, wood, clay, and fabric. A student inclined to the work of tailoring uses basic tools such as scissors, cutters, thread, pins, and machines, including the sewing machine, to sew cloth in a predetermined design. The student will develop manual skills, attention to detail and persistence to create high-quality products. Illustratively, a school could choose to offer high-tech machining, tailoring, carpentry and pottery in the Middle Stage, and robotic welding along with advanced courses in carpentry and tailoring in the Secondary Stage. Students in Grades 11 and 12 can benefit from gaining skills in operating advanced machinery that is used in more automated manufacturing.

c. Work in human services

Work in Human Services involves interaction with people to understand their needs and requirements. It deals with the capacity to communicate well and understand the processes and resources involved in providing a particular service. So, a person inclined to work in a nursing home should be well informed about procedures, and ways of communication with patients to deliver appropriate service. Through this form of work, students develop the essential skills required for that service as well as interpersonal skills and compassion for other fellow beings. Illustratively, a school could choose to help in a nursing home or work in a shop as part of this category in the Middle Stage. In the Secondary Stage, courses could, illustratively, be offered in housekeeping, wellness/beauty, and tourism/hospitality.

9.3.2.2 Middle Stage

a. Students will develop basic skills and knowledge in all three forms of work: Working with Life forms, Working with Machines and Materials, and Working in Human Services. At this Stage, the skills for work are the focus and not specific vocations.

b. In each Grade, three projects, one from each form of work will be implemented in schools. Thus, by the end of this Stage, students will work on nine projects.

c. States/Schools will choose vocations within the three forms of work, and design projects for each Grade in each form of work. The selection of projects must consider the context of the school, locality, and age-appropriateness of students.

d. Projects that align with other Curricular Areas will be supported by the respective subject Teachers. These projects can aid in interdisciplinary understanding by integrating concepts from other Curricular Areas. For example, in the case of agriculture or animal husbandry concepts from botany and zoology can be integrated with the project.

e. Towards the end of the academic year, a *Kaushal Mela* (skills fair) will be organised in the school for students to demonstrate their projects to the school, community members and other stakeholders. This will include a presentation of the project work, key learnings, reflections, and use of learnt skills at home.

f. It is to be noted that with this design in the Middle Stage, students will indeed be exposed to vocations and develop relevant capacities and knowledge; thus, this NCF does not use the phrase 'prevocational' for such learning in the Middle Stage, while that phrase has been used in other school education related documents.

9.3.2.3 Secondary Stage — Grades 9 and 10

a. Students will be given exposure to six vocations (two from each form of work) spread over two years. These will be at least equivalent to NSQF Levels 1 and 2, where relevant.

b. The vocations will be carefully identified considering the basic skills needed by students at this Stage for each of the three forms of work.

c. The focus would be on developing the appropriate skills with hands-on experience with the tools and techniques involved; only the limited theoretical knowledge relevant to students will be included. The hands-on experience will be supplemented with internship opportunities at this Stage.

d. These six vocations are chosen on the premise that exposure across these vocations will not only enhance exposure but also enable students to make an informed choice in Grades 11 and 12.

e. The choice of these vocations is also based on the premise that certain capacities in skills within cut across vocations. For example, a farmer needs to understand how motors and tractors work, and someone working in machine servicing needs similar capacities.

f. Students will learn the relevant skills for these vocations through both workshops conducted in the school as well as projects and internships in local sites of work.

g. Further, students will be given on-site exposure to industrial/agricultural spaces to broadly understand the functioning of vocations in the world of work. Schools must develop linkages with local industries, farms, service centres, cooperatives, relevant NGOs, state

transport corporations, cottage industries, printing presses, call centres, software design companies, mobile operating companies, law companies, local water/electricity boards to enable students to spend part of their time gaining work/practical experience at these facilities as interns while they are still in school.

h. It is not likely that all schools will have a trained Teacher for vocational courses. Hence, these vocational courses can also be taught by locally trained and experienced resource trainers and coordinated by regular Teachers who have been relevantly trained, also with appropriate use of technology.

9.3.2.4 Secondary Stage — Grades 11 and 12

In Grades 11 and 12 students take choice-based courses in different Curricular Areas. Vocational Education is one of the Curricular Areas that should be available for students. Students choosing vocational courses from this Curricular Area would have in-depth training in a specific vocation over the period of two years. These will be minimally at NSQF levels 3-4 where relevant.

Section 9.4
Current Challenges

There are a few challenges with the implementation of Vocational Education that need to be addressed on priority:

a. Vocational Education is often considered the 'last resort' for students who are not able to pursue higher academic education. This hierarchy in social status has undesirable influences on school education.

b. Vocational Education has been facing curricular and resource-based constraints. For instance, with schools in remote or rural locations, resources related to industrial work are hard to access, thereby restricting the opportunity to give exposure to those students.

c. With the lack of proper infrastructure, it becomes a struggle to let students undergo practical exposure. Most equipment (if any) such as computers and materials for home science is outdated or broken with no funds for repair or replacement.

d. There is a lack of understanding about assessments, especially given the emphasis on practical, hands-on learning.

e. There are no formal linkages with the world of work. As per KRCR 2019, students passing out from Grades 11-12 with Vocational Education often do not have well-defined pathways with their chosen vocation in higher education. Also, current forms of Vocational Education often push people into 'low-end' self-employment and contractual work of different forms rather than into 'good employment,' with little or no possibilities of income mobility. With such unclear directions, it is highly challenging to make connections with the job search in the market.

f. Teacher Education programmes for the preparation of Teachers for Vocational Education are not adequate.

Section 9.5
Nature of Knowledge

a. Capacities are at the core of vocational knowledge. These are procedural ('know-how') in nature and intended to accomplish specific tasks. This procedural knowledge enables further work-focussed activities, both in the world of work and in daily life. These capacities are of both kinds — specific to certain types of vocations and those that are not only useful across vocations but even more broadly in life, such as communication, teamwork and collaboration, strong work ethic, critical thinking, and more.

b. These capacities are further enhanced through knowledge ('know-that') from other areas. Therefore, knowledge from other Curricular Areas, including Science, Mathematics, Language, and Social Science, is used where relevant, to support the development of vocational knowledge.

c. Vocational knowledge also includes developing an understanding of specific norms and guidelines for a particular job. For example, rules and regulations, safety concerns, markets, and transportation.

d. Vocational knowledge includes knowing how to work with people in teams, and in organisations. It develops sensitivity towards the environment, collaboration, integrity, waste management, and other values mentioned in NEP 2020.

Section 9.6
Learning Standards

Across the Stages, students develop the essential values of persistence, creativity, collaboration, empathy, and most importantly, the willingness to do physical work. Students develop the competencies to contribute to home-based tasks to become productive members of the family.

An integrated approach is taken into consideration for Vocational Education in Foundational and Preparatory Stages so as to develop prevocational capacities and positive attitude towards productive work.

In the Middle Stage, students engage in different forms of work to learn a range of common capacities, knowledge bases, and values that form the basis for later specialisation. The objective is to make sense of the place of vocations in the world of work and inculcate 'working with hands' as an integral part of the vocation. Through exposure visits and opportunities to practise, students develop a systematic approach to completing the given task.

In Grades 9 and 10 of the Secondary Stage, students deeply engage in a few vocations involving rigorous practice and field-based exposure. The larger objective of this Stage is for the students to develop efficiency while performing the tasks, and the ability to distinguish between effective and non-effective practices while delivering a fine product/service. **In Grades 11 and 12 students will specialise further in chosen vocations — this is dealt with in Part C, Chapter 10, §5.5.**

As already discussed in the Approach to Vocational Education, vocations offered in the curriculum will be organised in three forms of work: Working with Life Forms, with Machines and Materials, and in Human Services in the Middle and Secondary Stages. Each form of work will have a Home

Curricular Goal, which will include the competencies students develop to be able to contribute to home-based tasks. This Curricular Goal is essential for students to manage their personal life and resources more productively and meaningfully. It equips students with essential capacities to manage their day-to-day life better and establish them as competent and productive members of the family and society.

Competencies are to be attained at the end of the Stage. Therefore, interim markers of learning achievements are needed so that Teachers can observe and track learning and respond to the needs of learners continually. These interim markers are Learning Outcomes. Thus, Learning Outcomes are granular milestones of learning and usually progress in a sequence leading to the attainment of a Competency.

However, Vocational Education is different from other Curricular Areas in terms of content and approach. While in most other Curricular Areas, it is possible to mark a clear progression in Learning Outcomes as students move towards attaining a competency, this is not possible in the same way in Vocational Education.

The progression across grades in Vocational Education is in terms of the development of capacities in different vocations. To see progression across different vocations as students move through Grades is, therefore, difficult. Hence, the Learning Outcomes must be articulated in terms of learning a vocation in a single Grade. This implies that the Learning Outcomes will be the same for all grades for most Competencies, they will just be for different vocations.

For example, let us assume students do a project on horticulture related to Life Forms in Grade 6, poultry in Grade 7, and animal husbandry in Grade 8.Some of the Learning Outcomes will be similar across the Stages since they will be achieved in both the Middle and Secondary Stages. The real difference will be observed in the level of complexity in the Secondary Stage. For example, the Learning Outcome 'Follows safety protocols while handling tools' remains the same in both Stages, but the complexity of following safety protocol increases with the usage of advanced tools or performing tasks of increased intricacies in the Secondary Stage.

At the same time, students will be a mixed group, with varying levels of pre-existing exposure and capacities. A majority of students doing some sort of work at home may already have the skills others do not, and will already have attained the Learning Outcomes of a higher Grade. For example, some students may already be maintaining and handling equipment related to agriculture, and Machine and Materials, while others may have capacities related to Services because they may be supporting ageing grandparents or helping parents run a shop.

Learning Outcomes, in any Curricular Area do not come with rigid Grade-specific boundaries. They are enabling guidelines for Teachers to plan their content, pedagogy, and assessment towards achieving specific Competencies. In the case of Vocational Education, context is key to content, pedagogy, and assessment. For example, a Grade 6 student will be as capable of handling an agricultural tool in a rural setup as a Grade 7 student, or even more so. On the other hand, students from an urban background may not have worked with their hands in fields. Therefore, it will be a challenge to assign specific Learning Outcomes for each Grade for each Competency.

9.6.1 Curricular Goals & Competencies

9.6.1.1 Middle Stage

In the Middle Stage, there are four Curricular Goals for each of the forms of work. **Students will learn multiple capacities, knowledge bases, and values, which are common across many vocations**. Each Curricular Goal deals with an overarching component from these:

- CG-1 involves the acquisition of knowledge and skills in the work
- CG-2 involves the application of the chosen form of work in the world of work
- CG-3 involves the values inculcated while working (Since they are not always measurable, they need to be observed in students' practices)
- CG-4 involves the application of knowledge and skills (learned through engaging in different forms of work) in home-based tasks

Following are the Curricular Goals and Competencies to be developed for any of the forms of work.

CG-1 Develops basic skills and allied knowledge of work and associated materials/ procedures	C-1.1 Identifies and uses tools for practice C-1.2 Approaches tasks in a planned and systematic manner C-1.3 Maintains and handles materials/equipment for the required activity
CG-2 Understands the place and usefulness of vocational skills and vocations in the world of work	C-2.1 Describes the contribution of vocation in the world of work C-2.2 Applies skills and knowledge learned in the area C-2.3 Evaluates and quantifies the associated products/ materials
CG-3 Develops essential values/ disposition while working across areas	C-3.1 Develops the following values/disposition while engaging in work: • Attention to detail • Persistence and focus • Curiosity and creativity • Empathy and sensitivity • Collaboration and teamwork • Willingness to do physical work
CG-4 Develops basic skills and allied knowledge to run and contribute to the home	C-4.1 Applies the acquired vocational skills and knowledge in a home setting

9.6.1.2 Secondary Stage

In the Secondary Stage Grades 9 and 10, there are three Curricular Goals for each of the forms of work. Each Curricular Goal deals with an overarching component:

- CG-1 involves the use of knowledge and skills in the work
- CG-2 involves the values inculcated while working (Since they are not always measurable, they need to be observed in students' practices)
- CG-3 involves the application of knowledge and skills in home-based tasks

Following are the Curricular Goals and Competencies to be developed for any of the forms of work.

CG-1 Develops in-depth basic skills and allied knowledge of work and their associated materials/procedures	C-1.1 Perform procedures competently through required tools/equipment C-1.2 Differentiates between effective and non-effective practices in completing the task
CG-2 Develops essential values while working in a specific vocation	C-2.1 Develops the following values while engaging in work: • Attention to detail • Persistence and focus • Curiosity and creativity • Empathy and sensitivity • Collaboration and teamwork • Willingness to do physical work
CG-3 Develops basic skills and allied knowledge to run and contribute to the home	C-3.1 Applies the acquired vocational skills and knowledge in a home setting

Box 9.6i

Mastery of the Subject

Each Curricular Area comes with at least one expectation of making the learner attain mastery in the work. Be it becoming proficient to read with comprehension or to be skilled at balancing a bicycle while riding it. This expected Competency certainly becomes an important outcome as it then helps the learner apply learnt skills to more cognitively challenging tasks (e.g., by learning to balance the bicycle, the learner can then learn to regulate the speed of riding). This mastery is important; to quote Dewey, 'It is a commonplace that the mastery of skill in the form of established habits frees the mind for a higher order of thinking.'

However, attaining mastery in any work is a subjective phenomenon, as it depends on the expectation that we set for learners to accomplish, depending on the Learning Standards. Attaining mastery of something can also be visualised as climbing a stairway where, at each step, students acquire the skills to become competent to learn new skills at the next step

(different levels of mastery). It is noteworthy to mention that the skills learnt alone can hardly be utilised without deepening knowledge and making appropriate judgements about how to use skills in new situations.

Thus, in the Middle Stage, mastery in the context of Vocational Education means that students can understand the different forms of work, and how each connects to the larger functioning of the world. Mastery is the attainment of the basic skills and knowledge of the vocation, and their application in day-to-day tasks or at times of need. For example, if students learn the skill of cooking, they would not need to be dependent on others to cook for them late at night when they feel hungry.

Mastery by the end of the Secondary Stage is associated with the deepening of knowledge and a higher level of proficiency. By this Stage, students should be able to comprehend and create products or services with indicated quality parameters. Mastery is also in the form of engaging in collaborative and productive work of utility. Last, but not the least, the efforts should result in not just skilled people but capable and cultivated human beings.

Section 9.7
Content

The approach, principles, and methods of selecting content have commonalities across subjects — those have been discussed in Part A, Chapter 3, §3.2 of this document. This section focusses only on what is most critical to Vocational Education in schools. Hence, it will be useful to read this section along with the above-mentioned the section.

Content for Vocational Education will be selected at two levels. At the first level, a selection will have to be made of vocations within the forms of work (please refer to Section 13.2.3.1). At the second level, a selection will have to be made related to the specific tasks and understanding students will have to engage with.

9.7.1 Principles of Selection of Vocations from Within Forms of Work

The following principles are intended to inform the selection of vocations from the three forms of work, that is, the vocations to be offered by the school.

a. **As locally as relevant as far as possible:** Students will better connect to the locally contextualised work and will be able to utilise the acquired skills and knowledge in their daily lives. Resource Persons and sites for practice will also be easily available. They will have greater chances of local employment. For example, in a rural context, for the different forms of work, (i) Agriculture and livestock rearing; (ii) Handling and repair of farm machinery, driving heavy vehicles for transport; and (iii) Catering to primary health needs of community members can be offered. In an urban setup, the different forms of work, (i) Floriculture, and nursery management; (ii) Handicraft work, welding, and casting; and (iii) Hospitality and tourism can be offered.

b. **Address and respond to students' aspirations:** Choices must also enable exposure to vocations that may not be practised locally but are aspirational, because of potentially attractive employment. For example, students in rural areas may not have hi-tech machining employment opportunities locally, but this may be aspirational. Similarly for employment opportunities in the Financial Services sector. **The vocations selected should balance between giving exposure to different forms of work, the school's capacity to teach, the local context, and aspirations.**

c. **Levels must be aligned to the expectations outlined in the NSQF:** Alignment to the NSQF levels will allow them to pursue further engagement with the vocation of their choice later in life while offering recognition for employment. To enable this, content chosen in Grades 9 and 10 (at least NSQF levels 1 and 2) should progress into advanced offerings in Grades 11 and 12 (at least NSQF levels 3 and 4). For example, a student selecting livestock rearing in the Middle and Secondary Stages must be able to pursue the vocation of livestock management. Similarly, a student studying beauty treatment should be able to progress into specialisations in makeup and hairstyling.

