Department of School Education & Literacy
Ministry of Education, Government of India

TECHNICAL NOTE ON
Assessment Framework

The document provides the assessment framework and its supporting rationale for the design, development and implementation of the National Achievement Survey (NAS) 2021. It also comprises of description and discussion about what an assessment intends to measure.

Table of Contents

INTRODUCTION

This document provides the assessment framework and its supporting rationalefor the design, development and implementation of the National Achievement Survey (NAS) 2021 covering the targeted Classes of 3, 5, 8 and 10 and the key subjects of Modern Indian Language and Mathematics (all Classes), Environmental Science (Classes 3, and 5), Social Science (classes 8 and 10), Science (classes 8 and 10) and English (class 10).

It provides a proposal for general design features that relate to the following:

- Assessment Design and Structure of Test Booklets,
- Sequencing of Subjects,
- Hierarchical Structure of Content to be Measured Across Booklets Within Subject

These features do not alter the major design features of the NAS from its design in 2017, to maintain comparability of student achievement results from 2017 to 2020.

The document discusses the learning outcomes measured in each of the assessments and how the outcome is structured in the background to facilitate disaggregating test scores to meaningful sub-scores within a subject. This approach maximizes the usefulness of information obtained from the test for the purposes for which the NAS is designed, that is to support policy development at central and decentralized levels, designing education improvement programs, taking decisions on use of resources, and helping schools to improve student outcomes and enhance teacher abilities to understand the learning achievement of the students.

A framework document plays a role in establishing a written record of how an assessment program should be developed from one administration year to the next. **Replicability of design is one of the keys to reliability and validity in assessment and in the value of the interpretation of results**.

ASSESSMENT FRAMEWORK

An assessment framework is a description and discussion about what an assessment intends to measure. A framework helps the people who are interested in the assessment to understand what the assessment is to measure. It also helps them to understand what the assessment results mean.

Further, it defines the organizing structure for the construction of tests. It is a general blueprint that guides the development of the assessment tools and defines 'what and how' the learning outcomes are to be assessed. Frameworks capture a range of subject- and grade-specific learning outcomes that are agreed to be central and non-negotiable.

Assessment frameworks must be forward-looking and responsive to changes, balancing current teaching practices with research findings.

Assessment frameworks are considered an essential planning document for system assessment programs since the measurement of trends over time requires stability in measurement processes. Achieving stability in measurement is very difficult, especially in the context of education where both personnel and pedagogical practice change constantly. Working from an assessment framework supports consistency of practice and allows changes to the testing program to be deliberate rather than accidental, and the consequences of the changes to be intended and accounted for rather than unintended. A framework thus provides a narrative description regarding the key features of an assessment.

What does an Assessment Framework include?

- The framework includes a definition of the 'domain' – the area of learning that is being measured. It explains which aspects of the domain are included in the assessment.
- The framework also outlines how the assessment is constructed, by setting out the proportion of items for each aspect of the learning domain that make up the assessment.
- It describes the response formats that are used, and the length and number of items in the assessment.
- The framework may also outline how the results of the assessment will be reported.

OVERVIEW OF THE ASSESSMENT FRAMEWORK FOR NAS-2017

Classes	Subjects	Test Forms	No of Items	Question Type (MCQ)
Class 3	Language Mathematics EVS	31, 32	- 15 items each on Language, Mathematics and EVS included in test forms 31 and 32 -45 items included in each test form (Duration 90 minutes)	25 unique items across both the test forms 5 anchor items between both the test forms
Class 5	Language Mathematics EVS	51, 52	-15 items each on Language, Mathematics and EVS included in test forms 51 and 52 -45 items included in each test form (Duration 90 minutes)	
Class 8	Language Mathematics Science Social Science	81, 82	-15 items each on Language, Mathematics, Science and Social Science included in test forms 81 and 82 - 60 items included in each test form (Duration 120 minutes)	

The Learning outcomes assessed in 2017 for classes 3,5 and 8 are provided in the Annex A

ASSESSMENT FRAMEWORK FOR NAS-2021: GENERAL DESIGN CONSIDERATIONS

Curricular Areas to be tested

In NAS-2021, the learning achievement of students shall be assessed in three key curricular areas each of Language, Mathematics and Environmental Studies (EVS) for class III and V; four key curricular areas of Language, Mathematics, Science and Social Science for class VIII and five curricular areas of Language, Mathematics, Science and Social Science and for class X English, Mathematics, Science, Social Science and one Modern Indian Language.

The following table shows the grades and subject coverage for NAS-2021 Assessment Framework.

