

P5 & P6 PARENTS' WORKSHOP

ANSWERING TECHNIQUES FOR SCIENCE

26 March 2021



PSLE SCORING IN 2021 (STANDARD)

Achievement Level

AL	RAW MARK RANGE
1	≥ 90
2	85 – 89
3	80 – 84
4	75 – 79
5	65 – 74
6	45 – 64
7	20 – 44
8	< 20

Example

ENGLISH LANGUAGE AL 3

MATHEMATICS AL 2

SCIENCE AL 1

MOTHER TONGUE
LANGUAGE AL 2

PSLE SCORE : 8



PSLE SCORING IN 2021 (FOUNDATION)

FOUNDATION LEVEL AL REFLECTED ON RESULT SLIP	FOUNDATION RAW MARK RANGE	EQUIVALENT STANDARD LEVEL AL
A	75-100	6
B	30-74	7
C	<30	8

WITH THE NEW ACHIEVEMENT LEVEL, WILL THERE BE A CHANGE IN PSLE SCIENCE?



X NO

Outline

1. Assessment Guidelines
2. Answering Science Questions
 - The Thinking Process



Examinations

- Standard Science
- Foundation Science



P5 Weighted Assessment

Standard

Term 1	Term 2	Term 3	Term 4
Learning Review (Non-weighted)	Weighted assessment (15%)	Weighted assessment (15%)	SA2 (70%)
Total: 50 m	Total: 50 m	Total: 50 m	Total: 100 m
MCQ Open-ended	MCQ Open-ended	MCQ Open-ended	MCQ Open-ended

P5 Weighted Assessment

Foundation

Term 1	Term 2	Term 3	Term 4
Learning Review (Non-weighted)	Weighted assessment (15%)	Weighted assessment (15%)	SA2 (70%)
Total: 30 m	Total: 50 m	Total: 50 m	Total: 70 m
MCQ Open-ended	MCQ Open-ended	MCQ Open-ended	MCQ Open-ended



P6 Weighted Assessment

Standard

Term 1	Term 2	Term 3
Learning Review (Non-weighted)	SA1	Prelims
Total: 50 m	Total: 100 m	Total: 100 m
MCQ Open-ended	MCQ Open-ended	MCQ Open-ended

P6 Weighted Assessment

Foundation

Term 1	Term 2	Term 3
Learning Review (Non-weighted)	SA1	Prelims
Total: 30 m	Total: 70 m	Total: 70 m
MCQ Open-ended	MCQ Open-ended	MCQ Open-ended

PSLE Standard Science



Purpose of Examination

The science paper assesses students' attainment in Science with respect to the aims of Primary Science Education as stated in the 2014 Science syllabus.

The syllabus document can be found:

<https://www.moe.gov.sg/-/media/files/primary/science-primary-2014.pdf?la=en&hash=02143C5C1BE89EA5F03F3A760E3EB74BC162D2C>

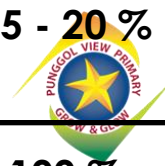
3



Topics & Weighting



THEMES/ TOPICS	QUESTION NOS.		WEIGHTING
	LIFE SCIENCE	PHYSICAL SCIENCE	
DIVERSITY	<ul style="list-style-type: none"> Variety of Living Things (General characteristics and classification) 	<ul style="list-style-type: none"> Diversity of non-living (General characteristics and classification) Diversity of materials 	5 - 10 %
CYCLES	<ul style="list-style-type: none"> Cycles in Plants & Animals (Life cycles, Reproduction) 	<ul style="list-style-type: none"> Cycles in matter and water (Matter, Water) 	20 - 25 %
SYSTEMS	<ul style="list-style-type: none"> Plant system (Plant Parts and functions, Respiratory & Circulatory Systems) Human System (Digestive system, Respiratory & Circulatory Systems) Cell system 	<ul style="list-style-type: none"> Electrical Systems 	15 - 25 %
INTERACTIONS	<ul style="list-style-type: none"> Interaction within the environment 	<ul style="list-style-type: none"> Interaction of forces (Magnets, Frictional force, gravitational force, force in springs) 	25 - 30%
ENERGY	<ul style="list-style-type: none"> Energy forms and uses (Photosynthesis) 	<ul style="list-style-type: none"> Energy forms and uses (Light and heat) Energy Conversion 	15 - 20 %
TOTAL	45 – 55%	45 – 55%	100 %



Process Skills



Process Skills

Knowledge with Understanding	40%
Application of Knowledge & Process Skills <ul style="list-style-type: none">• observing, comparing, classifying• use of apparatus & equipment• communicating – tables, charts & graphs• Inferring• Predicting• Analysing• Generating possibilities• Evaluating• Formulating hypothesis• Creative problem solving• Decision-making• Investigation	60%

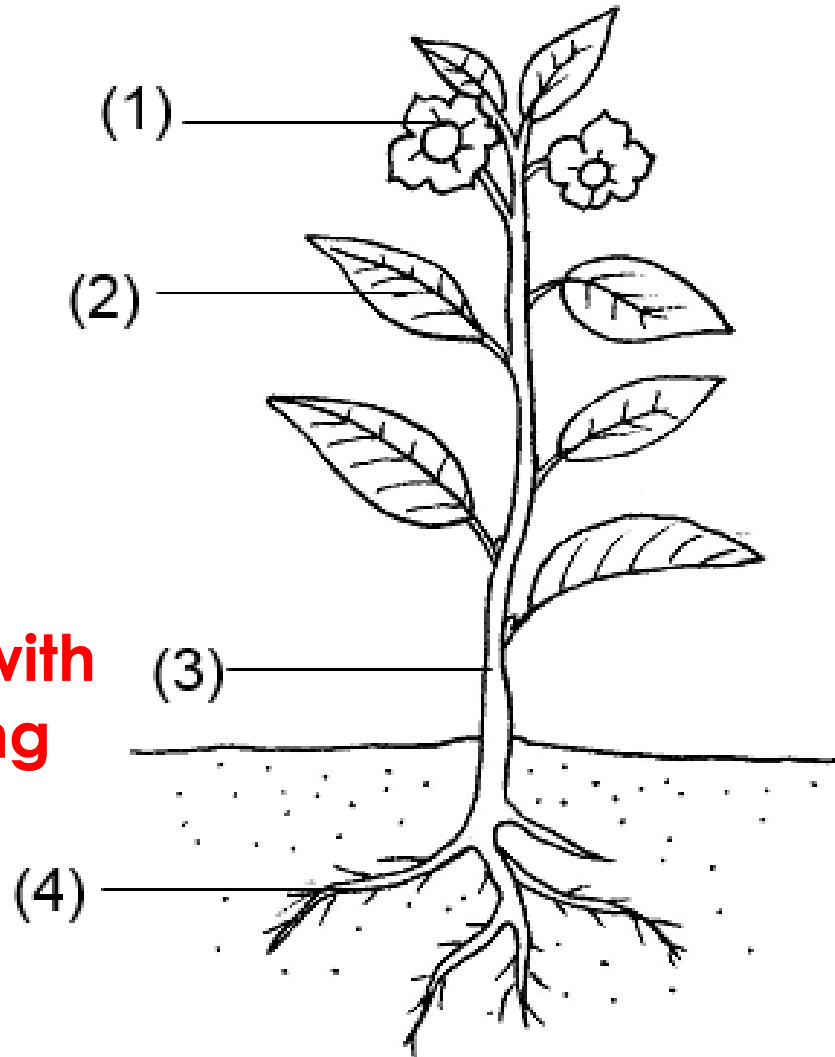


Knowledge with Understanding

Students should be able to demonstrate knowledge and understanding of scientific facts, concepts and principles.



