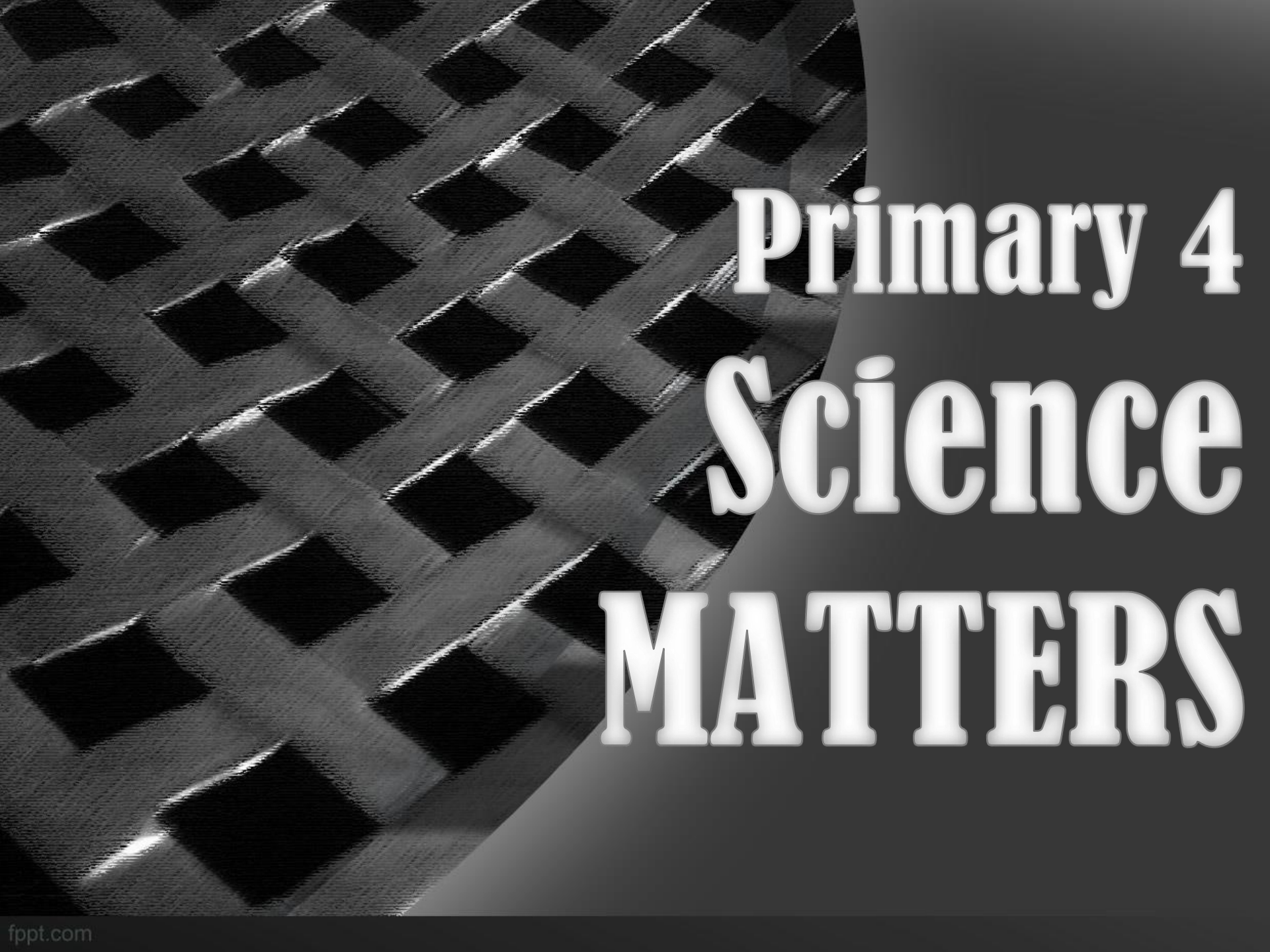


Scope of Briefing

- Science Syllabus and Curriculum
- Science Assessment Format
- Exemplar (PSLE) and Suggested Mark Scheme
- Answering Strategies
- Home Support

2014 Primary Science Syllabus

- To provide the student with a strong foundation in scientific concepts
- To nurture and develop the student's skills and necessary attitudes for scientific inquiry
- To develop the student in using these process skills to apply the scientific concepts to different contexts