	Grades			
Subjects	3	5	8	10
Mathematics	●	●	●	●
MI Language	●	●	●	●
Environmental Science	●	●		
Science			●	●
Social Science			●	●
English				●

Further, in line with recommendation of the National Policy of Education (NEP) - 2020 which emphasizes '*highest priority to achieve Foundational Literacy and Numeracy by all students by Grade 3', and '...the education system will achieve universal foundational literacy and numeracy in primary schools by 2025',* a consensus has been reached to measure the **Foundational Literacy and Numeracy (FLN) skillsthrough a separate study for class III.** Another area that has been emphasized in the NEP-2020 is: Socio-emotional Learning / Life Skills. The NEP - 2020 states, *'Education must build character, enables learners to be ethical, rational, compassionate and caring, while at the same time prepare them for gainful fulfilling employment'.*Therefore, students shall also be assessed for Socio-emotional Learning or Transversal Skills/ Life Skills through a separate study/assessment (to be discussed and confirmed). These skills would be assessed in Classes VIII and X.

Assessment Design for NAS-2021: Key Considerations

In large-scale assessments, each domain of interest includes a wide range of content and skills to be assessed. However, it is important that the test is not too long so as to lead to **student testing load**.

Student testing load refers to the total number of tests and items that will be administered to each student, and consequently, time they are expected to sit answering test questions. This number should be respective to grade level as student of different ages vary in their attention span and ability to sit long time being focused on test items. Also, reading load students are exposed to should be grade appropriate considering that in early grades student reading skills are still under development. Increased test load may cause fatigue that can deteriorate student performance by the end of testing time.

Another important consideration is – the set of items that each student takes should provide a ***valid, reliable, and interpretable measure*** of student learning that can be used to make pertinent inferences to inform instructional planning and interventions. To ensure **validity**, the content and competency coverage of items from which a student score is derived should be representative for the curriculum objectives and intended learning outcomes.To ensure **reliability**, there should be a sufficient number of observations from which a student score is derived. And finally, to ensure **interpretability and meaningfulness,** a student score is being matched with performance standards to enable its evaluation in terms of the performance levels. There are comprehensive descriptions of performance levels that are attributed to students' scores classified into these levels, which assumes that each student's score represents a sufficient evidence that can justify this attribution.

From these perspectives, NAS 2021 frameworks are designed to enhance validity, reliability, and interpretability of the derived measures of student learning.In order to ensure that there is sufficient content coverage without increasing testing load, it is necessary to design the assessment so that each student is only administered a fraction of all available items in the assessment.In this case, a series of linked test booklets that are carefully designed are created so that the data collected from them can be combined onto a single scale.

Considering these factors, NAS-2021 Assessment design proposes the following key decisions and the rationale/reasons for the same:

1. **Increase in thenumber of test booklets forGrades 3 and 5**-
   The increase in test bookletshas been proposedto increase the content coverage (learning outcomes being assessed and number of items assessing those learning outcomes) without increasing the cognitive /testing load on students.
   Further, it was observed during the field try outs for grades 3 and 5, the children were able to attempt all the items and complete the assessment in the given timeframe. Increase in test booklets for more content coverage will also ensure ***high content validity*** of the assessment. Whereas, increase in the items per learning outcome will ***increase reliability*** by ensuring a sufficient number of observations from which students' scores can be derived to make inferences about performance.

2. **All subjects integrated in each booklet for Grades 3 and 5**-
   As primary grade teachers teach more than one subject in the respective classes, therefore to ensure that teachers get holistic view of the student's learning levels across all subjects, and use the data from assessment for planning interventions, it was decided to include all subjects in each booklet for grades 3 and 5. The same was agreed upon with the Steering committee group.

3. **Use Modular Matrix Design forGrades 8 and 10-** Given the high number of curricular areas and subsequent learning outcomes to be measured in grades 8 and 10, it is recommended to use **modular matrix design**, where each student takes a combination of ***only*** two subjects. The subject modules are given in a balanced order to avoid serial effects on student performance, with consideration of keeping the anchor items in positions as close as possible to the positions they had in NAS 2017 (recommended principle of test equating[1]). A multi-subject, modular matrix design is characteristic of many large-scale assessments, and it is well established in the industry practice. Renowned assessments, such as PISA, TIMSS, and PIAAC, all make effective use of modular designs when two or more subjects are covered by testing program.

[1]Kolen, M. J. and Brennan, R. L. (2014) Test Equating, Scaling, and Linking: Methods and Practices. Springer; 3rd ed.

4. Along with enhanced reliability of measurement, **the consistency and accuracy of classification in performance levels based on test scores will be increased** – a substantially important characteristics of standards-based assessments (Livingston & Lewis, 1995)2.

5. In order to compare results with achievement data from 2017-**the anchor items from NAS-2017** will be included in the test booklets across all grades.

