To Serve with Quality

SCIENCE
PRIMARY FIVE

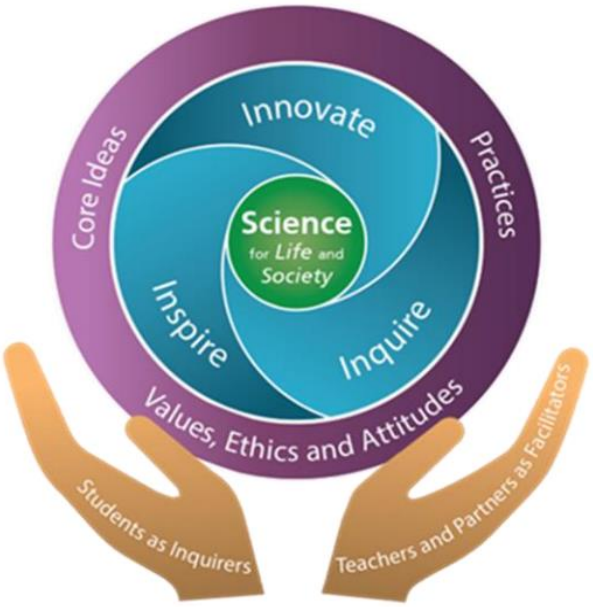
SCIENCE DEPARTMENT VISION AND MISSION

Vision: Every Shuqunite a creative and effective thinker

Mission: To nurture effective and creative thinkers with a sense of inquiry and passion for the learning of science

OVERVIEW OF THE SCIENCE CURRICULUM

The Primary Science Syllabus is based on the revised Science Curriculum Framework.



The Science Curriculum Framework (CPDD 2023)

Science for Life and Society in the centre circle captures the twin goals of Science education which are to:

1. Enthuse and nurture all students to be scientifically literate.
2. Provide strong Science fundamentals for students to innovate and pursue STEM for future learning and work.

The three main domains that make up the fundamentals of Science are:

1. Core Ideas of Science – The distilled core ideas are organised in five themes: ***Diversity***, ***Cycles***, ***Systems***, ***Energy*** and ***Interactions***. Fundamental concepts in life and physical sciences are broadly covered to provide a broad-based understanding of the environment, and it will help build a foundation upon which students can rely for further study.

2. Practices of Science -There are three components which are Demonstrating Ways of Thinking and Doing, Understanding the nature of Science and Relating Science, Technology, Society and Environment.

3. Values, Ethics & Attitudes in Science

SYLLABUS FRAMEWORK

The Core Ideas in this syllabus are organised as themes, which students can relate to in their everyday experiences, and to the commonly observed phenomena in nature. The aim is to enable students to appreciate the links between different themes/topics and thus allow the integration of scientific ideas. A key feature of the syllabus is the spiral approach. Scientific concepts and process skills are revisited at different levels and with increasing depth to allow students to integrate newly acquired knowledge and skills with their existing schemas.

PRACTICES

In Shuqun Primary, teachers engage students in Practices of Science through inquiry. One of the practices, Ways of Thinking and Doing supports development of various skills and processes. The development of skills and processes is progressive as students learn Science from Primary 3 to Primary 6.

The table below shows each Way of Thinking and Doing and what we hope students can achieve at the end of Primary 5.

	By the end of P5, students should be able to:
Posing questions and defining problems	• Ask questions out of curiosity or to deepen understanding. • Ask questions which can be investigated.
Designing investigations	Recognise a fair test (changed/ unchanged variables).
Conducting investigations and testing solutions	• Use senses, apparatus, and equipment to gather data. • Investigate to find out answers to questions (guided and open investigations). • Record and/or compare observations/ data using notes, drawings and charts.
Analysing and interpreting data	• Analysis of data and information in representations (e.g., tables, bar and line graphs, charts, and diagrams) to infer patterns and relationships or explain findings.
Communicating, evaluating and defending ideas with evidence	Communicate (e.g., written, verbal, pictorial, tabular or graphical) clear explanation and reasoning.
Making informed decisions and taking responsible actions	State or select options based on appropriate criteria with reasons.
Using and developing models	Use multiple representations (e.g., pictures, charts, diagrams, tables, graphs) to explain concepts.
Constructing explanations and designing solutions	Construct possible explanations and generate ideas.