P4 Science Curriculum Matters

Science Topics (Semester 1)

- Systems: Human & Plant (plants covered in P3)
- Cycles: Matter
- Energy: Heat

P4 Science Curriculum Matters

Science Topics (Semester 2)

- Energy: Light
- P4 Young Investigators' Project (YIP)
- Revision (Answering / Process Skills)

Science Lessons

- Activity Booklets (Hands-on)
- Review Practice (for OE Items)
- Vitamindz Topical / Skills Practice
- Student Handouts
- Weighted Assessments and year end exams
- SLS Lessons & Assignments
- Learning Journeys and Outdoor Learning

All the materials from P3 are needed for P4 Revision

YI Project

- Essential for practising process / thinking skills and inquiry
- Collaborative (small groups), self-directed learning
- Interdisciplinary
- Use of rubrics to assess (YI is non-weighted)
- Supported by Pre-YI activities to teach YI skills
- Runs for 5 - 6 weeks during Curriculum Time

Assessment Matters

Evaluating Learning

Through Class Work:

Activities, Written Work and SLS Assignments

Semester 1	Semester 2
Term Review 1 (Non-Weighted) (25m) **Weighted Assessment 1** Pen and Paper Test (25m)	**Weighted Assessment II** -includes 2 performance tasks (15m) **YI Project** (rubrics / quiz) **Year End Exams** (100m)

Assessment Objectives Year End Exams

Students should be able to

-To demonstrate their **knowledge** and **understanding** of scientific concepts

-To use various **process skills** to interpret and analyse data

and **apply scientific concepts** to **different contexts**

Year End Exams Weighting

STANDARD SCIENCE		
I	Knowledge with understanding	40%
II	Application of knowledge and process skills	60%

Format of Paper (Standard Science)

Section	Item Type	No. of QNs	Marks per QN	Weighting
A	MCQ	28	2	56%
B	OE	12 or 13	2, 3 or 4	44%

Duration of Paper : 1h 45 min

Distribution of Marks

According to Syllabus Content	
Life Science	45% - 55%
Physical Science	45% - 55%

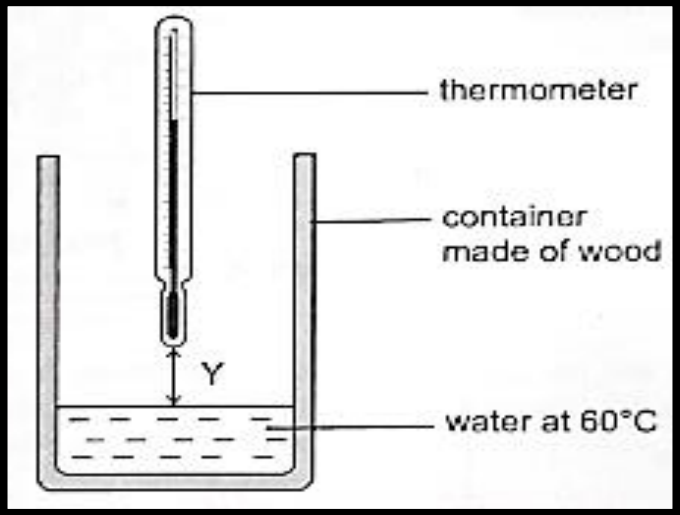
Exemplar – PSLE TEST ITEM

General Points

- An experiment is given as a scenario for the **first part** of the question. Students need to recognise the key idea based on the experiment and data given.
- In the **second part** of the question a real-world context will be given for students to apply this key idea.
- This type of test item that comes with a parallel example is the current trend observed in Primary Science Assessment.

Martin filled a container made of wood with water at 60°C. The temperature of water remained at 60°C throughout the experiment.

He measured the temperature of the air at various distance, Y, from the water surface.



His results are shown below.

Distance Y (cm)	2	4	6	8	10	12
Temperature of air (°C)	42	36	32	29	27	27

(a) Explain how using a container made of wood helped to make the experiment more accurate. [1]

(b) Give a reason why the experiment had to be conducted over a short period of time. [1]

(c) Based on the above results, what is the relationship between the temperature of the air and distance Y? [1]

Analysing part (a) - Key ideas

(a) Explain how using a container made of wood helped to make the experiment more accurate. [1]

- Wood is a poor conductor of heat, it conducts heat away slowly (from the water to the surrounding)
- This ensures that temperature of hot water does not drop quickly. Otherwise, it will affect the temperature of the air that is being measured.

