

Student Assessment Handbook

MATHEMATICS

For the
Royal Guard of Oman Technical College
Grade (12)



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1. Introduction

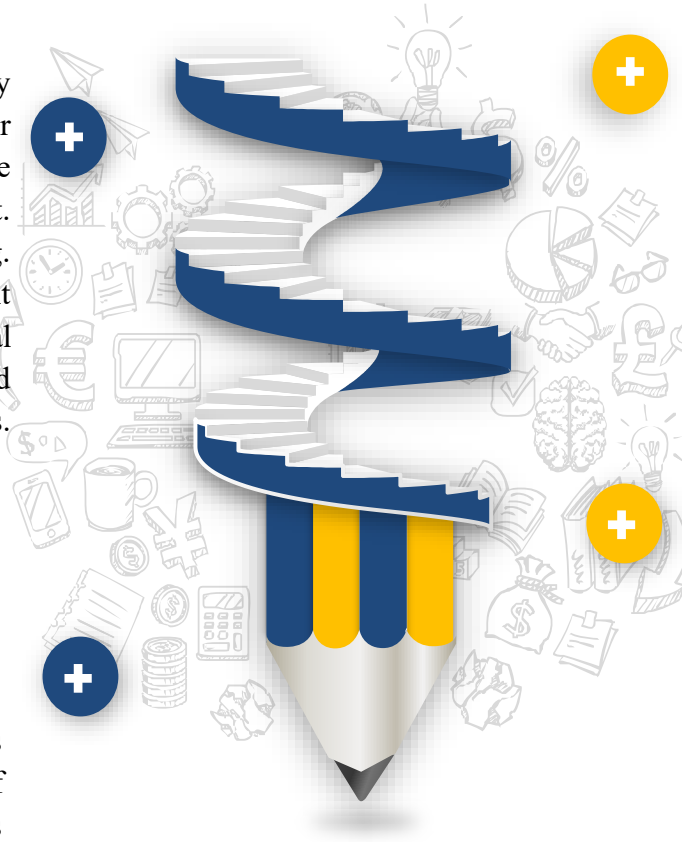
Assessment is an essential element of the educational process, by which the effectiveness of the educational process is evaluated, and the desired educational goals are achieved accordingly. As well as through which the elements of the different educational process are improved and developed due to the important information and data on the strengths and weaknesses of these elements.

Despite the multiplicity of patterns of educational assessment, continuous assessment is one of the most prominent of these patterns. This is due to the great importance it poses to help students know how much they have improved and inform parents about their children's performance levels. In addition, continuous assessment provides the teachers with important information about the level of achievement of educational goals/outcomes and helps them improve teaching methods and activates the real partnership between all related parties concerned with student education and learning through the integration of roles and responsibilities to assure quality in education.

This document is your guide to apply the continuous assessment. It provides a brief theoretical framework for the concept of continuous assessment and associated concepts and provides you with a frame of reference for how to implement continuous assessment tools by clarifying the mechanisms for implementing these tools and technical specifications