The diagram below shows a plant. Which part (1), (2), (3) or (4) helps the plant to take in water?



**Knowledge with
Understanding**

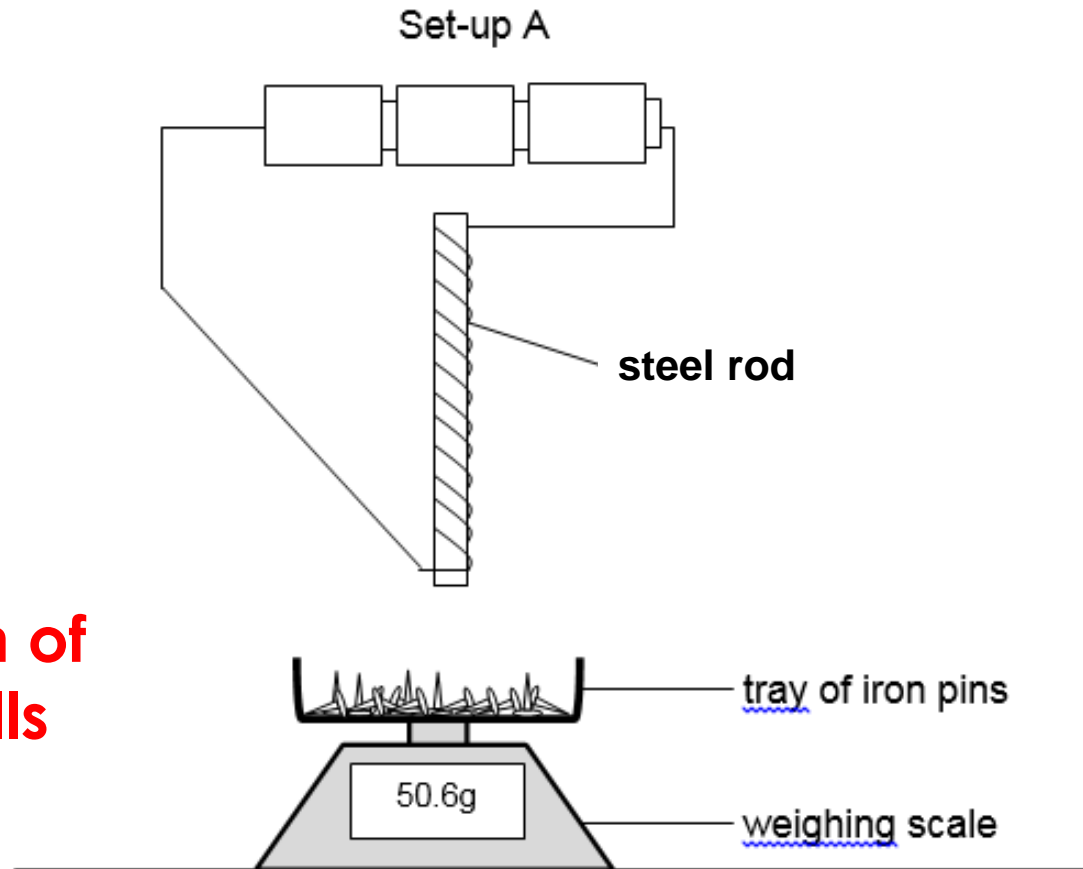
Application of Knowledge & Process Skills

Students should be able to

- (a) apply scientific facts, concepts and principles to new situations
- (b) interpret information (including pictorial, tabular and graphical) and investigate using one or a combination of the process skills.



Alex put some iron pins on a weighing scale and placed set up A above the tray as shown below.



Application of process skills

- (a) What would Alex observe after a while? [1]
- (b) What would happen to the reading on the weighing scale? [1]

BASIC PROCESS SKILLS

Observing	This is the skill of using our senses to gather information about objects or events. This also includes the use of instruments to extend the range of our senses.
Comparing	This is the skill of identifying the similarities and differences between two or more objects, concepts or processes.
Using apparatus & equipment	This is the skill of knowing the functions and limitations of various apparatus, and developing the ability to select and handle them appropriately for various tasks.
Communicating	This is the skill of transmitting and receiving information presented in various forms – written, verbal, pictorial, tabular or graphical.



HIGHER ORDER PROCESS SKILLS

Inferring	This is the skill of interpreting or explaining observations or pieces of data or information.
Analysing	This is the skill of identifying the parts of objects, information or processes, and the patterns and relationships between these parts.
Evaluating	This is the skill of assessing the reasonableness, accuracy and quality of information, processes or ideas. This is also the skill of assessing the quality and feasibility of objects.
Formulating hypothesis	This is the skill of making a general explanation for a related set of observations or events.



HIGHER ORDER PROCESS SKILLS

Generating possibilities	This is the skill of exploring all the alternatives, possibilities and choices beyond the obvious or preferred one.
Predicting	This is the skill of assessing the likelihood of an outcome based on prior knowledge of how things usually turn out.
Creative Problem Solving	This is a process of analysing a problem and choosing an innovative and relevant solution in order to remedy or alter a problem situation.
Decision-making	Decision-making is the process of establishing and applying criteria to select from among seemingly equal alternatives. The process of establishing criteria involves consideration of the consequences and values.

HIGHER ORDER PROCESS SKILLS

Investigation

This involves formulating questions or hypotheses, devising fair methods and carrying out those methods to find out answers to the questions or to verify the hypotheses.



Examination Format

The examination consists of one written paper comprising two booklets, Booklet A and Booklet B.



Examination Format

Booklet	Item Type	Number of questions	Number of marks per question	Marks
A	Multiple-choice	28	2	56
B	Open-ended	12-13	2, 3, 4, 5	44



Duration

Time allocated for the paper is
1 hour 45 minutes



PSLE Foundation Science



Purpose of Examination

PSLE Foundation Science assesses students' attainment in science as stated in the 2014 Science syllabus. The assessment includes recall of scientific facts and concepts and the application of process skills in various contexts.



