

**PRIMARY 6
SCIENCE CURRICULUM BRIEFING
4 February 2022**

Mr Ong Wee Leong
HOD Science
ong_wee_leong@moe.edu.sg

Mrs Clara Kang
LH Science
ang_yan_qing_clara@moe.edu.sg



HGS SCIENCE DEPARTMENT VISION

To **nurture** and **develop** every **HGS girl** with an **inquiring mind for Science**



What does my child learn in science?

2014 Science (Primary) Syllabus

For more details, visit the link :

- <https://go.gov.sg/moeprimarysciencesyllabus2014>



Science
Syllabus
Primary

Implementation starting with
2014 Primary Three Cohort

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Energy Conversion (P5 and P6 Standard)		
<ul style="list-style-type: none">• **Recognise that energy from most of our energy resources is derived in some ways from the Sun.• **Recognise and give examples of the various forms of energy.<ul style="list-style-type: none">- kinetic energy- potential energy- light energy- electrical energy- sound energy- heat energy <p><i>Note:</i></p> <ul style="list-style-type: none">- <i>The use of specific terms ("chemical energy", "gravitational potential energy" and "elastic potential energy") is not required.</i>	<ul style="list-style-type: none">• **Investigate energy conversion from one form to another and communicate findings.	<ul style="list-style-type: none">• **Show concern for the need to conserve energy usage in our everyday life.



© 2013 Curriculum Planning and Development Division.
This publication is not for sale. All rights reserved. No part of this publication may be reproduced without the prior permission of the Ministry of Education, Singapore.

What does my child learn in science?

Themes	* Lower Block (P3-P4)	** Upper Block (P5-P6)
Diversity	<ul style="list-style-type: none"> Diversity of living and non-living things (General characteristics and classification) Diversity of materials 	
Cycles	<ul style="list-style-type: none"> Cycles in plants and animals (Life cycles) Cycles in matter and water (Matter) 	<ul style="list-style-type: none"> Cycles in plants and animals (Reproduction) Cycles in matter and water (Water)
Systems	<ul style="list-style-type: none"> Plant System (Plant parts and functions) Human System (Digestive system) 	<ul style="list-style-type: none"> Plant System (Respiratory and circulatory systems) Human System (Respiratory and circulatory systems) <u>Cell System</u> Electrical System
Interaction	<ul style="list-style-type: none"> Interaction of forces (Magnets) 	<ul style="list-style-type: none"> Interaction of forces (Frictional force, gravitational force, <u>force in springs</u>) Interaction within the environment
Energy	<ul style="list-style-type: none"> Energy Forms and Uses (Light and Heat) 	<ul style="list-style-type: none"> Energy Forms and Uses (Photosynthesis) <u>Energy Conversion</u>



How is my child assessed in science?


- **Conceptual understanding and application of concepts and skills**
- ✓ Students can explain their understanding of concepts in their own words.
- ✓ Concepts which are correct in the context of the questions will be carefully evaluated and awarded marks.



Example 5: Energy in Food

Concept:
Photosynthesis

To help my plants grow well, I should put them in a place with light. Why?



Plants need light to make food. ✓

Plants need light to photosynthesise. ✓


Light provides food for the plant. ✗

Plants use light to photosynthesise (make their own food). It is conceptually incorrect to describe "light as providing food" for the plant.

Example 3: Heat

Concept:
Heat Conduction

This jacket keeps us warm because ...



Air slows down heat flow. ✓

Air prevents coldness from reaching us. ✗

Air is a poor conductor of heat. ✓

The description of coldness being transferred is conceptually incorrect. Heat is transferred from a warmer region to a colder region. The air in jacket slows down heat flow away from the body.

Formative Assessment (Ongoing monitoring)

- Science Journal
- Science Activity Book
- Hands-on activities with use of scientific skills / process skills
- Mastery worksheets
- Practice papers
- Teacher's classroom observations
- Student Learning Space (SLS)
- Exit Cards






➤ Example of Exit Card

EXIT CARD - Checking for your understanding.

The diagrams below show three objects.

On which object(s) is the force of gravity acting? Put a tick (✓) in the box.

soap bubbles	ship	aeroplane
		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



How is my child assessed in science?