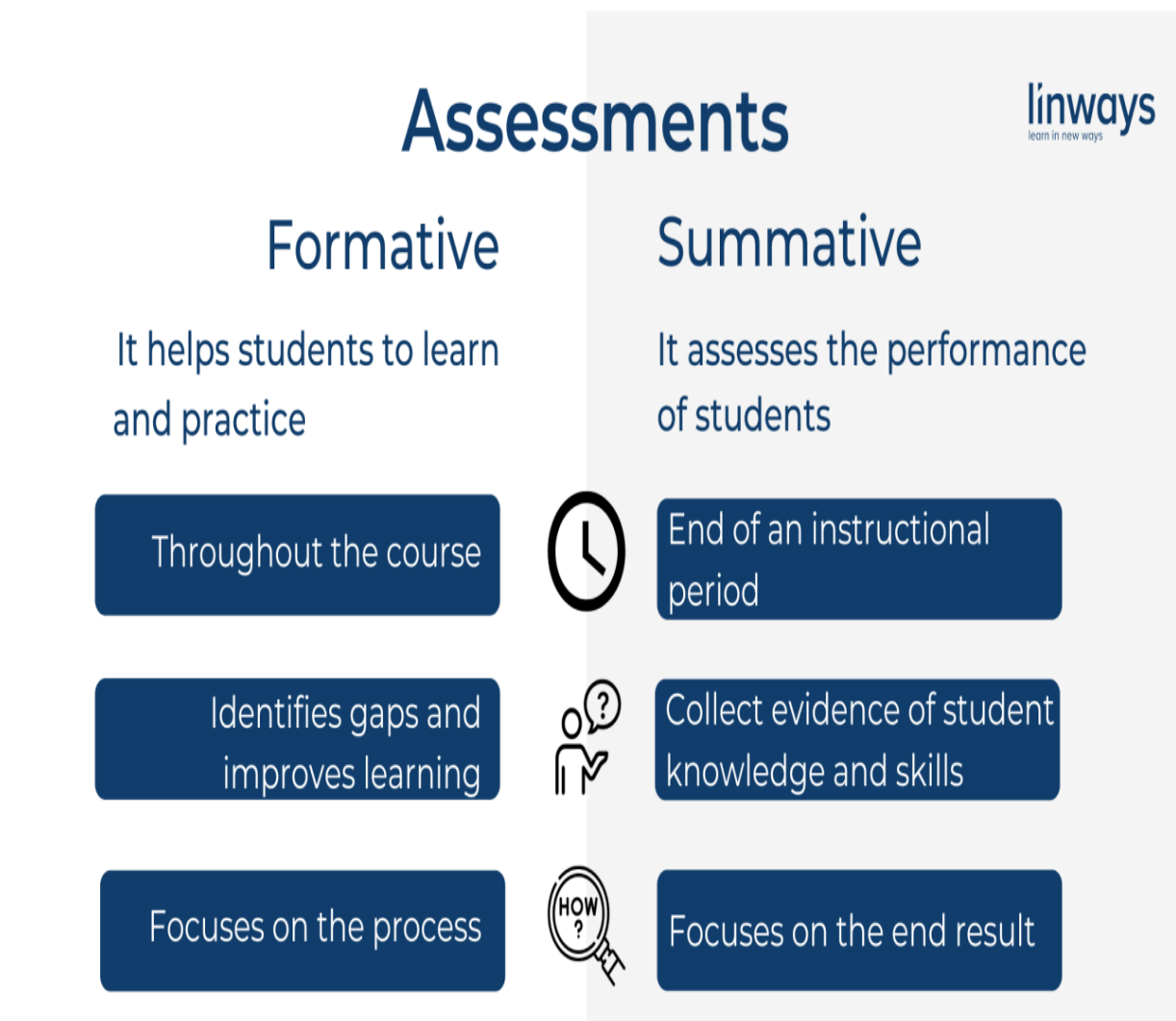
Assessment of student learning. Its purpose is to measure and report on standards of learning. Typically done by awarding marks and grades. Also, involves reporting to the Ministry and to parents.

Defined as: the process of employing information networks, computer equipment, educational software and materials from multiple sources, as well as using assessment to collect and analyze student responses, which in return help teachers to discuss the impacts of programs and activities on educational process and define them to reach a codified judgment based on quantitative or qualitative data related to academic achievement.



By using a combination of formative and summative assessments, teachers can ensure that students are meeting the learning goals and objectives and can provide valuable information to guide instruction and support student learning.

The brief differences between formative and summative assessments are shown in the following figure¹:



3. Cognitive levels

Knowledge		
1.	Recall/ Recognize	Make or identify accurate statements about science facts, relationships, processes, and concepts; identify the characteristics or properties of specific organisms, materials, and processes.
2.	Define	Provide or identify definitions of scientific terms; recognize and use scientific vocabulary, symbols, abbreviations, units, and scales in relevant contexts.
3.	Describe	Describe organisms, physical materials, and science processes that demonstrate knowledge of properties, structure, function, and relationships.
4.	Illustrate with Examples	Support or clarify statements of facts or concepts with appropriate examples; identify or provide specific examples to illustrate knowledge of general concepts.
5.	Demonstrate knowledge of scientific instruments	Demonstrate knowledge of how to use science. apparatus, equipment, tools, measurement devices, and scales.

Applying		
1.	Compare/ Contrast/ Classify	Identify or describe similarities and differences between groups of organisms, materials, or processes; distinguish, classify, or order individual objects, materials, organisms, and processes based on given characteristics and properties.
2.	Use Models	Use a diagram or model to demonstrate understanding of a science concept, structure, relationship, process, or biological or physical system or cycle (e.g., food web, electrical circuit, water cycle, solar system, atomic structure).
3.	Relate	Relate knowledge of an underlying biological or physical concept to an observed or inferred property, behavior, or use of objects, organisms, or materials.
4.	Interpret Information	Interpret relevant textual, tabular, or graphical information considering a science concept or principle.
5.	Find Solutions	Identify or use a science relationship, equations, or formulas to find a qualitative or quantitative solution involving the direct application/demonstration of a concept.
6.	Explain	Provide or identify an explanation for an observation or natural phenomenon, demonstrating understanding of the underlying science concept, principle, law, or theory.