Topics & Weighting



THEMES/ TOPICS	QUESTION NOS.		Weightings (%)
	LIFE SCIENCE	PHYSICAL SCIENCE	
DIVERSITY	<ul style="list-style-type: none"> Diversity of Living Things 	<ul style="list-style-type: none"> Diversity of non-living Diversity of materials 	10 - 20
CYCLES	<ul style="list-style-type: none"> Cycles in Plants & Animals 	<ul style="list-style-type: none"> Cycles in matter and water 	15 - 25
SYSTEMS	<ul style="list-style-type: none"> Plant system Human System 	<ul style="list-style-type: none"> Electrical Systems 	10 - 25
INTERACTIONS	<ul style="list-style-type: none"> Interaction within the environment 	<ul style="list-style-type: none"> Interaction of forces 	15 - 30
ENERGY	<ul style="list-style-type: none"> Energy forms and uses 	<ul style="list-style-type: none"> Energy forms and uses 	15 - 25
Weighting	45 – 55%	45 – 55%	100



Process Skills



Process Skills

Knowledge with Understanding	50%
Application of Knowledge & Process Skills <ul style="list-style-type: none">• observing, comparing, classifying• use of apparatus & equipment• communicating – tables, charts & graphs• Inferring• Predicting• Analysing• generating possibilities• Evaluating• formulating hypothesis	50%



Examination Format

The examination consists of one written paper comprising two booklets, Booklet A and Booklet B.



Examination Format

Booklet	Item Type	Number 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 - 4	20



Provision of Word List

The Foundation Science paper focuses on assessing students' grasp of basic scientific knowledge. A word list is provided during examination to allow students to display their knowledge and understanding without being unduly disadvantaged by their weakness in the English Language. It should be appreciated that the list is not exhaustive.



SOME USEFUL WORDS*

1	anus	44	light
2	attract / repel	45	liquid
3	battery	46	lung
4	blood (vessel)	47	magnet / magnetic material
5	boiling	48	mammal
6	breathe	49	mass / weight
7	bulb	50	measuring (cylinder)
8	butterfly	51	melting
9	carbon dioxide	52	metal
10	chicken	53	mouth
11	circulation	54	muscles
12	cockroach	55	mushroom
13	condense / condensation	56	nitrogen
14	conductor / insulator	57	(north / south / like) poles
15	contract / contraction	58	nose
16	(electric) current	59	oxygen
17	deforestation	60	plastic / rubber / wood
18	digestion	61	pollinate / pollination
19	earth	62	pollute / pollution
20	electricity / electrical circuit	63	predator
21	energy	64	prey
22	evaporate / evaporation	65	producer
23	expand / expansion	66	push/pull
24	fertilise / fertilisation	67	reflect
25	flexible	68	reproduce
26	float / sink	69	respiration
27	flower food(chain)	70	root
28	force	71	seed (dispersal)
29	freezing	72	shadow
30	friction	73	shape
31	frog	74	skeleton
32	fungi	75	solid
33	gas	76	space
34	germinate / germination	77	spore
35	global warming	78	spring balance
36	gravity	79	steam
37	gravitational force	80	steel
38	heart	81	stem
39	heat (gain / loss)	82	stomach
40	insect	83	switch
41	(large/small) intestine	84	temperature / thermometer
42	iron	85	volume
43	leaf	86	water (vapour)

*This list is not exhaustive. Candidates may be required to use words not found in the list.



Duration

Time allocated for the paper is
1 hour 15 minutes



STRATEGIES FOR ANSWERING SCIENCE QUESTIONS



Only one right answer to science questions?



Our stand

The primary science curriculum encourages pupils to learn science through **understanding basic concepts and applying what they have learnt in different contexts**. While there are certain scientific terms and concepts taught in the primary science syllabus, pupils can **demonstrate their understanding by using their own words in explaining concepts**.

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**. We do not encourage students to reproduce "standard answers" or be fixated with memorising keywords, as different application contexts would require different responses.

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.

(Sng Chern Wei, Director, CPDD1, 9 May 2015, ST)



Marks allocation

Marks are awarded for:

1. Applying science facts, concepts and principles to the given situation.
2. Giving responses that are conceptually correct and relevant in the context of the questions.

Do not give general statements as answers.

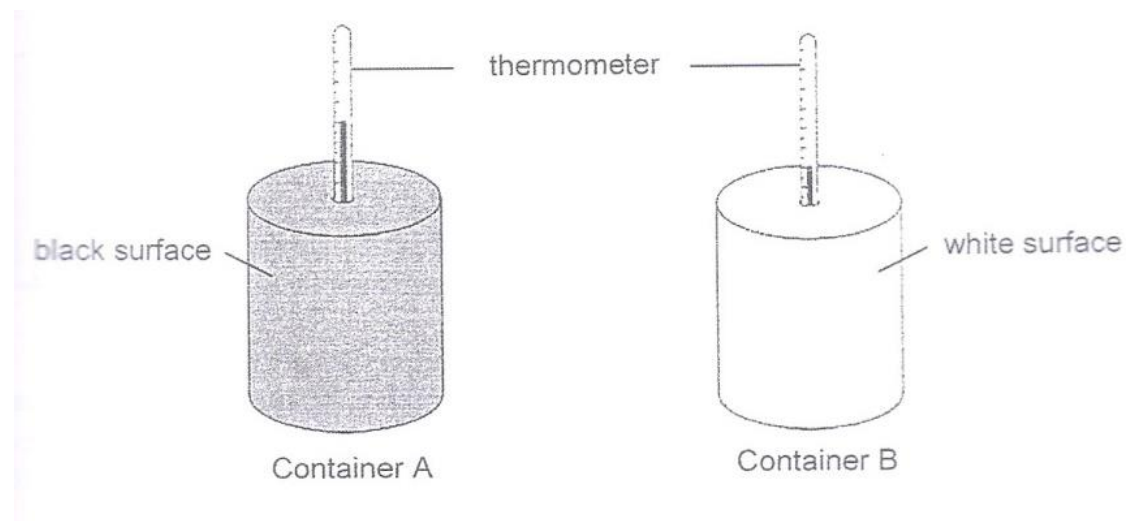


Recent Trends in Questions

- Integration of topics
- Application of science concepts in daily life.



Devi conducted an experiment using two identical air-tight containers, A and B, as shown. Container A had a black surface while container B had a white surface. She placed the container under the sun. At first, the thermometers showed the same reading.



After a few hours, she observed that the temperature in container A was higher than that in container B.

(a) What could Devi conclude from this observation?

Source: PSLE Examination questions, pg 62, EPH



Bird P lives in a very cold environment.



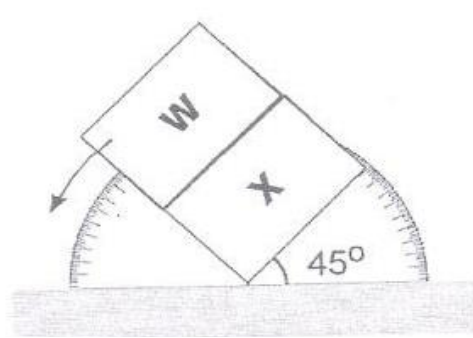
Bird P

- (b) Bird P usually stands with its back facing the sun. Suggest a reason for such a behaviour.
- (c) Bird P lives in large groups, staying very close to one another. Explain how staying very close to one another helps to keep warm.