Box 9.7i

NSQF

The National Skills and Qualifications Framework (NSQF), notified on 27 December 2013, is a competency-based, outcome-focussed, framework, composed of ten levels each representing different levels of complexity, knowledge, and autonomy, required to demonstrate competence commensurate for that level. Level one has the lowest and the level ten the highest complexity.

These levels, graded from one to ten, are defined in terms of Learning Outcomes that students must possess regardless of whether they are attained through formal, non-formal or informal learning. The first two levels largely expect students to be able to use materials and tools in a limited context, perform routine tasks under instruction and close supervision, become familiar with common terminology related to the vocation and workplace environments, and be able to differentiate between good and bad quality. The next two levels largely expect students to be able to work in jobs of their choice, within familiar, predictable, and routine situations, acquire the vocabulary of the chosen vocation, deepen their understanding of workplace environments, and develop the ability to take responsibility for their own work and learning.

The alignment between the NSQF and the curriculum will enable students to be able to take up employment after school completion or join a higher vocational programme.

Students who are already involved in some sort of work at home (e.g., farming, food preservation) or who have pursued a special vocational interest will be able to obtain higher certification as a result of Recognition of Prior Learning. RPL has been formalised as part of the Pradhan Mantri Kaushal Vikas Yojana, a flagship scheme of the Ministry of Skill Development and Entrepreneurship, implemented by the National Skill Development Corporation, for workers aged 18-45 years. It enables the recognition of formal, non-formal or informal learning based on the learning outcomes defined in the NSQF. If students so wish, RPL will also enable them to move into a vocational course at a time of their choosing, including after gaining work experience post-school completion.

9.7.2 Principles of Selection of Content Within Vocations

The following principles are intended to inform content selection at the levels of specific tasks and understanding that students will have to engage with.

a. **Content must be age-appropriate:** This will ensure that students acquire the required competencies as per their developmental stage and learning in other Curricular Areas. For example, a student in the early Middle Stage cannot start working with building circuit boards before working with simple circuits.

b. **Content should be interesting and meaningful:** Content selected should allow for varied activities, with scope to critically observe processes, and offer challenges within the capability of students. For example, while students must follow the standard stepwise processes involved in farming, they must be able to enjoy and appreciate the process of a plant growing, observe significant changes that happen to a plant, and the natural and man-made factors affecting the growth of a plant. They must have a sense of achievement once the plant is ready for use.

c. **Content must instil respect for the dignity of labour:** No particular work can be considered as a 'high level' work if every form of work is looked upon with equal respect and honour. The chosen content should also deal with the notions and beliefs associated with them, such that they give students a chance to see the importance of all kinds of labour. For example, they must realise the critical role each individual plays in any workplace – from the manager of a restaurant to a chef to the person who cleans the kitchen.

d. **Content must enable exposure to different aspects of vocations:** Students must get comprehensive exposure to different kinds of work. For example, sometimes students do not need any exposure since they are already working (either with family members or through relatives and contacts) but need specific capacities in that work to be developed. For example, a student might know the use of digital media, but should also develop the capacity of gathering relevant information to improve processes. Another example is a student who is working on a family farm; this student must understand the process through which produce from the farm reaches the market.

e. **Content must enable exposure to the ecosystem within which the vocation is placed:** Each vocation operates within its own ecosystem. This ecosystem is local and also extends beyond a small geography. It also includes intangibles such as relationships with clients, informal and formal codes of conduct, technical language, and opportunities for improvement. For example, a tailor operates in an ecosystem comprising local suppliers of materials, technicians to help with machines, helpers to sew hems and clients. The larger ecosystem comprises farmers producing cotton, weavers, cloth mills, transportation, producers of design catalogues, websites offering technical advice, and professional associations. Students must learn about both the local and larger ecosystems.

f. **Content must encourage students to develop and pursue specific interests:** Students should be encouraged to not just learn the skills of any work but to develop a curiosity to know how the work takes place in different contexts, how tools and machines work, what will happen in the absence of these tools and machines. Such exposure helps students select from the forms of work available to them. Once the preferred interest of vocation is chosen

by the students, the selected content should educate them on the gainful employment opportunities to contribute to the economy of the country as well. For example, students choosing to be in automotive services should be aware of the place of this service in the world of work (such as in local shops, transport businesses, and vehicle service centres).

g. **Content must provide hands-on exposure:** The essence of Vocational Education lies in the work being done practically. The relevant content, when it exposes students to multiple modes of hands-on tasks, enables them to attain mastery. For example, a student with no or minimal hands-on exposure to the work of carpentry will not be able to evaluate the quality of a finished product.

9.7.3 Illustrative Content, Materials and Tools

9.7.3.1 Content for Different Forms of Work Across Stages

The content indicated for each Form of Work in the Table below is illustrative. In the Middle Stage, the focus is on specific skills and practices and that progresses into Secondary Stage with a focus on specific vocations.

Table 9.7i

Progression of Illustrative Content in different Forms of Work across the Middle and Secondary Stage		
Forms of work	**Middle**	**Secondary (Vocations)**
Life Forms	• Soil Management and basic earthwork • Different Agricultural/Horticultural practices	• Nature-friendly farming • Nature Conservation/ Restoration • Nursery Management • Livestock rearing • Financial Services • Grooming and Personal Care Industry
Machine and Materials	• Handicraft work using materials such as paper, wood, clay, fabric, paints, inks • Using basic machines including modern machines	• Tailoring • Carpentry • Welding and casting • Pottery • Local art • Robotic machining • Electronic Equipment Repair
Human Services	• Aptitude to communicate well and work in teams • Basics of Healthcare and Hospitality • Basic ICT and Technological skills	• Healthcare • Electrical work • Transport services • Sales and Marketing • Hospitality and Tourism • Intermediate ICT and Technological skills

9.7.3.2 Materials and Tools

Illustrative materials and tools can be used for different forms of work. Some are easily available in the local community, while some are hard to reach, thus requiring external support. The table below indicates materials and tools segregated as per the forms of work.

Table 9.7ii

Illustrative Materials and Tools Used in Different Forms of Work		
Forms of work	**Materials**	**Tools**
Life Forms	• Naturally-sourced Materials: Soil, manure, water, fodder, plants • Other Materials: Chemical fertilisers, pesticides	• Axe, shovel, hand cultivator, spade, tag applicators, watering troughs, feeding troughs
Machines and Materials	• Tailoring: Thread, needle, fabric, scissors, cutters, marker chalk, tape, paper • Carpentry: Wood, nails, screws, glue, sand sealer, plywood	• Tailoring: Sewing and stitching machine • Carpentry: Saws, grinders and chisels, hand planer, grinding machine, moulders
Human Services	• Healthcare: Medical instruments, scrubs, medicine list, health record • Hospitality & Tourism: Hotels, food, beverages, vehicles • Sale & Marketing: Brochures, websites, catalogues, videos • Electrical work: Electrical wire, cables, switches, connectors • Automotive service: Steel, aluminium, copper fibres, rubber • ICT: Hardware materials such as motherboard, CPU, mouse • Software materials such as Electronic storage media, Informative tools such as the internet, and drive, Constructive tool such as MS Word, PowerPoint	• The intrinsic tool to interact, empathise, show humility, serve, repair, and follow procedures to utilise the materials effectively

9.7.3.3 Illustrative Projects in Middle Stage

The content in the Middle Stage will be operationalised in schools in the form of projects taken from each form of work. In each Grade, one project from each form of work will be undertaken by students, totalling 3 projects in a year. Thus, by the end of the Middle Stage, students will be able to work on nine projects.

The selected projects must be contextual, with relevance to the world of work, students' lives, and their age-appropriate learning. The Teacher can decide the execution strategy of these projects based on the geography, availability of additional resources, budget, and number of students. The crucial element which needs to be kept in mind is to provide as much real-life experience of the vocation as possible in order to achieve the Learning Standards.

Some vocational projects will also align with the concepts of Science and Social Science Subjects, so the respective Teachers can also add theoretical and practical inputs to enrich the learning experience of students.

These projects should be such that they give students creative and engaging opportunities to work on them beyond the dedicated hours of Vocational Education at schools. For example, if the project of tailoring enables the student to stitch independently, they will also be able to apply that skill in home-based tasks and support their family.

Following is the illustrative list of Projects with brief descriptions under each form of work:

Table 9.7iii

Illustrative Project List for the Middle Stage	
Projects (Life Forms)	**Description**
Kitchen Garden	The kitchen garden project will engage students in working with soil and agricultural equipment to produce simple fruits and vegetables on the school ground or available premises near the school.
DIY - Biogas plant Model	The project of creating a biogas plant model will engage students in learning a new source of energy using biological material and how it is utilised in the daily lives of people living, preferably, in rural areas. The Science Teacher can be involved in this project to bring out the chemistry in the conversion of waste matter into combustible gas.
Urban/Rural farming	By growing at a larger scale than a kitchen garden, students will learn the basics of soil preparation, sowing, irrigation, protection of crops from weeds, and properly storing the harvested crop.
Mobile Nursery	The Project Mobile Nursery will enable students to plant and manage the growth of different plants. They will learn to grow plants through different methods (cutting, grafting) and using different plant parts (vegetative propagation).
Care for animals	Students will systematically learn to take care of a few animals in the vicinity, e.g., dogs, cows, sheep, goat
Projects (Machine & Materials)	**Description**
Solar Panel Model	The project will engage students in learning about this renewable source of energy. The components of the project will include building the basic concepts related to solar energy, a demonstration of constructing the model by the Teacher, followed by assembling the model and observing how it functions with students.
Stitch and sew	The project will enable the students to learn the basic skills of stitching, creating patterns on fabrics, shaping fabrics, and eventually designing a basic garment of their choice.
Carve the wood	The woodcarving project will engage students in creating aesthetic wood crafts. The components of the project will include an introduction to basic woodcarving tools, drawing or planning an object to carve on wood, rough carving through chisels, detailed carving and polishing of the product.
Let's (dis)assemble!	The (dis)assemble project will include the process of assembling, disassembling, and repairing a basic vehicle , such as the bicycle. The components of the project will involve a basic introduction to assembling and repairing tools, repair of tyre punctures, replacing brakes, and assembling wheels.
Potter's clay	The project on pottery making will expose students to the rich craft work of the country. The students will learn to work with different kinds of clay, and practise making objects of varying complexity, depending on the level of skill they have learnt.
Project (Human Services)	**Description**
School's salon	The project of School salon will enable the students to develop the best practices in providing beauty wellness through various modes.
First aid	The first aid project will enable students to acquire basic knowledge of simple over-the-counter medicines and their application in providing the first form of aid. Students will learn to handle the medicines and relevant materials diligently while taking care of the injured/sick patient.
Food Fair	The project will be the school's annual fair with students taking the lead in serving food from different localities and different cuisines. This project will enable the students to learn the operationalisation processes of food from the basics of cooking to presenting and serving.

School's MIS	The project will enable the students to develop several computer skills to be able to form basic management information system of the school. The components of the project will include the basics of learning Office productivity tools, creating information-based MIS on student and Teacher details, and the budgeting report on Mid-Day Meals.
Mehendi Art	The 'Mehendi Art' project will engage students in developing the basic concepts of how Mehendi is prepared and used for multiple purposes. It will allow students to explore Mehendi businesses running in their neighbourhood and understand the different ways people use Mehendi in shops and homes. The components of the project will include making a Mehendi mix and putting it in cones, applying Mehendi patterns on hands and learning ways to take care post the application.
The Library Project	The library project will involve the management of the school library by students under guided support. Students will be able to participate in organising and managing the library books and space through effective practices.
School Shop	This project will enable the students to learn the management skills of running a shop on the school premises. The shop can consist of materials (stationary, snacks) which are of relevant utility to the school, or which promote the local craft (artworks) made by students. They will be able to learn to manage expenses, coordinate running the shop, and provide effective customer service.

9.7.3.4 Illustrative Course Design in Secondary Stage – Grades 9 and 10

In the Secondary Stage, there will be 6 core vocations covering two from each form of work. The illustrative core vocations include agriculture, plumbing, and beauty and wellness in Grade 9, and gardening, carpentry, and nursing and care in Grade 10. These core vocations represent all forms of work.

The design of the course will be as below:

Table 9.7iv

Courses in the Secondary Stage		
Form of Work	**Grade 9**	**Grade 10**
Working with Life forms	**Agriculture** a. Familiarity with and operating basic agricultural equipment b. Seed bed preparation, seed selection, proper spacing, row cropping, intercropping c. Fertilisation and soil management d. Pest and disease identification and control	**Gardening** a. Gardening tools - Familiarity with, usage, organising and maintenance b. Techniques of plant propagation c. Dealing with weeds d. Dealing with pests
Working with Machine and Materials	**Plumbing** a. Measure, cut, thread, or bend pipe to required angle, using hand or other tools b. Installation of household equipment such as geyser, RO c. Identify minor plumbing issues and resolution	**Carpentry** a. Measuring, cutting and sawing using basic hand tools such as planes, chisels, sandpaper, mallets b. Joining wooden pieces, driving nails c. Basics of painting and finishing restoration of old wooden items
Human Services	**Beauty and wellness** a. Introduction to beauty and wellness b. Manicure, pedicure, and Mehendi services c. Hair care d. Customer service orientation	**Nursing and care** a. Basic concept of health and Nursing b. Patient care and counselling c. Measuring vital signs d. Service orientation

Section 9.8
Pedagogy

The approach, principles, and methods of pedagogy and assessment have commonalities across subjects — those have been discussed in Part A, Chapter 3, §3.3 and §3.4 of this document. This section focusses only on what is most critical to Vocational Education in schools. Hence, it will be useful to read this section along with the above-mentioned section.

Knowledge, capacities, and values related to Vocational Education are acquired through consistent practice of doing and exposure to on-site work. This, work must result in productive outcomes, and students must be able to experience actual workplaces and meet people in these workplaces. They must have opportunities to discuss their experiences and reflect on their own learning.

9.8.1 Pedagogical Principles

9.8.1.1 Balance of Doing and Thinking

Productive work without applying intelligence risks becoming mechanical and only understanding theory in Vocational Educational does not make any sense at all. Thus, the Teacher must plan a judicious mix of theory and practice.

In the Middle Stage, the focus will be on not just the capacities of the selected vocation, but also the broader knowledge of the domain (e.g., if students are preparing to work as Nursing Assistants, then the domain will be healthcare), and its place in the world of work.

In the Secondary Stage, the proportion spent on the practical application must be greater. Students must also build an in-depth understanding of the place of the vocation in the world. At this Stage, apprenticeships can be offered to students, under the guidance of Resource Teachers/ Master Instructors in nearby facilities where the chosen work is practised.

9.8.1.2 Workshops and Project-based Learning

Having short duration (40 minutes) classes with individual plans for instruction for each class is not very appropriate for developing capacities for productive work. These require a longer duration of engagement. Thus, workshops and long-running projects are more suitable for Vocational Education.

Workshops are appropriate for developing specific skills and these workshops can be planned on 'bagless' Saturdays. For example, cleaning, cutting, and cooking for the entire school can be done in a workshop mode. Similarly, disassembling and assembling a motor pump can be done in a workshop. In workshops, usually, the focus can be on individual work.

Projects are of longer duration and can run over multiple weeks or even months. Working on a kitchen garden would involve preparing the land, planting seeds, periodic and consistent care and attention to the plants, including weeding and pest-control, and harvesting. Projects are usually better done as groups and students get to learn to work in teams.

Teachers Voice 9.8i

A day in the woodwork shed

It was a regular morning at the woodwork shed. Six girls and four boys, 11-year-olds, stood around scanning all the tools and pieces of wood stacked in the room. Finally, they laid their eyes on the small square pieces of recycled teak wood, chisels, and mallets placed before them. These were arranged at a two-plus feet distance around the large central table and on two other smaller tables in the corners of the shed.

