Curriculum Briefing
Primary 4 Science
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P4 SCIENCE TEACHERS

4AB MDM AISHAH ARIS, ST SCIENCE

4C MDM AISHAH ARIS, ST SCIENCE

4D MS THIVYADLO GOPALKRISHNAN
4E MRS MARTHA JOHN (SEM 1)
MS JULIE ANN DE SILVA (SEM 2)

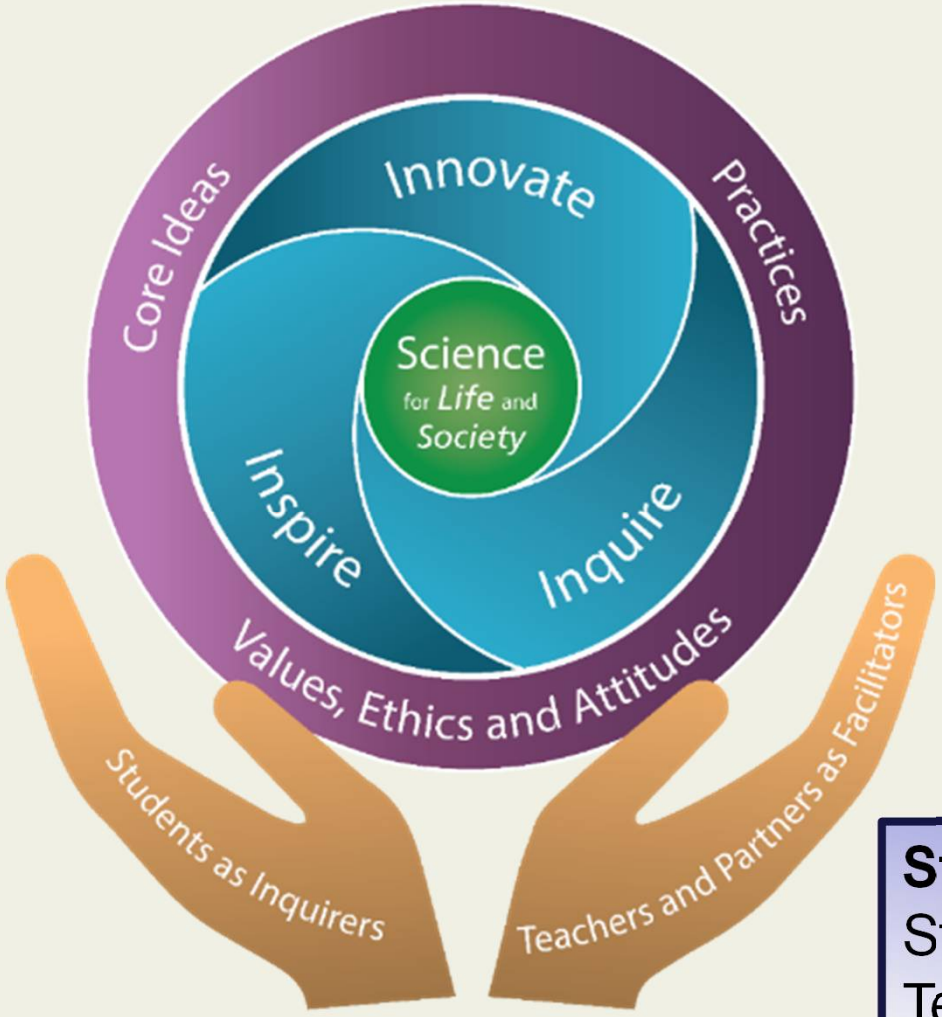
4F MDM AISHAH ARIS, ST SCIENCE

4G MRS MARTHA JOHN (SEM 1)
MS JULIE ANN DE SILVA (SEM 2)

4HI MDM GUO FENFLING, SH SCIENCE

MS SANTHA SELVA RAJU. ST SCIENCE

Science Curriculum Framework



Goals
Science for Life and Society

Vision - 3Ins
Inspire
Inquire
Innovate

Three Domains
Core Ideas
Practices
Values, Ethics and Attitudes

Stakeholders
Students as Inquirers
Teachers & Partners as Facilitators

21st Century Competencies Framework

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Scientific Literacy

We aim to :

- equip our pupils with the *skills* to enable them to :
  - use scientific knowledge to identify questions
  - draw evidence-based conclusions in order to understand and make decisions about the natural world and the changes made to it through human activity.

