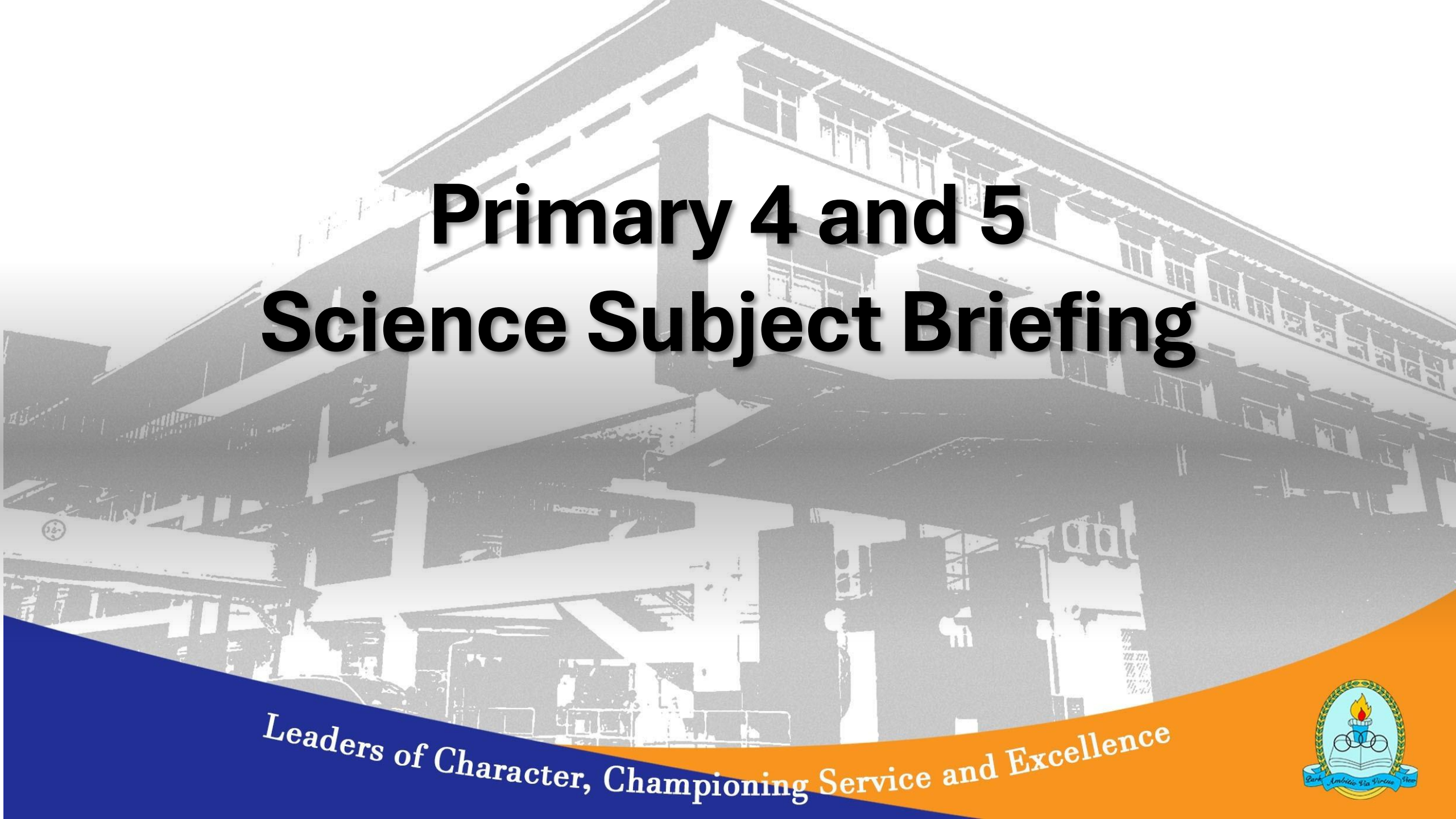
