Strategies for Learning

26 January 2019
Upper Block Sharing
## Overview of Sharing

<table>
<thead>
<tr>
<th>Time</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 min</td>
<td>PSLE 2017 Science Examination Format (Standard &amp; Foundation)</td>
</tr>
<tr>
<td>20 min</td>
<td>Strategies for Answering Science Questions</td>
</tr>
<tr>
<td>20 min</td>
<td>Hands-on Session for Parents</td>
</tr>
<tr>
<td>10 min</td>
<td>Q &amp; A</td>
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</tbody>
</table>
Objective:

Parents will be able to:

✓ adopt strategies to support your child’s learning of Science and help him/her manage learning Science in school
Based on 2017 PSLE SCIENCE EXAMINATION FORMAT (STANDARD) Duration – 1h 45 min

<table>
<thead>
<tr>
<th>Booklet</th>
<th>Item Type</th>
<th>No. of Questions</th>
<th>No. of mark per question</th>
<th>Mark</th>
</tr>
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<tbody>
<tr>
<td>A</td>
<td>Multiple Choice</td>
<td>28</td>
<td>2</td>
<td>56</td>
</tr>
<tr>
<td>B</td>
<td>Open-ended</td>
<td>12 - 13</td>
<td>2- 5</td>
<td>44</td>
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<tr>
<td></td>
<td>Total</td>
<td>40 - 41</td>
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<td>100</td>
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Based on PSLE Science 2017 Examination Format (Foundation)  
Duration – 1h 15 min

<table>
<thead>
<tr>
<th>Booklet</th>
<th>Item Type</th>
<th>No. of Questions</th>
<th>No. of marks per question</th>
<th>Marks</th>
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<tbody>
<tr>
<td>A</td>
<td>Multiple Choice</td>
<td>18</td>
<td>2</td>
<td>36</td>
</tr>
<tr>
<td>B</td>
<td>Structured &amp; Open-ended</td>
<td>6-7, 5-6</td>
<td>2-3, 2-4</td>
<td>14, 20</td>
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<tr>
<td></td>
<td>Total</td>
<td>30-31</td>
<td></td>
<td>70</td>
</tr>
</tbody>
</table>
Challenges faced by students in answering science questions

- difficulty understanding the questions.
- state their answers without justifying them.
- do not know how to extract and use the clues from the questions.
- unable to provide reasoning as to why the evidence support their answers.
- do not understand what is required of them. Difficulty in identifying the question types.
“U.R.L” IS AN ACTIVE READING STRATEGY

U - Underline → Trigger words
Read → Text, Tables, Graphs, Pictures
List → related concepts/facts

Recall concepts: Based on evidence surfaced through reading
Apply concepts: Make evidenced-based claim with scientific reasoning
Claim Evidence Reasoning (CER)

Provides students a structure to construct scientific explanation.

*Reasoning is the logical connection that links evidence to the claim.*
A statement or conclusion related to the question

Claim must answer to the question.
Evidence is the scientific data that supports your claim.

- It is something you can OBSERVE from the question. It can be presented in the form of data (table, graphs etc), pictures and observations.

- It must be sufficient and relevant to your claim.
Reasoning is the use of scientific concepts to explain how the evidence proves the claim.
Why C-E-R?

➢ Provide pupils with a framework to guide them through their thinking process when they read a question

➢ Help the students better able to structure their answers and write a scientific explanation
Approaches to guide pupils’ thinking in the understanding and constructing of scientific explanations

**Read and Understand the question**

- **URL**
- **Underline**
- **Read**
- **List**

**Construct Scientific explanations**

- **CER**
- **Claim**
- **Evidence**
- **Reasoning**
The diagram below shows the cross-section of a female flower.

Is the flower above likely to be pollinated by wind or animals? Explain your answer.
Is the flower above likely to be pollinated by wind or animals? Explain your answer.

The flower is pollinated by animals (Claim). The brightly coloured petal and the nectar in the flower (Evidence) attract animals to the flower (Reason). The stigma is inside the flower (Evidence), the pollen grains can easily land on the stigma when they drop off from the animals which are collecting the nectar in the flower (Reason).
Tommy was asked to create a puppet to be used in a puppet show as shown below.

He was given the following materials to make his shadow puppet.

Cardboard                  Tracing paper        Clear plastic sheet

Which material, cardboard, tracing paper or clear plastic sheet should Tommy choose to make his shadow puppet? **Explain** your answer.
Which material, cardboard, tracing paper or clear plastic sheet should Tommy choose to make his shadow puppet? Explain your answer.

Tommy chooses cardboard (Claim). A dark shadow is formed when light is completely blocked, (Evidence) Cardboard does not allow light to pass through so a dark shadow can be cast on the screen (Reasoning).
A metal lid was fitted tightly onto an empty glass jar, Mary placed the lid in hot water.

(a) After a while, she found it easier to remove the lid. Explain why.

The metal lid can be removed easily (Claim) as the metal lid (Evidence) is a better conductor of heat than glass, it expands more as it gain heat faster from the hot water as compared to the glass jar (Reasoning).
Study the diagram below.

(b) When Mary took a cold thick-walled glass from a refrigerator and placed it in boiling water as shown above, the glass cracked. Explain why.