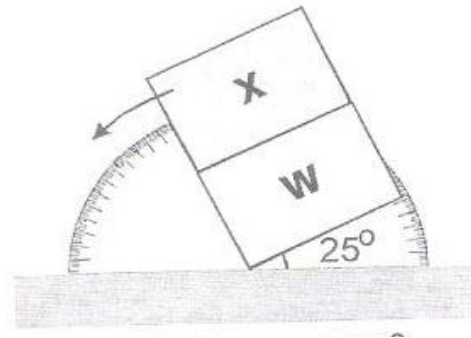
Sulaiman had two boxes, W and X, of the same size. X was heavier than W. He glued W and X together to form one block.

With W on top of X, the block was tilted until it fell as shown figure (a).

He then repeated the experiment with X on top of W. The block was tilted until it fell as shown in figure (b).



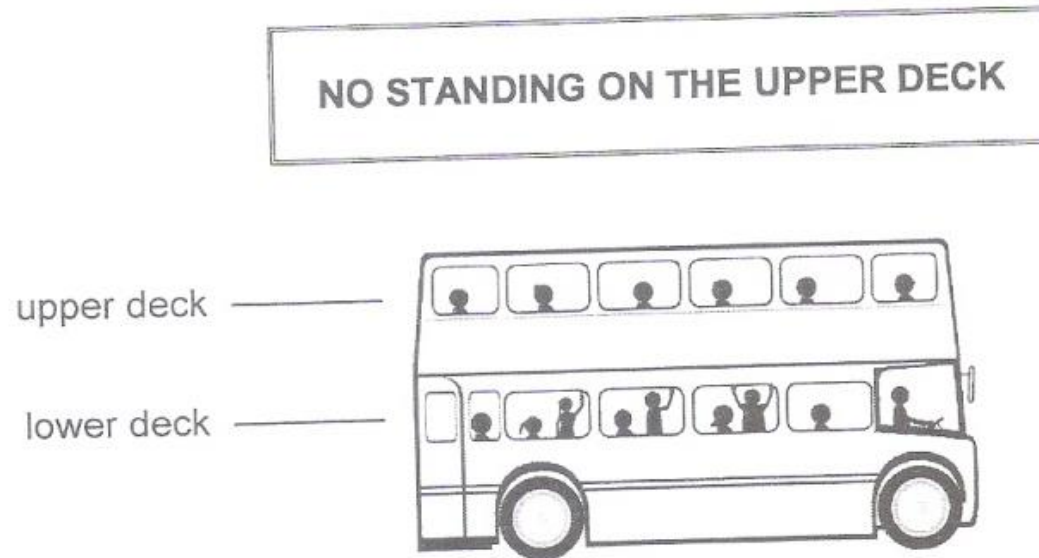
block fell over at 45°
figure (a)



block fell over at 25°
figure (b)

Source: PSLE Examination questions, pg 91, Hillview

The following sign is usually seen inside a double-decker bus to prevent overcrowding on the upper deck.



Using your answer to (a), give a reason why no standing is allowed on the upper deck when the bus is crowded.

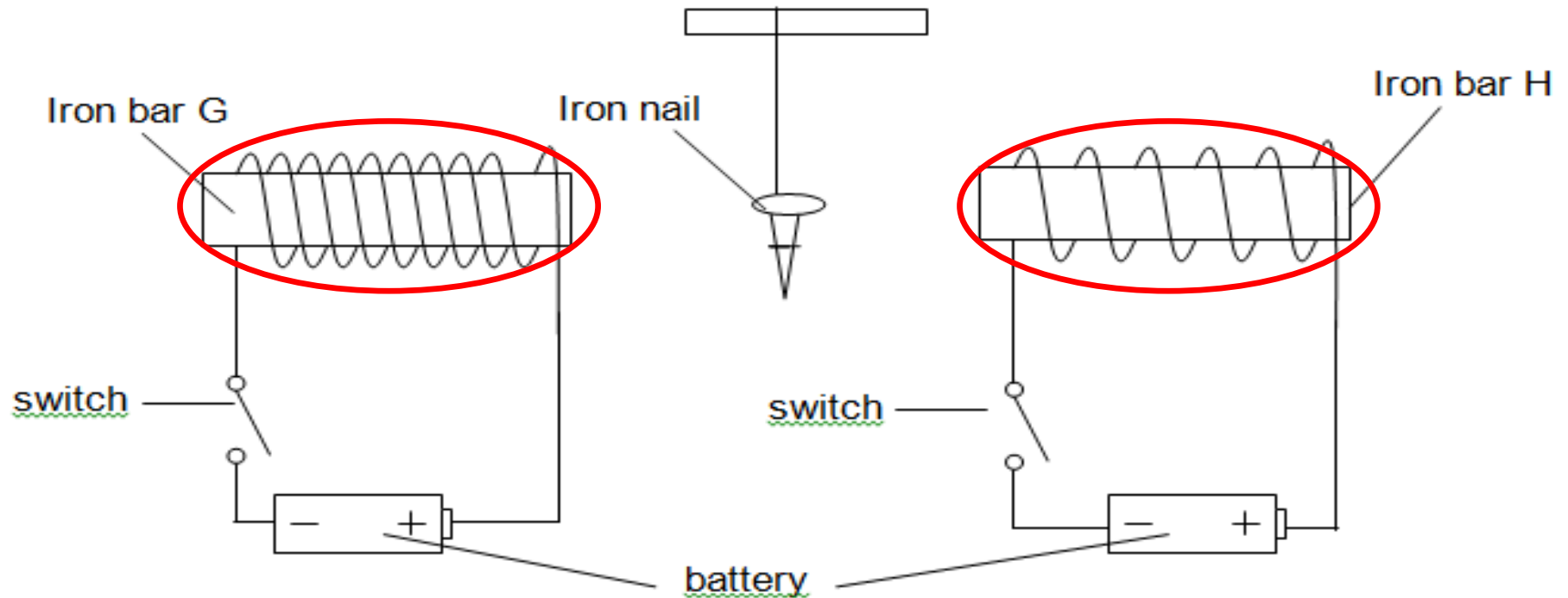
Source: PSLE Examination questions, pg 91, Hillview

Strategies for answering questions (MCQ & Open-ended)

- Read and understand the question.
- Look for contextual clues in the question.
- Interpret the diagrams
- Analyse the data given in the tables or graphs.
- Identify the underlying topic and concept(s).



16. An iron nail was suspended freely midway between iron bars G and H as shown below.



What will happen when the switches of both setups are closed at the same time?