2022 Holistic Assessment Overview (Standard)



Assessment of Learning				
	Term 1	Term 2	Term 3	Term 4
	Non-weighted Assessment	Semestral Assessment	Preliminary Assessment	PSLE
Total marks	50 marks	100 marks	100 marks	100 marks
Duration	50 min	1h 45 min	1h 45 min	1h 45 min
Weighting	0%	30%	70%	-



How is my child assessed in science?

Format of Paper (**Standard**) – 1 hour 45 min

Booklet	Item Type	No. of questions	Number of marks per question	Marks
A	Multiple-choice	28	2	56
B	Open-Ended	12-13	2 / 3 / 4 / 5	44

- Booklet A consists of 28 multiple-choice questions with four options. Each multiple-choice question carries 2 marks.
- Booklet B consists of 12 - 13 open-ended questions.
- Students are required to answer all the questions in the two booklets.



How is my child assessed in science?

2022 Holistic Assessment Overview (**Foundation**)

Assessment of Learning				
	Term 1	Term 2	Term 3	Term 4
	Non-weighted assessment	Semestral Assessment	Preliminary assessment	PSLE
Total marks	35 marks	70 marks	70 marks	70 marks
Duration	40 min	1h 15 min	1h 15 min	1h 15 min
Weighting	0%	30%	70%	-



How is my child assessed in science?

Format of Paper (**Foundation**) – 1 hour 15 min

Booklet	Item Type	No. of questions	Number of marks per question	Marks
A	Multiple-choice	18	2	36
B	Structured	6 - 7	2 / 3	14
	Open-Ended	5 - 6	2 / 3 / 4	20

- Booklet A consists of 18 multiple-choice questions with three options. Each multiple-choice question carries 2 marks.
- Booklet B consists of two parts – Structured questions (e.g Fill in the blanks, Matching, etc) and open-ended questions.
- Students are required to answer all the questions in the two booklets.
- A word list (not exhaustive) is provided during the examination.



How can I support my child in learning science?

1. Reinforce strategies used in school when going through questions with your child. (Encourage your child to try her best and attempt all questions).

Have you read and understood the question?

What do you think the topics/concepts the question must be linked to?

ANSWERING STRATEGIES

RHCTC

Read everything, then Highlight Clues, then identify Topic and Concept

CER

Claim Evidence Reasoning

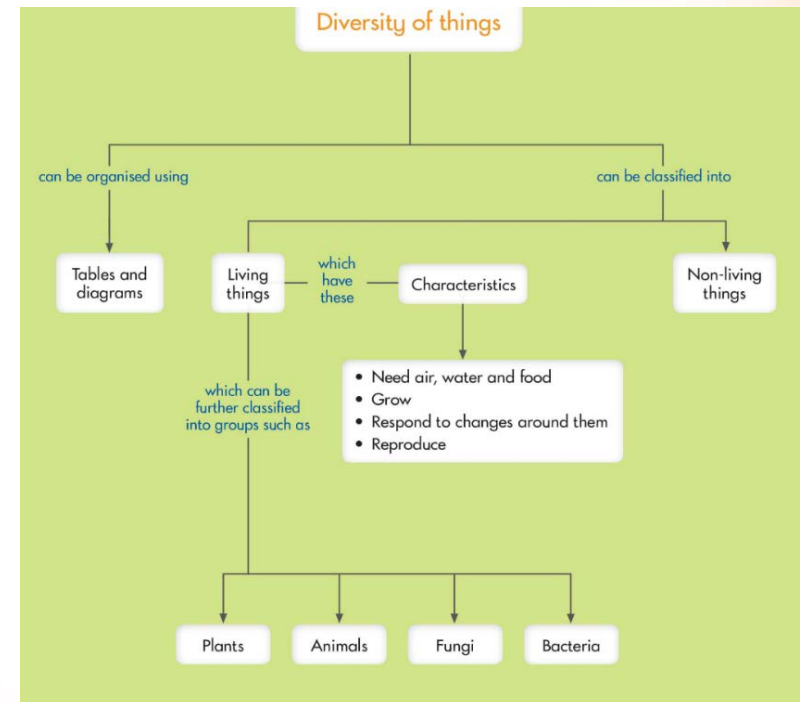
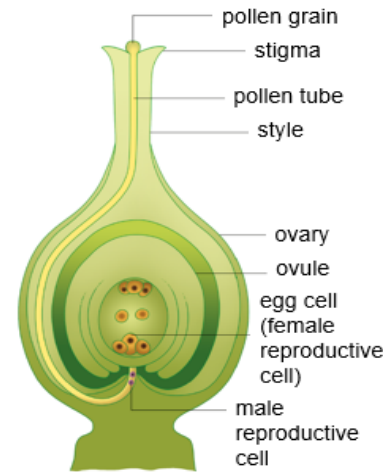
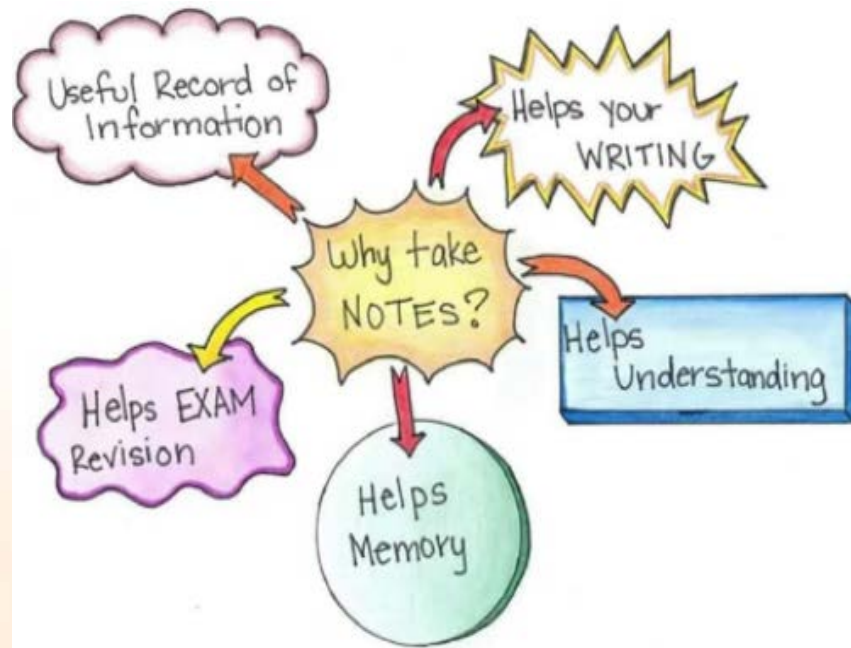
evidence can be given in question, pictures, table or graph