A. Number of Learning Outcomes to be assessed across subjects and grades in NAS-2021

Subject/Area	Grade 3	Grade 5	Grade 8	Grade 10
Modern Indian Language (MIL)	2	1	1	1
Mathematics	12	15	20	12
Environmental Science	10	13		
Science			12	10
Social Science			22	12
English				1
Total	24	29	55	36

[2]Livingston, S. A., & Lewis, C. (1995). Estimating the consistency and accuracy of classifications based on test scores. *Journal of Educational Measurement*, 32, 179–197.

B. Assessment Design for Grades 3 and 5

- There will be a total 4 test booklets each for Grade 3 and 5
- All subjects will be included in each test booklet
- Each test booklet will have at least 1 item corresponding to the learning outcome for the respective area/subject.
- Anchor items from NAS-2017 will be included in each test booklet for all subjects.
- Since the number of the test booklets is increased, the total number of items per subject will be increased, enabling more comprehensive content coverage compared to NAS 2017.

Table 1. Assessment Design: Grade 3

Grade 3	Set 1			Set 2			Set 3			Set 4		
	Area	New	Anchor	Area	New	Anchor	Area	New	Anchor	Area	New	Anchor
Sub 1	Lang	10	5	EVS	10	5	Math	12	5	EVS	10	5
Sub 2	Math	12	5	Lang	10	5	EVS	10	5	Math	12	5
Sub 3	EVS	10	5	Math	12	5	Lang	10	5	Lang	10	5
	TOTAL	32	15	TOTAL	32	15	TOTAL	32	15	TOTAL	32	15
		47			**47**			**47**			**47**	

Table 2. Assessment Design: Grade 5

Grade 5	Set 1			Set 2			Set 3			Set 4		
	Area	New	Anchor	Area	New	Anchor	Area	New	Anchor	Area	New	Anchor
Sub 1	Lang	10	5	EVS	13	5	Math	15	5	EVS	13	5
Sub 2	Math	15	5	Lang	10	5	EVS	13	5	Math	15	5
Sub 3	EVS	13	5	Math	15	5	Lang	10	5	Lang	10	5
	TOTAL	38	15	TOTAL	38	15	TOTAL	38	15	TOTAL	38	15
		53			**53**			**53**			**53**	

C. Assessment Design for Grades 8 and 10

- The Booklets for grades 8 and 10 will follow modular matrix design.Only 2 Subjects covered in each test booklet for both grade 8 and 10
- There will be a total of 4 test booklets for Grade 8
- There will be a total of 5 test booklets for Grade 10
- For Grade 8, each test booklet to have 60 items
- For Grade 10, each test booklet to have 70 items
- Anchor items from NAS-2017 will be included in each test booklet for all subjects.
- This design will lead to enhanced validity (more content coverage) and reliability (more items)

Table 3. Assessment Design: Grade 8

Grade 8	Set 1			Set 2			Set 3			Set 4		
	Area	New	Anchor	Area	New	Anchor	Area	New	Anchor	Area	New	Anchor
Sub 1	Lang-A	24	6	Math-B	24	6	Sci-A	24	6	SoSci-B	24	6
Sub 2	Math-A	24	6	SoSci-A	24	6	Lang-B	24	6	Sci-B	24	6
	TOTAL	48	12	TOTAL	48	12	TOTAL	48	12	TOTAL	48	12
		60			60			60			60	

Table 4. Assessment Design: Grade 10

Class 10	Set 1			Set 2			Set 3			Set 4			Set 5		
	Area	New	Anchor	Area	New	Anchor	Area	New	Anchor	Area	New	Anchor	Area	New	Anchor
Sub 1	Lang- A (Hindi/MIL)	28	7	Mat-B	28	7	Sci-A	28	7	SoSci-B	28	7	Lang- B (Hindi/MIL)	28	7
Sub 2	Mat-A	28	7	SoSci-A	28	7	Eng-A	28	7	Eng-B	28	7	Sci-B	28	7
	Total	56	14	Total	56	14	Total	56	14	Total	56	14	Total	56	14
		70			70			70			70			70	

The proposed assessment design for classes 3, 5 and 8 and 10 as shown in the tables above has the following features:

- **For Grades 3 and 5**:

  4 booklets instead of 2 (allowing for increased content measured without increasing the cognitive load) as shown in Tables 1 and 2 above

- **For Grades 8 and 10:**

  For grade 8, considering that there are four subjects to be assessed, it is opportune to design 4 booklets, with the resulting modular matrix design shown in Table 3 above. For grade 10, considering that there are five subjects to be assessed, it is opportune to design 5 booklets, with the resulting modular matrix design shown in Table 4 above.

