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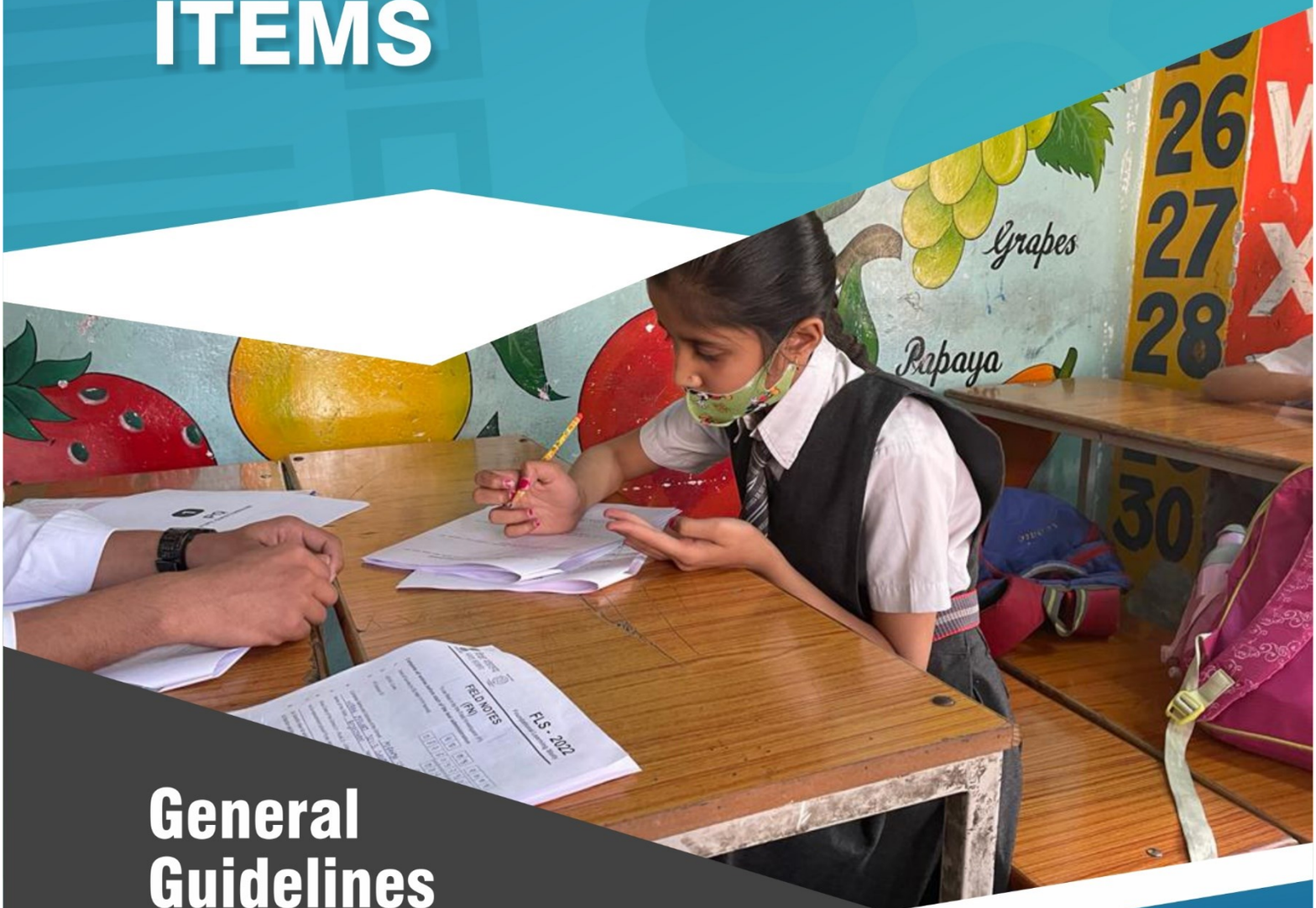
एन सी ई आर टी NCERT

NCERT
NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

सत्यमेव जयते

Ministry of Education
Government of India

DEVELOPING QUALITY ASSESSMENT ITEMS



General Guidelines

What is assessment?