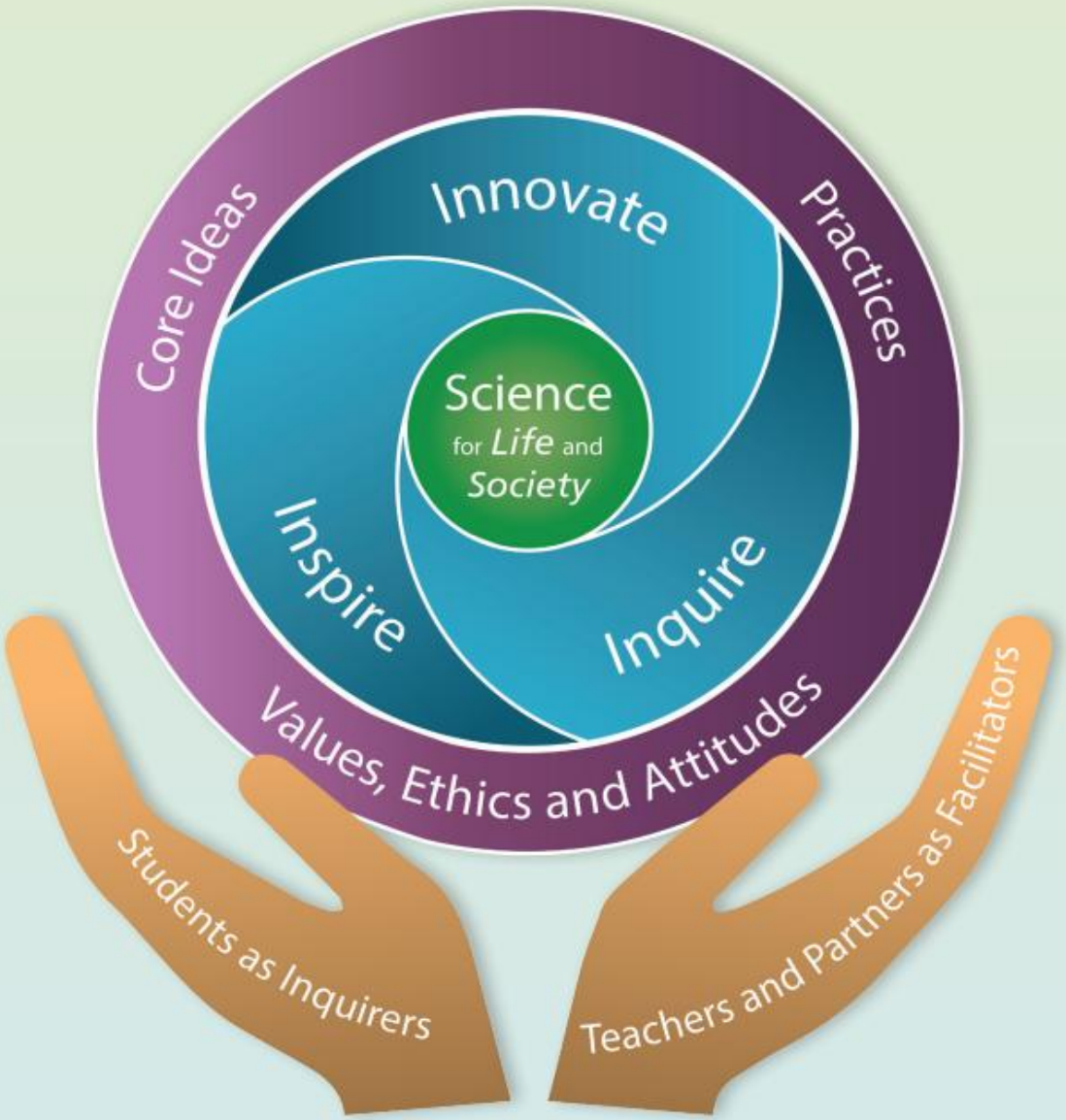