- Items from NAS-2017 Assessment Instruments need to be included as **Anchors** in the 2021 framework and thereby tools for the purpose of linking and scaling
- Same fixed order of subjects as in 2017, i.e., Language, Mathematics, Environmental Science, Social Science (to facilitate comparison with NAS 2017 and align with performance standards set in 2017 on this fixed order).
- The increase in number of test booklets for Grades 3 and 5, from 2 to 4, leads to an increase of total score points per subject across both booklets. The increase is mostly absorbed by the increase in Learning Outcomes measured.

DETAILS OF ASSESSMENT FRAMEWORKS FOR CLASSES 3,5,8& 10

I. Modern Indian Languages (MIL)

Modern Indian Language is treated in the national achievement survey from the perspective of reading comprehension and does not measure the other 3 language skills of listening, speaking, and writing. The reason for this is based entirely on the additional time and costs associated with measuring skills other than reading which, in the case of the oral dimension (speaking and listening), are complex to assess in a group-administered environment, and in the case of writing and speaking require human scoring.

Reading Comprehension

In order to preserve the key elements of reading comprehension and ensure comparability with NAS-2017 assessment framework for MIL for Classes 3,5,8 and10- the learning outcomes for reading comprehension from the NAS-2017 framework will be included in framework for NAS-2021. In addition, a more solid theoretical foundation to support the approach and permitting greater disaggregation of the data to sub-levels of the major construct (domain) of reading comprehension has been proposed. The proposal is captured in **Figure 1** below and consists of a hierarchical system of content standards from domain, to sub domain, strand, and learning outcomes.

Sub domains in reading comprehension relate to texts and are of 4 types: a) Narrative b) Exposition c) Argumentation and d) text given in form of lists, forms, graphs, timetables and diagrams. These texts help to expose students to a range of text types that include fictional stories (from different sources, complexities selected to target specific classes and ages) and non-fictional passages that are designed to inform the reader or persuade the reader (again from different sources to align with student needs).

Strands are the levels of cognitive complexity and include retrieval of information, interpretation and reflection on content and form of text and lastly evaluation of one's point of view. **Learning outcomes** in reading relate to the specific skills that we wish to develop in the learner: interacting with the information and ideas in a text etc.

Test items will be designed to measure the learning outcomes, which will also be mapped onto sub domains and strands. In this way, scores from reading comprehension test may be

reliably generated for sub domains and strands and outcomes, thereby enriching the amount of information generated from the assessment and providing a greater level of detail to teachers around how well students are performing in reading and how the instruction can be shaped to achieve better student performance.

Figure 1: Proposed Structure for Reading Comprehension in Modern Indian Language for NAS 2021 for Grades 3, 5, 8 and 10

DOMAIN :

Reading Comprehension

SUB-DOMAIN (Text Type)

-Narration
-Exposition
-Argumentation
-Lists, forms, graphs, timetables and diagrams

STRAND (Cognitive Complexity)

-Retrieving information (locates)
-Interpreting and reflecting on the content and form of texts in relation to their own knowledge of the world
-Evaluating & arguing their point of view

LEARNING OUTCOMES (NCERT)-

-Same as 2017 (Annexure A)
-For grades 5 & 10 Language LO refer Annexure B

II. Mathematics

The assessment framework proposed for Mathematics for NAS-2021 the learning outcomes which were assessed in NAS-2017. Retaining the learning outcomes from the 2017 framework will ensure comparability and overall reliability of results. As with the Modern Indian Language learning outcomes, the key difference in the proposed NAS-2021 Mathematics framework (as compared to 2017) is the application of the hierarchical system of content standards from domain, to sub domain, strand, and learning outcomes as shown in the frameworks for classes 3, 5, 8 and 10 below.

The three strands applicable across grade 3,5,8 and 10 frameworks are defined below:

STRAND 1 Recognizes and Applies single processing step.

Students can complete only a single processing step consisting of reproducing basic mathematical facts or processes or of applying simple computational skills. Students typically recognize information from diagrammatic or text material that is familiar and straightforward and in which a mathematical formulation is provided or readily apparent. The solution calls for application of a routine procedure in a single processing step.

STRAND 2 Interprets, Link and Integrates and Extrapolate a given pattern.

Students are able to interpret, link and integrate different representations of a problem or different piece of information; use and manipulate a given mathematical model involving symbolic representations; and verify or check given propositions.

STRAND 3 Generalization, Reasoning, Augmentation and Applies multiple steps to process.

Students take a creative and active role in their approach to mathematical problems. They interpret and formulate problems in mathematical terms, handle complex information, and negotiate several processing steps.