After enthusiastically welcoming them to their first woodwork class, we started by establishing basic rules of safety for working in the woodshed. After each one of them came up with a rule of their own (including not throwing instruments at each other!), I declared that there are five basic rules in the woodshed.

1. No running around in the shed
2. No 'playing' with the tools, but observe them and learn to use them
3. Initially, all students will work in the shed only when I am around
4. All students must help with setting up for and putting away materials after every class
5. Keep footwear on and exercise alertness when moving around in the shed
6. And most importantly, observe closely, listen carefully, and follow instructions obediently.

Muffled giggles erupted and a voice reminded me that it was six rules! I grinned sheepishly.

I started by demonstrating the use of tools with simple instructions. Typically, the most basic tools for the first few classes in woodcarving are flat chisels without handles, semi-curved chisels, and wooden mallets. I also showed them how to use the clamp to hold a block of wood down to the table. Students began touching the wood surface, feeling and smelling it. I shared that it was Burmese teak that was once used as part of a village house around the school and that recycled wood cut to small squares at the local sawmill is an excellent carving material.

I gave them the specific plan for the day. They were to carve out a small square in the wood clamped before them. Students first drew a square on the wood with pencils and rulers. They then practised the action of holding a chisel and a mallet. They picked up the flat chisel with their non-dominant hand and the mallet with their dominant hand. I demonstrated the two ways of holding the flat chisel, calling the first one a 'full fist hold' and the second hold as a 'feather hold.' I gave them five minutes to experiment with the holds. They were quite engrossed.

They began using the wooden mallet and struck gently on the head of the chisel. I suggested that they observe the amount of force they were applying to cut into the wood. Also, I urged them to explore the angles at which they will hold the chisel against the wood. I showed them that a ninety-degree angle will push the chisel deeper than a less-than-ninety-degree angle. A forty-five-degree angle of the chisel to the wood will drive the chisel diagonally, and a very low degree, say a ten-degree angle, will do something different which I asked them to find out for themselves. They all worked in silence, rather attentively, experimenting with the angles and the striking.

The class ended with students having made moderate progress in carving out small squares in their blocks of wood. As I watched them putting away their materials, feeling very pleased, a student made and quick dash towards me with a semi-curved chisel displeased that I forgot to show them how to use that tool.

9.8.1.3 Learning in Work Contexts

The pedagogy of Vocational Education will require different sites to ensure opportunities to learn in real-life work contexts. While this is not always possible, pedagogical approaches in the classroom must also align with real life. Starting with exposure visits, opportunities for internships and apprenticeships provide adequate opportunities for developing vocational capacities.

a. Exposure Visits

Exposure visits to nearby workplaces to observe productive work and interaction with people involved in productive work gives an experiential understanding of the work involved. For example, a visit to a hospital to understand the roles and responsibilities of nurses and health-care workers, or to nearby factories, and cottage industries can be organised with specific objectives in mind. Students must get an opportunity to engage with persons in these workplaces, and Teachers could organise follow-up visits as well inviting people from these workplaces to give guest lectures and demonstrations in the school.

b. Internships

Internships are short-duration placements in a workplace to learn about a specific job role. NEP 2020 emphasises the importance of an internship, '

All students will participate in a 10-day bagless period during Grades 6-8 where they intern with local vocational experts, such as carpenters, gardeners, potters, artists. Similar internship opportunities to learn vocational subjects may be made available to students throughout Grades 6-12, including holiday periods.' [NEP 2020, 4.26]

An internship enables students to experience a workplace environment that cannot be simulated in a classroom. They can observe and put forth questions to adults who are working at different jobs. This 'real' experience provides students to explore and decide whether they would like to take up the related vocation for further study. It also helps them identify the values and dispositions relevant in the workplace.

Students must have opportunities to engage with work that is aligned with their current capacities. A comprehensive orientation of both students and the individuals at the workplace will be required, with regular follow-up discussions. Members of the workplace will have to be sensitised to ensure the safety of students – physical and emotional.

Specific examples of workplaces where this internship can take place are:

- Working with Life Forms – poultry, dairy farms, pest control units, and nursery.
- Working with Machines and Materials – local mechanic workshops, carpentry workplaces, and tailoring units.

- Working in Human Services – hotels, restaurants, hospitals, gyms, old age homes, and beauty salons.

Assessment could be in the form of a reflective note, and/or presentation at the end of the internship. Students could also do a short project during the duration of the internship.

c. Apprenticeships

In the Secondary Stage, students will need to be given advanced on-site exposure in industrial/agricultural spaces to broadly understand the functioning of vocations in the world of work. Schools must develop linkages with local industries, farms, service centres, cooperatives, relevant NGOs, state transport corporations, cottage industries, printing presses, call centres, software design companies, mobile operating companies, law companies, local water/electricity boards to enable students to spend part of their time gaining work/ practical experience at these facilities as apprentices while they are still in school.

Apprenticeship involves on-site work experience over a long-term period to gain experiential skills and knowledge under the supervision of a mentor. Apprenticeship in the Secondary Stage will enable students to gain capacities to enter the workplace after completion of schooling or help them decide whether they would like to pursue a specific vocation.

An apprenticeship enables hands-on practice at on-site locations. Students develop an understanding of the culture, values and dispositions, and vocabulary of the workplace, and factors that affect functioning. They can develop a portfolio of their work to demonstrate their readiness for gainful employment.

Mentors will be experienced workers, with the ability to engage with students. They will need to undergo a short course offered at the DIET/BITE that will prepare them to be effective mentors.

A detailed design for the apprenticeship will have to be put in place. Modes could include an apprenticeship of about a month and a half during the summer vacation. Alternatively, students could spend 2 hours after school hours a few days a week.

Assessment could be through a demonstration of work by students, or a portfolio maintained during the apprenticeship. This should also include observations of students by the mentor.

Box 9.8i

Since, the educational importance of 'apprenticeship' in vocational education is enormous. it is important to use this as an integral part of the pedagogical approach. Thus, 'apprenticeship' integrated within school curricula must be firmly distinguished from other (equally useful) forms of 'apprenticeship,' which happen after students graduate from schools.

It is therefore important to note that in this NCF 'apprenticeship' is used as an essential pedagogical approach to gain 'know-how' knowledge, while the students are in school. This must not be seen from the lens of the Apprentice Act 1961.

9.8.1.4 Inclusion

One of the fundamental principles mentioned in NEP 2020 is equity and inclusion to ensure that all students can thrive in the education system. In Vocational Education, all students should be given equal access in terms of working with tools and resources.

Teachers must ensure no discrimination takes place towards students with having disabilities or students from specific genders or socio-economic backgrounds, not only in the school premise but also at external workplaces by other students, external trainers, or associated stakeholders.

Schools must coordinate with Resource Centres having special educators to meet the rehabilitation educational needs of learners with severe or multiple disabilities. An understanding of how to teach students with specific disabilities (including learning disabilities) must be an integral part of all Teacher education programmes.

Rigid gender roles still exist in society. Awareness must be built among stakeholders that the capacity for doing any work is independent of gender. Training modules for Teachers as well as Resource Persons/Master Instructors will need to address this aspect. For example, a boy is capable of working as a nurse, and a girl is capable of working as a welder.

Assistive devices and appropriate technology-based tools must be made available to help students with disabilities integrate more easily into classrooms and engage with peers, in addition to textbooks and manuals in Braille or audio-visual formats.

Collaboration with specialised agencies such as the National Association for the Blind (NAB), National Institute for Visually Handicapped (NIVH), and other institutions to design and customise Vocational Education courses across Stages of school education can be ensured by NCERT. A similar approach can be done for placing students for employment.

9.8.1.5 Safety

Safety considerations related to Vocational Education involve both the physical and emotional safety of students.

Physical safety relates to the use of equipment that has the potential to harm students. Emotional safety relates to protecting them from exposure to experiences that may distress them, as well as sensitising persons who will interact with them within and outside the school.

Forms of work involving the use of materials and complex tools need to be first instructed and demonstrated by the Teacher. The Teacher must indicate the necessary precautionary steps. Correctly holding the tools (e.g., while using a shovel, needle, or cutters) while performing a task can prevent injury and help create efficient products. Students should also be encouraged to take care of the tools and materials, and not use them for fun or to tease fellow students. Teachers will have to be very observant of students' practices with the tools and materials to guide them appropriately.

Exposure visits, internships and apprenticeships will have to be carefully planned in consultation with parents/guardians to ensure safe transit between school, home, and workplace. Preferably, a Teacher should accompany students in the Middle Stage when they go for an internship; if not possible, then a volunteer from the community can accompany the students. It is even possible for Secondary Stage students to be apprentices at the same place to assist Middle School students.

All Resource Persons/Master Instructors as well as other employees must be sensitised and be aware of legal provisions related to the safety of students. Vocational Education Coordinators must be in regular contact with them to discuss any challenges they may be facing related to students. DIETs/BITEs must also develop follow-up modules for Resource Persons/Master Instructors based on an analysis of their needs.

Section 9.9
Assessment

The approach, principles and methods of Assessment have a lot in common across subjects. Thus, to avoid repetition, these matters are not being repeated in this chapter. Please refer to Part A, Chapter 3, §3.4 for Assessment. In this section, only a few examples that are illustrative of good assessment practices in Vocational Education are described based on the principles and methods in the above-mentioned chapters.

Some key principles of assessment in Vocational Education are:

a. Students must be assessed on the capacities and values and dispositions related to the form of work they have engaged with, such as systematic organisation of tasks, knowledge of the use of safety protocols, working in groups, attention to details, as well as persistence and focus, curiosity and creativity, empathy and sensitivity, collaboration, and teamwork.

b. Students must be assessed primarily through demonstrated performance. Written tests may be included to assess capacities such as conceptualisation and planning. Portfolios maintained by students will be the basis of an oral test (viva voce). A consolidation of Teacher observations can also be used, particularly for the assessment of values and dispositions.

c. Students may also be assessed on their experience - the challenges they faced, the efforts to overcome the challenges, and their own assessment of the final product that they created. This can be done through written self-reports and reflection, and viva voce.

A few Teacher Voices illustrate assessment in Vocational Education below.

Teachers Voice 9.9i

Assessing through Multiple-Choice Questions

Objective: To assess students' comprehension on the processes required to complete the task

I teach Grade 7, and, this year, my students have done the following projects: a kitchen garden, a solar cooker model, and a library project. I wanted to assess how well they understood the process of planning. I used an MCQ related to planning in a different situation. I could have directly asked them to list the steps for any specific project, but I thought it would be better to assess their understanding of the general process.

Question: As you are aware, planning is a very important part of doing any work. Imagine you are working with a potter, and she has asked you to make a simple pot. What is the sequence of steps that you will follow?

a. (i) Selection of clay, (ii) Designing the pot, (iii) Preparing the clay, (iv) Preparing the wheel, (v) Creating the pot, (vi) Sun drying/baking in a kiln

b. (i) Selection of clay, (ii) Preparing the clay, (iii) Designing the pot, (iv) Preparing the wheel, (v) Creating the pot, (vi) Sun drying/baking in a kiln

c. **(i) Designing the pot, (ii) Selection of clay, (iii) Preparing the clay, (iv) Preparing the wheel, (v) Creating the pot, (vi) Sun drying/baking in a kiln**

d. (i) Preparing the wheel, (ii) Selection of clay, (iii) Preparing the clay, (iv) Designing the pot, (v) Creating the pot, (vi) Sun drying/baking in a kiln

Marking scheme: A-0; B-0; C-4; D-0

Teachers Voice 9.9ii

Assessing through Viva-Voice

Objective: To check my students' understanding of the task through their reflections

I teach Grade 8. I plan to conduct a viva voce based on the portfolio students have maintained throughout the year. I plan to do this instead of simply assessing the portfolio since I will be able to assess their learning more comprehensively. The portfolio consists of any products they have made during the year, or photographs and reflections. This year, the students did projects on basic bicycle repair, making a biogas plant model, and sewing garments for children. The duration of the viva voce will be 10 minutes

I asked the students to pick any of the projects that they liked best and asked them a few questions about it.

1. Why did you choose this project for discussion? Why do you think it is important?
2. How did you prepare to do the project? How did you plan? Where did you get materials?
3. Did you make any changes to your plan? If yes, what were the changes, and why did you make them? If not, is there any change you could have made?
4. What do you think of the quality of your work?
5. If you could do it again, what would you improve?

Marking scheme

Criteria	Descriptors & points
Reason for choosing specific project work	Is able to give reason(s) for choice – 1 point Is able to give reason(s) and justification – 2 points Is able to give reasons, justify them and connect it to the world of work and home life – 3 points

Planning	Preparation is limited to getting materials together – 1 point Preparation includes the above and sequencing of tasks – 2 points Preparation includes the above and design of end product – 3 points
Execution	Did not make any changes in plan – 1 point Explains change(s) in plan but cannot state reason(s) – 2 points Is able to state challenge(s) faced and reasons for change in plan – 3 points OR Did not make any changes in plan – 1 point Explains why there was no change(s) in plan– 2 points Is able to explain what could have been changed and to what effect – 3 points
Self-as-sessment	Simply states whether likes the work done or not – 1 point Gives reasons for self-assessment based on the end product – 2 points Gives reasons for self-assessment based on both the process and the end product – 3 points
Learning from project	Does not specify which improvement is necessary – 1 point States what improvements can be made in the end product – 2 points States what improvements can be made in the process and end product – 3 points

Teachers Voice 9.9iii

Assessing through Demonstration of Competencies

Objective: To assess the efficiency of students in performing the task

I teach Grade 9. I plan to assess students on Tie-and-Dye. The duration of the examination will be of 3 hours, which should be sufficient for them to demonstrate the Competencies required to tie and dye using a single colour. That is sufficient for me to assess without waiting for the final product. I prefer this mode of assessment to a simple question in a written test since I can observe them as they work. I have chosen to assess only the process they follow and not the product they create.

Instructions: Your task today is to tie and dye using a single colour. There are T-shirts of different colours as well as dyes available. You can use the worktables and the sink in the workshop to do your work. Remember, we will not be able to complete the process – once you have done the first rinse, you can show me your T-shirt, and then take it home to complete. You have 3 hours.

Rubric for assessment

Criteria	Grade C	Grade B	Grade A
Design	Randomly ties the T-shirt and applies the dye	Uses a design for Tie-and-Dye	Uses a design that makes the best use of the colours of the T-shirt and the dye
Process	Process is unplanned	Process is planned but time is not used effectively	Carries out process in an organised manner and makes optimal use of time
Interaction with peers	Is in a hurry to get materials and use the equipment	Chooses materials with consideration of others and waits for their turn to use the equipment	Coordinates with others for optimising the selection of materials and use of equipment

Section 9.10
Enabling Conditions

9.10.1 Teachers and Master Instructors/Resource Persons

The current B.Ed. and D.Ed. colleges do not offer specific courses for teaching Vocational Education. Therefore, till such time these programmes are available, existing Teachers will have to take Vocational Education in the Middle Stage, with support from Resource Persons, also referred to as Master Instructors in KRCR 2019 However, the Secondary Stage will demand specialisation in specific vocations.

KRCR 2019 proposes that

> *Special shorter local teacher education programmes will also be available at BITEs, DIETs, or at school complexes themselves for eminent local persons who can be hired to teach at schools or school complexes as 'master instructors', for the purpose of promoting local professions, knowledge, and skills, e.g., local art, music, agriculture, business, sports, carpentry, and other vocational crafts*
>
> *[Para 5.25].*

Therefore, guidelines for preparing these Resource Persons/Master Instructors will have to be developed by SCERTs, and appropriate modules developed by DIETs/BITEs.

The content of these short-term training courses must orient them not only to school pedagogy but the need for sensitivity and inclusion while interacting with students; they must also be aware of legal provisions related to school education.