How can I support my child in learning science?

2. Help your child revise and retain her science concepts.

- ✓ Document learning through drawing concept maps, taking notes or drawing pictorial representations with labels.



How can I support my child in learning science?

2. Help your child revise and retain her science concepts.

➤ Science textbooks (Lower & Upper)



➤ SLS

SINGAPORE
STUDENT
LEARNING
SPACE

SINGAPORE
STUDENT
LEARNING SPACE
LEARN ANYTIME, ANYWHERE, AT ANY PACE

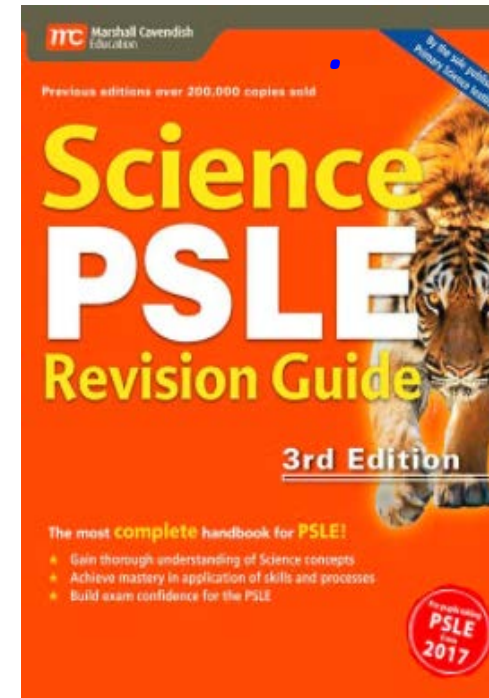
Username

Password

[FORGOT PASSWORD](#)

[Technical Support](#) [Login Troubleshooting](#) [Terms of Use](#) [Privacy Statement](#)
Copyright © 2019 Ministry of Education, Singapore. All rights reserved.

➤ PSLE Revision Guide



How can I support my child in learning science?

3. Help your child track her learning.

- Work with and guide your child in planning her revision schedule (revisit P3, P4, P5 and current P6 topics).
- Take time to track and monitor your child's work and revision schedule.
- Balance work & play.