Primary 4 and 5
Science Subject Briefing

Leaders of Character, Championing Service and Excellence

Science Curriculum Framework



Goals
The twin goals of Science education, as represented by the tagline ***Science for Life and Society,*** are central to the revised Science Curriculum Framework.

Vision (3 Ins)
Surrounding the innermost circle, the Vision of Science Education 2030 is articulated through the 3 **Ins** – *Inspire, Inquire, Innovate.*

Three Domains
The outermost layer of the framework shows three domains, *Core Ideas, Practices,* and *Values, Ethics and Attitudes.*

Stakeholders
The pair of hands shows *students as inquirers,* supported by *teachers and partners as facilitators* of the students' learning experiences.

P4 and P5 Science @ PVPS – Content

Primary 4 Content

- Plant system
- Human systems - Digestive system
- Matter
- Heat and effects of heat
- Light and shadows

Primary 5 Content

- Reproduction of animals and plants
- Water
- Electrical system
- Human systems – respiratory and circulatory systems
- Plant Transport system

P4 and P5 Science @ PVPS – higher order process skills

- Recognise and design a fair test
- Analyse and interpret information and data in different representations (e.g. tables, pictures, graphs, flow charts etc.) to infer patterns and relationships or explain findings

P4 Science – some common misconceptions

- Roots hold the plant upright. X
- Digestion breaks down food into smaller pieces. X
- Heat is the same as temperature. X
- When an object expands, its mass increases. X

P5 Science – some common misconceptions

- Fertilisation takes place when the sperm meets the egg. X
- Steam is the white mist that rises from hot water. X
- When clouds condense, they form rain. X
- Air is a type of gas. X
- Exhaled air does not contain oxygen. X
- Heart pumps oxygen around the body. X

Science @ PVPS – School-based Strategies

READ – a strategy to increase students' comprehension of science questions

Recall key concepts related to the question

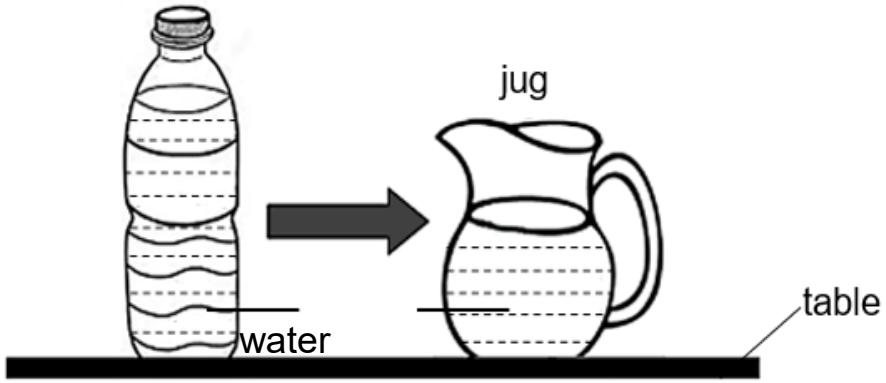
Eliminate wrong options (especially for MCQ)

Analyse and interpret data

Do annotations

P4 Science @ PVPS – School-based Strategies (READ)

The diagram below shows a bottle filled with water. Without spilling any water, Nayla poured all the water from the bottle into the jug.



What change(s) would Nayla observe?

A The shape of water changed.

B The mass of water decreased.

C The water occupied more space.

D The volume of water remained the same.

(1) A and D only

(2) B and C only

(3) B and D only

(4) A, B and C only

READ: suggested thinking process

Recall properties of water as a liquid.

Analyse diagram and note that bottle and jug have different shapes.

Do **annotations** by circling words in the options that make them wrong. E.g option B: mass decreased. Then cross out options B and C.

Eliminate options (2), (3) and (4)

P5 Science @ PVPS – School-based Strategies (READ)

Daniel is training for a tennis tournament.

Which of the following correctly describes what takes place in Daniel's circulatory system so that he can carry out the activity?

A The blood transports only digested food to his muscles.

B The heart pumps blood rich in carbon dioxide back to his lungs.

C The blood carries oxygen directly from the lungs to all parts of his body.

(1) B only

(2) C only

(3) A and C only

(4) A, B and C

READ: suggested thinking process

Recall the functions of the different parts of the circulatory system.

Analyse the 3 options.

Do **annotations** by circling the word/phrases 'only' in A and 'from the lungs' in C to highlight the mistakes.

