Objectives

Parents will be able to:

• Adopt strategies to support their child’s learning of Science and help him/her manage learning of Science in school
Overview

• Overview of Primary Science Syllabus (Lower Block)
• Revised Assessment Objectives
• Revised PSLE Examination Format
• Answering Techniques
• Parents’ Support from Home
• Q & A
### Primary Science Syllabus (Lower Block)

<table>
<thead>
<tr>
<th>Themes</th>
<th>Lower Block</th>
</tr>
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<tbody>
<tr>
<td><strong>Primary 3</strong></td>
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<tr>
<td>Diversity</td>
<td>Primary 4</td>
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<tr>
<td>• Diversity of living and non-living things</td>
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<tr>
<td>• Diversity of materials</td>
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<tr>
<td>Cycles</td>
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<tr>
<td>• Cycles in plants and animals (Life cycles)</td>
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<tr>
<td>• Cycles in matter (Matter)</td>
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<tr>
<td>Systems</td>
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<tr>
<td>• Plant system (Plant parts and functions)</td>
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<tr>
<td>• Human System (Digestive system)</td>
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<tr>
<td>Interactions</td>
<td></td>
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<tr>
<td>• Interaction of Forces (Magnets)</td>
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<tr>
<td>Energy</td>
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<tr>
<td>• Energy forms and uses (Light and Heat)</td>
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</tbody>
</table>
Exam Format for Lower Block

P3 Science Paper
50 marks
(1 hr)

Booklet A
(30 marks)

15 MCQ
2 marks each

Booklet B
(20 marks)

6 - 9 OE
2, 3 or 4 marks each
Exam Format for Lower Block

**P4 Science Paper**
- 100 marks
- (1 hr 45 min)

- **Booklet A**
  - 56 marks
  - 28 MCQ
  - 2 marks each

- **Booklet B**
  - 44 marks
  - 12-13 OE
  - 2, 3 or 4 marks each
Assessment Objectives

Students will be able to acquire and master:

i. Knowledge with Understanding
ii. Application of Knowledge and Process Skills
## Assessment Objectives

<table>
<thead>
<tr>
<th>Assessment Objectives</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>i Knowledge with Understanding</td>
<td>Students should be able to demonstrate knowledge and understanding of scientific facts, concepts and principles.</td>
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</tbody>
</table>
| ii Application of Knowledge and Process Skills | Students should be able to:  
  - Apply scientific facts, concepts and principles to new situations  
  - Use one or a combination of the following basic process skills:  
    - Observing  
    - Inferring  
    - Evaluating  
    - Comparing  
    - Predicting  
    - Analysing  
    - Classifying  
    - Generating possibilities  
    - Communicating  
    - Formulating hypothesis  
    - Using apparatus and equipment |
Questions are more applicative in nature and students are expected to understand and apply Science concepts learnt and will be required to demonstrate their mastery of a set of skills and processes.

• Students take the new syllabus examination where there are 28 MCQs instead of 30
• More weightage given to section B
  More Focus on real life application questions
• Foundation students will have more MCQs, 18 instead of 16

<table>
<thead>
<tr>
<th>Knowledge with Understanding</th>
<th>Application of Knowledge and Process Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>40%</td>
<td>60%</td>
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</table>

<table>
<thead>
<tr>
<th>Exam</th>
<th>MCQ</th>
<th>Open-ended</th>
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<tbody>
<tr>
<td>Main stream</td>
<td>56 marks (28 questions)</td>
<td>44 marks</td>
</tr>
<tr>
<td>Foundation</td>
<td>36 marks (18 questions)</td>
<td>34 marks (open-ended &amp; structure questions)</td>
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</tbody>
</table>
Questions have to be presented in many forms in order to assess different kinds of skills and processes.

Today, we will focus on answering 3 types of questions.