- *help our pupils to understand* the characteristic features of science as a form of human knowledge and inquiry.

- for our pupils to be aware of how science and technology shape our material, intellectual and cultural environments.

- equip our pupils with *ethics and attitudes* to engage in science-related issues as a reflective citizen.

Primary Science Syllabus

It aims to :

- provide students with experiences which build on their interest in and stimulate their curiosity about their environment

- provide students with basic scientific terms and concepts to help them understand themselves and the world around them

- provide students with opportunities to develop skills, habits of mind and attitudes necessary for scientific inquiry

- prepare students towards using scientific knowledge and methods in making personal decisions

- help students appreciate how science influences people and the environment

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P4 Science

Science as an Inquiry

1. **Question** - Learner engages in scientific questions

2. **Evidence** - Learner collects data in response to questions

3. **Explanation** - Learner formulates explanations from evidence

4. **Connection** - Learner connects explanations to scientific knowledge

5. **Communication** - Learner communicates and justifies explanations

P4 Science

What is central to science inquiry?

Helping students use evidence to create explanations for natural phenomena.

P4 Science

SCIENTIFIC ARGUMENTATION

How do you know that?
(Data in graphical, tabular or pictorial form)

CLAIM + EVIDENCE + REASONING = EXPLANATION

What do you know?
(The answer to the question)

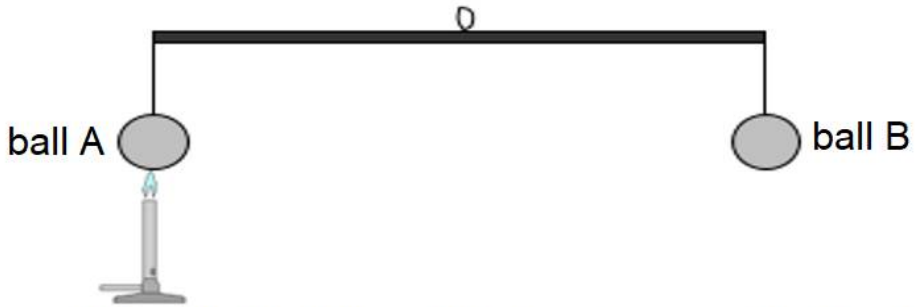
Why does your evidence support your claim?

(Connects evidence to claim which involves the use of a scientific concept to describe why the evidence support the claim)

P4 Science (feature in topical worksheet)

Sam hung two identical metal balls, A and B, on a rod such that the rod was balanced.

Then he heated ball A as shown in the diagram below.



Sam predicted that ball A would move downwards after being heated.

Do you agree with him? Explain your answer clearly. [2]

Thought box: List out ideas that you have. Cross out those that are improbable. Sequence your ideas (where applicable)

1) For the ball to move upward, what change must occur to the ball?
2) What change occurs when the metal ball interacts with heat?
3) What is the definition of volume?
4) What is the definition of mass?

*While crafting your answer, remember to use the **CER** approach.*

Checklist:

- ❑ **CLAIM:** Do you agree?
- ❑ **EVIDENCE:** Scientific data/information (e.g. table, graphical, pictorial, text, provided in the question that supports the claim.)
- ❑ **REASONING:** Explanation(s) using scientific concepts that supports your claim.

The thought box after each part question is meant for the pupils to make their thinking visible by organising and sequence random thoughts that the pupils pen down before they craft their responses as well as guiding the pupils to use CER to frame sound scientific explanations.