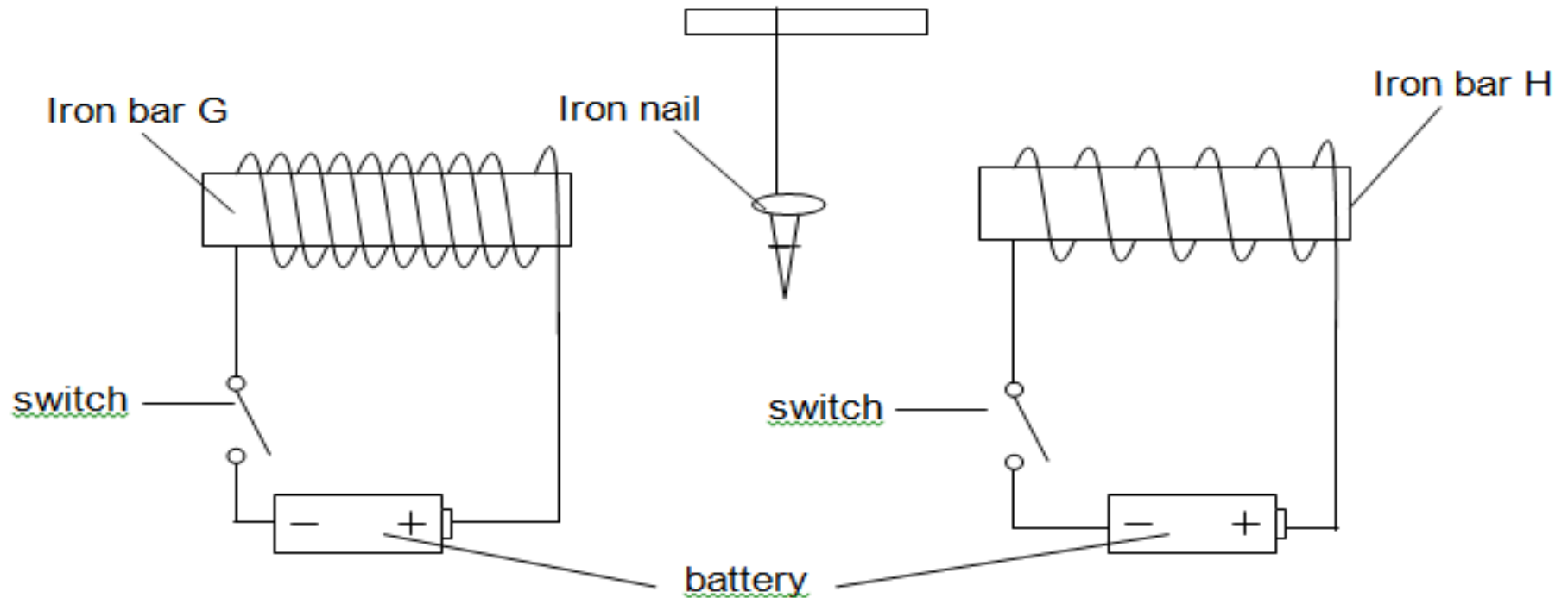
- (1) Nothing will happen.
- (2) The iron nail will swing back and forth.
- (3) The iron nail will be attracted to iron bar G.
- (4) The iron nail will be attracted to iron bar H.

Topic: Magnets

**Scientific concept:
Increase in number of coils
causes the electromagnet
to be stronger**



16. An iron nail was suspended freely midway between iron bars G and H as shown below.



What will happen when the switches of both setups are closed at the same time?

- (1) Nothing will happen. ✗
- (2) The iron nail will swing back and forth. ✗
- (3) The iron nail will be attracted to iron bar G. ✓
- (4) The iron nail will be attracted to iron bar H. ✗

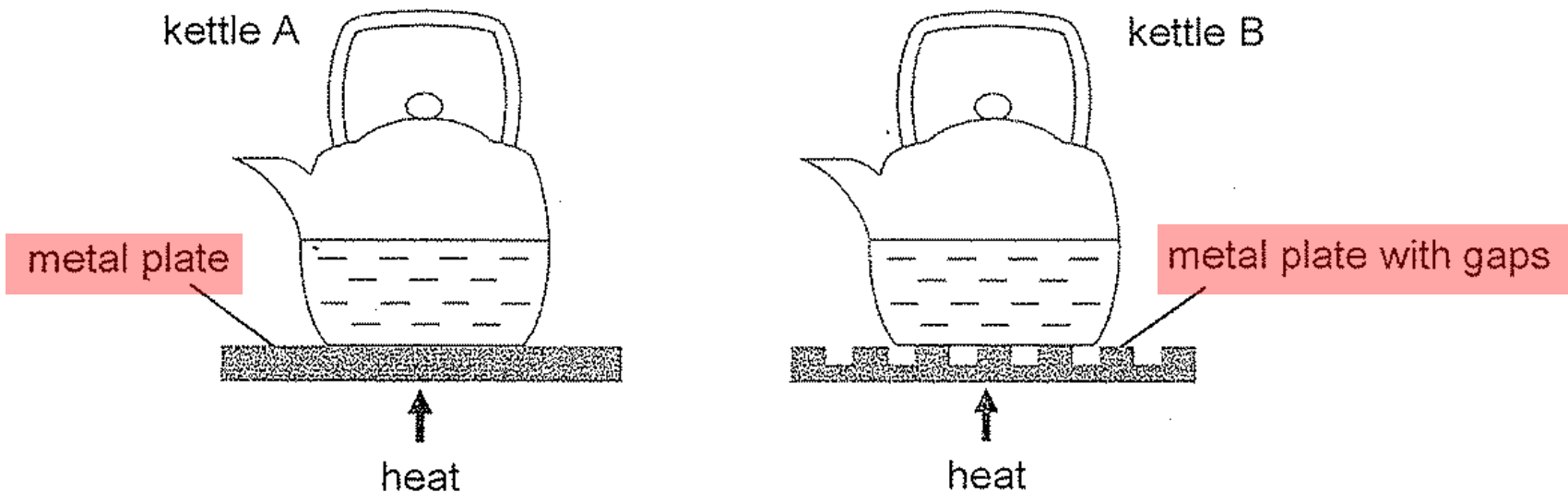
Ans: (3)

How to explain for open-ended

- A scientific explanation is more than a description.
- A scientific explanation should have a claim, evidences and reasoning.
- A scientific explanation must highlight the **scientific concept** behind the **observation**.



In an experiment, Johan placed two identical kettles on two metal plates of the same material with different surfaces. The kettles contained the same amount of water at room temperature. The plates were heated from below.