<table>
<thead>
<tr>
<th>Knowledge, Understanding and Application</th>
<th>Skills and Processes</th>
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<tbody>
<tr>
<td>Scientific phenomena, facts, concepts and principles</td>
<td><strong>Observing</strong></td>
</tr>
<tr>
<td>Scientific vocabulary, terminology and conventions</td>
<td><strong>Comparing</strong></td>
</tr>
<tr>
<td>Scientific instruments and apparatus including techniques and aspects of safety</td>
<td><strong>Classifying</strong></td>
</tr>
<tr>
<td>Scientific and technological applications</td>
<td><strong>Using apparatus and equipment</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Communicating</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Inferring</strong></td>
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<tr>
<td></td>
<td><strong>Formulating hypothesis</strong></td>
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<td></td>
<td><strong>Predicting</strong></td>
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<td></td>
<td><strong>Analysing</strong></td>
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<td></td>
<td><strong>Generating possibilities</strong></td>
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<td></td>
<td><strong>Evaluating</strong></td>
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<td></td>
<td><strong>Creative problem solving</strong></td>
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<td></td>
<td><strong>Decision-making</strong></td>
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<td></td>
<td><strong>Investigation</strong></td>
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Different questions require different strategies, but...

“U.R.L.”

can be applied to all question types.
“U.R.L.” as an active reading strategy

- **Underline** → Trigger words
- **Read** → text, tables, graphs and pictures
- **Link** → related topics and concepts

Apply concepts
1. Observing and Comparing

- This is the skill of identifying the similarities and differences between two or more objects, concepts or processes.
- Students should use their observation skills instead of prior knowledge.
1. Observing and Comparing

Look at the diagrams of the two animals shown above.

(a) State one similarity between the two animals.
- Both are animals. [Already stated in the question]
- Both can swim. [Although all these characteristics may be true about the animals, they are not observable from the diagrams.]
- Both found in the water. [Although all these characteristics may be true, they are not observable from the diagrams.]

(b) State one difference between the two animals.
- Animal X has legs. [No comparison made with animal Y]
- Animal X lay eggs on land but animal Y lays eggs in the water. [Although all these characteristics may be true, they are not observable from the diagrams.]
- Animal X has legs but animal Y does not have. [State what each of the animal has to ensure that the answer is more specific]
Look at the diagrams of the two animals shown above.

(a) State one similarity between the two animals.

- Both have scales as their body covering.
- Both have tails.

(b) State one difference between the two animals.

- Animal X has legs but animal Y has fins.
Try it out!

Look at the diagrams of the two plants shown below.

(a) State two similarities between the two plants.
   (i) Both plants have leaves.
   (ii) Both are plants with flowers/flowering plants.

(b) State one difference between the two plants.
   Plant Y has a strong stem but plant Z has a weak stem.
2. Skill: Inferring and Analysing: Flowchart

- Analysing is the skill of identifying the parts of objects, information or processes, and the patterns and relationships between these parts.

- Inferring is the skill of interpreting or explaining observations or pieces of data or information.
2. Skill: Analysing and Inferring: Flowchart

Cindy classified 3 animals as shown in the chart below.

(a) Based on the flowchart, state the characteristics of animal P.
Animal P does not give birth to its young and does not have gills.

(b) Which group of animal is R in?
Mammal
2. Study the flow chart below.

(a) Which animal group could Animal A be in?  
Mammal

(b) What are the characteristics of Animal B?  
Animal B lays eggs and does not have feathers.

(c) Based on the above classification, in what way is Animal A and B similar?  
Both animal A and B do not have feathers.
A fair test is an investigation where only one condition is changed while all others are kept the same.

This way, the changes are due only to the thing we want to test.
3. Skill: Investigation - Fair test

In any experiment, there are 3 variables:

1. Changed Variable (Independent Variable)
   - the only variable that you change in an experiment
   - In a fair test, only one variable is changed to show how it affects the results of the experiment.

2. Constant Variable (Controlled Variable)
   - the variable that does not change during an experiment
   - there is usually more than one constant variable in an experiment

3. Measured Variable (Dependent Variable)
   - the variable that you measure or observe
3. Skill: Investigation - Fair test

The pupils wanted to investigate which material, plastic or paper, is stronger. Their teacher gave them these materials for their investigation: paper, plastic sheet, ten 10g-weights, a hook made from a big steel clip.

**Aim of experiment:** To find out which material, plastic or paper, is stronger

**Results to measure:** The number of 10g-weights needed to tear the material

**Constant Variable:**
1) Size of the material
2) Type of hook
Try it out!

3. Andy magnetised an iron nail using the electrical method as shown in the diagram below. In addition to the materials stated in the diagram, Andy also had some steel clips.