Figure 2.1.: Proposed Structure for Mathematics for NAS 2021 for Grades 3 and 5

DOMAIN :	SUB-DOMAIN
Mathematics	-Shapes and Spatial Understanding -Numbers -Mental Arithmetic -Money -Measurement -Weight -Volume -Time -Data Handling -Patterns
	STRAND (Cognitive Complexity) -Recognizes and Applies single processing step -Interprets, links and integrates and extrapolates a given pattern -Generalisation, reasoning, augmentation and applies multiple steps to process
	LEARNING OUTCOMES (NCERT) -Same as 2017 (Annexure A)

Figure 2.2.: Proposed Structure for Mathematics for NAS 2021 for Grade 8

DOMAIN :	SUB-DOMAIN
Mathematics	-Number System -Algebra -Ratio and proportion -Geometry -Representing 3D in 2D -Construction -Mensuration -Data Handling -Introduction to Graphs
	STRAND (Cognitive Complexity) -Recognizes and Applies single processing step -Interprets, links and integrates and extrapolates a given pattern -Generalisation, reasoning, augmentation and applies multiple steps to process
	LEARNING OUTCOMES (NCERT) -Same as 2017 (Annexure A)

Figure 2.3.: Proposed Structure for Mathematics for NAS 2021 for Grade 10

DOMAIN :	SUB-DOMAIN
Mathematics	-Number System -Algebra -Trignometry -Coordinate Geometry -Geometry -Mensuration -Statistics and Probability
	STRAND (Cognitive Complexity) -Recognizes and Applies single processing step -Interprets, links and integrates and extrapolates a given pattern -Generalisation, reasoning, augmentation and applies multiple steps to process
	LEARNING OUTCOMES (NCERT) -Annexure B

III. Environmental Science / Science

It has been proposed that the Assessment Framework for EVS/ Science will assess the same learning outcomes as assessed in NAS-2017. Thehierarchical system of content standards from domain, to sub domain, strand, and learning outcomes followed in the EVS/Science frameworks for classes 3, 5 8 and 10 is shown below.

Figure 3.1.: Proposed Structure for EVS for NAS 2021 for Grades 3 and 5

DOMAIN :	SUB-DOMAIN
Environmental Sciences	-Family and Friends a) Relationships b)Work & Play c) Animals d) Plants -Food -Shelter -Water -Travel -Things we make and do
	STRAND (Cognitive Complexity) -Recognizes a valid scientific query -Identifying and/or using the evidence needed -Drawing or evaluating the conclusion -Demonstrating understanding of scientific concepts
	LEARNING OUTCOMES (NCERT) -Same as 2017 (Annexure A)

Figure 3.2.: Proposed Structure for Science for NAS 2021 for Grades 8 and 10

DOMAIN :	SUB-DOMAIN
Science	-Food -Materials -The World of the Living -Moving things, People and Ideas -How things Work -Natural Phenomena -Natural resource
	STRAND (Cognitive Complexity) -Recognizes a valid scientific query -Identifying and/or using the evidence needed -Drawing or evaluating the conclusion -Demonstrating understanding of scientific concepts
	LEARNING OUTCOMES (NCERT) -Same as 2017 for grade 8 (Annexure A) -For grade 10 refer Annexure B

IV. Social Science

It has been proposed that the Assessment Framework for Social Science will assess the same learning outcomes as assessed in NAS-2017. The hierarchical system of content standards from domain, to sub domain, strand, and learning outcomes followed in the Social Science frameworks for classes 8 and 10 is shown below.

Figure 4.1.: Proposed Structure for Social Science for NAS 2021 for Grade 8

DOMAIN :	SUB-DOMAIN
Social Science	HISTORY 1. The Establishment of Company Power 2. Rural Life and Society 3. Colonialism and Tribal Societies 4. Crafts and Industries 5. The Revolt of 1857-58 6. . Education and British rule 7. Women and reform 8. Challenging the Caste System 9. Colonialism and Urban Change 10. Changes in the Arts: Painting, Literature, architecture 11. The Nationalist Movement 12. India after Independence GEOGRAPHY 1. Resources (and their types) 2. Argriculture 3. Industries 4. Textile Industry 5. Information Technology 6. Human resources SOCIAL AND POLITICAL LIFE 1. The Constitution 2. Parliamentary Government 3. The Judiciary 4. Social justice and the marginalised 5. Economic Presence of the Government
	STRAND (Cognitive Complexity) -Identifying and/or using the evidence needed -Drawing or evaluating the conclusion -Demonstrating understanding of concepts -Environmental, Economic and Social Dimensions of Sustainable Development
	LEARNING OUTCOMES (NCERT) -Same as 2017 (Annexure A)