It follows that the first step would be to create a pool of 'Master Instructors' locally on priority. These 'Master Instructors' have an important role to play, since they will supplement the expertise of the regular Teachers. These Master Instructors may be artisans (rural and urban), health practitioners, mechanics, technicians, farmers, folk artists, local entrepreneurs, persons involved

in poultry farming or fishing, persons retired from the defence services, IT professionals, and beauticians. They can be brought in as guest faculty and can either impart knowledge of both theory and practice in their respective vocations or provide only practical training. In cases where specialised practical training is being provided to students outside schools, external instructors can also be brought in to teach the theoretical aspects along with mentors at the workplace.

Student internships and apprenticeships must take place in the workplace these Resource Persons/Master Instructors are associated with.

Schools must assist these Master Instructors to become comfortable in an academic environment, to handle students, and to comply with broader definitions of curricular and assessment frameworks in their work, through the short-term training courses provided at the DIETs/BITEs or the school/ school complex itself.

9.10.2 Conducive Space and Resources

The support of the community can also be taken to borrow materials and tools for use in schools. For example, agricultural or nursery tools can be taken from the local farmers or nurseries for a brief period to grow plants on the school grounds.

Relevant exposure to machines and equipment will also be required for students to apply the skills and knowledge acquired. Collaboration with the local shops and industries (e.g., art galleries, carpentry, and automotive shops), nearby farms and nurseries, hospitals, and tours and travels businesses (e.g., healthcare, tourism and hospitality, automotive service) will help provide necessary exposure and learning to understand the relevance of the vocation in the world of work.

A Skill Lab can be set up in schools to provide a 'real work' environment for students to work at. These skill labs can also be accessible for nearby schools to utilise. By channelling the investment of governments and CSRs, conducive spaces can be formed, even in remote locations.

Chapter 10

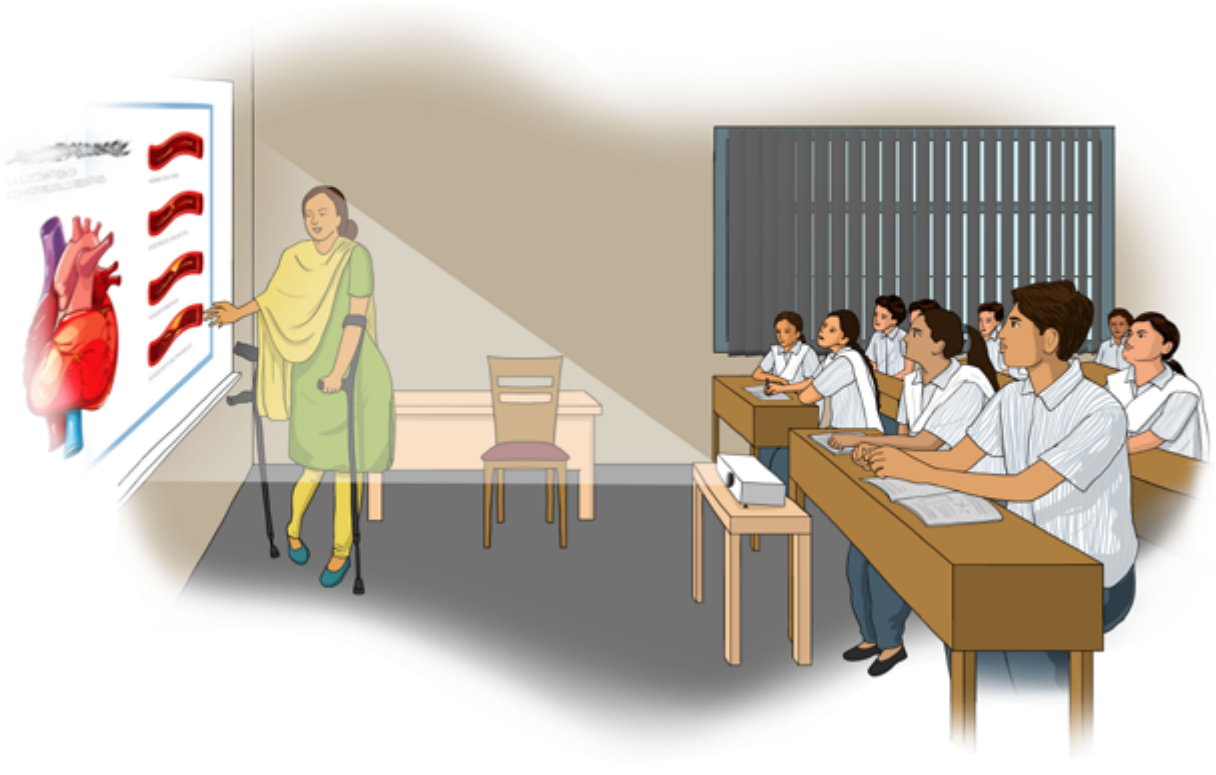
Subjects in Grades 11 and 12

The design of the Secondary Stage including Grades 11 and 12 is detailed in Part A, Chapter 2. This chapter details the design of the subjects that students will study in Grades 11 and 12.

As described in Part A, Chapter 2, in Grades 11 and 12, students will have flexibility and choice for the subjects that they want to study. They would choose from the subjects on offer from the schools. To truly enrich the education in these grades, schools should offer a wide range of subjects. As this NCF starts getting implemented, due to practical reasons, the schools may start with a few additions to their subject list. However, in the medium term and long term, this should cover the entire range of Curricular Areas and disciplines within them.

This chapter has only an illustrative set of subjects for Grades 11 and 12. The intent of this chapter is to lay out the principles by which the subjects and the content therein would be designed.

While the requirements from students and schools in Grades 11 and 12 will ensure a breadth of study providing multidisciplinary exposure, the study of each subject must also provide depth of study. The approach and the principles described below intend to provide depth of study in each of the subjects taken up.



As with all such situations in curricular design, depth of study will not come from loading an excessive load of content on to the student. The content must be 'just enough' and appropriate to give an understanding of the most important conceptual structures and paradigms in the subject to the key questions in the subject and the nuances of methods of enquiry. The expectation must be that having studied the subject in Grades 11 and 12, students should be able to pursue it further, independently or in a higher education institution.

The chapter describes what can be the 'generic Curricular Goal' for the subjects in Grades 11 and 12. The 'actual subject goals' and curriculum must respond to these generic Curricular Goals with specific matters that are relevant.

Generic Curricular Goals for Subjects in Grades 11 and 12: Students develop an understanding of the subject, including its key conceptual structures, paradigms, range of questions, most contemporary issues and subfields of study, and methods of inquiry at a level of depth that enables them to pursue the study of the subject independently or in higher education.

The rest of this chapter has taken up some subjects as illustrations. Each illustration has the principles for design for Grades 11 and 12 and illustrative content areas which could be spread over these two Grades. **These content areas together make for adequate content for Grades 11 and 12 to achieve depth. Other content areas may also be chosen, but they must be adequately comprehensive as these areas are together.** It must be noted that, as with the list of subjects here, even the content areas within each subject are **illustrative** — they are intended to convey a sense of what the subject design may look like for these Grades.

Section 10.1
Social Science

The Social Science and Humanities Curricular Area will, illustratively, offer History, Geography, Political Science, Psychology, Psychology and Mental Health, Economics, Development Economics, Sociology, Anthropology, Archaeology, and Philosophy.

10.1.1 Philosophy

This is an illustration for Philosophy.

10.1.1.1 Principles for Designing Courses in Philosophy

The aim of teaching Philosophy in Grades 11 and 12 is to create independent thinkers, rooted in the local context, but with the lifelong capacity to apply abstract ideas to a range of different contexts through the acquisition of necessary tools and skills.

The courses for Philosophy must be designed keeping the following in mind:

a. Students will understand and appreciate the rich traditions of Indian philosophical thought.
b. They will be able to explore contemporary issues in light of classical Indian philosophy.
c. They will understand the synthesis of ancient Indian and later Western ideas from the view of 20th century Indian thinkers.

d. They will develop an ethos that will enable them to become better citizens.

The study of this discipline in Grades 11 and 12 must take a comparative approach, rooted in Indian thought and the Indian context, but also encouraging dialogue between different traditions and time periods. This approach will allow students to see how ancient ideas can shed light on current problems. They will also be able to see how solutions from one context can address problems from another context. Such an approach requires not only thinking critically, but thinking creatively, imaginatively, and innovatively.

10.1.1.2 Illustrative Content Areas

Given below are illustrative content areas for Philosophy in Grades 11 and 12.

Content Area 1: Reasoning

The focus will be on different kinds of reasoning, both formal and informal, drawing from the rich tradition of Indian logic, using ideas from texts such as the Vaisesika-sutra, Varsaganya's Sasti-tantra, and Aksapada's Nyaya-sutra. Students will learn to identify, reconstruct, and evaluate arguments, as well as different techniques for responding to arguments. This will enable them to participate in rigorous debates but with a focus on cooperation rather than competition based on the classical Indian model of *vaada*. They will be introduced to formal (deductive) reasoning through identifying what is wrong with an argument (propositional calculus), as well as engaging with probabilistic reasoning. Finally, they will study inductive reasoning with a focus on arguments from analogy and inference to reach the best explanation. They will refer not only to examples taken from their own lives, but also texts such as Nagarjuna's Mula-madhyamaka-karika and Yogacara-bhumi-sastra.

Content Area 2: Knowledge and Scepticism

This content area is based on the classical Indian theory of knowledge, pramana-sastra, which is concerned with the idea of *pramana* — how we come to have knowledge. The three main types of *pramana* — perception, inference, and testimony — proposed by ancient thinkers will be studied, along with later voices in Western philosophy, and the ideas applied to understand contemporary issues. Questions explored by students will include — How do we come to know anything at all? And how can we be certain of what we know? We live in an age where it seems that knowledge can be accessed by anyone with a smartphone — but is this real knowledge? This content area will include ideas put forward by Advaita Vedanta, *Carvaka*, *Yogacara*, and *Kumarila Bhatta* in his commentary on the *Mimatsa-sutra*, and Buddhist thinkers. Students will also be introduced to a lively debate between *Prabhakara Mimamsa* and *Nyaya* that will help them in getting a firmer grasp on this problem. They will focus on the problems of trust, testimony, and expert knowledge through exploring questions, such as How do we know whom to trust when even experts cannot agree on a given issue? How can we trust some witnesses as believable and others as not in a court of law? On what grounds can we judge that a given website or news source is biased?

Content Area 3: Ethics

Through this content area, students will be introduced to ethical reasoning as a way of thinking about moral issues (cheating, violence, plagiarism, littering, tolerance, equality, empathy) they face in day-to-day life, enabling them to consider the ethical dimensions of these matters. This will help students understand ethical dilemmas by showing them normative ways of thinking about various issues. Students will develop the ability to be practical problem solvers while thinking about what it is to live an ethical and virtuous life themselves. This will be done through an introduction to ethics through writings from both Indian tradition (Buddhist thought, stories from Panchatantra, Jataka, Hitopadesh, Purusarthasiddhyupaya) and the Western tradition. Students will be enabled to take a multi-perspective approach to ethical reasoning, where they will be encouraged to develop their ethical views on these issues in cooperation with each other. Students will particularly be enabled to think about traditional Indian values and the values enshrined in the Constitution from an ethical point of view.

Content Area 4: Philosophy of Mind

What exactly are we? What is the nature of the *atman*? This was, along with questions about knowledge acquisition, one of the most divisive questions in classical Indian philosophy. On the one hand, substance dualism in the *Upanisads* and the texts of the *Nyaya-Vaisesika Darsana* sees the self as an eternal immaterial substance, while on the other hand, materialists, such as the *Lokayata Darsana*, see the self as no more than a conscious body. Some Buddhists deny that there even is such a thing as the self and argue that this illusory belief in *atman* is the source of all suffering. In the contemporary context, these debates about the self usually end up as debates about personhood, the mind, and the brain. Through this content area, students will examine how these ancient debates about the self can help us think about current issues around the mind, consciousness, and artificial intelligence. The Jainas believed that there were many kinds of *jiva* much as some philosophers today argue that non-human living beings such as animals (and even sophisticated computers) have minds. What are the implications of such a view? Students will focus on arguments for and against the implication of views, as well as examine the social and ethical implications of these various stances on the nature of the mind or self.

Content Area 5: Environmental Philosophy

Through this content area, students will be able to think abstractly about questions related to environmental issues, such as — Who is to blame for climate change, and are current solutions ethical? Is damage to the environment bad only because of its effects on humans, or do ethics reach beyond humanity? How should we change our political systems to take into account the rights of non-human animals? Is a carbon tax unfair to developing countries? What is climate justice? Students must be enabled to have an idea of potential answers and an understanding of how to adjudicate between these. They will be introduced to Indian and Western philosophical perspectives on the environment through engaging with environmental ideas from Vedas, Upanishads, Charaka Samhita, Matsya Purana, Panchtantra, and Jataka, as well as Gandhi and Amartya Sen. They will also undertake a close study of grassroots environmental movements such as the Chipko Movement, Green Revolution, and *Navdanya*. The problems and questions addressed are at the foundations of environmental science and environmental economics and also draw on environmental history.

10.1.2 History

This is an illustration for History.

10.1.2.1 Principles for Designing Courses in History

The aim of teaching History is to inculcate a historical sensibility about the past while acquiring disciplinary understanding and knowledge.

The courses for History must be designed keeping the following in mind:

a. Students will examine the Indian subcontinent from a historical lens spanning from prehistory and early history to the birth of the nation.

b. They will receive a strong grounding in the substantive content of Indian History while remaining aware of India's place in the world.

c. They will engage with perspectives on the emergence of modernity across the world, with a specific focus on key transformations in Europe.

d. They will understand the impact of events that occurred in one part of the world on other parts of the world over a period of time.

e. They will acquire the methods of history including the interpretation of literary texts and the methods of archaeology.

Students will develop a historical consciousness by engaging with necessary disciplinary foundations, methodological tools, and comparative frameworks.

10.1.2.2 Illustrative Courses

Given below are illustrative content areas for History in Grades 11 and 12.

Content Area 1: Ancient World

Through this content area, students will take a comparative and methodological approach towards understanding the prehistory and early history of the Indian subcontinent in the context of other parts of the world. It will cover the earliest population of the Indian subcontinent, followed by the spread of agriculture in the fertile crescent and South Asia, and the emergence of the earliest known cities and city-based civilisations in Mesopotamia, Egypt, and the Indian subcontinent. Students will examine the ancient literary (mythological and religious) works produced in India, Greece, and Syria, also covering the rise of new religions and philosophies in India and China. Methodologically, students will be introduced to the basics of the archaeological and historical methods and will learn to interpret early literary texts, as well as material culture to produce a historical narrative.

Content Area 2: States and Empires in India

Through this content area, students will be introduced to various kinds of large and complex political formations (such as states and empires) in India from about the 5th century to the 16th century. They will learn about the formation of more centralised state systems than those that existed in the previous periods. They will critically examine the nature of these states, especially the structures of power and levels of control over diverse geographies and communities. Students

will also be introduced to the widespread agricultural ecology and economy in India, as well as to the Indian Ocean trade networks and overland trade routes, such as the Silk Road, to see how India was deeply connected to the rest of the world in those times.

Content Area 3: Towards Modernity

Through this content area, students will be introduced to the emergence of modernity, as a temporal period and a concept, especially in the context of Europe. They will engage with the transformations to modern cultural, State, and economic institutions in Europe. In the cultural realm, Europe witnessed several key transformations, including the Renaissance and Reformation, the Scientific Revolution, Humanism, and the emergence of the nation-state. Economic aspects of modernity included the emergence of mercantilism and the concurrent search for the New World, the Industrial Revolution, and the spread of capitalism and colonialism. While the content area will focus on key historical transformations in Europe, it will also consider the impact these transformations had on the rest of the world, especially in America, Africa, and Australia.

Content Area 4: Birth of the modern Indian Republic

Through this content area, students will chart the emergence of colonial rule in India, from the 16th century, when the first European joint stock trading company arrived in India, to the birth of the modern nation-state in 1947, extending the moment of this birth up to the integration of princely States and the adoption of the Constitution by our Republic in 1950. Students will be familiarised with the struggle between European colonial powers for control over various parts of India, and the various forms of Indian resistance, including peasant and Adivasi resistance movements. Students will also be introduced to the vast administrative, educational, and social reforms that were introduced during the colonial period. Finally, students will discuss India's freedom struggle, including not only its well-known figures but also some lesser-known figures.