Reasoning		
1.	Analyze	Analyze problems to determine the relevant relationships, concepts, and problem-solving steps; develop and explain problem-solving strategies.
2.	Integrate/ Synthesize	Provide solutions to problems that require consideration of a number of different factors or related concepts; make associations or connections between concepts in different areas of science; demonstrate understanding of unified concepts and themes across the domains of science; integrate mathematical concepts or procedures in the solutions to science problems.
3.	Hypothesize/ Predict	Combine knowledge of science concepts with information from experience or observation to formulate questions that can be answered by investigation; formulate hypotheses as testable assumptions using knowledge from observation and/or analysis of scientific information and conceptual understanding; make predictions about the effects of changes in biological or physical conditions considering evidence and scientific understanding.
4.	Design	Design or plan investigations appropriate for answering scientific questions or testing hypotheses; describe or recognize the characteristics of well- designed investigations in terms of variables to be measured and controlled and cause-and-effect relationships; make decisions about measurements or procedures to be use in conducting investigations.
5.	Draw Conclusions	Detect patterns in data, describe or summarize data trends, and interpolate or extrapolate from data or given information; make valid inferences on the basis of evidence and/or understanding of science concepts; draw appropriate conclusions that address questions or hypotheses, and demonstrate understanding of cause and effect.
6.	Generalize	Make general conclusions that go beyond the experimental or given conditions and apply those conclusions to new situations; determine general formulas for expressing physical relationships.
7.	Evaluate	Weigh advantages and disadvantages to make decisions about alternative processes, materials, and sources; consider scientific and social factors to evaluate the impact of science and technology on biological and physical systems; evaluate alternative explanations and problem-solving strategies and solutions; evaluate results of investigations with respect to sufficiency of data to support conclusions.

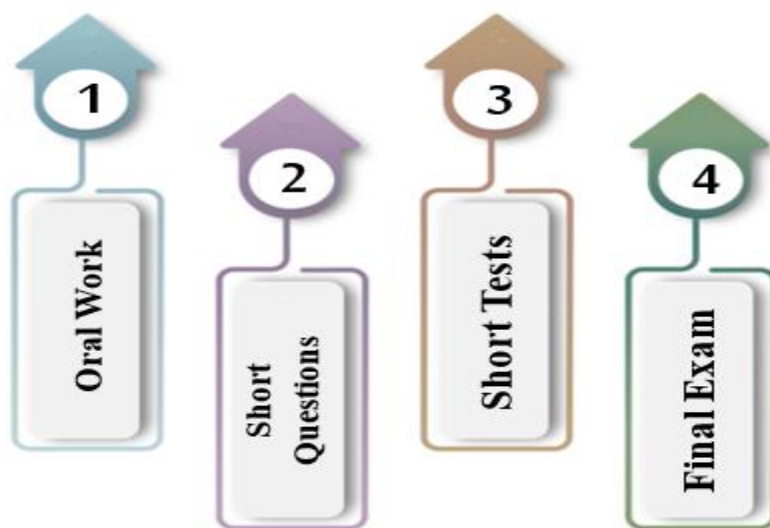
4. Level of demand

Each item will be designated as low (L), medium (M) or high (H) demand. The purpose of this is to enable differentiation between students. The table below describes the three levels of demand.

Low (L)	It is expected that most students will be able to answer low demand questions correctly. Items may have one or more of the following features: • test the least demanding aspects of a learning objective. • involve a small number of steps. • involve the use of routine procedures. • specify explicitly what the student needs to do • involve simple problems.
Medium (M)	Items may have one or more of the following features: • test the more demanding aspects of a learning objective. • require the selection and use of techniques and procedures to solve a problem. • involve several steps.
High (H)	It is expected that a minority of students will be able to answer high demand questions. Items may have one or more of the following features: • test the most demanding aspects of a learning objective. • involve the application of techniques and procedures to solve challenging multi-step problems. • there may be little guidance in the question.

There is no restriction on the combination of assessment objective and level of demand for an item. It is possible to have a high demand AO1 question or a low demand AO2 question.