Eliminate options (2), (3) and (4)

Science @ PVPS – School-based Strategies

CER – a scaffold for giving a scientific explanation (usually for open-ended questions)

Claim – a direct answer to make a stand

Evidence – an observation / data taken from information provided in the question

Reason – a scientific concept that supports the claim

P4 Science @ PVPS – School-based Strategies (CER)

Ishak recorded the temperature of the water in the three beakers at the start of the experiment and then fifteen minutes later. The table shows his results.

Container	temperature of water at the start of the experiment (°C)	temperature of water fifteen minutes later (°C)
P	80	75
Q	80	50
R	80	32

Using the experiment results, which container, P, Q or R, should Ishak use if he wanted to keep a bottle of iced coffee cold for the longest time? Explain your answer.

P. The temperature of water decreased the least so P is the **poorest conducer of heat** and the coffee would **gain least heat** from the surroundings.

Using CER as a scaffold for the explanation

Claim : P

Evidence: Least decrease in temperature as it is the poorest heat conductor

Reason: coffee gains least heat from surroundings

Students should use **READ** to guide them in comprehending the question.

E.g. **Analyse the data** by comparing which container has the greatest temperature decrease.

Recall the difference between good and poor heat conductors.

P5 Science @ PVPS – School-based Strategies (CER)

Nadia folded her wet towel to keep in the bathroom.

Her brother told her that she should unfold it to dry it quickly.

(c) Do you agree with Nadia's brother? Explain your answer.

Yes. Unfolding the wet towel **increases the exposed surface area of the water** so the water **evaporates more quickly.**

Using CER as a scaffold for the explanation

Claim : Yes

Evidence: Unfolding increases the exposed surface area of the water in the wet towel

Reason: water evaporates faster its exposed surface area increases.

Students should use **READ** to guide them in comprehending the question.

E.g. **Recall** that evaporation is the process that cause wet things to dry up. Recall the factors that affect rate of evaporation. **Annotate** the word 'quickly' as it suggests a comparison.

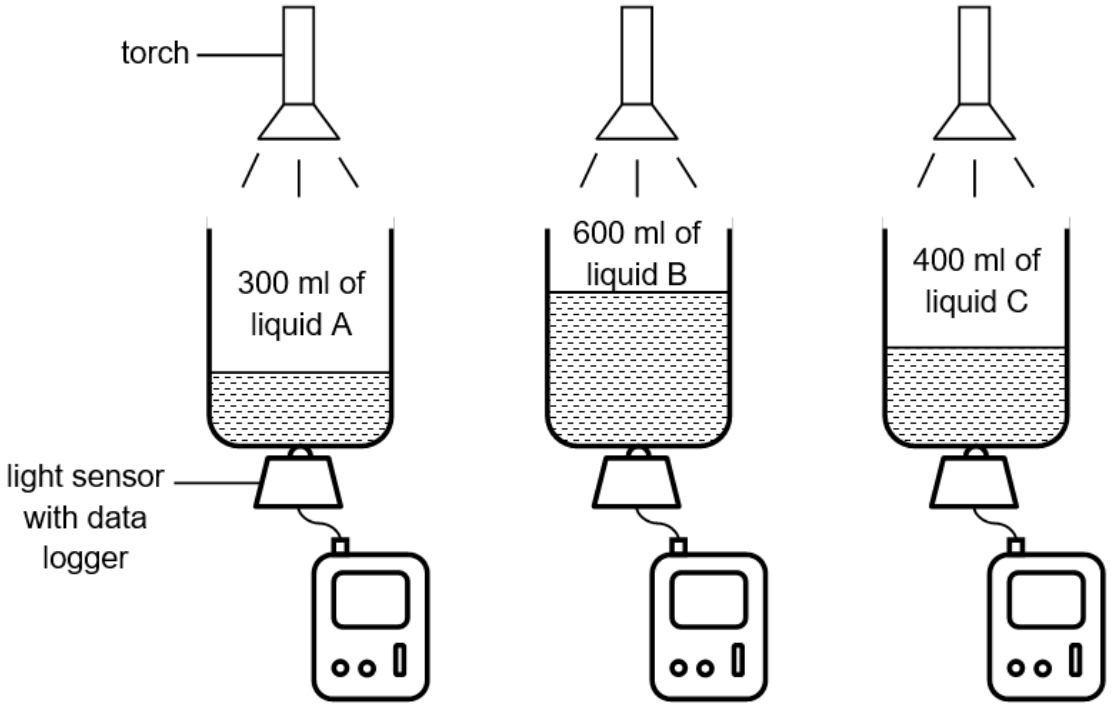
Science @ PVPS – Ways of Thinking and Doing Science

Students will learn to recognise and design a fair experiment.