Assessment is essentially the process of collecting evidence about what students know, understand and can do, with an aim to draw inferences about the learning levels attained by the students in different domains.

The administration and type of assessment varies in accordance to the levels at which administered and the purpose for which administered. The assessment conducted at the classroom level, at school, is different from an assessment carried out at key stages of education for the reasons of certification of successful completion of the stage (e.g., board examinations). Similarly, Large scale assessment conducted at state or national levels differs in purpose as these assess the working efficiency of the schooling system rather than the performance of the individual child

Assessment may also be viewed as diagnostic tools for the teachers to identify the strengths and weaknesses of the 'methodology of transaction' so as to improve upon, through additional efforts, guidance and support to scaffold the learning processes in a better manner. Assessment also contributes to gaining insight to the students' attainment of learning goals at the culmination of a particular course/programme/class.

Framing the Objectives of Assessment

It may be appreciated that assessment evaluates the student's learning and hence the type and focus of assessment will affect the teaching-learning transactions taking place within the classrooms in schools. For instance, assessment when focusing on the ability of the students' capacity of retention and retrieval will encourage the phenomenon of completion of syllabus and development of spectacle of 'temporary memory and regurgitation'. Conversely, when the focus of assessment is on evaluating the students' abilities such as critical thinking, problem solving, collaboration and creativity, will encourage classroom interaction aligning with a constructivist and socio-cultural approach to teaching-learning. Therefore, insights and diligence is warranted while designing assessment as it is intricately woven with the pedagogy, syllabus and the content of the academic interaction transacted in the classrooms.

The goal of National Education Policy (NEP) 2020 is to bring in a transformation in the way assessment is perceived. As per NEP 2020, the aim of assessment in the culture of our schooling system will shift from one that primarily tests rote memorization skills to one that is more formative, is more competency-based, promotes learning and development for our students, and tests higher-order skills, such as analysis, critical thinking, and conceptual clarity.

Broadly, assessment is a process that includes four basic components: 1) Understanding improvement over time. 2) Motivating students to learn and improve. 3) Evaluating the teaching methods. 4) Considering students' capabilities in relation to the group or criterion. In addition, good assessment can help students become more effective self-directed learners. Well-designed assessment strategies play a critical role in educational decision-making and are a vital component of ongoing quality improvement processes at the lesson, course and/or curriculum level.

Competency-based Assessment

To strive towards assessment practices that are more in alignment with changing scenarios globally is an important but challenging task. Assessment need to be informed by the vision pertaining to education. The purpose of education is to facilitate the growth of a competent individual capable of applying his/her knowledge and skills appropriately in simple as well as complex situations. In the fast paced world characterized by rapidly changing economic, social and technology domains, one needs to have diverse abilities to be able to navigate personal and professional lives efficiently. This understanding informs that assessment practices that merely focus on the retention or minimal thinking skills may not be appropriate in present scenario. Competency-based assessment provides a robust framework for revitalizing the assessment as well as the pedagogical approach and experiences.

Competencies are broad ideas and statements that sum up the knowledge, skills and disposition to be acquired in different curricular areas. Therefore, the focus of competency-based learning and assessment is far broader as compared to content-based approach to learning and assessment. Content-based approach to assessment rests on the premise of mastery of content and completion of the syllabus. On the other hand, competency-based assessment focuses on capturing student’s

knowledge, skills and attitudes in different areas and their application to authentic situations/real-world problems. Moreover, the focus in competency-based assessment is not confined to grades/marks but expands to students' mastery of skills, feedback to students, and improvement in performance. Competency-based assessments can also be cross curricular and may go beyond the contexts given in the textbooks.

NEP 2020 highlights that assessment should be competency-based, should promote learning and development for our students, and test higher-order skills, such as analysis, critical thinking, and conceptual clarity. The primary purpose of assessment will be diagnostic and will help to optimize learning and development for all students. This will be the underlying principle for assessment at all levels of education.