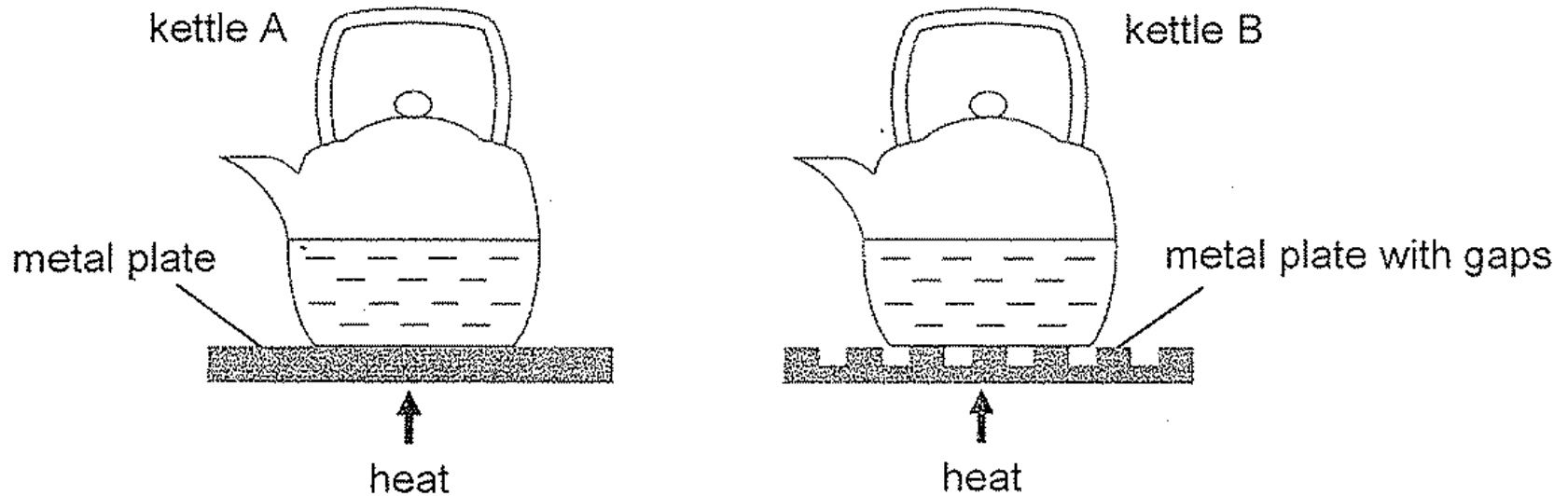
(a) In which kettle, A or B, would the water boil first? Give a reason for your answer. [1]

Topic: Heat

Scientific concept: gain heat, surface area

Source: Taken from PSLE Science 2009

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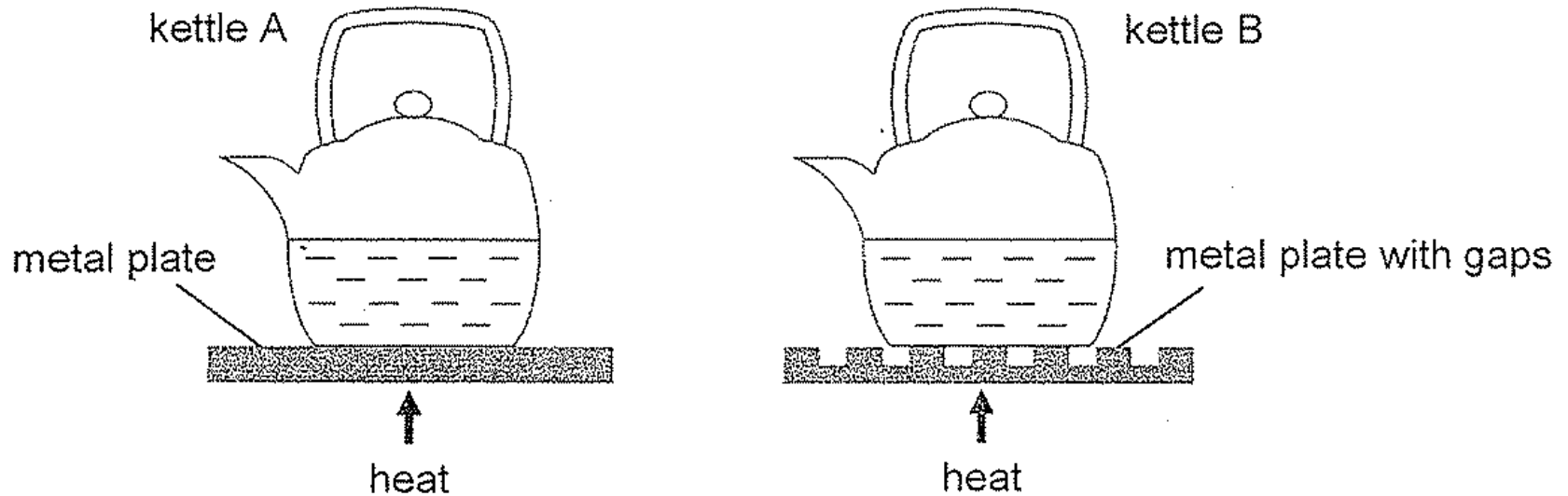
Notes:

When asked to make a choice between 2 or more objects, you have to show comparison of the objects.

- 2 objects: more, greater, lesser, fewer
- More than 2 objects: most, greatest, least



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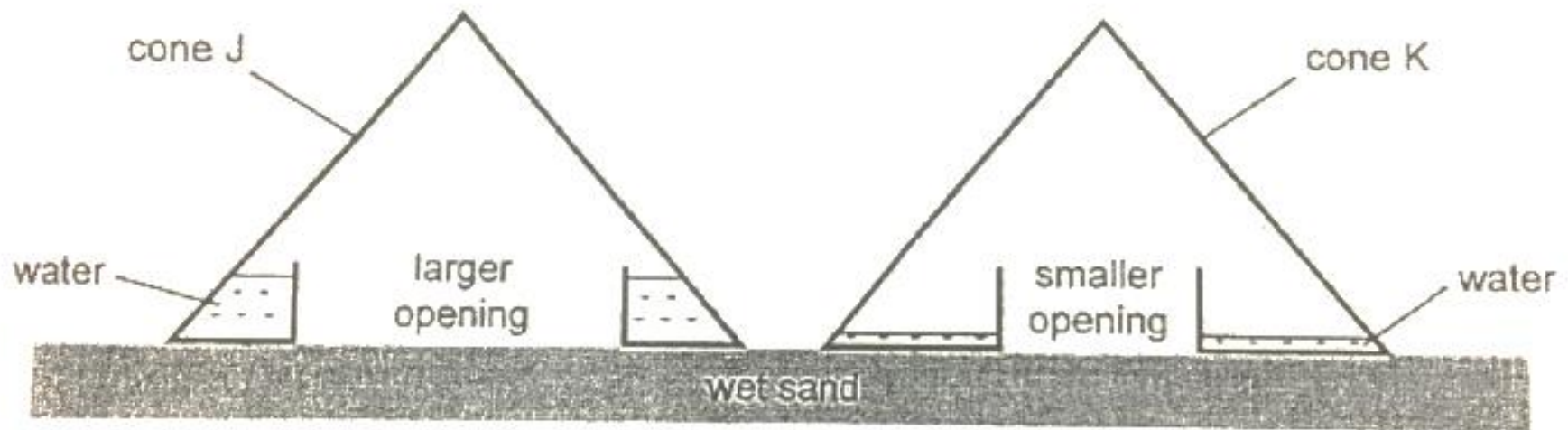
Kettle A,

- Kettle A has a **larger surface area in contact with the metal plate (observation)**
- **so it gains more heat (scientific concept)**



On a sunny day, Huiwen placed two plastic cones, J and K, on wet sand. Cones J and K were similar but J had a larger opening at the base than K.

After several hours, she saw some water collected at the base of each cone as shown.



Source: Taken from PSLE Science 2014

(a) Explain how the water was collected.

