*To Serve with Quality*

# SCIENCE
# PRIMARY SIX

## 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 6.

| | **By the end of P6, students should be able to:** |
|---|---|
| Posing questions and defining problems | • Ask questions out of curiosity or to deepen understanding.<br>• 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.<br>• Investigate to find out answers to questions (guided and open investigations).<br>• 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. |

**Table 2** shows an overview of the topics found in the Primary Science Syllabus. The topics are organised in levels to ensure a coherent and meaningful development of concepts as students progress from Primary 3 to Primary 6.

| **Levels** | **P3** | **P4** | **P5** | **P6** |
|---|---|---|---|---|
| **Themes** | **Diversity . Cycles . Systems . Interactions . Energy** | | | |
| **Topics** | • Diversity of living and non-living things (General characteristics and classification)<br>• Diversity of materials<br>• Cycles in plants and animals (Life cycles)<br>• Interaction of forces (Magnets) | • Plant system (Plant parts and functions)<br>• Human system (Digestive system)<br>• Cycles in matter and water (Matter)<br>• Energy forms and uses (Light)<br>• Energy forms and uses (Heat) | • Cycles in plants and animals (Reproduction)<br>• Cycles in matter and water (Water)<br>• Plant system (Respiratory and circulatory systems)<br>• Human system (Respiratory and circulatory systems)<br>• Electrical system | • Energy forms and uses (Photosynthesis)<br>• Energy Conversion<br>• Interaction of forces (Frictional force, gravitational force, elastic spring force)<br>• Interactions within the environment |

**SYLLABUS LEARNING OUTCOMES FOR PRIMARY 6 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

| **Energy Forms and Uses (Photosynthesis) (P6 Standard)** | | |
|---|---|---|
| **Learning Outcomes** | | |
| **Core Ideas** | **Practices** | **Values, Ethics and Attitudes** |
| • Recognise that living things need energy from respiration to carry out life processes.<br><br>*Note:*<br>- *The focus of respiration is on the release of energy from food.*<br><br>• Recognise that the Sun is our primary source of energy (light and heat).<br><br>• Differentiate between the ways in which plants and animals obtain energy. | • Investigate the requirements (water, light energy and carbon dioxide) for photosynthesis (production of sugar and oxygen). | • Show objectivity by using data and information to validate observations and explanations about photosynthesis. |

| Energy Conversion (P6 Standard) | | |
|---|---|---|
| **Learning Outcomes** | | |
| **Core Ideas** | **Practices** | **Values, Ethics and Attitudes** |
| • Recognise that energy from most of our energy resources is derived in some ways from the Sun.<br><br>• Recognise and give examples of the various forms of energy.<br>- Kinetic energy<br>- Potential energy<br>- Light energy<br>- Electrical energy<br>- Sound energy<br>- Heat energy<br><br>• Recognise that objects have weight because of the gravitational force acting on the object. | • Investigate energy conversion from one form to another. | • Show care and concern by being responsible in conserving energy in our everyday life. |

| Interactions within the Environment (P6 Standard) | | |
|---|---|---|
| **Learning Outcomes** | | |
| **Core Ideas** | **Practices** | **Values, Ethics and Attitudes** |
| • Identify the factors that affect the survival of an organism.<br>- Physical characteristics of the environment (temperature, light, water)<br>- Availability of food<br>- Types of other organisms present (producers, consumers, decomposers)<br><br>• Show an understanding of the effect on organisms when the environment becomes unfavourable (organisms adapt and survive; move to other places or die).<br><br>• Show an understanding of the energy pathway from the Sun through living things and identify the roles of various organisms (producers, consumers, predators, prey) in a food chain and a food web. | • Observe, collect and record information regarding the interacting factors within an environment. | • Show care and concern for Man's impact on the environment by being respectful and responsible towards the environment. |

| Interactions within the Environment (P6 Standard) | | |
|---|---|---|
| **Learning Outcomes** | | |
| **Core Ideas** | **Practices** | **Values, Ethics and Attitudes** |
| • Differentiate among organism, population and community.<br>- An organism is a living thing.<br>- A population is a group of organisms of the same kind, living and reproducing at a given place and time.<br>- A community consists of many populations living together in a particular place.<br><br>• Show an understanding that different habitats support different communities (garden, field, pond, seashore, tree, mangrove swamp).<br><br>• Show an understanding that adaptations serve to enhance survival and can be structural or behavioural.<br>- Cope with physical factors<br>- Obtain food<br>- Escape predators<br>- Reproduce by finding and attracting mates or dispersing seeds/fruits<br>• Give examples of man's impact (both positive and negative) on the environment. | | |

**PSLE PAPER FORMAT (SCIENCE)**

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

The duration of the paper is 1 hour 45 minutes.

| Booklet | Item Type | Number of Questions | Number of marks per questions | Marks |
|---|---|---|---|---|
| **A** | **Multiple-Choice** | **30** | **2** | **60** |
| **B** | **Structured** | **10 - 11** | **2, 3, 4 or 5** | **40** |
| **Total: 100 marks** | | | | |

**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

Below is the list of common scientific terms used in questions

| No. | Key words in Questions | What you should do |
|---|---|---|
| 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**

  **W**ater
  **O**xygen
  **W**armth

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

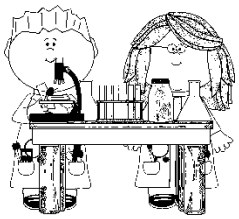
- Learn spelling of key words.

- 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/