

SCIENCE @ RMPS

2021

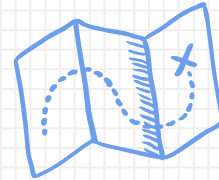


Vision

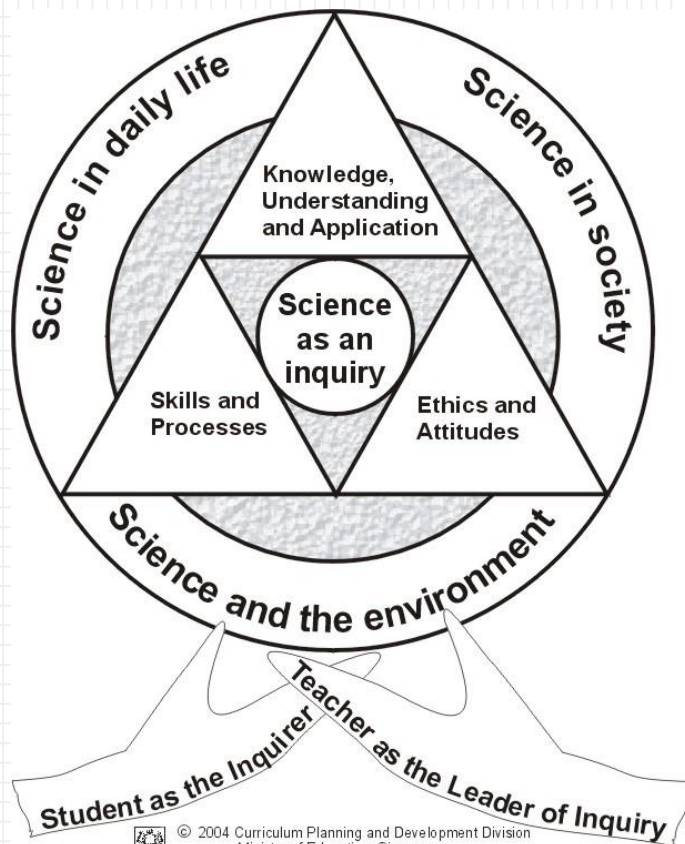
An inquirer with a passion for Science.

Mission

- To develop students with an inquiring mind.
- To equip pupils with science knowledge, skills, dispositions and attitudes.
- To make the learning of Science exciting, meaningful and relevant.



Science Curriculum Framework



A collection of 30 hand-drawn icons representing various scientific fields:

- Biology:** A beaker with bubbles, a cell, a microorganism, a globe, a lightbulb, a brain, and a planet with a ring.
- Chemistry:** A molecular structure, a DNA helix, and the chemical formula H_2O .
- Physics:** An atom, a graph with a bell curve, a plug, a book, a lightbulb, a star, a molecule, and the chemical formula H_2O .
- General Science:** A calculator, a globe, a lightbulb, a star, a molecule, and the chemical formula H_2O .

Inquiry-based learning starts by posing questions, problems or scenarios rather than simply presenting established facts or portraying a smooth path to knowledge. The process is facilitated by the teacher.

Content

- Scientific phenomena, facts, concepts and principles
- Scientific vocabulary, terminology and conventions
- Scientific instruments and apparatus including techniques and aspects of safety
- Scientific and technological applications

Ethics & Attitudes

Curiosity, Creativity, Integrity, Objectivity, Open-mindedness, Perseverance, Responsibility

Skills & Processes

Observing, Comparing, Classifying, Using Apparatus & Equipment, Communicating, Inferring, Formulating hypothesis, Predicting, Analysing, Generating possibilities, Evaluating

Good content knowledge is not enough...

Content Knowledge
+
Skills and Processes
(Scientific Method and
Experimental Design)
+

Application and articulation of
concepts into **authentic situations**



What is Conceptual Understanding?

- Conceptual understanding requires students to **organise facts and ideas** into a meaningful concept and making connections in science.
- Moving beyond rote memorisation of facts. Therefore, students can **apply their understanding of concepts to multiple contexts.**

(Kang, N. G., & Howren, C., 2004)



- While there are certain scientific terms and concepts taught, pupils can demonstrate their understanding by using their own words.
- The focus of learning science is **not** on giving “standard answers” or keywords, but on **developing students’ ability to inquire, understand and explain scientific phenomena.**

- The learning of science **does require a certain level of clarity though**, in the way concepts are explained, given the **context of the question**.
- Otherwise, **we may end up endorsing misconceptions** in students or rewarding them for ambiguous responses.