Figure 4.2.: Proposed Structure for Social Science for NAS 2021 for Grade 10

DOMAIN :	SUB-DOMAIN
Social Science	HISTORY I. Events and Processes II. Economies and Livelihoods III. Culture, Identity and Society GEOGRAPHY 1. Resources (and their types) 2. Natural resources 3. Forest and Wildlife resources 4. Agriculture 5. Water resources 6. Mineral resources 7. Power resources 8. Manufacturing industries 9. Transport, Communication and Trade POLITICAL SCIENCE 1. Democracy in a contemporary world 2. Designing of Democracy in India 3. Electoral politics in Democracy 4. Institutions of Parliamentary Democracy 5. Citizens' rights in Democracy 6. Working of Democracy 7. Power sharing mechanisms in Democracy 8. Competition and Contestations 9 Outcomes and Challenges ECONOMICS 1. The Story of Development 2. Money and Financial System 3. The Role of Service Sector in Indian Economy 4. Globalisation 5. Consumer Awareness **STRAND (Cognitive Complexity)** -Identifying and/or using the evidence needed -Drawing or evaluating the conclusion -Demonstrating understanding of concepts -Environmental, Economic and Social Dimensions of Sustainable Development **LEARNING OUTCOMES (NCERT)** -Annexure B

ANNEXURE- A

Learning Outcomes assessed in NAS-2017 Classes 3, 5&8

Class 3-Language

Learning Outcomes	Description
L304	Reads small texts with comprehension i.e., identifies main ideas, details, sequence and draws conclusions
L312	Reads printed scripts on the classroom walls: poems, posters, charts etc.

Class 3-Mathematics

Learning Outcomes	Description
M301	Reads and writes numbers up to 999 using place value
M302	Compares numbers up to 999 based on their place values
M303	Solves simple daily life problems using addition and subtraction of three digit numbers with and without regrouping
M304	Constructs and uses the multiplication facts (up till 10) in daily life situations
M305	Analyses and applies an appropriate number operation in the situation/ context
M306	Explains the meaning of division facts by equal grouping/sharing and finds it by repeated subtraction
M309	Identifies and makes 2D-shapes by paper folding, paper cutting on the dot grid, using straight lines etc.
M311	Fills a given region leaving no gaps using a tile of a given shape
M312	Estimates and measures length and distance using standard units like centimeters or meters & identifies relationships
M317	Reads the time correctly to the hour using a clock/watch
M318	Extends patterns in simple shapes and numbers
M319	Records data using tally marks, represents pictorially and draws conclusions

Class 3-Environmental Science

Learning Outcomes	Description
E302	Identifies simple features (e.g. movement, at places found/ kept, eating habits, sounds) of animals and birds in the immediate surroundings.
E303	Identifies relationships with and among family members
E304	Identifies objects, signs (vessels, stoves, transport, means of communication, transport, signboards etc.), places (types of houses/shelters, bus stand, petrol pump etc.) activities (works people do, cooking processes, etc.) at home/school/ neighborhoods
E305	Describes need of food for people of different age groups, animals/birds, availability of food and water and use of water at home and surroundings
E307	Groups objects, birds, animals, features, activities according to differences/ similarities using different senses. (e.g. appearance/place of living/ food/ movement/ likes-dislikes/ any other features)
E309	Identifies directions, location of objects/places in simple maps using signs/symbols/ verbally
E310	Guesses properties, estimates quantities of materials/activities in daily life and verifies using symbols/non-standard units
E311	Records observations, experiences, information on objects/activities/places visited in different ways and predicts patterns etc.
E313	Observes rules in games (local, indoor, outdoor)
E314	Voices opinion on good/bad touch , stereotypes for tasks/play/food in family w.r.t gender, misuse/wastage of food and water in family and school.

Class 5-Language

Learning Outcomes	Description
L504	Reads and comprehends independently storybooks, news items/ headlines, advertisements etc.
L508	Reads text with comprehension, locates details and sequence of events

Class 5-Mathematics

Learning Outcomes	Description
M401	Applies operations of numbers in daily life situations
M412	Explores the area and perimeter of simple geometrical shapes (triangle, rectangle, square) in terms of given shape as a unit
M418	Calculates time intervals/duration of familiar daily life events by using forward or backward counting/addition and subtraction
M421	Represent the collected information in tables and bar graphs and draws inferences from these
M501	Reads and writes numbers bigger than 1000 being used in her/his surroundings
M504	Estimates sum, difference, product and quotient of numbers and verifies the same using different strategies like using standard algorithms or breaking a number and then using operation
M505	Finds the number corresponding to part of a collection
M506	Identifies and forms equivalent fractions of a given fraction
M508	Converts fractions into decimals and vice versa
M509	Classifies angles into right angle, acute angle, obtuse angle and represents the same by drawing and tracing
M512	Relates different commonly used larger and smaller units of length, weight and volume and converts larger units to smaller units and vice versa
M513	Estimates the volume of a solid body in known units.
M514	Applies the four fundamental arithmetic operations in solving problems involving money, length, mass, capacity and time intervals
M515	Identifies the pattern in triangular numbers and square number
M516	Collects data related to various daily life situations, represents it in tabular form and as bar graphs and interprets it