[2]

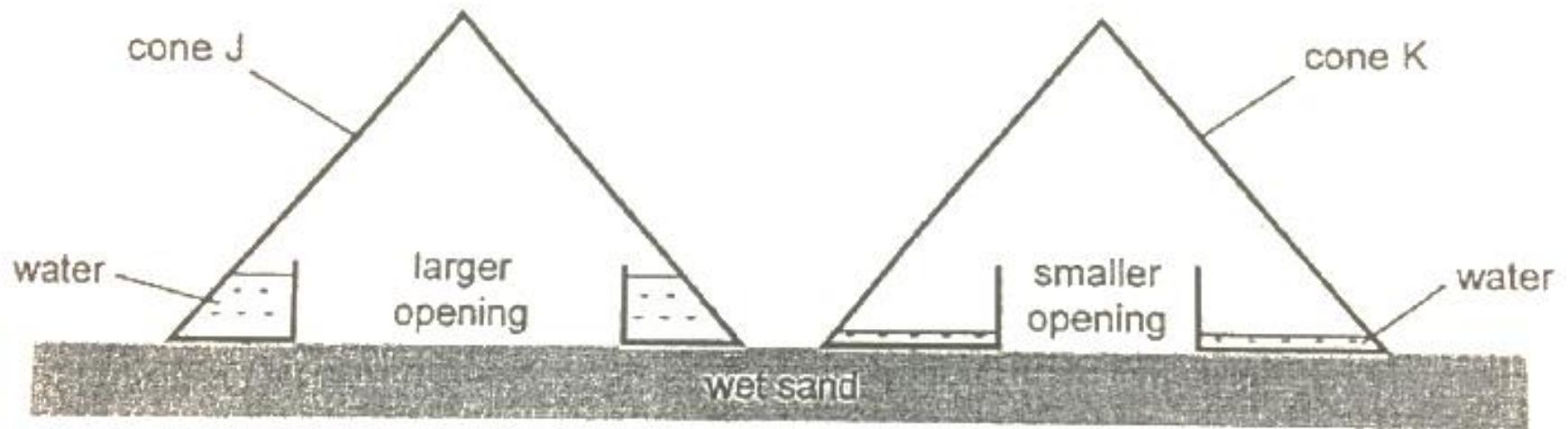
Topic: Water & Changes of states

Scientific concept: Evaporation & Condensation



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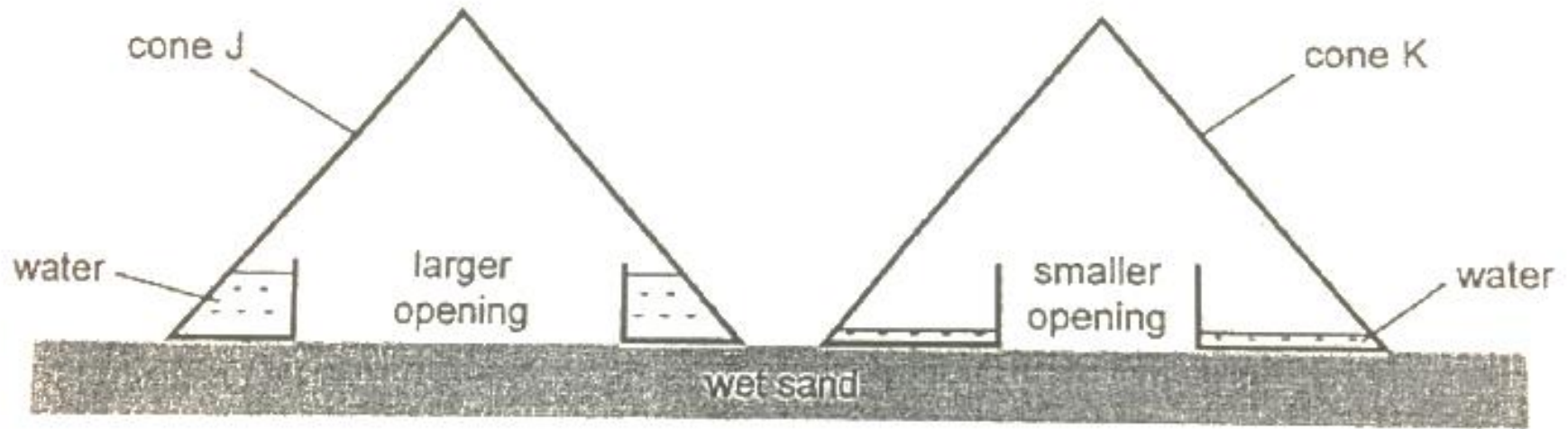
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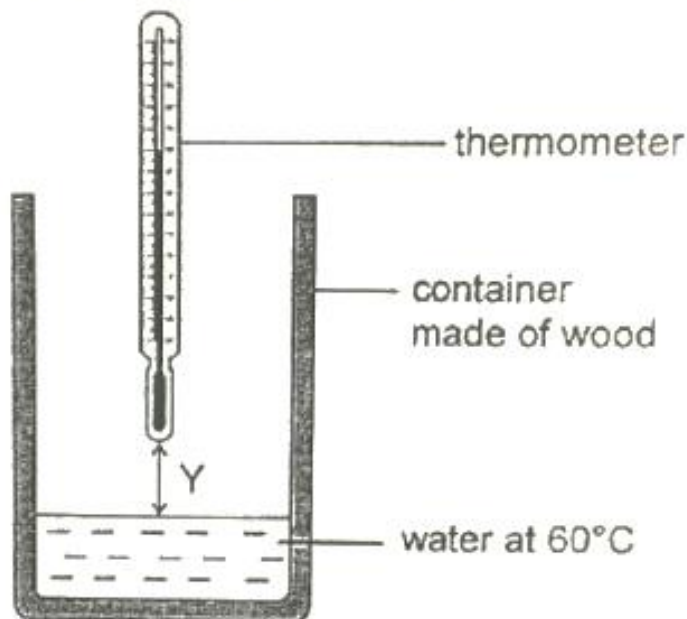
Source: Taken from PSLE Science 2014

(b) More water was collected in cone J than in cone K. Explain why.

[1]

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

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



Her results are shown below.

Distance Y (cm)	2	4	6	8	10	12
Temperature of air ($^{\circ}\text{C}$)	42	36	32	29	27	27

(a) What is the relationship between the temperature of the air and distance Y ? [1]

Topic: Heat

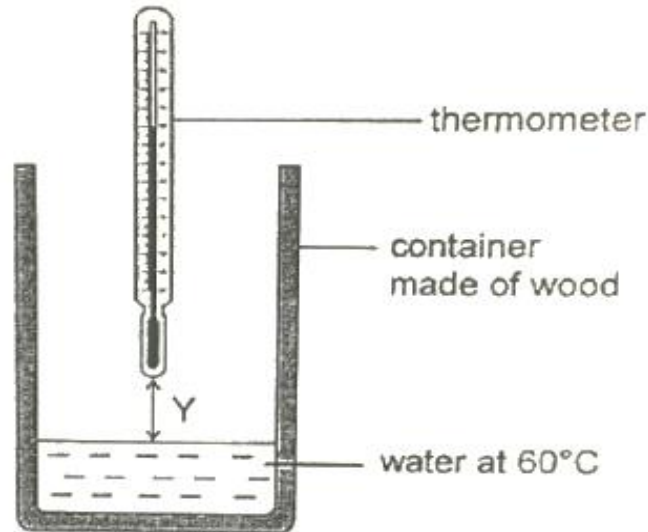
Source: Taken from PSLE Science 2014

Scientific concept: Conductor of heat



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

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Temperature of air ($^{\circ}\text{C}$)	42	36	32	29	27	27

(a) What is the relationship between the temperature of the air and distance Y? [1]

Notes:

When stating a relationship, students must state the cause and effect in the right order.