Strategies

- **Read the questions carefully.**
- Identify key phrases and words in the question stem before attempting to answer.
- **Identify the concept** tested.
- **Model** answering techniques
(**Concept-Apply-Link** /
Concept-Evidence-Reasoning)
- Make thinking visible - **Claim,**
Support, Question



Primary Science Syllabus Overview

Themes	Lower Block (P3 & P4)
Diversity	<ul style="list-style-type: none">• Diversity of living and non-living things• Diversity of materials
Cycles	<ul style="list-style-type: none">• Cycles of plants and animals (Life cycles)• Cycles in matter and water (Matter)
Systems	<ul style="list-style-type: none">• Plant system (Plant parts and functions)• Human system (Digestive system)
Interactions	<ul style="list-style-type: none">• Interaction of forces (Magnets)
Energy	<ul style="list-style-type: none">• Energy forms and uses (Light)• Energy forms and uses (Heat)

Primary Science Syllabus Overview

Themes	Upper Block (P5 & P6)
Cycles	<ul style="list-style-type: none">• Cycles in plants and animals (Reproduction)• Cycles in matter and water
Systems	<ul style="list-style-type: none">• Plant System• Human System• Cell System• Electrical System
Interactions	<ul style="list-style-type: none">• Interaction of forces• Interaction within the Environment
Energy	<ul style="list-style-type: none">• Energy forms and uses (Photosynthesis)• Energy Conversion

A collection of 30 hand-drawn icons representing various scientific fields. The icons include: a beaker with bubbles, a calculator, an atom, a cell, a microorganism, a graph with a bell curve, a globe, a molecular structure, a globe with a face, a test tube with a plant, a rocket, a lightbulb, a plug, an apple, a book, a pi symbol, a heart rate line, a lightbulb, a star, a pill, a microscope, a U-shaped magnet, a planet with a ring, a brain, a DNA helix, and a water molecule (H2O).

- Learning Packages/Worksheets (filed in the Science file)
- Revision material



Assessment

- Paper format

<u>Multiple Choice</u>	<u>Open-Ended</u>
28 questions	12-13 questions
56 marks	44 marks

<u>SA1 Topics</u>	<u>Preliminary Examination</u>
<ul style="list-style-type: none">• All P3, P4, P5 topics• Energy• Energy Conversion• Forces• Interactions within the Environment	<ul style="list-style-type: none">• All P3-P6 topics

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- ✓ Speaking
- ✓ Doing
- ✓ Visiting
- ✓ Reading

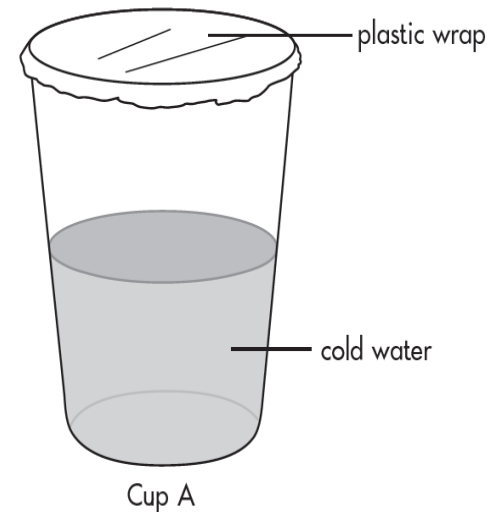
Speaking



Language used in Science is very often different from our day-to-day language.

Why does the cup feel wet?

- The water came from the fridge.
- The coldness of the cold water can be felt.
- The cold water came out of the cup.



Speaking

- **Concept:** Condensation
- Water vapour in the surrounding air came in contact with the cooler outer surface of the cup.
- The water vapour **lost heat and condensed** into **water droplets**.



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- Green beans
- Chili seeds
- Peanuts
- Bread mould
- Mould on oranges

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- Mealworms
- Fish
- Crayfish
- Snails
- Bear in mind – responsibilities involved in pet ownership

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Doing – E.g. growing green beans

Science Concepts:

- Living things need food, air and water.
- What are the conditions needed for germination?
- How can I prevent my green bean from germinating?
- When does the developing seed need sunlight?



Doing – E.g. growing green beans

- Plants need sunlight to make their own food.
- Plants can reproduce from seeds.
- How to conduct a fair test?
- And more ...

Observing, Comparing, Classifying, Using apparatus and equipment, Communicating, Predicting, Formulating Hypothesis



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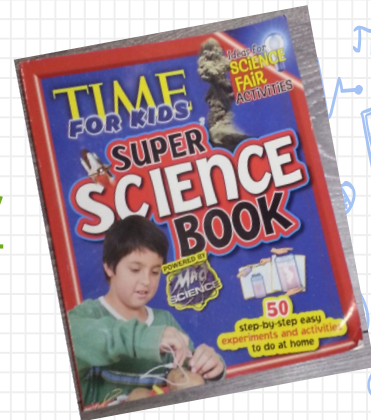
- Singapore Zoo / Night Safari / River Safari
- Jurong Bird Park
- S.E.A. Aquarium, Sentosa
- Marina Barrage
- ArtsScience Museum
- Kranji Farms
- Parks (E.g. Hortpark)
- Gardens by the Bay
- Sungei Buloh Wetland Reserve
- Singapore Science Centre
- **Everywhere and Anywhere!**

Reading

- Science Books
- Newspapers
- Magazines
- Youtube channel:

<https://www.youtube.com/user/1veritasium>

- MythBusters:
<http://dsc.discovery.com/tv-shows/mythbusters>



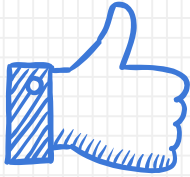
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Thank you.