To assess the learning levels of students, different assessment tools are used and it is important that the assessment tools are in tandem with the focus and purpose of the assessment. NEP 2020 also highlights that the assessment tools need to be aligned with the learning outcomes, capabilities, and dispositions as specified for each subject of a given class.

Some Key Competencies in different Curricular Areas

In order to move towards competency-based schooling and education system, an understanding of what competencies entail is a prerequisite. Competencies are statements that specify what children will know, be able to do, or be able to demonstrate when they have completed or participated in a course or program.

Competencies are the ways of thinking or intellectual approaches that develop as students become increasingly proficient in a domain. In other words, the broad domains of skills, knowledge and disposition as relevant to different disciplines can be communicated through specific set of competencies. Competencies need to be focused and developed at different levels depending upon the broad content outline of the curricular subjects, cognitive level of students and their milieu.

The table provides competencies for the disciplines of Language, Mathematics, EVS/Science and Social Science. For language, in particular, the competencies are given for the reading comprehension domain.

Language	Mathematics	EVS/Science	Social Science
Retrieving information (locates)	Recognizes and Applies single processing step	Recognizes a valid scientific query	Identifying and/or using the evidence needed
Interpreting and reflecting on the content and form of texts in relation to their own knowledge of the world	Interprets, links and integrates and extrapolates a given pattern	Identifying and/or using the evidence needed	Drawing or evaluating the conclusion
Evaluating & arguing their point of view	Generalisation, reasoning, augmentation and applies multiple steps to process	Drawing or evaluating the conclusion	Demonstrating understanding of concepts
--	--	Demonstrating understanding of scientific concepts	Environmental, Economic and Social Dimensions of Sustainable Development

Developing Competency-based Assessment Items

In the context of assessment, the term 'item' means 'every individual question'. Each of the items in an assessment attempts to measure a certain 'construct'. A construct may relate to various kinds of psychological abilities such as certain type of knowledge like names of colours, having an understanding like understanding of mathematical operations or ability to perform like completing an electric circuit and making a working model of bulb/bell. An item aims to collect evidence of the presence or absence of a certain construct by presenting the student with some stimulus to which the student responds. Sometimes the students can choose the response from the given response options, at other times they may be asked to construct their own response. In order to obtain a fair idea of the presence/absence of a construct, it's important to have high quality error-free items.

Item stimulus and context

An item may begin with a relevant context/prompt followed by the question. This context or prompt

is called the 'Stimulus'. To make the stimulus engaging, information may be given in a variety of ways such as through a piece of text, a diagram, a graph, a table, a map, a chart, or a combination of these.

To develop an interesting stimulus is an important part of item development. The length of stimulus is also dependent on the subject to be assessed. While it is important to have text of suitable length while assessing reading or listening comprehension at different grade levels, for subjects like Mathematics and Science, it is important to keep a tab on the length of the stimulus. In all respect, the stimulus should present factually correct data.

Good stimulus material has the following characteristics:

- It is substantive and worth examining closely.
- It is likely to be of interest to the target audience.
- It is well written and well designed.
- It is optimally challenging, not too hard or too easy.
- It does not pose spurious challenges.
- It is factually correct.
- It offers opportunities for searching questions.
- It is self-contained.

The competency-based items aim to assess students' attainment of certain competencies (as explained in the preceding section) and do so by anchoring the item in the grade level content. Therefore, the first and foremost criteria for developing good quality items for competency-based assessment is to ensure its alignment with the mapped competency and the specific grade level.

Some **generic principles** to follow while developing assessment items are as follows-

- Where appropriate, providing some context for the stimulus material is important. Context may be provided through a heading or a brief introduction. For example, an extract from a science fiction novel might be introduced as follows: "This piece of writing is from a novel setting the future."
- The item should test a single construct/concept.
- The content of the item should be engaging and should be displayed well for the students to feel motivated to attempt it.

- The item format should be in tandem with the focus of the question. While some questions render themselves more suitable as constructed-response items, others can be effectively framed as MCIs.
- The item should test the mapped domain/topic and must not digress from it to maintain the validity of the item.
- The item should not favour the students from a particular social, cultural or linguistic group, geographical location or gender.
- The graphics, if used, should be copyright free and should be of good resolution.
- While reference to good assessment items is encouraged, it is important that the items are adapted to the context of the learners and are not copied from other sources. Items must not be plagiarised from other sources.