5. Assessment Tools



Mark Distribution of Assessment Tools:

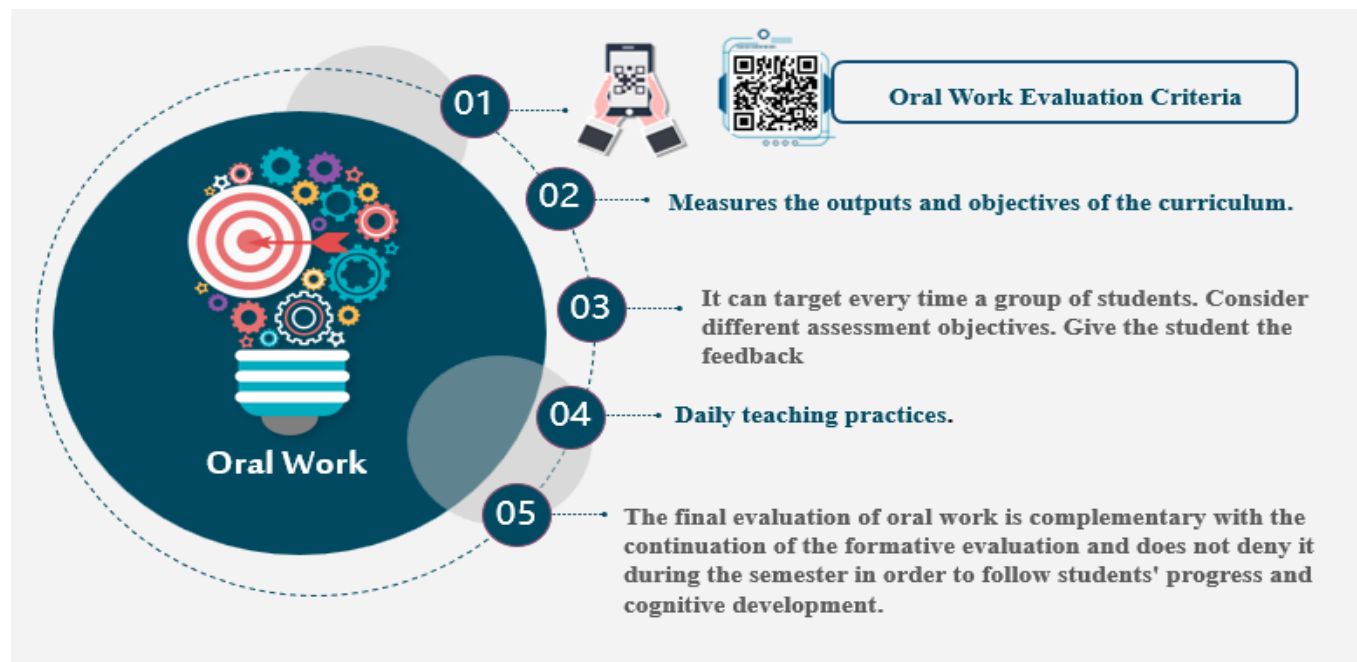
Continuous Assessment		Mark
		Grade 12
Continuous Assessment Tools	Oral Work	5
	Homework	-
	Short Questions	5
	Short Tests	20
Final Exam		70
Total		100

6. Assessment Tools Specifications

6-1: Oral work

One of the targeted methods of collective thinking that helps to develop the student's expressive ability, along with self-confidence, ability to listen, dialogue, express opinion and respect for other opinions. This tool is applied through different educational attitudes to obtain oral responses from students on an issue or subject, usually between two or more parties (either between the teacher and the student or between the teacher and a group of students or between the student and his colleague or between the student and a group of students).