Analysing part (b) - Key ideas

(b) Give a reason why the experiment had to be conducted over a short period of time. [1]

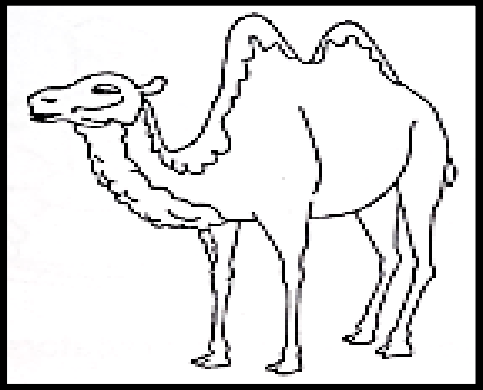
- The temperature of water will not remain constant as water will lose heat to the surrounding.
- It will affect the temperature of the air that is being measured.

Analysing part (c) - Key ideas

(c) Based on the above results, what is the relationship between the temperature of the air and distance Y? [1]

- Relationship between distance Y and the temperature of air
- As distance Y increases, the temperature of air decreases

(d) Animal H lives in the desert.



It stands on the hot sand with its four long legs.

(i) Based on Martin's findings, explain why having long legs is an advantage for animal H. [1]

(ii) The temperature in the desert gets very low at night. Animal H has thick fur to help it adapt to life in the desert. Explain why having thick fur is an advantage for animal H. [1]

Analysing part (di) - Key ideas

(di) Based on Martin's findings, explain why having long legs is an advantage for animal H. [1]

- Long legs help to keep the camel's body away from the hot sand
- Reduces the amount of heat the body gains from the hot sand

Analysing part (dii) - Key ideas

(dii) The temperature in the desert gets very low at night. Animal H has thick fur to help it adapt to life in the desert. Explain why having thick fur is an advantage for animal H. [1]

- Heat from the body would not be lost quickly to the cold surroundings

Concepts from different topics are tested here. (Heat energy and animal adaptation to surrounding temperature.)

Mark Scheme

- Marks awarded for conceptual understanding
- Student's answers that are different from the mark scheme are carefully evaluated if they are conceptually correct
- Marks are not awarded for merely stating 'correct' key words in the answer statement.

Mark Scheme

- Answer must be specific to the context.
- Answers must show evidence of understanding of relevant concepts and mastery of skills will be given due credit.

Conceptual Understanding

- Knowing and understanding scientific knowledge is important.
- But simply acquiring scientific knowledge does not prepare a student sufficiently for the examination.
- Scientific knowledge is only useful when a student knows which situations to apply it in and how to modify it for new situations.

Implications

- Accurate understanding of concepts is very, very important
  - ✓ **Make connections** between concepts learnt
    - Materials & Magnets
    - Heat & Materials
    - Plant Systems & Plant Life Cycle
  - ✓ **Apply** concepts / skills in new situations (YIP)
  - ✓ **Give reasons** for choices made
- Revision of concepts learnt in P3

Assessment Matters

- Revise P3 and P4 work which forms the bulk of year end exams
- Concepts covered in P3 are tested through more challenging questions in P4

Answering Technique
Claim → Evidence → Reasoning

Claim → Evidence → Reasoning (CER)

Claim

- Answer to the question
- Usually the easiest for the students

Evidence

- Must be appropriate / precise (usually quantitative data)
- Must be sufficient

Reasoning

- Explains how the evidence supports the claim
- Often includes scientific principles

Support at Home

- Read widely, beyond the text book.
  For example, Singapore Scientist

- Watch Science Programmes - Documentaries on TV
  For example, Animal Planet and Discovery Channel

- Helps to understand how concepts can be applied in varied contexts

Support in School

In school, we provide our students ample opportunities for experiential learning in our Science Curriculum, in the event they do not have sufficient time at home.

- Outdoor Learning & Learning Journeys
- Enrichment Activities as extension to concepts learnt
- Hands-on Activities and YI Project
- ICT Infusion
- HPPS Library for reading materials