10.1.3 Sociology

This is an illustration for Sociology.

10.1.3.1 Principles for Designing Courses in Sociology

The aim of teaching Sociology is to help students understand society as a form of reality, as a level of human existence which exists within and beyond the individual. They must be able to connect sociological knowledge to understanding, actions, and strategies in the everyday world, as well as in building strategies for structural change.

The courses for Sociology must be designed keeping the following in mind:

a. Students will be enabled to better understand their own selves and the social institutions and structures which shape their lives.

b. They will be able to grasp our shared humanity across all the variations that occur in different social locations.

c. They will be able to understand how gender, material conditions, and social groups and identities shape our subjectivities so that they can start building greater intersubjectivities.

d. They will become aware of different ways of seeing society, including from Western and Indian perspectives and different social locations within India.

The emphasis must be on doing Sociology rather than only reading it, thereby offering students reflexive, analytical, and emancipatory ways of seeing the world.

10.1.3.2 Illustrative Content Areas

Given below are illustrative content areas for Sociology in Grades 11 and 12.

Content Area 1: Introduction to Sociology

Through this content area, students will be introduced to the sociological perspective through the exploration of certain social patterns that are fundamental to life in the contemporary era. These will include institutions, such as family, marriage, and kinship. They will also include the growth of capitalism, rationalisation, industrialism, and the State. Students will be introduced to sociological ways of understanding various forms of ethnicity and nationalism. Through these, the basic concepts and methods of Sociology will be learnt, such as roles, norms, social structures, and culture. Students will also be introduced to some basic research methods of Sociology and how sociological knowledge is constructed. A 'sociological imagination' will thus be learnt through which students will be able to see their selves within a broader changing social context.

Content Area 2: Social Structure, Identity, and Self in India

Students will be introduced to the study of India's social structure and how to connect it with patterns of subjectivity, such as the formation of the self and identity. They will learn to look at these from functionalist, conflict, and interpretivist perspectives. Important aspects of India's social structures will be introduced, including the differences between rural and urban social life. The focus of the content area will be social structures that can lead to social inequalities and diversities related to gender, class, caste, tribe, and religion, as well as how unity and harmony with these diversities can be achieved. Their historically changing contours will be studied along with the social forces changing them. The social construction of the self and various kinds of identities will be discussed along with the relationship between the micro and the macro in social life. The ways in which agency operates to change social structures, as well as the ways in which social structures affect our subjectivity, will be discussed.

Content Area 3: Politics, State, and Development in India

Politics is a way of deciding between contending points of view and can be a way of reconciling them or asserting one over the other. Through this content area, students will be introduced to the institutions and cultures involved in making decisions related to social life in India. They will also learn about various social forces that act to influence politics. The State is one of the major institutions which balances and decides between conflicting voices and strives for unity. Different approaches to the State will be introduced along with the challenges of bureaucratisation. Democracy will be discussed as a way of connecting the State with different interest groups and social forces. Its trajectory in India will be explored along with challenges to it. Social movements will be discussed as a way of exerting pressure from outside the established system of power, which can provide an important corrective impulse. The relationship between politics, the State, and the economy will be introduced. Students will learn the different ways in which humans adapt to their environment and their systems of production, distribution, and consumption. Capitalism as the pre-eminent contemporary way of organising this will be discussed, along with the challenges it poses. The changing and contested role of the State will also be discussed, along with different views on privatisation. The trajectories of development in India and its experience

by different social groups will be studied. The impact of globalisation on the State, culture, and the economy will be traced.

Content Area 4: Sociology of Culture — Mass Media, Education, and Religion

Through this content area, students will learn about the importance of culture in human existence and the different institutions which shape and contest it. The major ways of understanding culture will be introduced, including culture as the entire way of life of a community, and culture as a code of symbols and practices. The multi-layered and overlapping character of culture will be illustrated through different examples in the mass media, where many voices exist at the same time. The politics of culture will be introduced through ideas of hegemony and counter-hegemony in mass media. Cultural power and the assertion of interpretations as a method of domination will be explored through examples of communities, castes, religions, languages, and so on. Status groups and their politics will also be discussed. Connected with this will be the problem of social location and objectivity in knowledge. The sociological perspective on culture will be deepened through the study of education and religion. The functions of religion in social life will be introduced along with its relationship with other social structures and processes such as family, gender, and politics. The social and cultural processes changing religion will be explored. The functions of education along with interpretivist and conflict perspectives on education will be introduced through examples from India. A particular focus will be to understand differences in educational access and achievement in India.

Section 10.2
Science

The Science Curricular Area will, illustratively, offer Biology, Chemistry, Physics, Modern Physics, Computational Biology and Earth Sciences.

10.2.1 Biology

10.2.1.1 Principles for Designing Courses in Biology

The aims of teaching Biology are for students to explore the subject at different scales, and have an appreciation for the process of science, and the progression of scientific ideas. Students will develop the capacity to engage more deeply with any area in the discipline.

The courses for Biology must be designed keeping the following in mind:

a. Students will be able to see the integration of different fields of biology and highlight the interconnections between these fields.

b. They will develop capacities for observation, documentation, and familiarity with quantitative reasoning and multi-disciplinary approaches.

c. They will engender sensitivity towards biological issues (environment, health) in their surroundings and be aware of how citizens can contribute to their local communities and to science.

d. They will be aware of bioethical concerns that arise in biology today.

e. They will also be exposed to diverse careers in the life sciences.

Biology has a reputation for being descriptive and students often have to remember many facts without having any context. This produces students who have a lot of factual knowledge but are ill-equipped to meet the challenges of modern life sciences. To align school education with current practices in life sciences, the content must be streamlined. Whenever description-heavy content is included, an attempt must be made to provide appropriate context.

Students must be exposed to a multi-pronged approach to studying life sciences, and a balance between breadth and depth in covering different themes must be maintained.

10.2.1.2 Illustrative Content Areas in Biology

Given below are illustrative content areas for Biology in Grades 11 and 12.

Content Area 1: Biodiversity and Biogeography of India

Through this content area, students will be given an overview of the scope of life sciences, the various length and time scales at which biological phenomena occur, and the methods employed by scientists to investigate these phenomena. Students will be encouraged to think like a scientist by using case studies from India. They will develop an appreciation for natural history, and an understanding of biodiversity and the factors which affect the richness and diversity of life in different regions. A broad exposure to biodiversity in India will be complemented by a deeper exploration of biodiversity in their local region, and an introduction to systematic practices of studying biodiversity through taxonomy and nomenclature. Students will engage with units on the impact of climate change and the importance of conservation efforts. Through the theme of biodiversity and biogeography, students will develop general capacities for quantitative reasoning (interpretation of graphs, computation of summary statistics), as well as observation skills through activities requiring them to identify and classify species in their surroundings. Students will also be made aware of careers in ecology, sustainability, and other allied fields and how citizens can contribute to scientific research.

Content Area 2: The Unity of Life

Through this content area, students will engage with the common structures and processes that underpin all of biology. This area will include a discussion of cell theory and our current understanding of cellular structures and processes. Subsequently, students will explore important classes of molecules that are constituents of cells and the functions they perform. In this context, students will learn about the identification of DNA as genetic material. This will be followed by a historical account of genetics and how Mendel identified the fundamental principles of heredity and how they were rediscovered later. An essential aspect that must be discussed is how evolutionary processes can provide a framework for investigating biological phenomena across scales. This will involve an overview of the development of the theory of evolution by natural selection through the work of Darwin and Wallace, a discussion of the modern synthesis, and an introduction to phylogenetics through the study of the Tree of Life. Students will also be introduced to molecular biology (Central Dogma, Genetic code) and gene regulation. Case studies (e.g., antimicrobial resistance) will be used to illustrate the importance of an integrated understanding of biological systems in modern life sciences. Students will become familiar with concepts that are essential to study any biological system. They will also appreciate that scientific theories and ideas take time to develop and that there is value in understanding the historical context of their origin.

Content Area 3: Organismal Biology

Through this content area, students will explore many aspects of the biology of non-human organisms (microbes, fungi, plants, animals) using an evolutionary framework. Representative examples of development and simple illustrations of the genetics of the body will be given, along with a small set of topics related to the physiology and anatomy of plants and animals. Topics in ecology and the biology of food production will be covered, including population, community and behavioural ecology, energy flows, and the interaction between different species. A diverse set of examples (spanning the tree of life) will be used to illustrate concepts. Food production, food security (including challenges of climate change and diseases, the role of biotechnology) and sustainability (resource use, environmental impact) will be discussed. Students will be encouraged to draw connections between food security challenges, and physiological and ecological constraints.

Content Area 4: Agriculture and Animal Husbandry

Through this content area, students will explore commercially important organisms along with some examples of the developmental biology, anatomy, and physiology of these organisms. The role of breeding and biotechnology will be discussed followed by ecological and environmental constraints and challenges to food production. Students will study the topic of disease management and the possibilities of biocontrol. They will recognise why an understanding of physiology and an ecological sensibility is essential for sustainable food production.

Content Area 5: Human Biology

Through this content area, students will explore the evolutionary history of the genus Homo and the human genome project. Thereafter, they will learn about major organ systems in a manner that connects with discussions of the genome, and concepts of physiology and evolution, as well as health and well-being. After discussions on the importance of diet and nutrition, an overview of communicable and non-communicable diseases will be provided. Coverage of diseases will be accompanied by methods of preventive care, diagnosis, the biology behind administering medication and treatments, and the role of pharmaceutical companies. Given the age group, concerns of reproductive health, mental health, substance abuse, and addiction will be explored. Students will be made aware of many careers related to human health. They will also explore the connection between individual health and planetary health, and why one must view health from a community perspective rather than just an individual one.

10.2.2 Chemistry

This is an illustration for Chemistry.

10.2.2.1 Principles for Designing Courses in Chemistry

The aim of teaching Chemistry is to progressively build a clear framework that gives a coherent overview of the subject, explain why it matters, and shows how different areas of content are connected.

The courses for Chemistry must be designed keeping the following in mind:

a. Students will be equipped with tools to begin understanding how chemistry works rather than knowledge of the facts of Chemistry.

b. They will develop the necessary conceptual foundations and, at the same time, develop an overview that is a sufficiently broad introduction to the discipline.

c. They will be able to understand and represent chemical phenomena at three levels — macroscopic, molecular, and symbolic — to identify patterns and form connections that underlie all chemical phenomena.

d. They will recognise that chemists are uniquely qualified to contribute meaningfully to frontier research areas related to climate change, environmental issues, materials science, biology, and medicine.

At this level, students must deal with content at an appropriate level of rigour to build a certain amount of comfort with using all three levels of representation to enable the transition from facts enumerated through rote learning in a fragmented way to connecting phenomena at the molecular scale to those at the astronomical scale. Curriculum content must ensure that students have, and recognise they have, appropriate intellectual resources and know how to connect these resources as they construct and revise explanations or predictions.

10.2.2.2 Illustrative Content Areas in Chemistry

Given below are illustrative content areas for Chemistry in Grades 11 and 12.

Content Area 1: Structure, Bonding, and Properties in Chemistry

Through this content area, students will develop a perspective that sees the universe as a collection of fundamental particles and their combinations. It will lead them to the realisation that properties of materials, compounds, and molecules of life are all consequences of the fundamental principles that Chemistry establishes. The interconnectedness of structure to bonding patterns, and thereby their influence on observable properties, will be elucidated, and the connections will be explicitly made. As concepts are accumulated, the connections to the real world will become progressively more comprehensive. This model fundamentally removes the inherent abstraction in Chemistry via observations of the wonders of Science that the student can see, smell, hear, taste, and touch. This area will cover the structure of the atom and its electronic distributions, the classification of elements in the Periodic Table, and their periodic properties. Building on these principles, the combination of elements to form compounds, the nature of these bonds, and molecular geometry will be detailed. To illustrate, principles of structure, and bonding hydrocarbons and their functional groups will be introduced alongside their variations in connectivity and spatial arrangement via isomerism, and the structure-property relationships in transition metal complexes will be included.

Content Area 2: Principles of Reactivity

Through this content area, students will focus on the study of chemical systems; how and why the reactions occur, drawing upon the properties of elements, bonding, and structure learn previously. They will focus on the application of sub-microscopic models of matter and structure-property relationships to explain, predict, and control chemical behaviour. Students will be introduced to concepts regarding chemical thermodynamics, acid-base equilibria, and chemical kinetics from the perspective of the transformation of matter, and the underlying principles that govern the reactivity of chemical substances. Reactions of organic and inorganic compounds will be used to illustrate the concepts of enthalpy, free energy, equilibrium, and kinetics of reactions.

Students will explore patterns of reactivity in organic and inorganic systems, functional group chemistry, kinetics, mechanisms, and catalysis. They will initiate the systematic study of the common classes of organic compounds, emphasising theories of structure and reactivity. Students will consider and measure the energies and rates of the chemical reactions and predict the products. Through this content area, students will be able to connect observations of chemical reactivity at the macroscopic level with the changes at the molecular level, and use principles studied to predict reactions and use these reactions to make modifications to small molecules.

Content Area 3: Modern Applications of Chemistry

It is essential to provide students with meaningful contexts in their life and provide a 'big picture' of Chemistry. Through this content area, students will have the space to integrate the essential concepts with applications of Chemistry, thereby enabling them to realise the interrelatedness of Chemistry, Society, and Technology. They will explore synthetic approaches, analytical methods, and structure-property relationships of some vital chemicals needed or used in our daily lives, in addition to the analysis of their impact on the environment. This includes natural substances such as biological macromolecules as well as anthropogenic chemicals such as drugs, food substances, colourants, and cosmetics. It also includes a structural understanding of inorganic and hybrid materials. Students will examine classification, preparation methods, applications, and the environmental concerns of polymers, and gain insight and information on fuels and energy and the contribution of Chemistry to sustainable energy technologies. Finally, students will focus on the structure and behaviour of chemical compounds contributing to the biomedical and agricultural fields, and the application of fundamental chemical principles to industrial manufacturing processes.

10.2.3 Physics

This is an illustration for Physics.

10.2.3.1 Principles for Designing Courses in Physics

The aim of teaching Physics is to enable students to explore the methods of Physics, and how theories are built and tested. They are intended to help students engage with the empirical nature of Physics, as well as how these theories help explain phenomenon around them.

The courses for Physics must be designed keeping the following in mind:

a. Students will develop the ability to formulate scientific questions about their observations of and experiences in the real world.
b. They will be able to make connections between their experiences and observations to what is transacted in the classroom and laboratory.
c. They will develop the ability to represent real-world phenomena in mathematical terms.
d. They will develop the ability to test laws and theories of Physics through observation and experimentation.

An interdisciplinary approach, integrating Mathematics, Biology, and Chemistry must be taken. Content from Mathematics, such as calculus, vector analysis, and trigonometry must be included, as and when necessary.

10.2.3.2 Illustrative Content Areas

Given below are illustrative content areas for Physics in Grades 11 and 12.

Content Area 1: Mechanics

Through this content area, students will focus on the essential concepts related to motion in one and two dimensions, force and mechanical work, various forms of energy, and the conservation of energy illustrated through various examples. Differential calculus will be taught as part of the unit on motion. Some notions of energy and length scales in matter will be discussed through examples in everyday life, thus introducing students briefly to some of the modern ideas in condensed matter and biological physics. Applications of these concepts to other disciplines will be emphasised through various examples. Here, the focus will be on giving a hands-on experience and relating this to the phenomena in everyday life.

Content Area 2: Electricity and Magnetism

Through this content area, students will get a broad overview of the main phenomena, including the historically significant experiments starting from Gilbert's work on static electricity and properties of magnets to Hertz's experiment confirming the existence of electromagnetic waves. Related theoretical ideas will also be covered, along with familiarising students with basic experimental techniques and relevant foundational mathematical concepts. For example, students will learn the techniques of basic integral calculus that are needed for understanding and applying Gauss' Law and Ampere's Law. This content will help students appreciate the links between all the above aspects and understand certain everyday natural phenomena and technologies from the lens of physical principles.