Tool Application



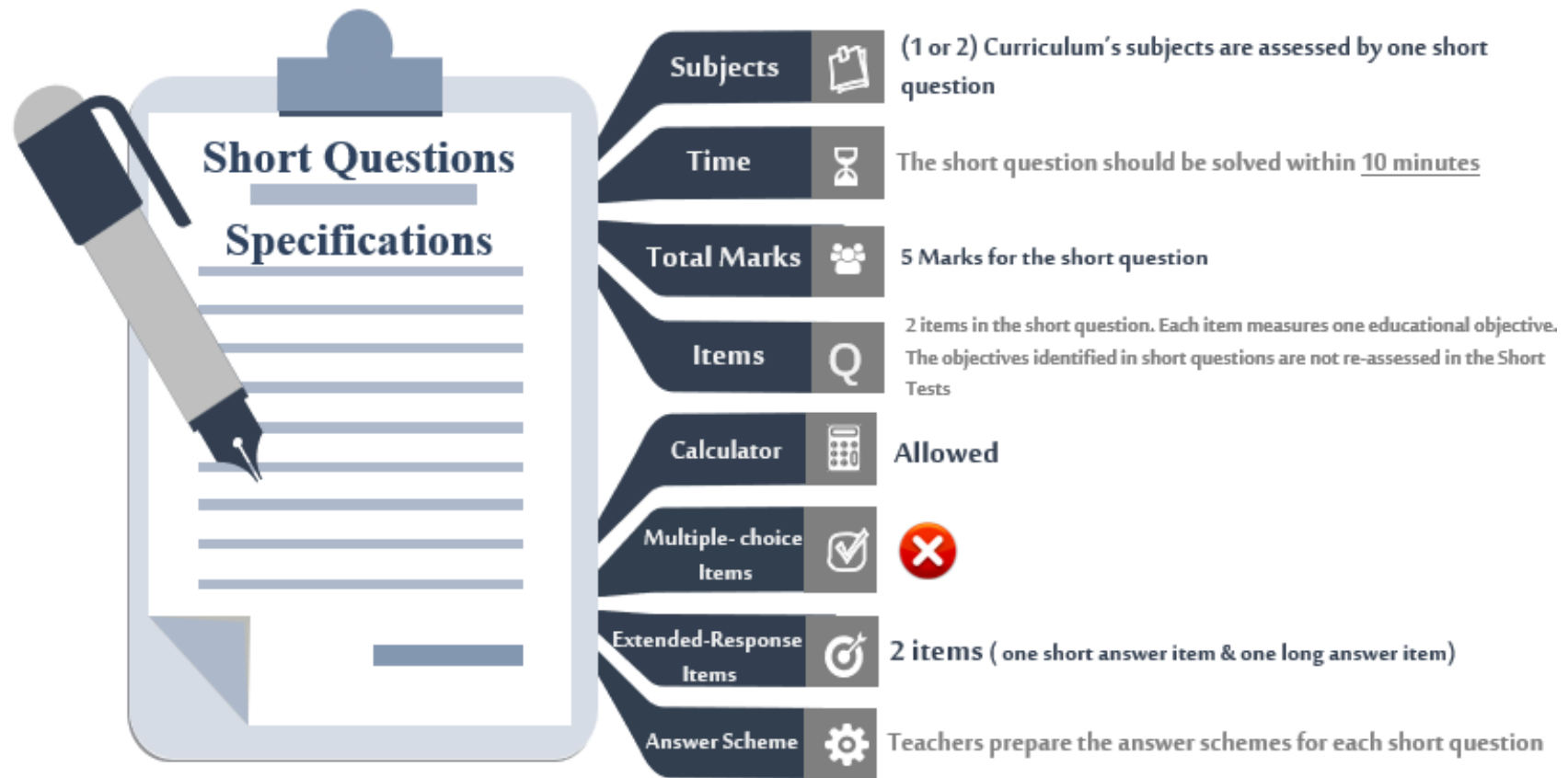
Customize Marks

The oral work is assessed as a summative continuous assessment tool through each semester as follows:

Grade	Total Marks	Assessing periods	Remark
12	5	2	The student is assessed twice each with 5marks during the semester. Then take the average

6-2: Short Question

An evaluation tool that is used continuously during class to ensure that student has achieved the required educational outcomes, followed by appropriate feedback.



Customize Marks

The short question marks are distributed as a summative continuous assessment tool as follows:

Grade	Total Marks	Assessing periods	Remark
12	5	1	The student is assessed once with 5 marks during the semester