REVISION TIMETABLE

	MON	TUE	WED	THU	FRI	SAT	SUN
	9AM - 11AM REVISE SUBJECT 1	9AM - 11AM REVISE SUBJECT 1	9AM - 11AM REVISE SUBJECT 1	9AM - 11AM REVISE SUBJECT 1	9AM - 11AM REVISE SUBJECT 1	10AM - 12PM REVISE SUBJECT 1	REST!
BREAK!	11:15AM - 1:15PM REVISE SUBJECT 2	11:15AM - 1:15PM REVISE SUBJECT 2	11:15AM - 1:15PM REVISE SUBJECT 2	11:15AM - 1:15PM REVISE SUBJECT 2	11:15AM - 1:15PM REVISE SUBJECT 2	12:45AM - 2:45PM REVISE SUBJECT 2	REST!
BREAK!	2PM - 4PM REVISE SUBJECT 3	2PM - 4PM REVISE SUBJECT 3	2PM - 4PM REVISE SUBJECT 3	2PM - 4PM REVISE SUBJECT 3	2PM - 4PM REVISE SUBJECT 3	3PM - 5PM REVISE SUBJECT 3	REST!
BREAK!	4:15PM - 6:15PM REVISE	4:15PM - 6:15PM REVISE	4:15PM - 6:15PM REVISE	4:15PM - 6:15PM REVISE	4:15PM - 6:15PM REVISE	GO HAVE FUN	REST!



How can I support my child in learning science?

4. Other forms of support you can provide.

- Check her handbook to monitor her homework and corrections.
- Support and monitor your child's online learning (with supervision, if necessary) e.g SLS assignments, online research
- Stimulate your child's interest in Science by going Science Centre or outdoors (e.g. Zoo, Gardens by the Bay etc), exploring relevant YouTube videos, reading Science related magazines, Science related programmes/documentaries on TV channels etc.



Haig Girls' School



NATIONAL GEOGRAPHIC

Discovery

BBC

Bitesize

5. Resource for parents

- **Useful link for parents** <https://www.schoolbag.sg>

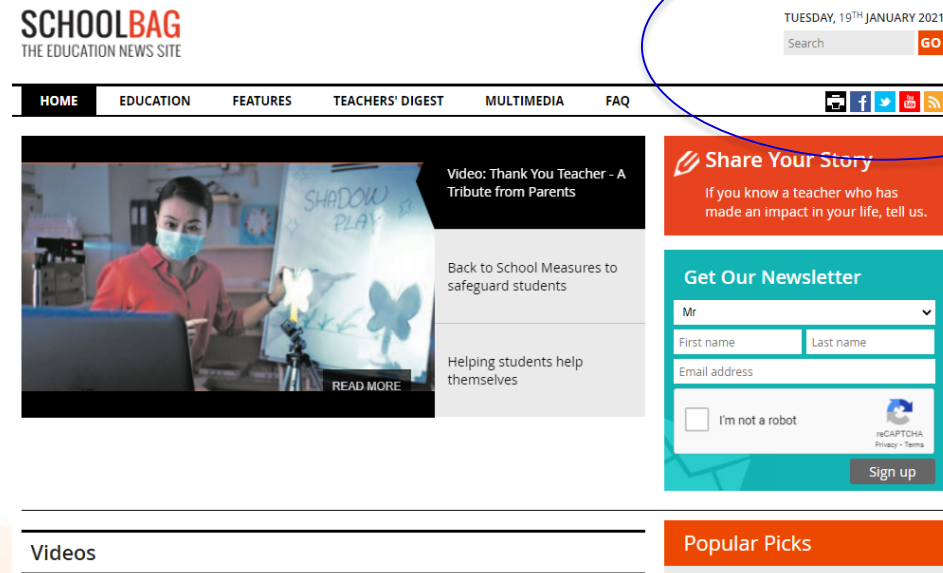
Schoolbag.sg is an online publication by the Ministry of Education, Singapore. It provides parents, educators and the general public with education news, school features and tips.

Use the search function and search science:

<https://www.schoolbag.edu.sg/search-result?q=science>



SCHOOLBAG
THE EDUCATION NEWS SITE



SCHOOLBAG
THE EDUCATION NEWS SITE

TUESDAY, 19TH JANUARY 2021

Search

HOME EDUCATION FEATURES TEACHERS' DIGEST MULTIMEDIA FAQ

Video: Thank You Teacher - A Tribute from Parents

Back to School Measures to safeguard students

Helping students help themselves

READ MORE

Share Your Story

If you know a teacher who has made an impact in your life, tell us.