Content Area 3: Waves and Optics

Through this content area, students will build on ideas related to Mechanics, and Electricity and Magnetism. This will involve building a connection between various topics in Physics and also a bit of repetition of those topics, which will help students assimilate and appreciate various phenomena. Topics include the pendulum and spring-mass system as simple harmonic oscillators, basic acoustics, the Doppler effect, ray optics and optical instruments, and finally ideas in wave optics keeping in mind interference and diffraction.

Content Area 4: Thermodynamics and Properties of Matter

Through this content area, students will engage with coherent and integrated handling of thermodynamics, properties of materials, and essential topics, such as collection of particles, basic gas laws (such as the law of Avogadro), energy and energy transfer and radiation as a mode of energy transfer. They will learn about hydrostatics, motion of fluids, ideal gas laws, laws of thermodynamics, phase changes, modes of heat and energy transfer including blackbody radiation, and the photoelectric effect.

Section 10.3
Mathematics and Computational Thinking

Mathematics and Computational Thinking will illustratively offer Core Mathematics, Business Mathematics, Advanced Mathematics, and Computer Science.

10.3.1 Core Mathematics

This is an illustration for Core Mathematics.

10.3.1.1 Principles for Designing Courses in Core Mathematics

The aim of teaching Core Mathematics is to develop the capacity of students to think logically and analytically, and at the same time, discover their own strengths and interests in the discipline.

The courses for Core Mathematics must be designed keeping the following in mind:

a. Students will engage in mathematical processes, such as reasoning, modelling, visualisation, problem solving, and formal communication while engaging with the content areas of Mathematics such as algebra and geometry.

b. They will develop an appreciation of the structure of Mathematics as a discipline, making connections between areas of Mathematics as well as with other disciplines of study.

c. They will be introduced to powerful ideas of Mathematics, such as infinite sums, limits, and probability, towards developing a deeper understanding of Mathematics as a discipline.

d. They will develop a healthy predisposition to formal problem-solving as an opportunity to promote self-learning and reflection, as well as the application of concept learning.

Students must be exposed to a structure that places importance on problem solving through building concepts, skills, processes, and metacognition. They should progress in the content areas of number systems, algebra, geometry, and trigonometry, and engage with coordinate geometry, calculus, and probability and statistics. New representations help students make connections between algebra and geometry; they must also get opportunities for modelling.

10.3.1.2 Illustrative Content Areas

Given below are illustrative content areas for Core Mathematics in Grades 11 and 12.

Content Area 1: Mathematical Foundations

Through this content area, students will strengthen their capacity for mathematical reasoning and be able to understand the need for proof as well as what constitutes proof. A powerful proof technique, the principle of mathematical induction, is introduced. Students learn the language of sets, functions, and relations. They engage with a range of functions that students may have already encountered (in algebra, geometry) and with newer functions (trigonometry) to understand the domain and range in each case.

Content Area 2: Algebra and Geometry

Students learn to go back and forth between geometric objects on the plane, and their algebraic expressions. Linear equations and their solutions are related to their geometric visualisation.

Their representation by matrices provides a powerful tool for computation and helps the transition to three dimensions. Geometric objects, such as parabolas, ellipses, circles, and hyperbolas, are studied as loci of points in motion.

Content Area 3: Calculus

An informal understanding of the notion of limit leads to a similar notion of continuity, which is adequate to understand the Mathematics of motion and rate of change. Students learn the gradient of a curve at a point and the notion of a second derivative, with its application to maxima minima problems. Integration is understood as the reverse process of differentiation. Students learn to evaluate definite integrals and use this to compute the area of a region bounded by a curve and lines parallel to the axes.

Content Area 4: Probability and Statistics

Students learn to select between ways of representing raw data (and explain why). They learn to use measures of central tendency and variation and use these to compare two sets of data. They learn permutations and combinations and use them in calculating probabilities of events. The notion of sample space is introduced, and students learn to set up one. The basic laws of probability, independence of events, and conditional probability are learnt.

Section 10.4
Art Education

The Art Education Curricular Area will, illustratively, offer Indian Classical Music, Folk Music, Contemporary Music, Theatre, Puppetry, Sculpture, Fine Arts, Folk Painting, Graphic Design, Motion Pictures, Photography, and Textile Designing.

Art Education aims to help students achieve more depth in a chosen art form, while also providing flexibility to explore related areas of study. Content should be based on the art and culture of their region, and by considering the resources and infrastructure that can be set in place for these programmes to operate efficiently.

Students who choose Art Education as one of their areas of study will need to decide which of the two categories they would like to specialise in — Art Practice or Art Appreciation and Management. Within these categories, they will choose a form — Visual Arts, Theatre, Music, or Dance and Movement. Based on this choice, students must engage largely with content in the chosen category, with some engagement with content from the other. For example, if a student chooses Art Practice, they will focus on content related to this category and also study some content in Art Appreciation and Management. This is to ensure that the student gains breadth in both Art Appreciation and Management and Art Practice while allowing them to go deeper in one of the categories.

10.4.1 Art Practice

This is an illustration for the category of Art Practice.

10.4.1.1 Principles for Designing Courses in Art Practice

The aim of Art Practice in Secondary Stage is to develop capacities in a specific art form and refine students' aesthetic sensibilities. They will learn the structure of the form, develop an appreciation for it, and be able to creatively express themselves through it.

The courses for Art Practice must be designed keeping the following in mind:

a. Students will engage in embodied and experiential learning through the making, thinking, and appreciation processes.

b. They will undergo rigorous practice in a chosen form.

c. They will be able to link practice to theory, art history, and contemporary issues relevant to each art form.

10.4.1.2 Illustrative Content Areas

The table below contains an illustrative set of areas for study in Art Practice.

Table 10.4i

Areas for Study in Art Practice				
	Visual Arts	**Theatre**	**Music**	**Dance and Movement**
1	Drawing	Theatre for Social Change	Indian Classical Vocal	Indian Classical Dance
2	Painting	Introduction to Acting	Indian Classical Instrumental	Indian Folk Dance
3	Sculpture and Ceramics	Theatre in Education	Indian Folk Music	Yoga and Indian Martial Arts
4	Textile Arts and Design	Participatory Theatre	Indian Light-classical and Film Music	Contemporary Dance and Movement
5	Indian Decorative Arts and Crafts Traditions	Indian Folk Theatre	Orchestra, bands, and ensembles	Costume and Stage design for Dance and Movement
6	Photography	Indian Classical Theatre	Recording, Editing, and Production	Dance and Movement choreography
7	Graphic design and New Media	Theatre Design and Stagecraft	Song writing	Dance for physical fitness and wellbeing
8	Film, Video, Animation	Scriptwriting for Theatre	Music and New Media	Dance Drama

The table below illustrates content areas for Visual Arts in the category of Art Practice.

Table 10.4ii

Content Areas for Visual Arts		
Category	**Content Areas**	**Other Related Content Areas**
Art Practice	Drawing	Indian Decorative Art and Crafts Traditions Theatre Design and Stagecraft, Film, Video, Animation, Portfolio Development
Art Practice	Sculpture	
Art Appreciation and Management	Visual Arts in India (Past to Contemporary)	
Art Practice (Elective)	Textile Arts and Design	

Content Area 1: Drawing

Drawing serves as a foundation for a wide range of creative disciplines - painting, sculpture, architecture, visual communication, engineering, or fashion design. The ability to draw well contributes to developing effective communication skills. Through this content area, students will learn key skills and techniques across artistic mediums and applications.

Content Area 2: Sculpture

Through this content area, students will learn to develop their own artistic ideas and expression by creating sculptural objects. They will learn to refine their skills and techniques in any medium of their choice (clay, wood, fabric, mixed media) through rigorous practice.

Content Area 3: Visual Arts in India (Past to Contemporary)

Through this content area, students will be introduced to the history of Indian Art through selective examples from pre-history to contemporary times. Every example will provide students with an opportunity to study the aesthetic qualities of the artwork, as well as understand the social and cultural context of artists through history. Students will also have space to explore archives and find artwork or artefacts of importance on their own. They will learn to interpret artworks, develop perspective, and appreciate diverse artistic expressions.

Content Area 4: Textile Arts and Design

Through this content area, students will be introduced to the world of textiles, and their diverse forms and functions in our lives. Students can experiment with various materials, fibres, and fabrics, understand their properties of colour, texture, insulation, opacity, and longevity, and explore their applications in multiple contexts (clothing, sports gear, safety gear, interior design, and architecture, as a medium for artistic expression). Based on the local traditions, students could be introduced to techniques of embroidery, knitting, weaving, applique, textile dyeing, and quilting.

10.4.2 Art Appreciation and Management

This is an illustration for Art Appreciation and Management.

10.4.2.1 Principles for Designing Courses in Art Appreciation and Management

The aim of teaching Art Appreciation and Management is to develop among students the capacity for appreciation of the Arts through engaging with theoretical, historical, and contemporary perspectives. They will also develop an understanding of managing art exhibits (conservation, curation, and event management in the Arts).

The courses for Art Appreciation and Management must be designed keeping the following in mind:

a. Students will acquire knowledge of art history and aesthetics.

b. They will refine their skills of interpretation, writing, documentation, community engagement, and organisation.

c. They will develop a meaningful appreciation for the Arts.

10.4.2.2 Illustrative Content Areas

An illustrative set of areas for study in Art Appreciation and Management is given in the table below:

Table 10.4iii

Areas for Study in Art Appreciation and Management				
	Visual Arts	**Theatre**	**Music**	**Dance and Movement**
1	Visual Art in India (Past to Contemporary)	Indian Classical Theatre and its Theories	Indian Classical Music Theory	Indian Classical Dance and its Theories
2	Visual Art from around the World (Past to contemporary)	Theatre traditions from around the world	Musical traditions from around the world	Classical Dance traditions from around the World
3	Crafts traditions from India and the World	Indian Folk Theatre	Folk Music Traditions from India and the World	Folk Dance and Movement Traditions from India and the World
4	History of Visual Design and Communication	Theories of Acting	Study of Indian Musical Instruments	History and Traditions of Yoga and Indian Martial Arts
	Common to all forms			
5	Indian Aesthetics and *Rasa* Theory			
6	Museums and Archives (Conservation and Documentation)			
7	Curation and Event Management in the Arts			
8	Portfolio Development (Particularly for students who wish to apply for higher education in the Arts)			

The table below illustrates content areas for Music in the category of Art Appreciation and Management.

Table 10.4iv

Content Areas for Art Appreciation and Management in Music		
Category	**Content Areas**	**Other Related Content Areas**
Art Appreciation and Management	Museums and Archives	Indian Aesthetics and *Rasa* Theory Curation and Art Event Management
Art Appreciation and Management	Indian Classical Music Theory	
Art Practice	Indian Folk Music	
Art Appreciation and Management (Elective)	Portfolio Development	

Content Area 1: Museums and Archives

Through this content area, students will be introduced to the importance of museums and archives in preserving and promoting art and culture. Students will study museum collections and their resources through visits to local museums as well as online resources of museums across India and the world. Students will also learn about the various processes of maintenance, conservation, research, and outreach programmes that museums undertake. Students will be required to work on their own projects to design, visualise, and present a select collection of artefacts, objects, or documents in a museum.

Content Area 2: Indian Classical Music Theory

Through this content area, students will be introduced to the philosophy, canons, and compositional structure that characterise different aspects of Indian music. Students will learn about different *srutis* and scales, frequencies of notes, arrangements of notes in *raagas*, emotions and *rasas* evoked through *raagas, taal* patterns, their styles, and combinations, as well as important composers, music theorists, and developments that have occurred in Indian Classical Music through history.

Content Area 3: Indian Folk Music

Through this content area, students will be introduced to the practice of folk genres from different parts of India. Students will explore and practise different styles of folk music to develop an understanding of musical styles, themes, instruments, and performance techniques that are used in folk music.

Content Area 4: Portfolio Development

Through this content area, students will be introduced to the concept, design, and development of portfolios for the purpose of external viewership. Students will be exposed to various samples of portfolios to analyse their design, structure, content, and effectiveness in representing an artist's work. Through such exercises, they will be guided to conceptualise their own portfolio, make selections from their existing portfolios, and create new works to strengthen them. They will write about their own motivations and ideas for their artworks and develop a visual consolidation and presentation of the portfolio.

Section 10.5
Vocational Education

The Vocational Education Curricular Area will offer subjects to be aligned to the National Skills Qualifications Framework NSQF, within the three forms of work. Illustratively, the Curricular Area will offer Agriculture, Gardening, Automotive, Automobile Servicing, Machining, Electronics, Community Health, Accounting Services, Data Entry and Management, Banking Services, Retail Services, and Textile and Garments.

10.5.1.1 Principles for Designing Courses in Vocational Education

The aim of Vocational Education is to enable students to acquire the necessary understanding and skills related to a specific job role. They will be equipped to take up a job after leaving school if they so wish. With this in mind, the courses will be aligned with Levels 3 and 4 of the NSQF or higher. It must be noted that NSQF is a 'outcomes based' framework and the levels are not tied to years of study.

The courses for Vocational Education must be designed keeping the following in mind:

a. Students will acquire the necessary knowledge to perform routine jobs of their choice.
b. They will demonstrate necessary skills and follow routine processes based on an understanding of appropriate rules and equipment.
c. They will acquire the vocabulary of their chosen vocation.
d. They will acquire a basic understanding of the social, political, and natural environment the vocation is located in.

Schools will offer courses in at least one vocation in the three forms of work - Engaging with Life and Nature, Engaging with Machines and Materials, and Engaging with Human Beings.

Students will engage with actual practice; as far as possible, this will be enabled within schools through setting up appropriate workshops with available resources. In addition, students will undergo internships as well as an apprenticeship in their chosen vocation. These will enable students to experience working under supervision and develop an understanding of the workplace and its place in the larger world. The combined time spent on internship and apprenticeship should be at least 40% of the total time allotted for this Curricular Area.

Box 10.5i

It is important to note that, in this NCF, 'apprenticeship' is used as an essential pedagogical approach to gain 'know-how' knowledge, while the students are in school. This must not be seen from the lens of the Apprentice Act, 1961. See Part C, Chapter 9,.

10.5.1.2 Illustrative Content Areas

Below is a list of illustrative areas of study — one area has been elaborated for each of the forms below in this table.