SYLLABUS LEARNING OUTCOMES FOR PRIMARY 5 STANDARD SCIENCE

The Primary Science Syllabus (2023) is available online at

https://www.moe.gov.sg/-/media/files/primary/syllabus/2023-primary-science.ashx?la=en&hash=ACABF4256B5F341428F59A346834E73CCD27CC39

Cycles in Plants and Animals (Reproduction)		
Learning Outcomes		
Core Ideas	**Practices**	**Values, Ethics and Attitudes**
• Recognise that a cell is a basic unit of life. • Show an understanding that living things reproduce to ensure continuity of their kind and that many characteristics of an organism are passed on from parents to offspring. • Describe processes in the sexual reproduction of flowering plants. - Pollination - Fertilisation (seed production) - Seed dispersal - Germination *Note:* - *Fertilisation occurs when a male reproductive cell fuses with a female reproductive cell.*	• Investigate the ways in which plants reproduce. - Spores - Seeds *Note:* - *Vegetative propagation methods, such as stem cutting, are not required.*	• Show curiosity by questioning and exploring the surrounding plants and animals. • Show care and concern by being responsible towards plants and animals.

Cycles in Plants and Animals (Reproduction)		
Learning Outcomes		
Core Ideas	**Practices**	**Values, Ethics and Attitudes**
- *The use of specific terms ("self- pollination" and "cross-pollination") to describe the pollination process is not required.* - *Knowledge of the pollen tube formation is not required.* - *The specific location where fertilisation takes place in the female reproductive system is not required.* • Recognise the process of fertilisation in the sexual reproduction of humans. *Note:* - *Fertilisation occurs when a sperm fuses with an egg.* - *The fertilised egg develops in the womb.* - *Students should know that ovaries produce eggs, and the testes produce sperms.*		

Cycles in Plants and Animals (Reproduction)		
Learning Outcomes		
Core Ideas	**Practices**	**Values, Ethics and Attitudes**
- *Foetal development and the mechanism of obtaining air, food and water through the umbilical cord are not required.* • Recognise the similarity in terms of fertilisation in the sexual reproduction of flowering plants and humans.		

Cycles in Matter and Water (Water)		
Learning Outcomes		
Core Ideas	**Practices**	**Values, Ethics and Attitudes**
• Recognise that water can exist in three interchangeable states of matter. • Show an understanding of how water changes from one state to another. - Melting (solid to liquid) - Freezing (liquid to solid) - Boiling/Evaporation (liquid to gas) - Condensation (gas to liquid) • Show an understanding of the terms melting point of ice (or freezing point of water) and boiling point of water. • Show an understanding of the roles of evaporation and condensation in the water cycle. • Recognise the importance of the water cycle.	• Compare water in 3 states. • Investigate the effect of heat gain or loss on the temperature and state of water. - When ice is heated, it melts and changes to water at 0^{o}C. - When water is cooled, it freezes and changes to ice at 0^{o}C. - When water is heated, it boils and changes to steam at 100^{o}C. - When steam is cooled, it condenses to water. • Investigate the factors which affect the rate of evaporation. - Wind - Temperature - Exposed surface area	• Show concern for water as a limited natural resource and be responsible in conserving.

Cycles in Matter and Water (Water)		
Learning Outcomes		
Core Ideas	**Practices**	**Values, Ethics and Attitudes**
• Recognise the importance of water to life processes. • Describe the impact of water pollution on Earth's water resources.		

Plant System (Respiratory and circulatory systems)		
Learning Outcomes		
Core Ideas	**Practices**	**Values, Ethics and Attitudes**
• Identify the parts of the plant transport system and describe their functions. *Note:* - *Recall of the relative positions of water-carrying and food-carrying tubes is not required.* - *The use of specific terms (xylem and phloem) is not required.* - *The concept of transpiration pull is not required.*	• Investigate how food and water are transported in the plant.	• Show objectivity by seeking data and information to validate observations and explanations about plant parts and functions. • Show care and concern by being responsible towards plants.

Electrical System		
Learning Outcomes		
Core Ideas	**Practices**	**Values, Ethics and Attitudes**
• Recognise that an electric circuit consisting of an energy source (battery) and other circuit components (wire, bulb, switch) forms an electrical system. • Show an understanding that a closed circuit allows current to flow. • Identify electrical conductors and insulators.	• Construct simple circuits from circuit diagrams. • Investigate the effect of some variables on the current in a circuit. - Number of batteries (arranged in series) - Number of bulbs (arranged in series and parallel)	• Show concern for the need to conserve and to have proper use and handling of electricity.

ASSESSMENT

The school-based formal assessment serves to assess students' attainment in Science with respect to the aims as stated in the primary syllabus. Each formal assessment is weighted and reflected in the students' result slips at the end of each semester.

The tables below show the formal assessment across Term 2 to Term 4.