Get Our Newsletter

Mr

First name Last name

Email address

I'm not a robot

reCAPTCHA
Privacy - Terms

Sign up

Videos

Popular Picks



School's Support in our Pupils' Learning

Previously in the Lower Block...



Can you recall what the basic needs of living things are?

Living things need air, food and water to survive.



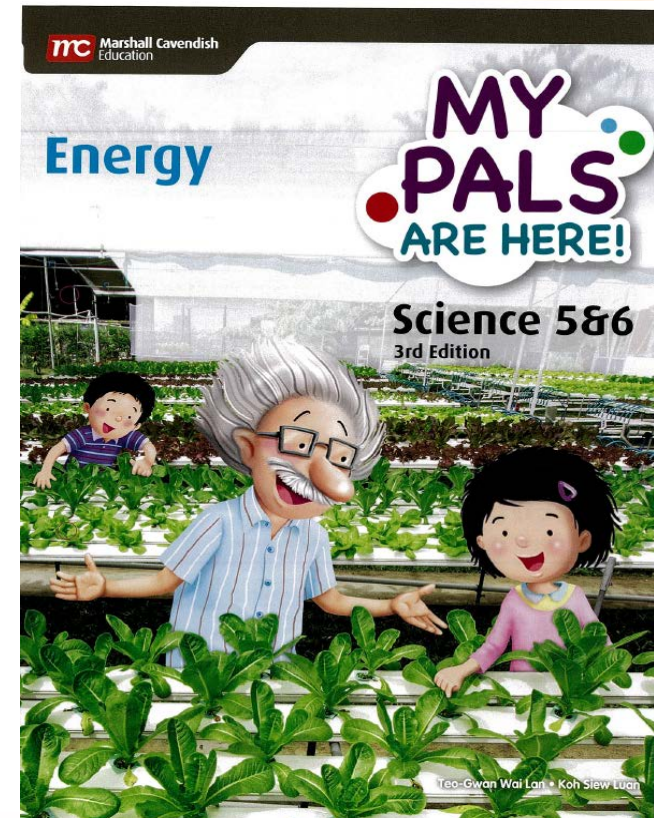
Revise lower block during lesson

Previously in the Lower Block...



Can you recall which body system is involved in the digestion of food?

What happens to the digested food in that process?



School's Support in our Pupils' Learning



ANSWERING STRATEGIES

RHCTC

Read everything, then
Highlight Clues, link to
Topic and
Concept learnt

CER

Claim
Evidence
Reasoning

evidence can be given in question, pictures, table or graph

✓ **RHCTC** – understand the question

Encourage annotations to organize their thoughts.

✓ **Elimination** – for MCQ

✓ **CER** – for Open-Ended Questions

Answers must be supported by evidence.

Note: Students still need to know their science concepts well.



School's Support in our Pupils' Learning

✓ Use of **answering strategies in MCQ**

(by elimination and encouraging pupils to make simple notes / working to organize their thoughts)

✓ Use of **answering strategies in OE**

(CER : reason with evidence with data given)



MCQ

ANSWERING STRATEGIES

RHCTC

Read everything, then Highlight Clues, then identify Topic and Concept

CER

Claim Evidence Reasoning

evidence can be given in question, pictures, table or graph

Gary gave 10g of leaves, 10g of fruits and 10g of meat to four different Organisms A, B, C and D. After an hour, he weighed the amount of food uneaten. The table below shows the results of Gary's investigation.

Organism	Mass of food uneaten (in g)	
	Meat	Fruits and leaves
A	10	6
B	10	5
C	5	2
D	5	4

Handwritten notes on the table: For A, B, and D, 'Meat' is circled and 'Same' is written. For C, 'Meat' is circled and 'Decrease' is written. For A, B, and D, 'Fruits and leaves' is circled and 'Decrease' is written.

Which of the organisms in Gary's investigation obtained energy from both sources of food?