Class 5- Environmental Science

Learning Outcomes	Description
E403	Identifies relationship with and among family members in extended family
E410	Records observations/experiences/information for objects, activities, phenomena, places visited in different ways and predicts patterns and activities/ phenomena
E501	Explains the super senses and unusual features (sight, smell, hear, sleep, sound, etc.) of animals and their responses to light, sound, food etc.
E503	Describes the interdependence among animals, plants and humans
E504	Explains the role and functions of different institutions in daily life (Bank, Panchayat, cooperatives, police station, etc.)
E505	Establishes linkages among terrain, climate, resources (food, water, shelter, livelihood) and cultural life. (e.g. life in distant/difficult areas like hot/cold deserts)
E506	Groups objects, materials, activities for features/properties such as shape, taste, color , texture, sound, traits etc.
E507	Traces the changes in practices, customs, techniques of past and present through coins, paintings, monuments, museum etc. and interacting with elders
E508	Guesses (properties, conditions of phenomena), estimates spatial quantities (distance, area, volume, weight etc.) and time in simple standard units and verifies using simple tools/set ups
E509	Records observations/experiences/information in an organized manner (e.g. in tables/ sketches/ bar graphs/ pie charts) and predicts patterns in activities/ phenomena (e.g. floating, sinking, mixing, evaporation , germination , spoilage) to establish relation between cause and effect.
E510	Identifies signs, directions, location of different objects/landmarks of a locality / place visited in maps and predicts directions w.r.t. positions at different places for a location
E512	Voices opinions on issues observed/experienced and relates practices/happenings to larger issues of society
E513	Suggests ways for hygiene, health, managing waste, disaster/emergency situations and protecting/saving resources

Class 8-Language

Learning Outcomes	Description
L813	Read textual/non-textual materials with comprehension and identifies the details, characters, main idea and sequence of ideas and events while reading

Class 8-Mathematics

Learning Outcomes	Description
M601	Solves problems involving large numbers by applying appropriate operations
M606	Solves problems on daily life situations involving addition and subtraction of fractions / decimals
M620	Finds out the perimeter and area of rectangular objects in the surroundings like floor of the class room, surfaces of a chalk box etc.
M621	Arranges given/collected information in the form of table, pictograph and bar graph and interprets them
M702	Interprets the division and multiplication of fractions
M705	Solves problems related to daily life situations involving rational numbers
M706	Uses exponential form of numbers to simplify problems involving multiplication and division of large numbers
M707	Adds/subtracts algebraic expressions
M710	Solves problems related to conversion of percentage to fraction and decimal and vice versa
M717	Finds out approximate area of closed shapes by using unit square grid/graph sheet
M719	Finds various representative values for simple data from her/his daily life contexts like mean, median and mode
M721	Interprets data using bar graph
M801	Generalizes properties of addition, subtraction, multiplication and division of rational numbers through patterns
M802	Finds rational numbers between two given rational numbers
M803	Proves divisibility rules of 2, 3,4, 5, 6, 9 and 11
M804	Finds squares, cubes, square roots and cube roots of numbers using different methods
M808	Uses various algebraic identities in solving problems of daily life
M812	Verifies properties of parallelogram and establishes the relationship between them through reasoning
M818	Finds surface area and volume of cuboidal and cylindrical object
M819	Draws and interprets bar charts and pie charts

Learning Outcomes	Description
SCI703	Classifies materials and organisms based on properties/characteristics
SCI704	Conducts simple investigation to seek answers to queries
SCI705	Relates processes and phenomenon with causes
SCI708	Measures and calculates e.g., temperature; pulse rate; speed of moving objects; time period of a simple pendulum, etc.
SCI710	Plots and interprets graphs
SCI711	Constructs models using materials from surroundings and explains their working
SCI801	Differentiates materials, organism and processes
SCI804	Relates processes and phenomenon with causes
SCI805	Explains processes and phenomenon
SCI807	Measures angles of incidence and reflection, etc.
SCI811	Applies learning of scientific concepts in day-to-day life
SCI813	Makes efforts to protect environment