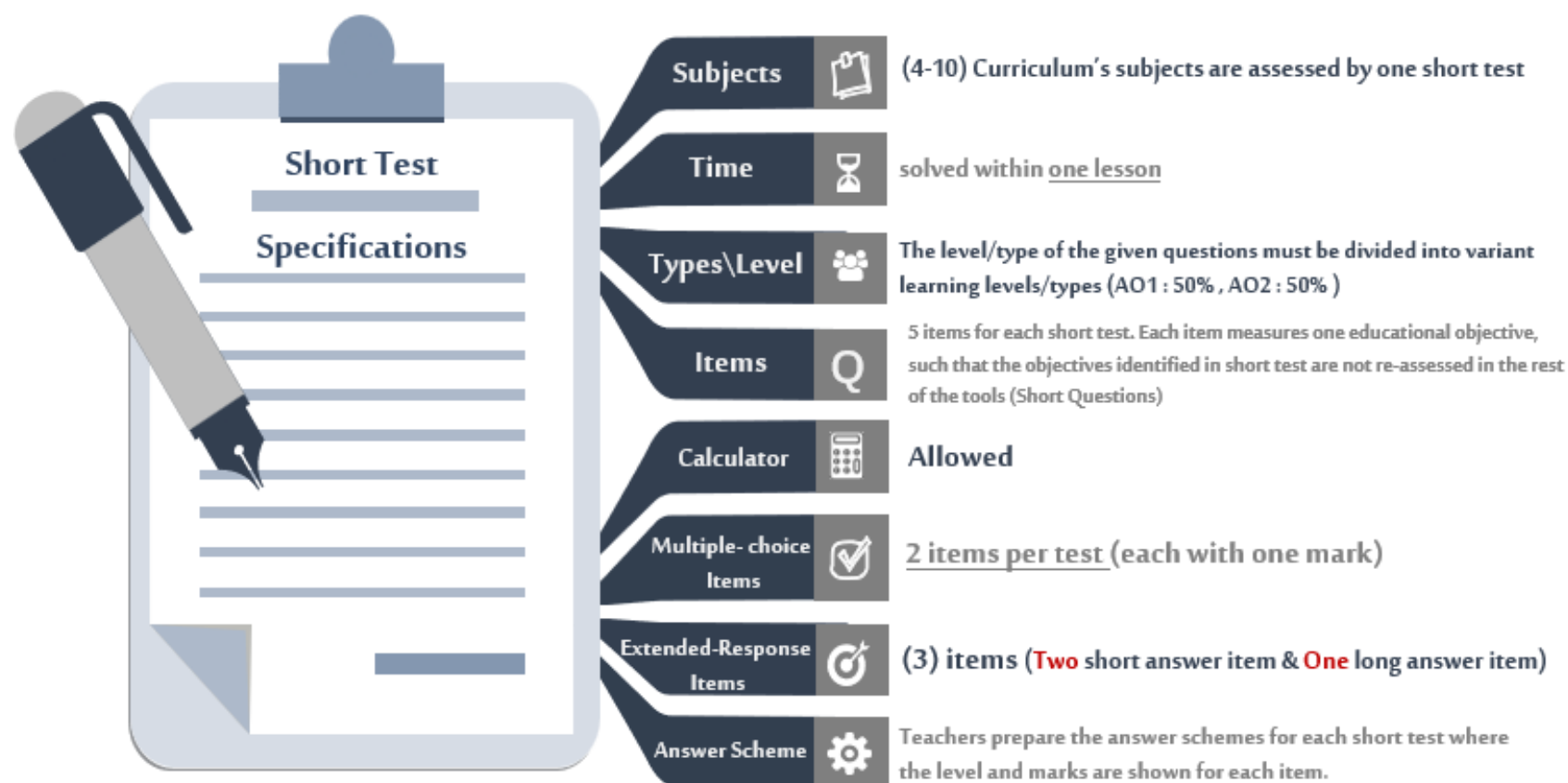
Items Types

For each short question, the types, number and scores assigned to each item are shown below:

Item Types	Number of Items	marks
Short Answer Items	1	(1-2) Marks
Long Answer Items	1	(3-4) Marks

6-3: Short Test

Defined as one of the assessment tools that prepared by the teacher during the year applied at the end portion of the content. The feedback should be given to the students directly after the short test.



Customize Marks

The short test marks are distributed as a summative continuous assessment tool as follows:

Grade	Assessing periods	Marks
12	2	20 marks and the students are assessed twice during semester each with 10 marks