(1) B only ✓
 (2) C and D only ✓
 (3) A, C and D only ✗
 (4) A, B, C and D ✗

(2 ✓)

For plants to make food, there must be _____

A carbon dioxide ✓
 B nitrogen ✗
 C sunlight ✓
 D water ✓

Without... plant cannot make food

(1) A and C only ✗
 (2) B and D only ✗
 (3) A, C and D only ✓
 (4) B, C and D only ✗

(3 ✓)



School's Support in our Pupils' Learning

✓ Use of **answering strategies in MCQ**

(by elimination and encouraging pupils to make simple notes / working to organize their thoughts)

✓ Use of **answering strategies in OE**

(CER : reason with evidence with data given)



OE

ANSWERING STRATEGIES

RHCTC

Read everything, then Highlight Clues, then identify Topic and Concept

CER

Claim Evidence Reasoning

evidence can be given in question, pictures, table or graph

Three living things W, X and Y are classified in the table below.

eats only plants	Eats only small animals	Makes its own food
W	X	Y

(b) Which one of the living things, W, X or Y, is a plant? Explain your answer.

Y is a plant. Only plants can make their own food.

Evidence to support answer. (Link to concept learnt that plants can photosynthesis with the right conditions to make their own food).



School's Support in our Pupils' Learning

- ✓ Use of **critique sessions in class to improve OE** answers using pupils' exemplars (to hone pupils' ability to better answer OE questions)

(Let's Explore!)
TB Source

i) As the number of times the toy car was wound up, the distance travelled by the car increases.

ii) To get an average result to ensure that his results are more reliable and accurate.

a) As the number of times he wound up the toy car increases, the distance travelled by the toy car increases.

b) The type of toy car used should be kept the same.

Feedback : There is only 1 toy car used with different number of windings changed actually.



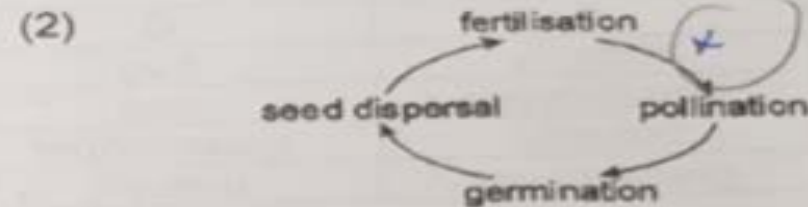
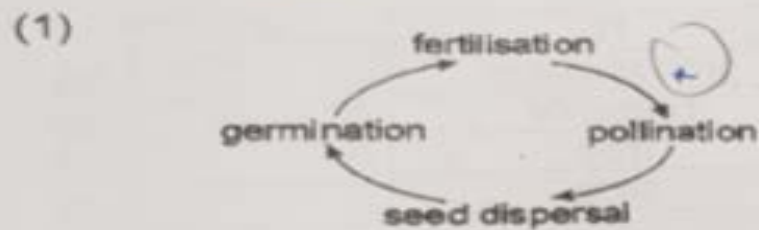
School's Support in our Pupils' Learning

- ✓ Use of **critique sessions in class through MCQ distractors** (to check on pupils' understanding on the science concepts)

Concept : Cycle of flowering plant

Dispersal of seed followed by germination stage. When it grows into an adult plant, it flowers to go through pollination and fertilisation . After fertilisation, the flower will develop into a fruit which contain seed(s) which will start the cycle once again.

18. Which one of the following shows the correct sequence of reproduction of a flowering plant in one cycle?



School's Support in our Pupils' Learning

Format of Paper (EOY) **Standard** – 1 hour 45 min

Booklet	Item Type	Suggested time spent
A	Multiple-choice	45 - 50 min
B	Open-Ended	55 - 60 min

Tips for students for good time management :

- Good to have more time for booklet B to analyse and structure their answers.
- Extra time for revisiting difficult question(s) that were skipped earlier.



School's Support in our Pupils' Learning

Format of Paper (**Foundation**) – 1 hour 15 min

Booklet	Item Type	Suggested time spent
A	Multiple-choice	30 - 36 min
B	Structured Open-Ended	39 - 45 min