Learning Outcomes	Description
SST605	Identifies latitudes and longitudes, e.g., poles, equator, tropics, States/UTs of India and other neighboring countries on globe and the world map
SST610	Locates important historical sites, places on an outline map of India.
SST625	Describes the functioning of rural and urban local government bodies in sectors like health and education
SST703	Explains preventive actions to be undertaken in the event of disasters
SST704	Describes formation of landforms due to various factors
SST722	Explains the significance of equality in democracy
SST726	Describes the process of election to the legislative assembly
SST731	Explains the functioning of media with appropriate examples from newspapers
SST733	Differentiates between different kinds of markets
SST734	Traces how goods travel through various market places
SST802	Describes major crops, types of farming and agricultural practices in her/his own area/state
SST805	Locates distribution of important minerals e.g. coal and mineral oil on the world map
SST807	Justifies judicious use of natural resources
SST809	Draws interrelationship between types of farming and development in different regions of the world
SST810	Distinguishes the modern period from the medieval and the ancient periods through the use of sources
SST815	Explains the origin, nature and spread of the revolt of 1857 and the lessons learned from it.
SST816	Analyses the decline of pre-existing urban centers and handicraft industries and the development of new urban centers and industries in India during the colonial period
SST818	Analyses the issues related to caste, women, widow remarriage, child marriage, social reforms and the laws and policies of colonial administration towards these issues
SST823	Applies the knowledge of the Fundamental Rights to find out about their violation, protection and promotion in a given situation
SST827	Describes the process of making a law. (e.g. Domestic Violence Act, RTI Act, RTE Act)
SST831	Identifies the role of Government in providing public facilities such as water, sanitation, road, electricity etc., and recognizes their availability
SST833	Draws bar diagram to show population of different countries/India/states

ANNEXURE- B

Learning Outcomes in NAS-2021 for Class 5 (Language)&Class 10

Class 5-Language

Learning Outcomes	Description
L508	Reads text with comprehension, locates details and sequence of events.

Class 10-English

Learning Outcomes	Description
LII1007	Reads, comprehends and responds to complex texts independently.

Class 10-MI Language/Hindi

Learning Outcomes	Description
LI1011	पाठ्यवस्तुमेंशामिलरचनाओंकेअतिरिक्तअन्यकविता, कहानी, एकांकीकोपढ़ते-लिखतेऔरमंचनकरतेहैं।

Class 10- Science

Learning Outcomes	Description
SCI1001	Differentiates materials, objects, organisms, phenomena, and processes, based on, properties and characteristics.
SCI1002	Classifies materials, objects, organisms, phenomena, and processes, based on properties and characteristics.
SCI1003	Relates processes and phenomena with causes and effects
SCI1004	Explains processes and phenomena.
SCI1005	Analyses and interprets data, graphs, and figures
SCI1006	Calculates using the data given
SCI1007	Uses scientific conventions to represent units of various quantities, symbols, formulae, and equations.
SCI1008	Applies learning to hypothetical situations
SCI1009	Applies scientific concepts in daily life and solving problems
SCI1010	Derives formulae, equations, and laws

Class 10- Social Science

Learning Outcomes	Description
SST1001	Recognises and retrieves facts, figures, and narrate processes.
SST1002	Classifies and compares events, facts, data, and figures.
SST1003	Explains cause and effect relationship between phenomena, events, and their occurrence.
SST1004	Analyses and evaluates information.
SST1005	Interprets.
SST1006	Draws interlinkages within Social Science.
SST1007	Identifies assumptions, biases, prejudices, or stereotypes about various aspects.
SST1008	Demonstrates inquisitiveness, enquiry.
SST1009	Constructs views, arguments, and ideas on the basis of collected or given information.
SST1010	Extrapolates and predicts events and phenomena.
SST1011	Illustrates decision making/problem solving skills.
SST1012	Shows sensitivity and appreciation skills.

Class 10- Mathematics

Learning Outcomes	Description
M1001	Generalises properties of numbers and relations among them studied earlier to evolve results, such as, Euclid's division algorithm, Fundamental Theorem of Arithmetic and applies them to solve problems related to real life contexts.
M1002	Develops a relationship between algebraic and graphical methods of finding the zeroes of a polynomial.
M1003	Finds solutions of pairs of linear equations in two variables using graphical and different algebraic methods.
M1004	Demonstrates strategies of finding roots and determining the nature of roots of a quadratic equation.
M1005	Develops strategies to apply the concept of A.P. to daily life situations. Works out ways to differentiate between congruent and similar figures.
M1006	Establishes properties for similarity of two triangles logically using different geometric criteria established earlier such as, Basic Proportionality Theorem, etc.
M1007	Derives formulae to establish relations for geometrical shapes in the context of a coordinate plane, such as, finding the distance between two given points, to determine the coordinates of a point between any two given points, to find the area of a triangle etc.
M1008	Determines all trigonometric ratios with respect to a given acute angle (of a right triangle) and uses them in solving problems in daily life contexts like finding heights of different structures or distance from them.
M1009	Derives proofs of theorems related to the tangents of circles.
M1010	Examines the steps of geometrical constructions and reason out each step
M1011	Finds surface areas and volumes of objects in the surroundings by visualising them as a combination of different solids like cylinder and a cone, cylinder and a hemisphere, combination of different cubes, etc.
M1012	Calculates mean, median and mode for different sets of data related with real life contexts.