To Serve with Quality

SCIENCE
PRIMARY FOUR

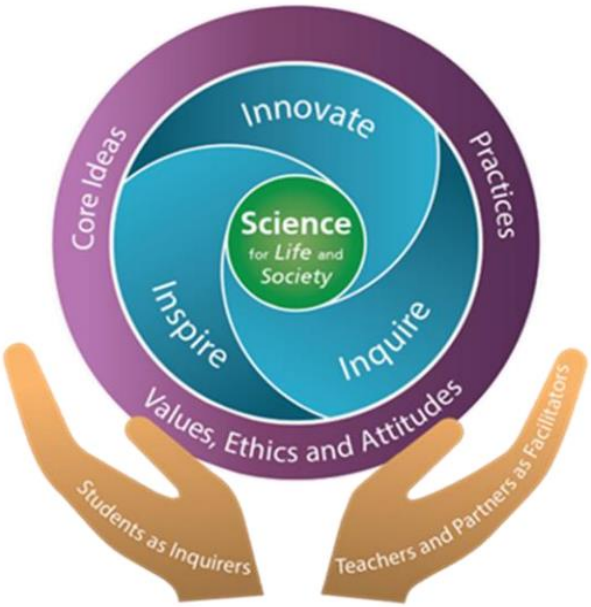
SCIENCE DEPARTMENT VISION AND MISSION

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 4.

	By the end of P4, students should be able to:
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 investigations). • Record and/or compare observations/ data with suggested scaffolding.
Analysing and interpreting data	• Simple 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.

SYLLABUS LEARNING OUTCOMES FOR PRIMARY 4

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

Plant System (Plant parts and functions)		
Learning Outcomes		
Core Ideas	**Practices**	**Values, Ethics and Attitudes**
• Identify the different parts of plants and state their functions. - leaf - stem - root *Note: Food-carrying and water-carrying tubes in the plant transport system are introduced in the topic of Plant System (Respiratory and Circulatory Systems) in P5.*	• Observe plant parts.	• Show curiosity in exploring the surrounding plants and question what they find. • Show concern by being responsible towards plants.

Human System (Digestive System)		
Learning Outcomes		
Core Ideas	**Practices**	**Values, Ethics and Attitudes**
• Identify the organ systems and state their functions in human (digestive, respiratory, circulatory, skeletal and muscular). *Note: This learning outcome introduces students to an overview of human systems in the body. Detailed knowledge of the muscular and skeletal systems (such as names of the bones/muscles in the body and descriptions of how they work) are not required.*		• Show curiosity in questioning about the structures or functions of the body.

• Identify the parts in the human digestive system (mouth, gullet, stomach, small intestine and large intestine) and describe their functions.		

Cycles in Matter and Water (Matter)		
Learning Outcomes		
Core Ideas	**Practices**	**Values, Ethics and Attitudes**
• State that matter is anything that has mass and occupies space. • Differentiate among the three states of matter (solid, liquid, gas) in terms of shape and volume.	• Measure mass and volume using appropriate apparatus.	• Show curiosity in exploring matter in the surroundings and question what they find.

Energy Forms and Uses (Light)		
Learning Outcomes		
Core Ideas	**Practices**	**Values, Ethics and Attitudes**
• Recognise that an object can be seen when it reflects light or when it is a source of light. *Note: The law of reflection is not required.* • Recognise that light travels in straight lines and thus a shadow is formed when light is completely or partially blocked by an object.	• Investigate the variables that affect shadows formed. - Shape, size and position of object(s) - Distance between light source-object and object-screen Note: The use of specific terms (transparent, translucent, opaque) is not required.	• Show objectivity by using data and information to validate observations and explanations about light.

Energy Forms and Uses (Heat)		
Learning Outcomes		
Core Ideas	**Practices**	**Values, Ethics and Attitudes**
• Identify some common sources of heat. • State that the temperature of an object is a measurement of its degree of hotness. • State that heat is a form of energy. • Differentiate between heat and temperature. • Show an understanding that heat flows from a hotter to a colder object/ region/ place until both reach the same temperature. • Relate the change in temperature of an object to the gain or loss of heat by the object. • List some effects of heat gain/loss in our everyday life. - Contraction / expansion of objects (solid, liquid and gas) - Change in state of matter • Identify good and poor conductors of heat. - Good conductors: metals - Poor conductors: wood, plastics, air, rubber *Note: Recall of the rate of heat transfer of specific materials (such as different types of metals) is not required.*	• Measure temperature using a thermometer and a datalogger with temperature/heat sensors.	• Show objectivity by seeking data and information to validate observations and explanations about heat.

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 table below shows the formal assessment across Term 2 to Term 4.

Term 2 15%	**Term 3 15%**	**Term 4 70%**
Weighted Assessment 1	Weighted Assessment 2	End-of-Year Examination
30 marks	30 marks	100 marks

END-OF-YEAR EXAMINATION

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 question**	**Marks**
A	Multiple -Choice	30	2	60
B	Structured	12- 14	2, 3, 4	40
Total: 100 marks				

The duration of the paper is 1 hour and 30 minutes.

QUESTION TYPES

1. Basic Items (30%)

Item Type	Number of Questions	Weighting
Multiple-Choice Questions	10	20%
Structured Questions	4-6	10%
Total	14-16	30%

Multiple-Choice Questions
For each question, four options are provided of which only one is the correct answer. A pupil chooses one option as his/her answer.
Structured Questions
For each question, student writes the answer in the spaces provided. Examples of structured questions are 'fill in the blanks', 'matching', etc.

2. Knowledge with Understanding ((AOI) - 20%
   Demonstrate knowledge and understanding of scientific facts, concepts and principles

3. Application of Knowledge and Process Skills (AOII) - 50%

- 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.

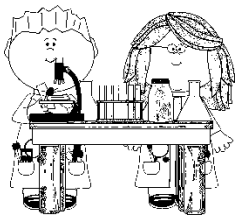
- Learn spelling of key words.

- 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/