Multiple Choice Questions & Open-Constructed Items

There are two common types of items or response formats- Selected Response and Constructed Response.

Selected response items comprise of Multiple-Choice Items or MCQs. An MCQ has the following parts

- **Stimulus**: A stimulus is a prompt (picture, graph, table etc.) that is given before the stem in an item. Multiple choice items may or may not have a stimulus

- **Stem**: The part of the item that presents the question or task to be accomplished. In a multiple choice item, the stem may be phrased as a question or statement (closed-stemmed) or an incomplete statement (open-stemmed).

- **Distractors**: Incorrect answer choices.

- **Key**: The correct answer choice.

MCQs can be used to assess a wide range of learning outcomes including simple recall of knowledge, analysis of phenomena, application of principles and interpretation of cause and effect relationships. They are also useful when there is a need to cover a significant amount of content in a short time. Good quality MCQs maximise the validity of the assessment as students can attempt numerous items in a given amount of testing time, resulting in broader sampling of course content. MCQs that are carefully constructed can also provide valuable feedback to the student.

Stimulus	**Aman travelled 120.7 km in a train and then he travelled 58.6 km in a bus.**
Stem	How far did Aman travel?
Distractor	178.13 km
Distractor	178.3 km
Key	179.3 km
Distractor	178.0 km

MCQs may have 4-6 response options. MCQs can be of both kinds that have one correct answer choice/key or more than one correct answer choice/key. This needs to be mentioned in the item whether the student is expected to choose one or more than one option can be chosen. Most of the times, MCIs have one key and other options are well framed distractors. Matching items are also selected response items.

Guidelines pertaining to framing of MCQs are as follows:

- The question should be framed in as accurate a manner as possible with comprehensible vocabulary, sentence structure and sentence length.
- The stem of the item for MCQs should not be unnecessary lengthy
- Avoid using passive voice in the stem.

- Also, avoid using words such as No, Not, Least, Most, Likely etc. in the stem. If necessary to use, these words need to be highlighted.

- For simple Multiple-Choice Questions (MCQs), there should only be one key with high quality distractors that help identify high ability students from low ability students. Key can be more than one in case of simple MCQ with more than one correct answer choices.

- Response options in the MCQs should be independent of each other. All the response options should be framed in such a way that fits the sentence structure of the stem.

- Avoid using 'all of the above' and 'none of the above' as options.

- The response options should be of comparable complexity, sentence structure and sentence length.

- The correct key along with explanation should be provided for the MCQs.

- Effective multiple-choice distractors represent logical misunderstandings by the examinee.

- Effective multiple - choice questions avoid distractors that are too close to the key.

- Frame a constructed response item when the students are required to provide an explanation, illustrate a line of reasoning or justification.

Constructed Response Items

Constructed Response Items comprise of Short Constructed Response, Long or Extended Constructed Response and Performance assessment items. Open-constructed items require the students to frame the response to answer the questions being asked. All constructed response items consist of the following two parts

- **Prompt**: The prompt is the part of the item that presents the question(s) or tasks to be answered. This basically has the stimulus and the question.

- **Rubric**: The rubric presents the criteria that will be used in scoring the open–ended item. In addition the scoring criteria, rubrics should include examples and/or answer keys.

Rubrics are scales that differentiate levels of student performance. They contain the criteria that must be met by the student and the judgement process that will be used to rate how well the student has performed. An exemplar is an example that delineates the desired characteristics of quality in ways students can understand. These are important parts of the assessment process. Well-designed rubrics include:

- performance dimensions that are critical to successful task completion;
- criteria that reflect all the important outcomes of the performance task;
- a rating scale that provides a usable, easily-interpreted score; and
- criteria that reflect concrete references, in clear language understandable to students, parent, and other teachers.

Guidelines pertaining to framing of Open-Constructed Items are as follows

- Effective constructed response items contain neither undue wordiness and negation, nor passive voice constructions.