- Write the aim statement and hypothesis for an experiment.
- Identify the 3 types of variables.
- Infer the relationship between the changed and measured variables.
- Communicate the data collected in an experiment.
- Analyse data to draw conclusion to an experiment.

Science @ PVPS – Ways of Thinking and Doing Science

Anika wanted to compare the amount of light that could pass through three different liquids A, B and C. She set up the following experiment and measured the amount of light that could pass through each liquid with a light sensor attached to a data logger.



(a) Anika's teacher told her that she did not conduct a fair test. State one change Anika must make so her experiment is fair.

Use 600 ml of liquid A, B and C for the experiment.

State two variables that Anika must keep the same to ensure a fair test. [2]

(i) Distance between torch and liquid

(ii) Type of torch

Students must **recall the criteria of a fair test.** They should be able to **identify the correct changed variable** based on the aim statement of the experiment. They also need to consider the **factors that would affect the amount of light** that can be measured.

Science @ PVPS – Assessment

Students are assessed on their understanding and application of science concepts and the mastery of process skills.

To help students see connections and recall linking ideas, students are also assessed on related past years' topics.

1. Written assessment (weighted)
2. Performance Task (weighted) – P4 only
3. Topical worksheets and practice papers (non-weighted)

Science @ PVPS – The Parents' Guide

- Help your child relate science to the things she observes in her everyday life.
- Process skills such as observing, using apparatus and making measurements are skills often used in daily lives.
- Ask questions that require your child to describe or explain her observations.

Why is the glass wet when it is filled with a cold drink?

Science @ PVPS – The Parents' Guide

Help your child to study science effectively.

(1) Equip your child with appropriate reading skills.

E.g. read slowly, make connections, read more than once

(2) Adopt good study habits *e.g. revise what the teacher taught every week, read up on topic in the textbook, jot down questions to ask in class*

(3) Make notes effectively *e.g. in point form, mapping information using graphic organiser*

Science @ PVPS – The Parents' Guide

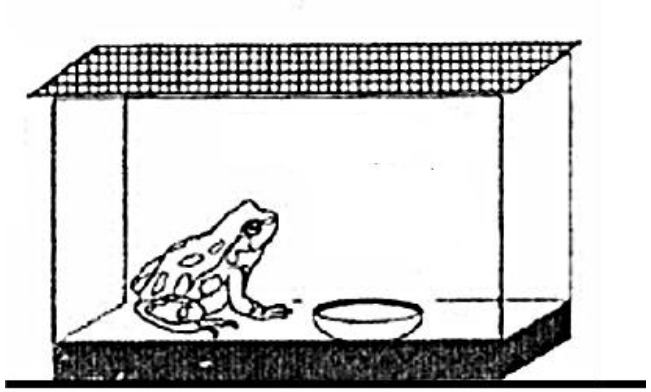
Reminders when answering science questions

(1) Avoid giving general statements. Answer by making reference to the question. This can be done by citing evidence from the question.

e.g. Why did the frog in the tank die eventually?

Living things need air, food and water to survive. (X)

The frog did not have food. (√)



Science @ PVPS – The Parents' Guide

Reminders when answering science questions

(2) Avoid using pronouns as they tend to be ambiguous.

e.g. What will happen to the plants in set-up P and set-up Q?

It will dry up and die while the other plant will continue to grow well. (X)

The plant in set-up P will dry up and die while the plant in set-up Q will continue to grow well. (√)

(3) Good to know the spelling of key scientific vocabulary.

Science @ PVPS – The Parents' Guide

Reminders when answering science questions

(4) Pay attention to words such as 'Explain', 'Describe', 'State', to determine how much information is needed when answering. The marks allocated is also a good indication.

Thank you

If there are further questions, feel free to contact your child's Science teacher.