Table 10.5i

Work with Life Forms	Work with Machines and Materials	Work in Human Services
Dairy Farming • Introduction to Dairy Farming • Maintaining Healthy Performance of Livestock • Workplace Culture and Practices • Apprenticeship	**Agricultural Machine Operation** • Introduction to Agricultural Machines • New Technology and the Future of Agricultural Machinery • Workplace Culture and Practices • Apprenticeship	**Frontline Health Worker** • Introduction to Community Health and Public Health • Roles and Responsibilities of Frontline Health Workers • Workplace Culture and Practices • Apprenticeship
Sericulture • Introduction to Sericulture • Production of Silk from Young Age and Old Age Silkworms • Workplace Culture and Practices • Apprenticeship	**Irrigation Service Technician** • Introduction to Irrigation • Operation and Maintenance of Irrigation Systems • Workplace Culture and Practices • Apprenticeship	**Vision Technician** • Basic Introduction to Ophthalmology • Making Optical Prescriptions • Workplace Culture and Practices • Apprenticeship
Small Poultry Farming • Introduction to Small Poultry Farming • Rearing and Maintaining Poultry Birds • Workplace Culture and Practices • Apprenticeship	**Plumber (General)** • Basic sanitary fittings and fixtures — Installation and Repair • Advanced sanitary fittings and fixtures — Installation and Repair • Workplace culture and Processes • Apprenticeship	**Heritage Tour Guide** • Role and Relevance of a Heritage Tour Guide • Managing Different Kinds of Heritage Tours • Workplace Culture and Practices • Apprenticeship
Soil and Water Testing Lab Assistant for Agriculture • Introduction to Soil and Water Testing • Managing Plant Nutrients • Workplace Culture and Practices • Apprenticeship	**Hi-tech technical services** • Kinds of equipment and uses [e.g., drones, computing part of machines, mobile communication infrastructure] • Basic design and diagnosis • Physical and computing solutions • Escalation and remote support • Workplace Culture and Practices • Apprenticeship	**Beauty Therapist** • Introduction to Beauty & Wellness Industry and Beauty Therapy • Basics of Different Kinds of Beauty Services • Workplace Culture and Practices • Apprenticeship
Gardening • Managing Gardens and Nurseries • Landscaping and ornamentation • Workplace Culture and Practices • Apprenticeship	**Field Technician — Washing Machine/ Air Conditioning/ Refrigerator** • Basic Electricity and Electronics • Repair and Maintenance of Washing Machine/ Air Conditioner/ Refrigerator • Workplace Culture and Practices • Apprenticeship	**Yoga Instructor** • Philosophy and Practice of Yoga • Yoga and the Human Body • Workplace Culture and Practices • Apprenticeship

Floriculture • Fundamentals of floriculture, nursery, and seed production • Simple and tongue layering, ground layering, air layering or Gootee • Workplace Culture and Practices • Apprenticeship	**Auto Service Technician** • Introduction to Engineering Geometrics and Drawing • Serviceability, maintenance, replacement or repair of Engine Components • Workplace Culture and Practices • Apprenticeship	**Hair Stylist** • Introduction to Hair Care • Basics of hair styling • Workplace Culture and Practices • Apprenticeship
Mushroom Cultivation • Medicinal and nutritional value of different types of mushrooms • Mushroom cultivation and the economic benefits of growing mushrooms • Workplace Culture and Practices • Apprenticeship	**Baking** • Baking Bread, Pastries, Cakes, Chocolates, and Desserts • Quality and Marketing • Workplace Culture and Practices • Apprenticeship	**Dietician** • Food habits, discipline, and a balanced diet • Food chart for pregnant women, kids, adults, anti-ageing food habits, healthy food habits for women • Workplace Culture and Practices • Apprenticeship
Sheep / Goat Farming • Different Varieties of Sheep/ Goat and Seasonality in Sheep/Goat Farming • Developing a business model, availing government support • Workplace Culture and Practices • Apprenticeship	**Jam, Jelly and Ketchup Processing** • Fruit and Vegetable Processing • Quality and Marketing • Workplace Culture and Practices • Apprenticeship	**Home Health Aide** • Clinical skills essential in providing basic healthcare services • Infection control, hygiene, safety, usage of protective devices • Workplace Culture and Practices • Apprenticeship

Schools should offer areas of study that respond to multiple considerations weighed adequately, for example, aspirations of students, school's ability to transact the curriculum, local needs, future needs of society.

Also, it is important for school education to have the widest possible range of such offerings, and not be restricted by any constraint or restraint. For example, areas of work, where actual employment is governed by any licensure requirements, does not imply that that area of work cannot be studied in schools — only that the school study should be integrated within the licensure requirements, or that the student will have to fulfil the licensure conditions after graduating from school in order to be eligible for employment. Equally, since the NSQF levels are not tied to years of study, it should be possible to prepare students for higher NSQF levels, if required by the licensure requirements.

Work with Life Forms — Gardening

This is an illustration for Work with Life Forms.

Given below are illustrative content areas for Gardening in Grades 11 and 12.

Content Area 1: Managing Gardens and Nurseries

Students will be introduced to the care and maintenance of gardens and nurseries. Gardens will include small home gardens and pot gardening. Nurseries will include those at both, small and

large scale. Students will learn to grow and maintain plants grown in the region, from the preparation of pots/soil to nutrition and irrigation. They will identify and correctly use the appropriate tools and equipment. They will also understand the marketing of plants, including flowers.

Content Area 2: Landscaping and Ornamentation

Students will learn to visualise small and large spaces as aesthetically pleasing gardens. They will learn how to identify ornamental plants suitable for the climate in the region, where to source them, and how to grow them. They will learn how to establish and maintain lawns, ranging in size from a small patch to a large park. Students will also be able to identify and place elements (e.g., bird baths, garden furniture, wind chimes, stones/rocks, arches, waterfall, ornamental pots, trellises, follies) that help make a garden functional and attractive.

Content Area 3: Workplace Culture and Practices

Students will engage with the culture of the workplace as well as practices specific to the nature of the vocation they have chosen. This will be enabled through on-site exposure, videos, and discussions in the classroom. On-site exposure will be through internships at relevant different facilities, where students will get a chance to observe and interact with persons working there. They will also be required to view videos of different kinds of facilities (e.g., practices related to the maintenance of large parks, ornamental gardens, gardens in heritage monuments). Discussions will help them consolidate their observations and draw general principles of work. This will be conducted jointly by the Teacher and Resource Persons.

Apprenticeship

Students will work as part-time apprentices in an actual place of work — this will be one of the facilities in which they were placed as interns. This will enable them to have an on-site work experience and understand the different factors involved in actually doing a job. It will help them become aware of the culture and language of work and the factors affecting its functioning. Students will gain experiential skills and knowledge of the work under the supervision of a Mentor. The Mentors will be identified persons already working in the chosen facility, with sufficient work expertise, who will undergo a short course to prepare them to work with students. Students will also be required to maintain a portfolio containing products they have created or processes they have followed.

Work with Machines and Materials — Jam, Jelly, and Ketchup Processing Technician

This is an illustration for Work with Machines and Materials.

Given below are illustrative content areas for a Jam, Jelly, and Ketchup Processing Technician in Grades 11 and 12.

Content Area 1: Fruit and vegetable processing

Students will be introduced to the possibilities and processes of fruit and vegetable processing, as well as the science that underlies it. They will learn different techniques to prepare jams, jellies, and ketchup. They will be given a basic introduction to food microbiology so that they understand how food is preserved and what causes it to spoil. They will learn how to prepare, clean, and maintain materials as well as work areas for processing.

Content Area 2: Quality and Marketing

Students will gain an understanding of food quality and sanitation laws for processed food products. They will learn how to correctly package jams, jellies, and ketchups and maintain necessary documents and records. Students will also understand concepts related to occupational health and hygiene, and basic first aid in case of accidents. They will learn about appropriate pricing, and also about channels through which processed fruit and vegetables can be sold for different target groups.

Content Area 3: Workplace Culture and Practices

Students will engage with the culture of the workplace as well as practices specific to the nature of the vocation they have chosen. This will be enabled through on-site exposure, videos, and discussions in the classroom. On-site exposure will be through internships at relevant different facilities, where students will get a chance to observe and interact with persons working there. They will also be required to view videos of different kinds of facilities (e.g., they can view processes in large, automated facilities, and small businesses run from home). Discussions will help them consolidate their observations and draw general principles of work. The Teacher and Resource Persons will jointly conduct this.

Apprenticeship

Students will serve as part-time apprentices in an actual place of work — this will be one of the facilities in which they were placed as interns. This will enable them to have an on-site work experience and understand the different factors involved in actually doing a job. It will help them become aware of the culture and language of work, and the factors affecting its functioning. Students will gain experiential skills and knowledge of the work under the supervision of a Mentor. The Mentors will be identified persons already working in the chosen facility, with sufficient work expertise, who will undergo a short course to prepare them to work with students. Students will also be required to maintain a portfolio containing products they have created or processes they have followed.

Work in Human Services — Tour Guide

This is an illustration for Work in Human Services.

Given below are illustrative content areas for Tour Guide in Grades 11 and 12.

Content Area 1: Role and Relevance of a Tour Guide

Students will be introduced to the tourism industry and its importance for individuals and the local economy. They will understand the context in which the tourism industry operates and its potential as a vocation. They will also understand the job role of tour guides and their place/role in the tourism industry.

Content Area 2: Managing Different Kinds of Tours

Students will engage with a variety of tours in which the tour guide plays an important role, e.g., pilgrimages, wellness and medical tours, tours for leisure and recreation, gastronomy tours, cultural tours, and tours for sporting events. While understanding the specific requirements for each of the different kinds of tours, they will be encouraged to draw general principles related to communication with clients and colleagues, gender - and age-sensitive practices, health and hygiene, safety practices, etiquette, and hospitable conduct.

Content Area 3: Workplace Culture and Practices

Students will engage with the culture of the workplace as well as practices specific to the nature of the vocation they have chosen. This will be enabled through on-site exposure, videos, and discussions in the classroom. On-site exposure will be through internships at relevant different facilities, where students will get a chance to observe and interact with persons working there. They will also be required to view videos of different kinds of facilities (e.g., they can watch a city tour, a heritage tour, or a tour on a train visiting different places). Discussions will help them consolidate their observations and draw general principles of work. The Teacher and Resource Persons will jointly conduct these.

Apprenticeship

Students will serve as part-time apprentices in an actual place of work — this will be one of the facilities in which they were placed as interns. This will enable them to have an on-site work experience and understand the different factors involved in actually doing a job. It will help them become aware of the culture and language of work, and the factors affecting its functioning. Students will gain experiential skills and knowledge of the work under the supervision of a Mentor. The Mentors will be identified persons already working in the chosen facility, with sufficient work expertise, who will undergo a short course to prepare them to work with students. Students will also be required to maintain a portfolio containing products they have created or processes they have followed.

Section 10.6
Physical Education and Well-being

In Grades 11 and 12 of the Secondary Stage, the NCF caters to three broad categories of students, who may wish to pursue Physical Education and Well-being in different forms after completing school:

a. Students who want to continue sports and physical activity for recreational purposes. Such students can also be nodal persons for physical educational knowledge for a community. This group can take up **Physical Education for Community Wellness.** Illustratively, courses that could be offered in this category include Yoga and Lifestyle.

b. Students who are interested in taking up sports-based vocational opportunities in growing areas, such as sports education and fitness industry, sports management, sports analytics, sports psychology, or even allied medical fields, such as sports physiotherapy. This category can take up **Physical Education as a Vocation.** Illustratively, courses that could be offered in this category include Physical Education for Children with Disabilities.

c. Students who are interested in taking up playing sports professionally or are interested in allied fields of professional sports. These are students who have already achieved some proficiency in a particular sport, game, or practice (yoga or Tai chi). Such students will have the option to pursue it further, develop advanced skills, and compete at the highest level. This category can take up **Physical Education for a Professional Sportsperson.** Illustratively, courses that could be offered in this category include Sports and Nutrition and Biomechanics and Sports.

10.6.1 Physical Education for Community Wellness

This is an illustration of Physical Education for Community Wellness.

10.6.1.1 Principles for Designing Courses for Physical Education for Community Wellness

The aim of teaching Physical Education for Community Wellness is to prepare students to continue their interest in sports and physical activity from a recreational and wellness point of view. Students will build their capacities to contribute to community wellness through enabling community events related to sports and physical activities.

The courses for Physical Education for Community Wellness must be designed keeping the following in mind:

a. Students will build a foundation for understanding the different aspects of sports and physical activities as well as wellness.
b. They will be introduced to the domain of community wellness.
c. They will be prepared to engage with members of the community in the capacity of a coach and manager.

10.6.1.2 Illustrative Content Areas

Given below are illustrations of content areas Physical Education for Community Wellness.

Content Area 1: Sports and Fitness — An Introduction

Through this content area, students will be introduced to basic human anatomy and physiology and its connection with physical activity and fitness. In addition, aspects of nutrition, injury prevention, and basic first aid will also be included.

Content Area 2: Community Coaching (for a chosen sport)

Through this content area, students will be prepared to develop capacities for engaging in team sports for community development. Basic coaching skills relevant to the sport and the interconnection between developing life skills through team sports will be the focus.

Content Area 3: Sports and Fitness Advanced Basics

Through this content area, students will be introduced to the practices required for strength and conditioning training. Maintaining strength, endurance, and flexibility is necessary for any sports or physical activity. Students will get an understanding of how to develop these capacities in other persons, including the use of practices like yoga for developing strength and flexibility.

Content Area 4: Sports Management (basic)

Through this content area, students will be introduced to different aspects of managing teams for participating in sporting events. These sporting events are often important aspects of building a community around sports. Students will engage with team management, event management, resource management (sourcing and maintaining equipment and playing areas), and some aspects of sports promotion — sponsorships, endorsements, and so on.

10.6.2 Physical Education as a Vocation

This is an illustration for Physical Education as a Vocation.

10.6.2.1 Principles for Designing Courses for Physical Education as a Vocation

The aim of teaching Physical Education as a Vocation is to develop capacities and skills to be able to work in vocations based on sports and fitness. Students will be introduced to various options available in sports, fitness, and wellness domain.

The courses must be designed based on the following principles..

a. Students will acquire a holistic view of sports, fitness, and wellness practices.

b. They will develop an understanding of the physiological, nutritional, socio-emotional and ethical aspects of sports, fitness, and wellness.

c. They will develop capacities in at least one form of vocation connected to sports, fitness, and wellness.

Since there are multiple growing areas in this domain, a specific focus could be offered within a content area.

10.6.2.2 Illustrative Content Areas

Given below are illustrations of content areas for Physical Education as a Vocation.

Content Area 1: History of Sports and Wellness in India and the World

Through this content area, students will be introduced to the rich heritage of practices related to sports, fitness, and wellness in the Indian subcontinent. It will also give an overview of how these practices have travelled to other countries. Students will be introduced to a few key systems of fitness and wellness practices across the globe, along with sports that originated in India and in different parts of the world.

Content Area 2: Sports and Fitness Advanced Basics

Through this content area, students will go deeper into the practices required for strength and conditioning training. Maintaining strength, endurance, and flexibility is necessary for any sports or physical activity. Emphasis will be on giving students an understanding of how to develop these capacities in others. Students will also engage with the use of practices like yoga for developing strength and flexibility. They will also be introduced to malpractices and the problem of doping in sports.

Content Area 3: Focus on a specific aspect

Through this content area, students will focus on one of the following.

a. *Introduction to sports coaching (in a particular sport)*

   i. Safeguarding in sports

   ii. Strength and conditioning

   iii. Teaching skills

   iv. Strategy and tactics in sports

b. *Introduction to sports officiating (in a particular sport)*
    i. Rules and regulations of sport
    ii. Sport officiating guidelines
c. *Introduction to sports education*
    i. Safeguarding in sports
    ii. Strength and conditioning
    iii. Teaching skills
    iv. Teaching life skills through sports
d. *Introduction to sports physiotherapy*
    i. Human anatomy and physiology
    ii. Sports injuries — prevention and management
e. *Introduction to sports management*
    i. Operations and planning in event management
    ii. Marketing, sponsorships, endorsements, and publicity
    iii. Finances and accounting in events
    iv. Team management
    v. Athlete management
    vi. Ethics in sports
f. *Introduction to sports analytics and statistics*
    i. Strategy and tactics in sports
    ii. Basic python programming
    iii. Using sports data for strategy
g. *Introduction to sports photography and videography*
    i. Introduction to equipment and maintenance
    ii. Basics of photography
    iii. Action photography
h. *Introduction to sports media and journalism*
    i. History of sports media and journalism
    ii. Journalism — Ethics and norms

10.6.3 Physical Education for a Professional Sportsperson

This is an illustration for Physical Education for a Professional Sportsperson.

10.6.3.1 Principles for Designing Courses for Physical Education for a Professional Sportsperson

The aim of teaching Physical Education for a Professional Sportsperson is to strengthen the capacities and skills in students towards pursuing sports and physical activities at a professional

level. The assumption is that many of these students will already be undergoing coaching in their respective choice of sport and these courses will aid their development.

The courses must be designed keeping the following principles in mind:

a. Students will engage with important aspects of the anatomy and physiology of the human body.
b. They will develop skills to build their endurance, strength, and flexibility through different systems.
c. They will learn and apply techniques and strategies in a specific sport.

Students must be offered specific content aligned to the specific sport or activity they have chosen to specialise in.

10.6.3.2 Illustrative Content Areas

Given below are illustrative content areas for Physical Education for a Professional Sportsperson.

Since practice is a particularly important component of this area of study, half the time should be allotted to individual practice and training.

Content Area 1: Sports and Fitness Advanced Basics

Through this content area, students will engage with the practices required for strength and conditioning training. Maintaining strength, endurance, and flexibility is necessary for any sports or physical activity. Students will get an understanding of how to develop these capacities and also use practices like yoga for developing strength and flexibility. Students will also be introduced to malpractices and the problem of doping in sports.