He wanted to conduct an investigation to find out if adding one more battery would affect the strength of the iron nail.

<table>
<thead>
<tr>
<th>Aim of experiment:</th>
<th>changed variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>To find out</td>
<td>if adding one more battery would affect the strength of the iron nail</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Results to measure:</th>
<th>measured variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>The number of</td>
<td>steel clips attracted by the iron nail</td>
</tr>
</tbody>
</table>

Identify the variables in the experiment.

<table>
<thead>
<tr>
<th>Changed Variable</th>
<th>Number of batteries used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured Variable</td>
<td>Number of steel paper clips attracted by the iron nail</td>
</tr>
<tr>
<td>Constant Variable:</td>
<td>Type of batteries used</td>
</tr>
<tr>
<td>1)</td>
<td>Number of coils around the iron nail</td>
</tr>
</tbody>
</table>
Approaches to guide students’ thinking in the understanding

- Read and Understand the question
  - URL
  - Underline
  - Read
  - List

- Construct Scientific explanations
  - CER
  - Claim
  - Evidence
  - Reasoning
Why C-E-R?

➢ To provide students with a framework to guide them through their thinking process when they answer an open-ended question.

➢ To help the students better able to structure their answers and write a scientific explanation
Claim – Evidence - Reasoning

Claim-Evidence-Reasoning approach was adapted from Toulmin’s model of argumentation to frame and guide student’s explanation.

Explanation
A statement or conclusion that answers the question.

➢ The claim must be accurate, specific and answer the question.
➢ It can be provided in the question as an observation and this observation needs to be explained. In this case, the CLAIM has been given.
➢ It can also be presented as a question requiring students to make a choice, i.e Plant A or B?
The evidence is the scientific data that supports your claim.

➢ The evidence is something you can OBSERVE from the question. The evidence can be presented in the form of data (Table, graphs etc), observations or inferences

➢ Evidence answers the “What makes you say that?” question posed after a claim is made.
Reasoning is the scientific concepts linking how the evidence proves the claim

- Connects evidence to the claim.
- It shows a detailed understanding of the scientific principles involved and used correct scientific terms.
The C-E-R Approach

Study the two plants below.

Have leaves

No leaves

Plant A

Plant B

Which plant is more likely to die? Explain your answer.

Plant B (Claim). Unlike plant A, there are no leaves in Plant B (Evidence). Without leaves, plant B is thus unable to make its own food (Reasoning). Without food, plant B will most likely not survive.
How can you support your child's learning?

- Raise your child’s awareness of Science in their daily life

  **Ask “open” questions instead of answering them**

  **Have a curious mind and explore together**

  **Give them sufficient thinking time for them to answer**
How does putting a brick in the water tank help to save water?
A water tank used for flushing a toilet bowl is shown below. After flushing, water enters and re-fills the tank. The tank will stop filling when the water reaches level L.

Beng Soon wanted to use less water to flush the toilet bowl. Megan suggested to put some pebbles into the water tank.

Based on the information given, explain how Megan’s suggestion will help Beng Soon to conserve water.

_____________________________________________________

_____________________________________________________

_____________________________________________________

Topic: P4 Matter

Concept: Matter occupies space.
Science... in the Kitchen

Why does the metal spoon feel hot after a while?

What does this tell you about the property of heat?

What can I do to open a stubborn metal jar lid?
Limin could not remove the metal lid from a glass jar.

Limin poured hot water on the metal lid. How does this help to remove the lid from the glass jar?

1. Heat causes the air in the jar to expand.
2. Heat causes the lid to expand more than the jar.
3. Water reduces the friction between the lid and the jar.
4. Water reduces the friction between the hand and the jar.

Topic: P4 Heat
Concept: Matter expands when it gains heat.
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 concepts words
- Encourage the use of strategies learnt in their work
How can you support your child's learning?

- Online resources to deepen and broaden students’ 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)
Q & A
Please hand the forms to your friendly facilitators.

Thank you for attending the 2019 Parent Learning Fest!