- The answer of a constructed response item cannot be given with a simple yes or no

- Effective constructed response items yield responses that encompass/cover the range of aspects given under completely correct and partially correct.

- Effective constructed response items have prompts that clearly indicate the amount and type of information that must be provided in the response to receive the highest score point.

Guidelines for Preparation of Scoring Criteria for Extended Response Questions

Marking schemes are written guides that help teachers mark constructed response items in a systematic and objective manner. The scoring rubric of the constructed response items should comprise of all the criteria that will be used for marking a response as fully correct/partially correct and incorrect. Broadly the following principles should be followed while preparing marking scheme:

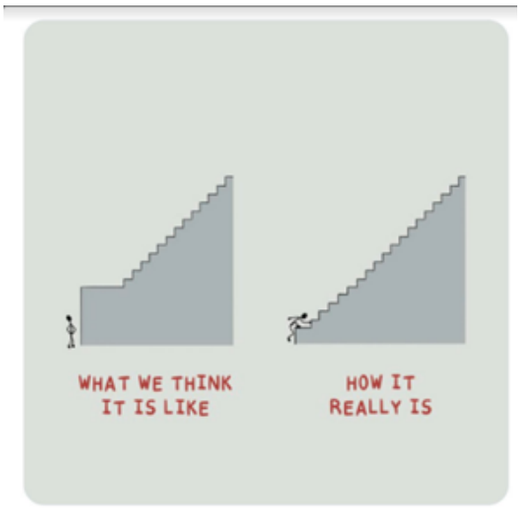
- Effective constructed response items have rubrics that contain descriptive statements relating to the skill or standard being assessed and do not include statements about skills unrelated to the skill or standard being assessed.
- Marks should be awarded in line with specific skills and competencies assessed in the question.
- Marks should be allocated based on the appropriateness of the context and the time taken by the student to respond to a question.
- Marks should be awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme. Therefore, rubrics should accommodate such answers.
- Further information should be provided wherever to eliminate subjectivity in evaluation.
- Details about value points should be provided wherever required.
- No level should be defined in the rubrics for negative marks.

Preparing Questions

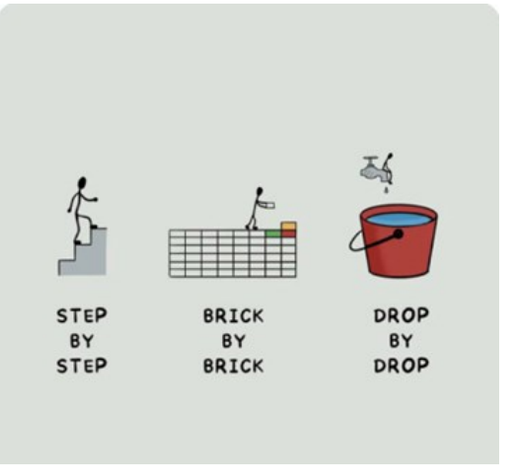
Preparing questions or writing items is an effort intense activity. While it is important to follow and refer to the guidelines for writing different items, writing and engaging in creating error-free items also calls for creativity and a thorough understanding of concept and possible misconceptions around it. Often, the first draft of the item requires modifications and corrections. Therefore, item

writers or teachers are encouraged to review the questions/items thoroughly vis-à-vis the guidelines given for the item development and rubrics for marking the answer. The item developers are also encouraged to get a peer review done. Sometimes, involving the students in this process, gives a lot of insights into framing better questions.

While framing questions, the task may look like:



And the way to make it seem less difficult is to take it…..