Items Types

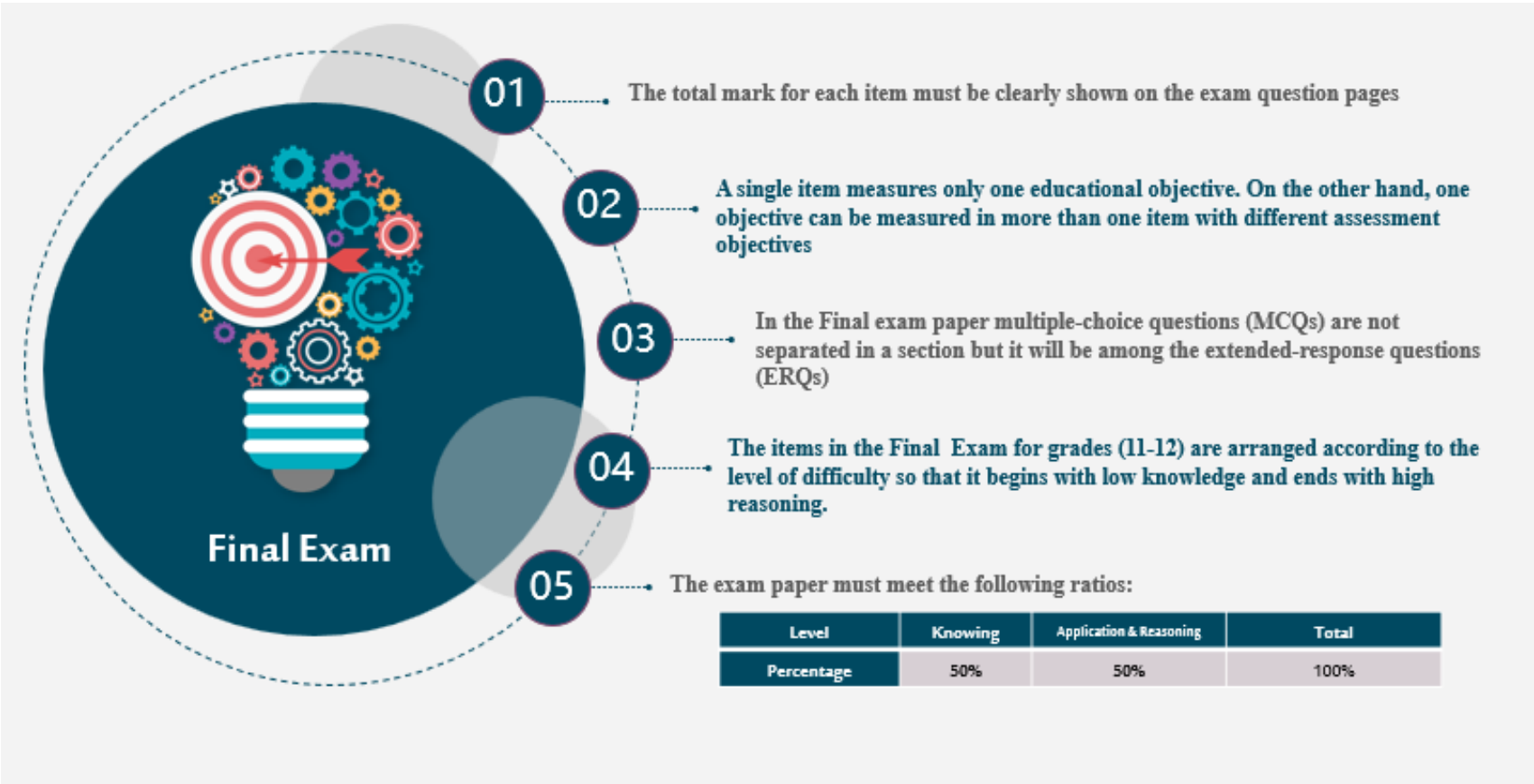
Item Types		Number of Items	Marks
Multiple Choice Items		2	1 mark per item
Extended Response Items	Short Answer Items	2	2 marks per item
	Long Answer Items	1	4 marks