The glass cracked (Claim) because the outer layer of glass was in contact with the boiling water (Evidence) and it gained more heat from the hot water than the inner layer. The outer layer of glass expanded more than the inner layer, so the glass cracked (Reason).
Fatimah put two hot buns each in box R and box S as shown below.

She observed that the hot buns in box R became slightly wet after sometime, but not those in box S.

Explain why the hot buns in Box R became wet.
She observed that the **hot buns in box R** became slightly wet after sometime, but **not those in box S**. **Explain why the hot buns in Box R became wet.**

The buns in box R became slightly wet but not those in box S (**Claim**). There was no holes on the cover of box R, hot water vapour from the hot buns was trapped inside box R but not in box S. (**Evidence**). The hot water vapour touched the cool inner surface of the box cover lost heat to the cool surface and condensed, forming water droplets which dripped onto the buns but the hot water vapour in box S flowed out of the openings on the cover. (**Reason**)
Not all questions can use CER strategy to write a scientific answer.

It is important to identify the right question type before applying the CER strategy to answer the question.
PSLE Questions

Application of Scientific concepts to authentic real-life scenarios
Are you thirsty?
Which of the following about the packet of coffee is correct?

(1) Both the shape and the volume of the coffee did not change.
(2) The shape of the coffee changed but the volume did not.
(3) The volume of the coffee changed but the shape did not.
(4) Both the shape and the volume of the coffee changed.
Muthu performed an experiment on two different types of springs, P and Q, of the same length using the set-up shown in Diagram 1.

He measured the extension of the spring after adding a mass. His results are shown in Table 1 below.

<table>
<thead>
<tr>
<th>Mass (g)</th>
<th>Spring P extension (cm)</th>
<th>Spring Q extension (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>2.9</td>
<td>1.9</td>
</tr>
<tr>
<td>200</td>
<td>6.1</td>
<td>4.0</td>
</tr>
<tr>
<td>300</td>
<td>9.0</td>
<td>5.9</td>
</tr>
<tr>
<td>400</td>
<td>12.1</td>
<td>8.1</td>
</tr>
</tbody>
</table>

Table 1

(a) Based on his results, state the relationship between the mass and extension of spring P. [1]

(b) Explain the purpose of the pin in the set-up. [1]

(c) When Muthu removed a few plates quickly from the top, the metal disc moved up continuously from A to C. Name the main forms of energy of the metal disc at B. [1]

(d) Next, Muthu changed all the spring P to spring Q. He put back all the plates on the metal disc. Based on the results in Table 1, describe one difference Muthu will observe of the new dish rack with spring Q when he removes a plate from the top. Explain your answer. [2]
Let’s try.....

PSLE
2016
Qns 37

37 Liwen conducted an experiment using four identical tubes as shown.

After a few hours, a drop of liquid Y was added to each tube. When liquid Y was added, the colour of water changed according to the amount of carbon dioxide present.

(a) Each number below represents a different colour. The number for the colour of the water in tube A is 4.

<table>
<thead>
<tr>
<th>Increasing amount of carbon dioxide</th>
<th>purple</th>
<th>red</th>
<th>yellow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

Suggest a number for the colour of the water in tubes B and D. [1]

Tube B: _______   Tube D: _______

(b) Liwen predicted that tube C has more carbon dioxide than tube A. However, her friend Santhi said that this may not be true. Explain why tube C may not have more carbon dioxide than tube A. [2]
Sushi on the move.....
Peter has a toy train that runs on batteries. He placed plates of food on the train as shown below.

(a) When he switched on the toy train, it moved along the track. Fill in the boxes below to show the energy conversion as the train is moving.

Battery → Wires → Train → +

(b) Peter did not change the batteries. Give a reason why the train moved faster as the food was removed.

(c) Peter placed a wooden block under the track at point H.

Explain why the train moved more slowly as it moved from G to H.
How does a phone become ‘Smart’?

Send your phone to PGPS!
Seng Huat connected his phone to the electricity supply with a wire. The plug of the wire fitted the phone properly.

Diagram 1

(a) The wire is covered with rubber. State a property of rubber that makes it safe for this use. [1]

(b) Seng Huat held the phone by the wire.

Diagram 2

(i) The phone did not drop off immediately in Diagram 2. Explain why the phone did not drop off. [1]

Diagram 3

(ii) The phone dropped to the ground after a few seconds as shown in Diagram 3. Explain, in terms of forces, why the phone dropped. [1]
Cracks in concrete slabs
When air became very cold suddenly, cracks appeared on the pavement.

Explain how the change in temperature caused the pavement to crack.
How can you support your child's learning?

- Develop a routine for revision and homework
- Use of mindmaps & diagrams as a revision tool
- Remember science facts using catchy phrases and acronyms
- Learn to spell and use the important concept words
- Encourage the use of strategies learnt in their work
How can you support your child's learning?

Online resources to deepen and broaden pupils knowledge

(i) Sciberdiver
   http://www.sciberdiver.edu.sg

(ii) SLS platform
    https://vle.learning.moe.edu.sg/login

(iii) National Geographic
   http://www.nationalgeographic.com

Other materials to consider
- youtube videos (must screen through)
Please hand the forms to your friendly facilitators.

Thank you for attending the 2019 Parent Learning Fest!
Thank you