Item Quality Checklist (To be used by item developer / reviewer)

S.No.	Please check the following for items	Mark ✓ if Yes and Mark ✗ if No
1	**Validity of items**	
1.1	Aligned to the content and concepts covered in the class	
1.2	Aligned to the competency to be assessed.	
2	**Quality concerns in stems and prompts w.r.t. factual andconceptual accuracy and language**	
2.1	Is the information in the stem/prompt factually andconceptually accurate?	
2.2	Does the stem/prompt avoid being unnecessarily wordy/providingextraneous information?	
2.3	Does the stem/prompt use negatives only when necessary?	
2.4	Does the stem/prompt avoid complex, ambiguous, and/or tricky language?	
2.5	Is the stem/prompt free of grammatical errors?	
2.6	Does the stem/prompt present one clearly formulated question?	
2.7	Does the stem/prompt contain all information necessary fora response?	
3	**Specific Quality Concerns in Constructed-Response Prompts (Write NA if not applicable)**	
3.1	Does the prompt clearly communicate what is expected fromstudents to get full marks?	
3.2	Does the prompt have sufficient breadth to support a full range of responses?	
3.3	Does the prompt elicit the format of response intended/expected?	

3.4	Does the prompt focus on a concept not easily tested in multiple-choice format?	
4	**Quality Concerns in Options/Distractors for Multiple-Choice Items (Write NA if not applicable)**	
4.1	Is there one, and only one, clearly correct answer?	
4.2	Are options independent of each other/Are there no options with the same meaning?	
4.3	Are distractors based on reasonable misconceptions and errors?	
4.4	Are options parallel in structure, degree of specificity, and/or length? Are there no unnecessarily wordy options?	
4.5	Do options avoid repetitive wording?	
4.6	Are options sufficiently plausible and reasonable for item discrimination?	
4.7	Is the correct answer not clued by the item stem, such as absolutes or words repeated in both the stem and options?	
4.8	Are options in logical order?	
4.9	Are there no absolute words, such as always and all, in only one option?	
4.10	Are there no misleading and/or tricky options?	
4.11	Are there no all-inclusive options?	
5	**Quality Concerns in Item Art (Graphics) and Stimuli**	
5.1	Does the art/stimulus avoid clueing the correct answer to an item?	
5.2	Does the art/stimulus contain appropriate and accurate labels?	
5.3	Is the art/stimulus not confusing or overwhelming?	
5.4	Is the art/stimulus clear, accurate and sufficient to answer the item?	
5.5	Is the art/stimulus significantly free from copyright issues?	

5.6	Is the art/stimulus necessary, relevant and useful to answer the question?	
5.7	Is the art/stimulus likely to be interesting/engaging to students?	
5.8	Is the art/stimulus pitched at appropriate grade/age/reading level?	
6	**Item Bias and Sensitivity Issues**	
6.1	Is the item accessible to the greatest number of test-takers?	
6.2	Is the item free from bias in the areas of- gender, caste, religion, socio-economic class/status/regional diversity, age, culture, physical appearance?	
6.3	Is the item language unbiased towards a particular linguistic group?	
6.4	Is the item sensitive to special-needs groups?	
6.5	Does the item avoid offensive, disturbing or controversial Information?	

Template for Writing Items

School UDISE Code:		Grade:	
Subject:			

Difficulty level	Domain/Topic	Learning Outcome
Easy ☐		
Medium ☐		
Hard ☐		
Competency ▷		

Stimulus	Text, Figure, Table, Graphs, Maps etc.		
		Option/ distractor*	Correct Response Option*
	A		
	B		
	C		
	D		
	E		
	F		

Explanation for Key	☐	
Constructed Response Scoring Rubric		

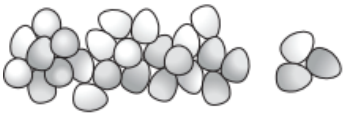
**Please write the word 'key' in the Correct Response option coloumn whenever applicable. Key can be more than one in case of simple MCQ with multiple correct options.*

Sample Items

1. Foundational Stage:

School UDISE Code:		**Grade:**	III
Subject:	**Mathematics**		

Difficulty level	**Domain/Topic**	**Learning Outcome**
Easy ☐	Number Operations	
Medium ■		
Hard ☐		
Competency ▷	■ Recognizes and Applies single processing step	
	☐ Interprets, links and integrates and extrapolates a given pattern	
	☐ Generalisation, reasoning, augmentation and applies multiple steps to process	

Stimulus	A girl collected 24 pebbles from a riverside. To count the pebbles, she put them in groups of 3. Which of the following shows the 24 pebbles in groups of 3?		
	Option/ distractor		**Correct Response Option***
	A		
	B		Key
	C		
	D		

Explanation for Key	The pebbles are put in groups of 3 and there are 8 such groups making it a total of 24 pebbles.