6-4: Final Exam

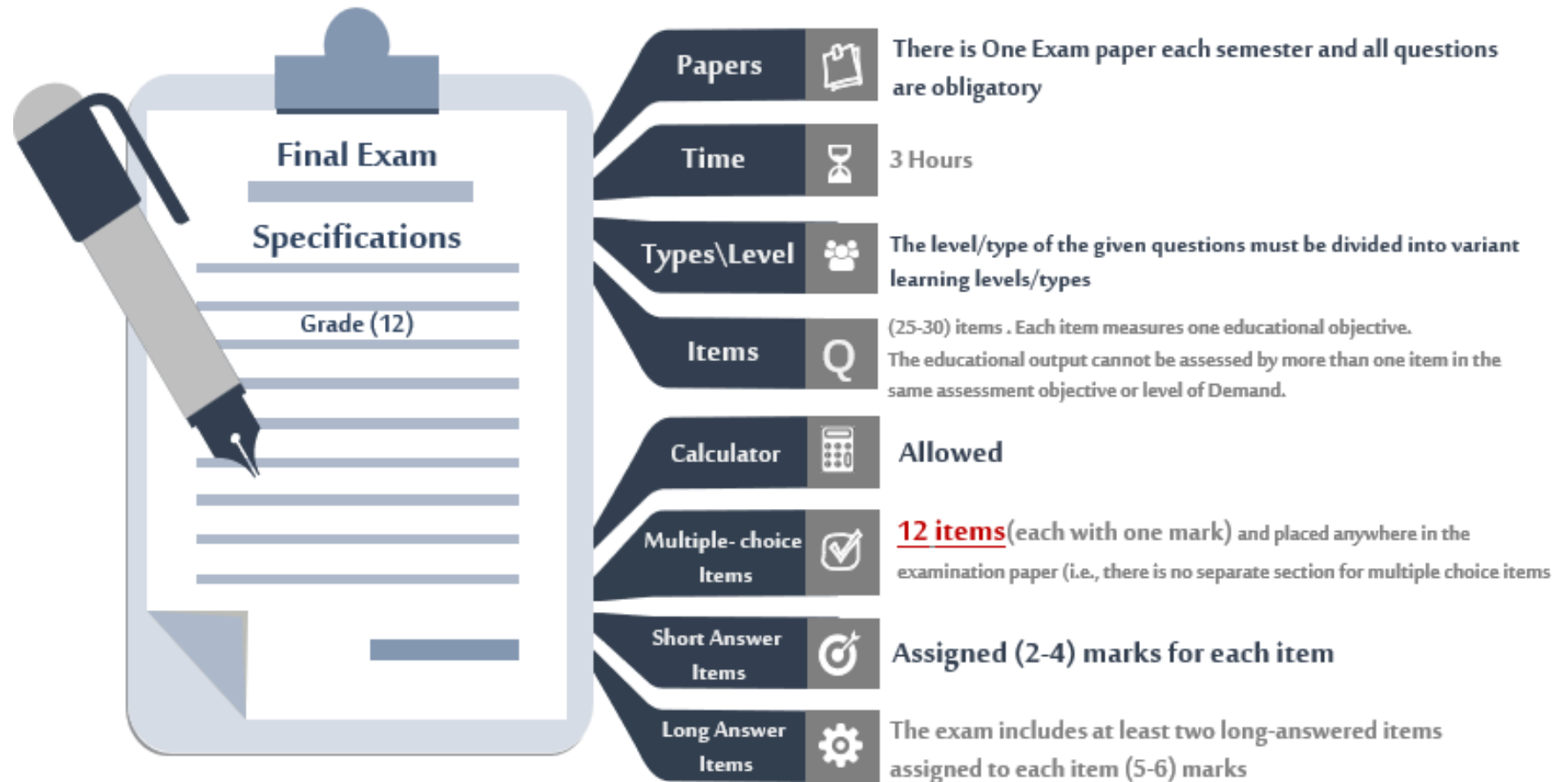
Defined as one of the assessment tools that are administered at the end of each semester. Ratios of assessment items and distribution of marks are considered when the questions are prepared in the final exam paper as follows:

Mark Distribution							
70 Marks	Assessment Objectives	AO1 (50%)			AO2 (50%)		
		35 marks			35 marks		
	Levels of Demand	L (40%)	M (40%)	H (20%)	L (40%)	M (40%)	H (20%)
		14	14	7	14	14	7

Specification of Final Exam Paper for The End of The Academic Year for Grade 1



Final Exam Specification



Customize Marks of Final Exam of the final Exam

1st Semester				
Unit	Weight (%)	Multiple-choice Questions	Extended-response Questions	Total
		Marks	Marks	
Algebra	12%	1	7	8
Logarithms and exponential functions	12%	1	7	8
Trigonometry	33%	4	19	23
Vectors	12%	1	8	9
Matrices	13%	2	7	9
Complex Numbers	18%	3	10	13
TOTAL	100%	12	58	70

2 nd Semester				
Unit	Weight (%)	Multiple-choice Questions	Extended-response Questions	Total
		Marks	Marks	
Limits of functions	8%	1	5	6
Differentiation	42%	5	24	29
Integration	38%	5	22	27
Normal Distribution	12%	1	7	8
TOTAL	100%	12	58	70

7. Mathematics Assessment Sheet for Grade (12)

Evaluation Form of Student Performance - Academic Year 2024/2025

School Name:		Teacher Name:	
Grade: 12 /	Subject: Mathematics		Semester:

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