

SCIENCE @ RMPS

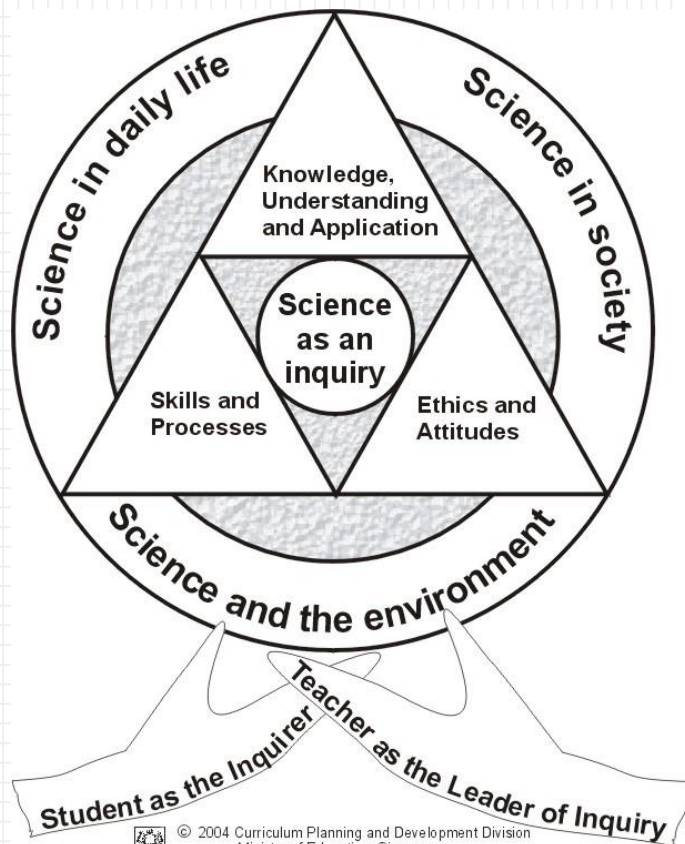
2021



A hand-drawn diagram of a folded piece of paper, likely representing a letter or envelope. The paper is folded into three sections. A dashed line is drawn across the middle section, and an 'x' mark is drawn in the rightmost section. The drawing is done in blue ink on a light blue grid background.

- [illegible]

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.

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- Biology:** A beaker with bubbles, a cell, a microorganism, a globe, a lightbulb, a brain, and a DNA double helix.
- Chemistry:** A test tube with a plant, an apple, a book, a lightbulb, a pill, a hexagonal molecule, a planet with a ring, and the chemical formula H_2O .
- Physics:** A calculator, an atom, a graph with a bell curve, a rocket, a clock, a lightbulb, a star, a U-shaped magnet, and the chemical formula H_2O .
- General Science:** A globe, a molecule, a clock, a lightbulb, a star, a U-shaped magnet, and the chemical formula H_2O .

- **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, Claim-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

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- General Science:** A calculator, a globe, a lightbulb, a star, a molecule, and the chemical formula H_2O .

- $$E = mc^2$$

**Please keep the P3-P6 work for revision!*

Term	Weightage	Assessments
1	10%	<ul style="list-style-type: none"> Performance Task Topical Review Practical Test
2	15%	
3	10%	



Assessment

- SA2 (65%)

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

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

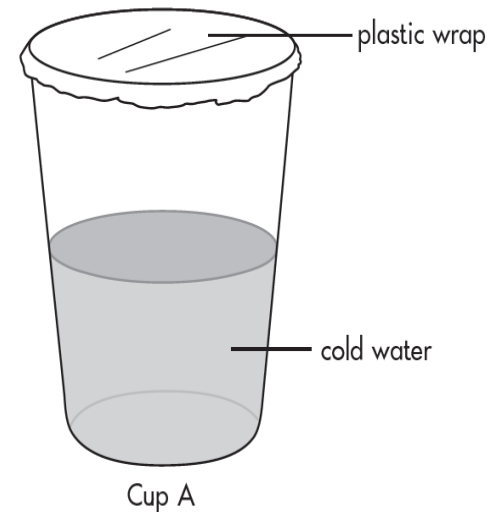
Speaking



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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- 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

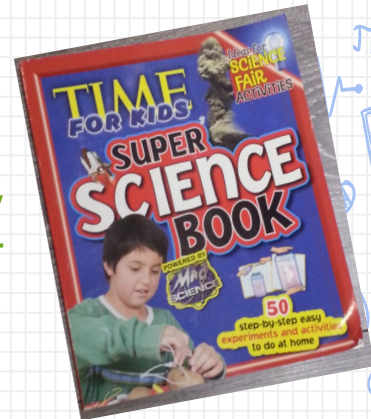


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- Singapore Zoo / Night Safari / River Safari
- Jurong Bird Park
- S.E.A. Aquarium, Sentosa
- Marina Barrage
- ArtsScience Museum
- Kranji Farms
- Parks (E.g. Hortpark)
- Gardens by the Bay
- Sungei Buloh Wetland Reserve
- Singapore Science Centre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

Reading

- Science Books
- Newspapers
- Magazines
- Youtube channel:
- <https://www.youtube.com/user/1veritasium>
- MythBusters:
<http://dsc.discovery.com/tv-shows/mythbusters>



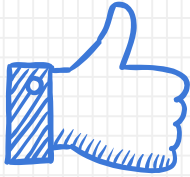
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Thank you.