Primary 4 Science Matters

Scope of Briefing

- **Science Curriculum**
- **Science Assessment**
- **Exemplar PSLE Test Item, Suggested Mark Scheme and Implications**
- **Revision and Answering Strategies**
- **Home and School Support**

Aims of Science Syllabus

- **Build on students' interests and stimulate their curiosity about themselves and their environment.**

- **Acquire basic scientific concepts to help them understand themselves and the world around them.**

- **Develop skills, dispositions, and attitudes for scientific inquiry.**

- **Apply scientific concepts and skills in making responsible decisions.**

- **Appreciate how Science influences people and the environment.**

P4 Science Curriculum

Topics (Semester 1)

- **Systems: Human Organ Systems & Review of Plant Parts & Functions**
- **Cycles: Matter**
- **Energy: Heat Energy**

Topics (Semester 2)

- **Energy: Light Energy**
- **Renewable Energy Programme (REP)**
- **Young Investigators' Project (YIP)**
- **Revision (on going)**

P4 Science Curriculum

Other activities / programmes

- **Renewable Energy Programme (REP)**
  - ***Students will carry out hands-on activities to learn more about solar energy and its uses (enrichment)***
- **Learning Journey to Gardens by Bay**

P4 Science Curriculum

Key thinking processes covered in the curriculum through various activities

- **Decision Making**
- **Investigation**
- **Creative Problem Solving**

Decision Making

Establishing and applying criteria to select from among seemingly equal alternatives.

E.g. Giving students a number of objects and ask them to prove which object is a magnet

Investigation

Involves formulating hypothesis, planning & carrying out fair experiments to test the hypothesis.

E.g., Young Investigators Project (YIP)

Creative Problem Solving

Analyzing a problem & choosing a novel but relevant solution for remedy

E.g., Thinking of ways to slow down bread from turning mouldy

Young Investigators Project

- **Essential for practising process / thinking skills and inquiry**
- **Collaborative (small groups), self-directed learning**
- **Interdisciplinary (infusion of STEM in hands-on activities)**
- **Use of rubrics to assess (YI project is non-weighted)**
- **Supported by Pre-YI activities to teach process skills**
- **Runs for 3 - 4 weeks during curriculum time**

Lesson Resources

- **Activity Booklets (Topical)**
- **Review Practice WS**
- **Vitamindz Topical / Process Skills Practice WS**
- **Student Handouts**
- **Exam Practice Papers**
- **SLS Lessons & Assignments**
- **Outdoor Learning / LJs**

All the materials from past topics are needed for revision in the current year

Evaluating Learning

Through Class Work:

Activities, Written Work and SLS Assignments

Semester 1	Semester 2
Term Review (Non-weighted) **Weighted Assessment 1**	**Weighted Assessment 2** **YI Project (non-weighted)** **End of Year Examination**
More details will be given later	

Evaluating Learning

Assessment Objectives:

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

Evaluating Learning

Format of Paper (New)				
Section	**Item Type**	**No. of QNS**	**Marks per QN**	**Weighting**
A	**MCQ**	**30**	**2**	**60%**
B	**OE**	**11 - 12**	**2 - 4**	**40%**

Duration of Paper : 1h 45 min

Evaluating Learning

Weighting of Test Items		
I	Knowledge with understanding	40%
II	Application of knowledge and process skills	60%

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

Assessment: PSLE Science

Exemplar - General Learning 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.**