Content Area 2: Focus on a specific aspect

Through this content area, students will focus on a specific sport or physical activity that may be aligned with the sport they intend to pursue professionally or that is of deep interest to them. They will also be supported in building their individual capacity for playing sports. The focus areas could be:

Focus on specific sport/physical activity

a. Basic skills and techniques in sport (in a particular sport)
b. Tactics and strategy in sport (in a particular sport)
c. Basics of Pilates
d. Basics of Tai-chi

Individual

a. *Pranayama* and understanding yoga sutras
b. Endurance and cardiovascular training (in a particular sport)
c. Advanced strength and conditioning

Section 10.7
Interdisciplinary Areas

The Interdisciplinary Areas Curricular Area will, illustratively, offer Business Studies, Accounting, Sustainability and Climate Change (Environmental Education), Media and Journalism, Family and Community Sciences (the current form of Home Science), Indian Knowledge Systems, and Legal studies. This list may be enhanced continually.

Illustration of content areas Sustainability and Climate Change, and Media and Journalism is outlined below.

10.7.1 Sustainability and Climate Change

This is an illustration for Sustainability and Climate Change.

10.7.1.1 Principles for Designing Courses for Sustainability and Climate Change

The aim of teaching Sustainability and Climate Change is to enable in students a deeper engagement with Environmental Education and explore the interconnectedness with sustainability and climate change grounded in the Indian context.

The courses for Sustainability and Climate Change must be designed keeping the following in mind:

a. Students will engage with complex environmental problems without being overwhelmed by them.

b. They will describe and summarise environmental challenges linking society and the environment.

c. They will understand trade-offs and ethical dimensions of sustainability and climate change challenges.

d. They will develop environmental literacy, enabling them to engage in environmental action.

Addressing environmental challenges requires an interdisciplinary perspective incorporating science, society, economy, and politics. The content for Sustainability and Climate Change must be developed using the framework of social-environmental systems that conceptualises environmental issues as complex, non-linear in cause and impact, subject to shocks, and with tipping points. Central to the framework is equity and environmental justice, which must be emphasised.

Students must engage with sustainability and climate change challenges at different scales. They should learn both about the need for and limitations of individual versus systemic change, and technological fix versus participatory action. They should also be involved in analysing case studies of successful interventions at different scales that have addressed environmental problems without being overwhelmed by the complexity of the challenge — an important learning for students.

10.7.1.2 Illustrative Content Areas

Given below are illustrative content areas for Sustainability and Climate Change in Grades 11 and 12.

Content Area 1: Environmental Science from a Social-Environmental Systems Perspective

Environmental challenges can no longer be addressed by traditional approaches where there was a clear separation between pure Science and Social Science. As humans, we are today an intrinsic part of our environment, and our actions result in impacts on the environment and humanity. With this is in mind, students will study about the threats to the earth, the interconnected nature of planetary boundaries, and thresholds that are breached, as well as explore using the systems perspective to examine the tipping points. The need for going beyond individual behavioural change to requiring interventions at a systemic level for environmental sustainability will be emphasised. Students will also understand how the use of technology alone (via new approaches to waste management or energy production) cannot completely address sustainability objectives, which require working adaptively with people, culture, markets, and policies.

Content Area 2: Environmental Pollution – Air

Air pollution is one of the major environmental challenges faced today with serious implications for human health. Students will understand concepts around air pollution such as meteorology, composition (SPM, NOX, SOX), and sources (industrial, vehicular). They will examine the effects of air pollution on plants, animals, as well as human health, the economic implications, and issues of pollution and environmental justice. They will also examine air pollution control measures, from technological to behavioural.

Content Area 3: Biodiversity

Students will start by refreshing concepts of biodiversity (ecosystems, species, natural landscapes), and why biodiversity is important for human existence on this earth. They will then understand the threats to biodiversity, and how this has affected biodiversity at a global and national scale. The impacts of the loss of biodiversity linked to human dependence will also be included. This content area will provide a context to the history of biodiversity conservation, with a focus on a critique of Indian legislation (laws, protected areas, community conservation) and their implications. Students will also learn a few methods of documenting local diversity using tools such as citizen science and People's Biodiversity Registers (PBRs).

Content Area 4: Climate Change

Climate change is reshaping the world's environment with major implications for humanity in the coming decades. Students will be introduced to the science of the earth's climate system and will explore issues of climate justice and changing weather patterns. They will be introduced to national and international agreements on climate change action, and to positive steps that can be taken for climate change adaptation and mitigation at different levels from the local level to the national and international levels.

10.7.2 Media and Journalism

This is an illustration for Media and Journalism.

10.7.2.1 Principles for Designing Courses in Media and Journalism

The aims of teaching Media and Journalism are to introduce students to media in its diverse forms, technology, and function, and to enable them to develop media literacy and production skills.

The courses for Media and Journalism must be designed keeping the following in mind:

a. Students will critically examine the role of media in society through a set of broad-ranging engagement with diverse media forms, ranging from traditional media to the news space on social media.

b. They will engage with a comprehensive history of media in its global and local scope.

c. They will understand the basic elements of different mass media and acquire the basic tools of journalism.

d. They will be able to produce media on a smaller scale using available tools and technology.

10.7.2.2 Illustrative Content Areas

Given below are illustrative content areas for Media and Journalism in Grades 11 and 12.

Content Area 1: Media Literacy

Through this content area, students will be enabled to develop into discerning consumers and analytical appraisers of media texts. They will be equipped with knowledge about their working methods. They will be able to distinguish between different media and identify salient features of different media forms. Through real-world examples, they will explore the key characteristics that set each mass medium—including newspapers, radio, television, the internet, and social media—apart from others. They will learn how our perceptions of the outside world are affected by popular media.

Content Area 2: History of Media

Through this content area, students will be supported in identifying socially responsible media practices in India, through historical examples set against the larger background of various social movements and historical developments. Among other things, they will also learn about key figures of the Indian national movement and social reform, such as Mahatma Gandhi and B R Ambedkar, as journalists. They will develop a fairly broad understanding of the postcolonial Indian State and the media institutions, and media policies developed by the State. They will also be provided an overview of such developments in print, broadcast, and digital media.

Content Area 3: Basics of Journalism

Through this content area, students will be introduced to the fundamentals of Journalism, covering newspapers, broadcast media, and social media. They will gain a foundational understanding of reporting, news gathering, interviewing, and story pitching. They will learn about journalistic ethics and how to act socially responsibly, as well as fact-checking techniques while gathering news. They will engage with the journey of a news story within a given span of time, the various stages of mediation it goes through, and learn to be cautious of disinformation.

They will be introduced to the tools and techniques for checking news. They will learn how to differentiate between various news story types and how to report them. Students will also practise reporting in various genres and formats by exploring issues and themes of interest to them.

Content Area 4: Media Making Project

Through this content area, students will work on themes of local relevance and use available resources to create one or more newsletters/school magazines/wall magazines. They will develop capacities for research and planning, gathering data, writing, editing, design, and production. Using available tools and technology, they will create audio and video stories and curate them on social media platforms.

Section 10.8
Languages

A range of languages must be offered in Grades 11 and 12. Illustratively, Languages native to India, Foreign Languages, Classical Languages, and Literature of different Languages. The illustration given in this Chapter is of English Language and English Literature.

10.8.1 English Language

This is an illustration for English Language.

10.8.1.1 Principles for Designing Courses in English Language

The aims of English Language teaching in the Secondary Stage are to develop communicative competence and build language proficiency. Students will build capacities for enhanced language use in real-life contexts and develop cultural awareness and appreciation for the diversity of English-speaking societies.

The courses for English Language must be designed keeping the following in mind:

a. Students will explore and understand the history and evolution of the English language in India.
b. They will develop the ability to communicate effectively in a variety of contexts, including formal and informal settings.
c. They will widen their language base for personal, academic, creative, and vocational pursuits.
d. They will develop the ability to comprehend and evaluate texts, and explore rhetoric, reading, and writing in different real-life contexts.

10.8.1.2 Illustrative Content Areas

Given below are illustrative content areas for English Language in Grades 11 and 12.

Content Area 1: English in India

Through this content area, students will learn about the history of English, briefly in England and subsequently in other parts of the world, with a specific focus on India. A sense of the many 'kinds' of English spoken globally, including Indian English and English in India, is crucial to young people's understanding of themselves in the history of a once colonial and now international language. They will engage with perspectives on cross-language borrowings and enhance vocabulary skills, with a focus on etymology and material on English words from Indian languages. Students will also produce reflections on their family histories of language, mapping their respective families' locations on the language grid, and their own individual language-related abilities, achievements, and aspirations.

Content Area 2: Functional English

Through this content area, students will begin to develop functional language proficiency within and beyond academic contexts. The focus will be on effective language use in a range of contexts, through which students can: (i) improve their practical language skills in everyday encounters; (ii) widen and develop their language base for academic, creative, and vocational pursuits; (iii) acquire widely applicable study skills; (iv) reinforce proficiency skills gained in middle - and early secondary-school classes; and (v) become increasingly independent and confident users of English.

Content Area 3: English for Communication

Through this content area, students further enhance their ability to move from the academic context to communication in a real-world context. Using Communicative Language Teaching (CLT) methods, students will be enabled to use language in simulated real-life contexts. The target language (English) will be used by students to perform tasks requiring communicative competence and performance. The focus will be on effective communication, while the production of language in prescribed forms will be a secondary activity. Apart from face-to-face communication, phone conversations would be considered as well as the various forms of digital communication. In the process, students will develop skills in negotiation, critical thinking, and collaborative work. Also, the classroom would come as close to the real world as possible in terms of language use.

Content Area 4: English Language and Composition

Through this content area, students will learn about the power of language in communication. They will gain skills in using language to influence and persuade others, as well as understand the ways in which people communicate ideas and meaning through both spoken and written language. By learning about rhetoric, students can develop the abilities needed to communicate effectively, analyse arguments critically, and engage in discourse. Emphasis will be on non-fiction texts, and students will be provided opportunities to identify and analyse the persuasive language used by authors to shape and influence discourse. Students will gain the tools they need to analyse and put forth arguments, contributing to their development as informed and engaged citizens.

10.8.2 English Literature

This is an illustration for English Literature.

10.8.2.1 Principles for Designing Courses in English Literature

The aim of teaching English Literature is to foster in students both critical and creative skills and a deep love for literature in all its variety.

The courses for English Literature must be designed keeping the following in mind:

a. Students will engage with a breadth of literary texts from across India, including those translated from Indian languages.

b. They will engage with and understand the language and the formal aspects of texts through writing.

c. They will use the English language as a tool for creativity and self-expression.

d. They will appreciate the richness and diversity of India through literary and cultural texts.

Literature is the means, the 'subject-matter content,' for fluent oral and written communication. Immersion in the English language is an important focus of Literature. Therefore, students must engage with reading selections grouped around possible themes of interest to secondary school students, including young adult and school life, environment, magic and wonder, science fiction, and nature. While the focus will remain primarily on written texts, students choosing English Literature will be able to extend their critical and creative skills to other textual forms.

10.8.2.2 Illustrative Content Areas

Given below are illustrative content areas for English Literature in Grades 11 and 12.

Through these content areas, students will be introduced to a range of literary forms, and acquaint them with texts from India and abroad, in English and in translation.

Content Area 1: Reading Literature

Through this content area, students will learn to interpret texts and communicate their understanding orally and in writing. Students will be aware of the variety of written forms that are a part of our world—ranging from classical literary texts to newspapers and WhatsApp messages. Students can then be introduced to prose and poetry from different periods of time and diverse cultural contexts. They will learn to identify the formal features of texts and their thematic concerns. Students will individually and in groups rewrite texts by changing words, settings, and beginnings and endings to understand how meanings are produced.

Content Area 2: The Short Story and the Novel

Through this content area, students will be introduced to the idea of human beings as fundamentally narrative creatures with an urge for 'logical' conclusions and of storytellers as the first custodians of community histories. Students will read some examples of short story precursors (such as jests, anecdotes, parables) as well as some of their non-western counterparts (including the Indian katha and qissa). They will then move on to folk and fairy tales, and the fable in Western and Eastern traditions. Students will engage with the short story in its modern avatar, examining how it has developed out of earlier forms, and reading four or five examples from various parts of the world. Among other things, they will inspect what fantasy means in the

shorter genres, why realism came to take over the short story at a particular time, and why fantasy has made something of a comeback today. Students will briefly learn about the history of the novel and read extracts from some early novels. Finally, they will engage with a complete novel and analyse it in detail.

Content Area 3: Introduction to Poetry and Drama

Through this content area, students will experience a direct engagement with the form, content, and effect of the works themselves. These will be foregrounded over an author - and tradition-centric approach to prescribed texts. Poetry-specific activities will direct students to note the relationships between words, sounds, affect, images, and cultural contexts. Drama-centric activities will also include reflections on the continuity and differences between texts and performances, on performance traditions closer home, and on the many spaces of performance (theatre, radio, streets, marketplaces, religious spaces, festivities, television, film, performance art, sketches).

Content Area 4: Reading and Writing: Poetry/Essay/Short Story/Drama

Through this content area, students will concentrate on one of four forms. They will read more advanced texts in the form chosen and engage with them critically. Students will become familiar with the formal and structural elements of the chosen form, as well as with elements of its literary history and its adoption into different literary traditions in India and abroad. They will also engage in a series of writing exercises that will help them gain familiarity with the form on a practical basis and explore the possibilities it offers for their own self-expression. Students will take ownership of the chosen form and adapt it to suit their own contexts. Students will undertake a creative writing project where they will write their own stories, poems, essays, or plays.

Section 10.9
Grades 11 and 12, and Higher Education

'The current nature of secondary school exams, including Board exams and entrance exams - and the resulting coaching culture of today - are doing much harm, especially at the secondary school level, replacing valuable time for true learning with excessive exam coaching and preparation. These exams also force students to learn a very narrow band of material in a single stream, rather than allowing the flexibility and choice that will be so important in the education system of the future.'

[NEP 2020, 4.36]

In recent decades, there has been an unfortunate trend in India to see Grades 11 and 12 as merely a means to gain admission into higher education. The curricular logic often gets twisted due to this kind of instrumental thinking.

The curricular logic of the NCF is oriented towards realising the aims and goals for school education. The Learning Standards, content, pedagogy, and most crucially the assessments are designed towards achieving these aims. The purpose of the Secondary Stage of schooling, particularly Grades 11 and 12, must not be imagined as a mechanism for selecting and sorting students for different programmes in higher education. This curricular logic is derived from the four fundamental principles articulated by NEP:

a. **Flexibility,** so that learners have the opportunity to choose their learning trajectories and programmes, and thereby choose their own paths in life according to their talents and interests.

b. **No hard separations** between Arts and Sciences, between curricular and extra-curricular activities, and between vocational and academic streams. This will eliminate harmful hierarchies among, and silos between, different areas of learning.

c. **Multidisciplinarity** and a **holistic** education across the Sciences, Social Sciences, Arts, humanities, and sports for a multidisciplinary world in order to ensure the unity and integrity of all knowledge.

d. **Emphasis on conceptual understanding** rather than rote learning and learning for exams.

The curriculum for Grades 11 and 12 is guided by these motivations, rather than as instrumental 'preparation' for selection into higher education programmes.

NEP 2020 has made a sincere attempt to delink the school education processes from the admissions processes of higher education.



The National Testing Agency (NTA) will work to offer a high-quality common aptitude test, as well as specialized common subject exams in the sciences, humanities, languages, arts, and vocational subjects, at least twice every year. These exams shall test conceptual understanding and the ability to apply knowledge and shall aim to eliminate the need for taking coaching for these exams. Students will be able to choose the subjects for taking the test, and each university will be able to see each student's individual subject portfolio and admit students into their programmes based on individual interests and talents.

[NEP 2020, 4.42]

It must be emphasised here that the specialised common subject examinations envisaged by NTA should be broad in terms of focussing on the key conceptual structures and methods of investigation in the discipline. If these subject examinations test narrow content knowledge, it would be misaligned with the goals and approaches of the NCF.