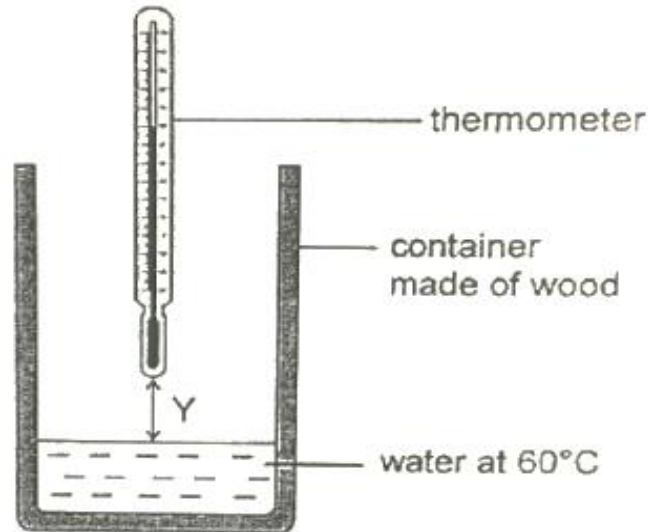
- As (cause) _____, the (effect) _____.

Source: Taken from PSLE Science 2014



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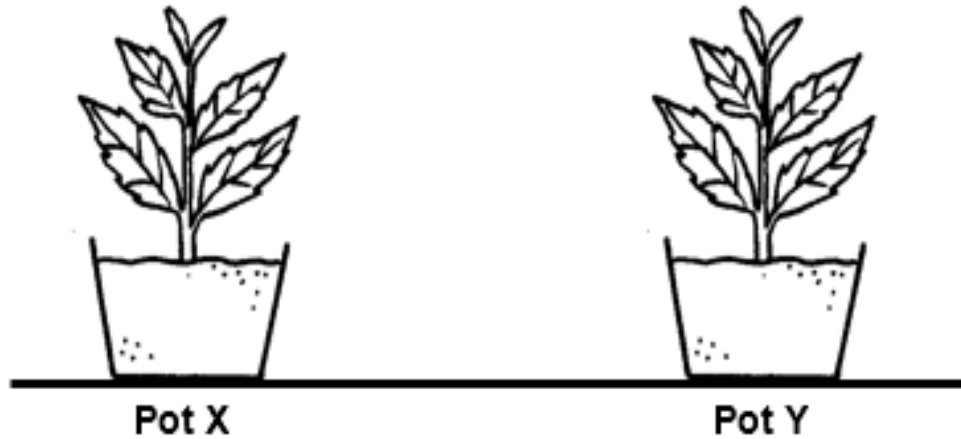
As the distance Y (cause) _____, the temperature of air (effect) _____.



FAIR TEST

- ◆ There should only be ONE changed variable.
- ◆ All other variables that might affect the experiment must be kept constant.
- ◆ Students should be able to explain how these variables would affect the experiment.

Jahan wanted to find out the effect of pond water on plants. She planted two identical plants into pots X and Y as shown below.



- (a) Complete the table below to show how Jahan should set up Pot Y to ensure a fair test. [1]

	Pot X	Pot Y
Type of soil	Garden soil	
Amount of soil	3.5 kg	
Type of water	Tap water	
Amount of water	150 ml	

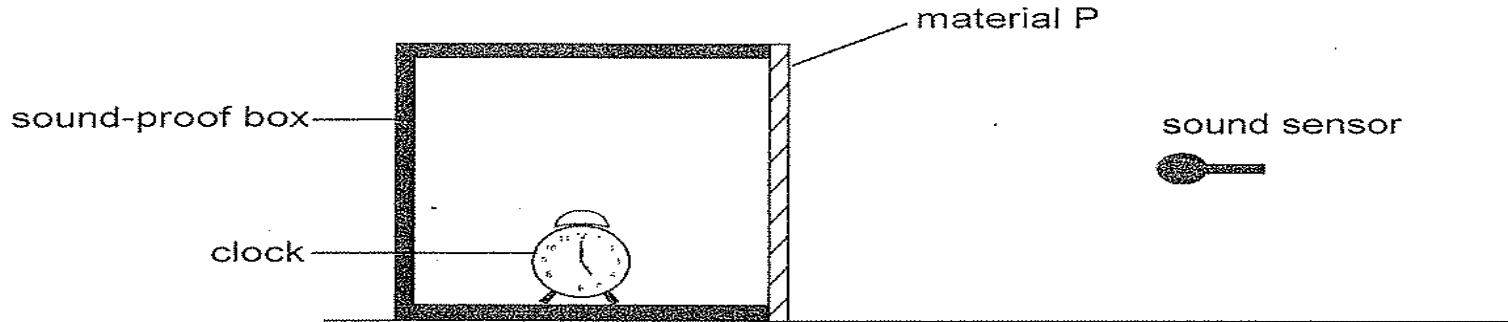
Identifying the variables of a fair test based on aim of experiment

Variable change

Variable kept the same

Variable to measure

Rita wanted to study the effect of some materials on the loudness of sound. She set up an experiment as shown below. She covered the open side of a sound-proof box with material P.



The clock was set to ring at a certain loudness. She recorded the loudness of the clock with a sound sensor placed at a fixed distance. She repeated the experiment using materials Q and R of the same thickness as material P. The table below shows the results.

material	loudness of sound (unit)
P	80
Q	30
R	50

- (a) Give a reason why the thickness of materials P, Q and R should be the same to ensure a fair test. [1]

Source: Taken from PSLE Science 2009

To measure the amount of sound that can pass through the materials



How can you help your
child?



Suggestions

1. Revise with your child the concepts that they have learnt in school.
2. Use questions to test your child to ensure that he/she can remember and apply what he/she has learnt.
3. Ensure that your child uses the strategies when answering the questions.



Suggestion

Helping Your Child to Enjoy Science

22 JUN 2016



Enjoy science in everyday life as you spend time with your children!

<https://www.schoolbag.sg/story/helping-your-child-to-enjoy-science>



Video



<https://www.youtube.com/watch?v=CyElHdaqkjo&t=7s>

IF YOU HAVE ANY QUERIES AFTER THIS SESSION, YOU MAY DROP AN E-MAIL TO:

Mr Ivan Ng (HOD Science): ng_wee_liat_ivan@moe.edu.sg

Ms Sylvia Wang (LH Science): wang_yong_ling_sylvia@moe.edu.sg



THANK YOU