2. Preparatory Stage:

School UDISE Code:		Grade:	V
Subject:	Language		

Difficulty level	Domain/Topic	Learning Outcome
Easy ☐ Medium ■ Hard ☐	Reading Comprehension	---
Competency ▷	☐ 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	

Stimulus	**A recipe of a fruit salad is given below-** **Ingredients** 4 oranges Half cup of pomegranate or grapes 1 tablespoon of honey Half teaspoon of cardamom powder (a spice) **Instructions** 1. Wash all the fruits. 2. Peel 3 oranges, cut into slices, and put in a bowl. 3. If using pomegranate, peel the fruits and take the seeds out and add to the bowl. 4. If using grapes, remove the stem, if any and add the grapes to the bowl. 5. Put the juice of one orange into a saucepan with the cardamom and honey. Stir over a gentle heat for 5 minutes. 6. Pour the hot sauce over the fruit in the bowl and mix gently. 7. If you don't eat it immediately, keep it cool.

	The oranges are added to the salad in two different ways. Explain them.
Constructed Response	

Constructed Response Scoring Rubric	**Correct Response** 1. Orange is peeled and cut into slices and added/ Pieces are added. 2. Orange juice is added/Orange juice is taken outand added after heating. **Partially Correct Response** 1. Any one of the points given under 'correct response'. **Incorrect Reponse** Response other than the one mentioned in correct or partially correct response.

3. Middle Stage:

School UDISE Code:		Grade:	VIII
Subject:	Mathematics		

Difficulty level	Domain/Topic	Learning Outcome
Easy ☐ Medium ☐ Hard ■	Number system and pattern	---
Competency ▷	☐ Recognizes and Applies single processing step	
	☐ Interprets, links and integrates and extrapolates a given pattern	
	■ Generalization, reasoning, augmentation and applies multiple steps to process	

Stimulus

Matchsticks are used to make the following figures. Observe the pattern.

Figure 1 Figure 2 Figure 3

If the pattern is continued, how many matchsticks will be used to make Figure 10.

	Option/ distractor	Correct Response Option*
A	30	
B	33	Key
C	36	
D	39	
E	42	

Explanation for Key	The general rule that applies in the pattern is 3x+3 where x represents the number of squares. In the pattern the triangle and the squares are sharing the sides. For Figure 10, number of required matchsticks will be 3x10+3= 33

4. Secondary Stage:

SchoolUDISECode:		**Grade**:	10
Subject:	**Social Science**		

Difficulty level	**Domain/Topic**	**Learning Outcome**
Easy ☐ Medium ■ Hard ☐	Integrated: Agriculture, Resource andDevelopment and water resource	---
Competency ▷	☐ Identifying and/or using the evidence needed	
	☐ Drawing or evaluating the conclusion	
	☐ Demonstrating understanding of concepts	
	■ Environmental, Economic and Social Dimensions of Sustainable Development	

Stimulus	The pictures below show a type of agriculture practised in some parts of India.  1. Explain any 2 features of agriculture shown in the above pictures. 2. Mention one likely challenge that may be faced by the farmers practicing this type of farming after few years?
Constructed Response	

Constructed Response Scoring Rubric	**Correct Response**
	• Gives a detailed description of the features: (any 2)
	  • Large size of the farms
	  • Use of machines
	  • Use of chemical fertilizers, pesticides and irrigation to increase productivity

	• Likely challenge: (any one) • Over irrigation leading to water logging which increases the salinity and alkalinity of the soil • Too much use of chemical fertilizers and pesticides may lead to water and land pollution **Partially Correct Response** • Explains both the features of agriculture correctly but for (ii) unable to write the challenges faced OR • Explains only one feature of agriculture and for (ii) writes the challenge correctly • Explains only one feature of agriculture correctly and unable to write the second feature of agriculture and the challenge • Unable to write the features of the agriculture correctly but writes only the challenge correctly **Incorrect Response** Irrelevant and wrong answer

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