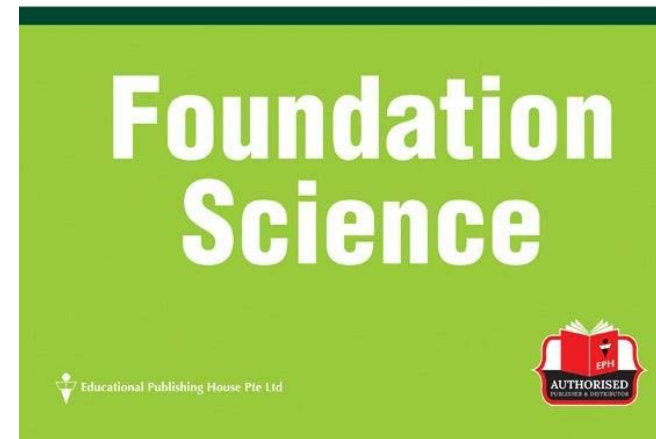
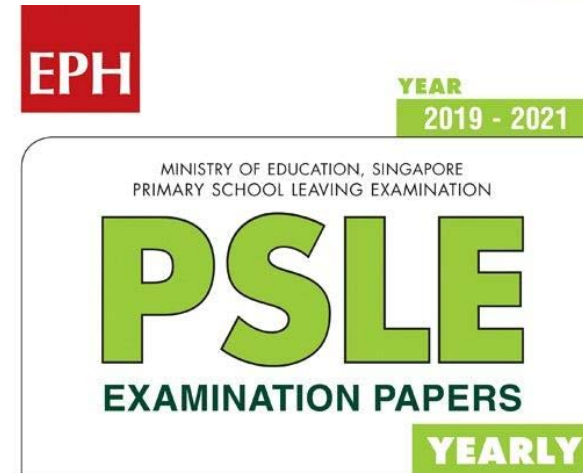
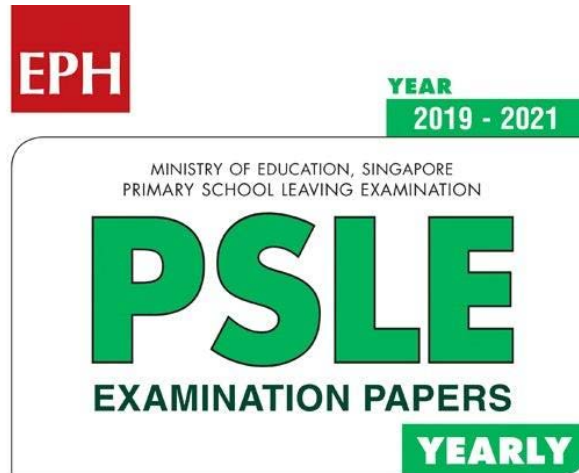
Tips for students for good time management :

- Good to have more time for booklet B to analyse and structure their answers.
- Extra time for revisiting difficult question(s) that were skipped earlier.



School's Support in our Pupils' Learning

- ✓ Use of **PSLE Book** (exposure to practice using authentic PSLE past year papers and revision)



School's Support in our Pupils' Learning

- ✓ Science laboratories with rich resources and science kits, eco-pond, science garden - *Support Science learning experiences*
- ✓ D3T2 Science (P4, 5 and 6) - *Talent Development Programme*
- ✓ Remedial / 1 to 1 consultation - *Help pupils bridge learning gaps*
- ✓ Science Games @ Recess - *Promote joy of learning*
- ✓ Science magazines available for browsing in school library and books for loan for enrichment - *Promote joy of learning*



Haig Girls' School



Conceptual Understanding in Primary Science: Examples and Applications

2022



Conceptual Understanding in Primary Science

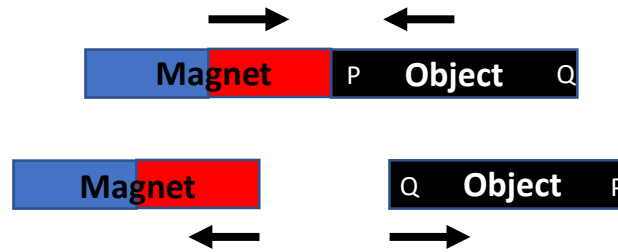
- Students learn Science through understanding and applying concepts and skills in different contexts in an age-appropriate manner.
- The focus of learning Science is not on giving "standard answers" or keywords. Students can show their understanding by using their own words to explain clearly in the context of the question.
- Science is alive and its applications are all around us.

Examples and Applications in Different Contexts

Example 1: Magnets

Concept:
Magnetic Repulsion

The object is definitely a magnet. Do you agree?



Yes, they attract each other.



Yes, the magnet and object move away from each other.



Yes, they repel each other.



If the object is only attracted by a magnet, it may just be a magnetic material. There is insufficient evidence to conclude that the object is a magnet. The object is definitely a magnet only if it repels a magnet.

Example 1: Magnets

Applications in daily life

Magnets help us in our everyday life!



There are magnets in my toy!