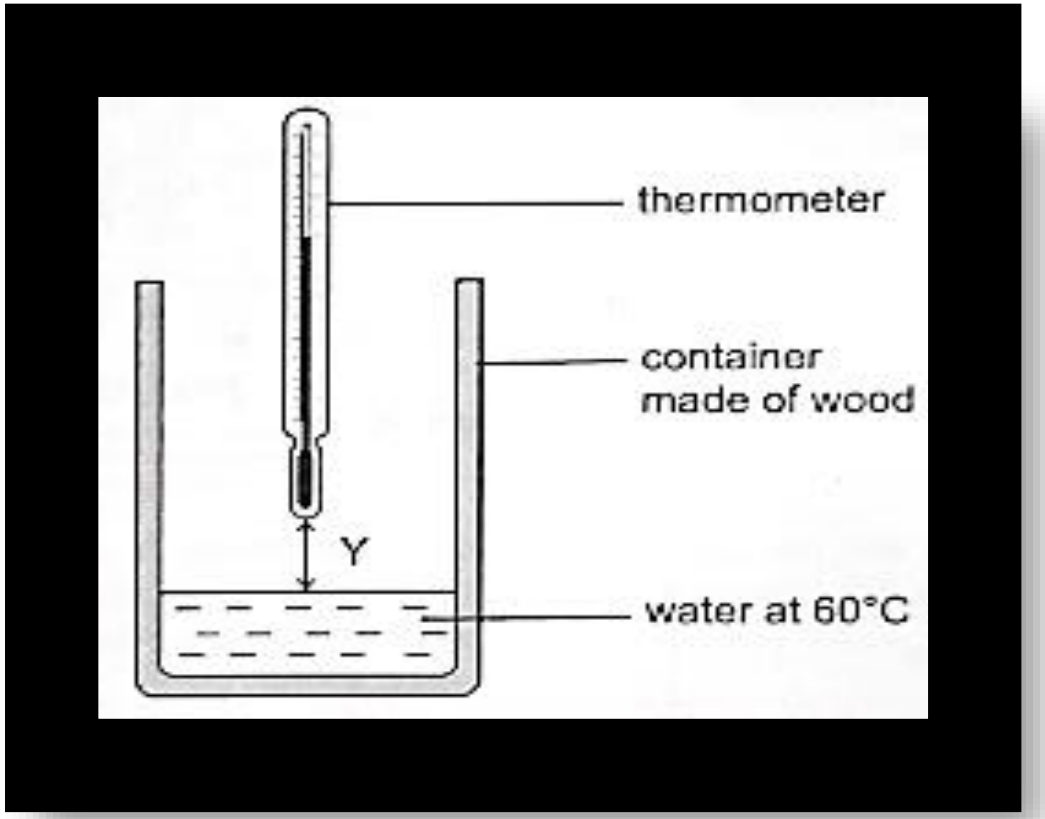
- **This type of test item with a parallel example is one of current trends observed in Primary Science Assessment.**

Assessment: PSLE Science

Exemplar

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.



Assessment: PSLE Science

Exemplar (continued)

His results are shown below.

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

Assessment: PSLE Science

Exemplar (continued)

(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 from the water to the surrounding air slowly.**

- **To ensure that temperature of hot water does not drop quickly. Otherwise, it will affect the temperature of the air that is being measured.**

Assessment: PSLE Science

Exemplar (continued)

(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 the same as water will lose heat to the surrounding.**
- **It will affect the temperature of the air that is being measured.**

Assessment: PSLE Science

Exemplar (continued)

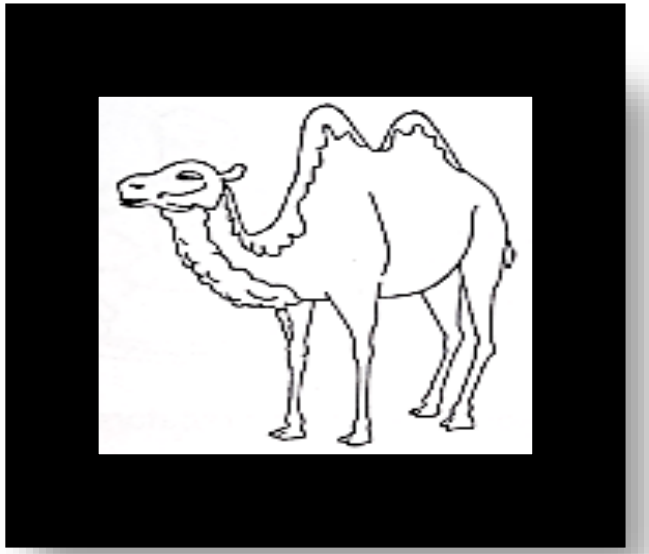
(c) Based on the above results, what is the relationship between the temperature of the air and distance Y? [1]

- **As distance Y increases, the temperature of air decreases**

Assessment: PSLE Science

Exemplar (continued)

(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]

Assessment: PSLE Science

Exemplar (continued)

(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**

Assessment: PSLE Science

Exemplar (continued)

(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 extreme surrounding temperature.

Assessment: PSLE Science

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.**

Assessment: PSLE Science

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.**

Revision

Implications

- **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.**

Revision

Implications

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

Answering Strategy: CER

Claim → Evidence → Reasoning (CER) Approach

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**

Home Support

- **Read widely, beyond the textbook.**
  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**

- **Revise with your child what has been covered in school including answering techniques**

School Support

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 and STEM Infusion**
- **HPPS Library for reading materials**

Thank You