Primary 5 (Standard)

Term 2 15%	**Term 3 15%**	**Term 4 70%**
Weighted Assessment 1	Weighted Assessment 2	End-of-Year Examination
40 marks	40 marks	100 marks

END-OF-YEAR EXMINATION

The examination consists of one written paper comprising two booklets, Booklet A and Booklet B.

Booklet	**Item Type**	**Number of Questions**	**Number of marks per questions**	**Marks**
A	**Multiple-Choice**	**30**	**2**	**60**
B	**Structured**	**12 - 13**	**2 - 5**	**40**
Total: 100 marks				

The duration of the paper is 1 hour and 45 minutes.

QUESTION TYPES

1. Knowledge with Understanding (AOI) - 40%

- Demonstrate knowledge and understanding of scientific facts, concepts and principles

2. Application of Knowledge and Process Skills (AOII) - 60%

- Apply scientific facts, concepts and principles to new situations
- Use one or a combination of basic process skills

Glossary of Science Terms

Below is the list of common scientific terms used in questions.

No.	Term	Description of meaning
1	analyse	to identify the parts of objects, information or processes, and the patterns and relationships between these parts
2	classify	to group objects or events based on common characteristics
3	communicate	to transmit and receive information which is presented in various forms – written, verbal, pictorial, tabular or graphical
4	compare	to identify similarities and differences between objects, concepts or processes
5	construct	to put a set of components together, based on a given plan
6	describe	to write (using diagrams where appropriate) the main points of a topic
7	differentiate	to identify the differences between objects, concepts or processes
8	evaluate	to assess the reasonableness, accuracy and quality of information, processes or ideas
9	formulate hypothesis	to make a general explanation for a related set of observations or events. It is an extension of inferring
10	generate possibilities	to explore all the alternatives, possibilities and choices beyond the obvious or preferred one
11	identify	to select and/or name the object, event, concept or process
12	infer	to explain or draw a conclusion based on observations, data or information
13	investigate	to find out answers to the questions or to verify the hypotheses
14	list	to give a number of points or items without elaboration
15	make decisions	to establish and apply criteria to select from among seemingly equal alternatives. The process of establishing criteria involves consideration of the consequences and values
16	measure	to obtain a reading from a suitable measuring instrument
17	observe	to obtain information through the use of the senses
18	predict	to assess the likelihood of an outcome based on prior knowledge of how things usually turn out
19	recognise	to identify facts, characteristics or concepts that are critical to the understanding of a situation, event, process or phenomenon
20	relate	to identify and explain the relationships between objects, concepts or processes
21	show an understanding	to recall information (facts, concepts, models, data), translate information from one form to another, explain information and apply information
22	state	to give a concise answer with little or no supporting argument

EXAMINATION PREPARATION AND STRATEGIES

- Develop a daily routine for revision and homework.

- Organise and link scientific concepts.
  - Make and organise notes by using any form of graphic organisers such as concept maps and mind maps.

- Use acrostics or mnemonics to remember science facts and concepts.
  - Acrostics involve the formation of a sentence or a story using the first letters of key words.

  Example: Factors required for seed germination

  Water
  Oxygen
  Warmth

- Encourage your child to ask questions and observe things, phenomena or changes around us. Observation is an important step leading to scientific explanations.

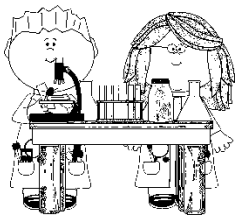
- Learn spelling of key words.

- Practise by attempting questions in topical worksheets and practice papers. Correct mistakes and re-learn the erroneous concepts.

R.I.S.E Strategy to Answering Science Questions

Multiple-Choice Questions:

R – Read the question carefully. Study given diagrams, tables or graphs. Make comparisons if there is more than one diagram, tables of graphs.



I – Identify key words and topic(s)/concept(s) tested.

S – Study all options carefully.

E - Eliminate distractors to arrive at the best possible answer.

Open-ended Questions:

R – Read the question carefully. Study given diagrams, tables or graphs. Make comparisons if there is more than one diagram, tables of graphs.

I – Identify key words and topic(s)/concept(s) tested.

S – Select relevant concepts to answer the question. Check the mark allocation and answer to the point.

E – Express and explain answers clearly. Avoid adding unnecessary and unrelated information in your answer.

SUGGESTED SCIENCE WEBSITES

Student Learning Space: https://vle.learning.moe.edu.sg/home

Young Scientist Badges Portal: https://youngscientist.sscglobal.com.sg/

National Geographic Kids: https://kids.nationalgeographic.com/