Magnets help us to separate the magnetic materials in our rubbish too.



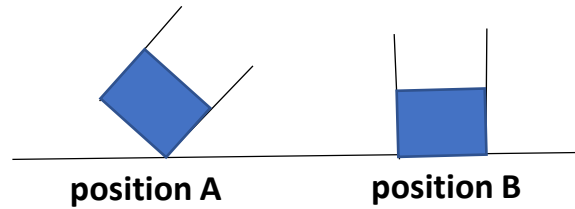
Yes, they are even used in Maglev trains!



Example 2: Matter

Concept:
Properties of Matter

A substance is put in a container.
The container is placed in positions A and B below.
The object is definitely a solid. Do you agree?



Yes, it is a solid because it takes up the same amount of space in positions A and B.



Yes, the substance has a fixed shape and volume in both positions A and B.



Yes, the substance did not change its shape in position A.



If the substance only takes up the same amount of space in the container, it may be a liquid. There is insufficient evidence to conclude that the substance is a solid. The substance is definitely a solid if it has a definite shape and volume.

Example 2: Matter

Applications in daily life

Properties of solids, liquids and gases are applied in our everyday life.



We can fill balloons of different shapes and sizes as gases have no definite shape and volume!



Water takes the shape of the containers as it has no definite shape.



We can also have ice sculptures in cold environment as ice has a definite shape and volume.



Example 3: Heat

Concept:
Heat Conduction



Air slows down
heat flow.

This jacket keeps us warm because ...



air
in
jacket



Air prevents coldness
from reaching us.



Air is a poor conductor of heat.



The description of coldness being transferred is conceptually incorrect. Heat is transferred from a warmer region to a colder region. The air in jacket slows down heat flow away from the body rather than prevents coldness from reaching us.

Example 3: Heat

Applications in daily life

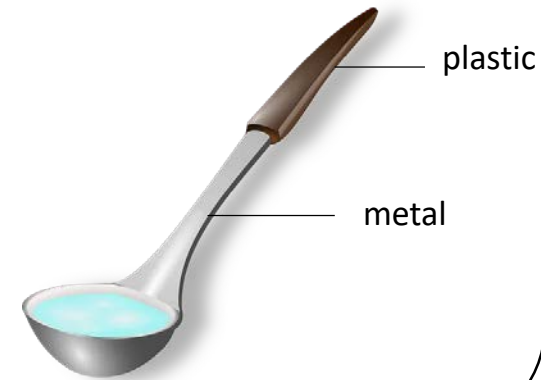
Some objects are better conductors of heat so they allow heat to flow through faster than others. What are some examples of heat flow in our everyday life?



Heat flows through the metal pot quickly to cook our food.

Some objects are made of both good and poor conductors of heat, such as the soup ladle.

I can hold the plastic handle safely when getting my hot soup.



Heat flows through the cardboard slowly so that I can hold my hot drink.



Example 4(a): Water Cycle

Concept:
Evaporation

There are water droplets on the leaves in the morning.
They are not there after a while. Why?



Water has disappeared!



Water has evaporated.



Water didn't disappear. It evaporated.
Conceptually, it continues to exist, except in a different state.
'Water has disappeared' does not explain what happened to the water.
Evaporation happens when water changes from liquid to gas.

Example 4(b): Water Cycle

Concept:
Evaporation

There are water droplets on the leaves in the morning.
They are not there after a while. Why?



Water has changed
from liquid to air.



Water has become
water vapour.



Air is made up of different gases including water vapour.
So it is a misconception that water vapour is air.

Example 4: Water Cycle

Applications in daily life

Evaporation is happening around us ...



Just like water from my clothes evaporated!



Putting little balls in reservoirs can help to slow down evaporation of water.



And water by the road evaporating!



Example 5: Energy in Food

Concept:
Photosynthesis

To help my plants grow well,
I should put them in a place with light. Why?



Plants need light
to make food.



Plants need light to photosynthesise.



Light provides food
for the plant.



Plants use light to photosynthesise (make their own food). It is conceptually incorrect to describe “light as providing food” for the plant.

Example 5: Energy in Food

Applications in daily life

Photosynthesis is important ...



During photosynthesis, plants provide us with oxygen!



Plants photosynthesise to make food for themselves.



When there are more plants, more carbon dioxide in the air will be taken in by the plants during photosynthesis. With less carbon dioxide in the air, this in turn helps to reduce global warming!



Thank you