Syllabus Organisation

Levels	P3	P4	P5	P6
Themes	**Diversity . Cycles . Systems . Interactions . Energy**			
Topics	• Diversity of living and non-living things (General characteristics and classification) • Diversity of materials • Cycles in plants and animals (Life cycles) • Interaction of forces (Magnets)	• **Cycles in matter and water (Matter)** • **Human system (Digestive system)** • **Plant system (Plant parts and functions)** • **Energy forms and uses (Light)** • **Energy forms and uses (Heat)**	• Cycles in matter and water (Water) • Cycles in plants and animals (Reproduction) • Plant system (Respiratory and circulatory systems) • Human system (Respiratory and circulatory systems) • Electrical system	• Photosynthesis • Interaction of forces (Frictional force, gravitational force, elastic spring force) • Interactions within the environment • Surviving in the Environment (Adaptations, Man's impact on the environment)

P4 Science

Attitude Coverage
1) Curiosity
2) Creativity
3) Integrity
4) Objectivity
5) Open-mindedness
6) Perseverance
7) Responsibility

P4 Science

Skills and Processes at P5 level
Skills • Observing • Comparing • Classifying • Using apparatus and equipment • Communicating • Inferring • Predicting • Analysing • Generating possibilities • Formulating hypothesis

Skills and Processes
Processes • Creative Problem Solving • Decision Making • Investigation **At the level appropriate to P4*

P4 Science

Components of Lessons

1) Theory - Concept teaching

2) Hands-on : Practical Sessions in the science laboratory

3) Topical notes

4) Topical Supplementary Worksheets :
   - Worksheet 1 : Misconception
   - Worksheet 2 : MCQ
   - Worksheet 3 : Open-ended

5) Learning Log: Topical reflections (concept map:last reflection) by pupil for each unit

6) Learning Log: Pupil's self-evaluation of their own learning(checklist)

7) Topical Review (at the end of each unit)

P4 Science

Written Assignments

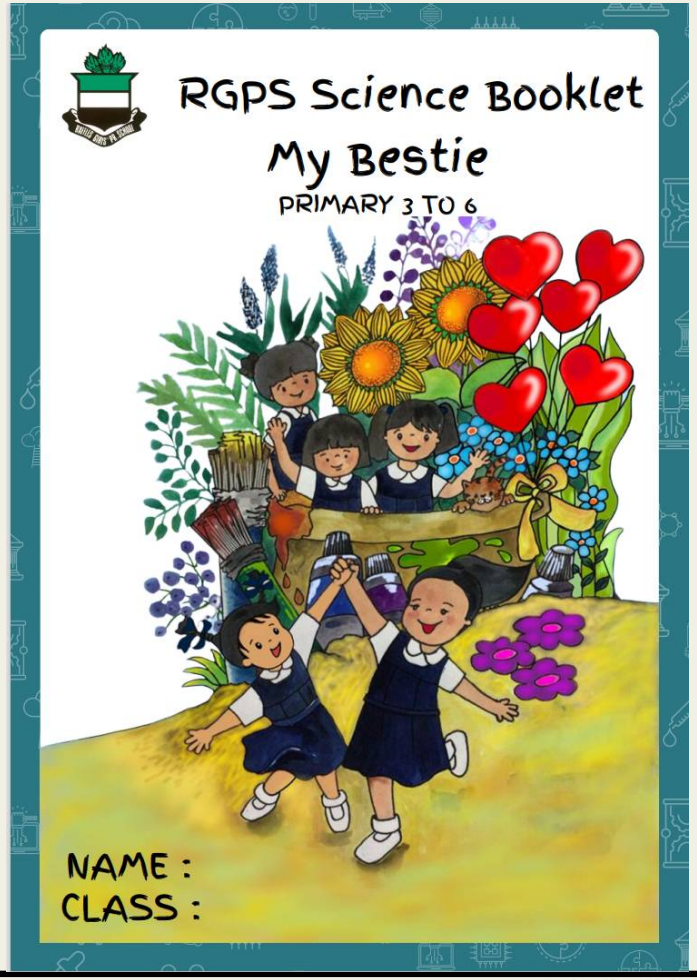
1) Inspiring Science Activity Worksheets
2) Topical unit Supplementary Worksheets
3) Topical Reflections (on Learning Log)

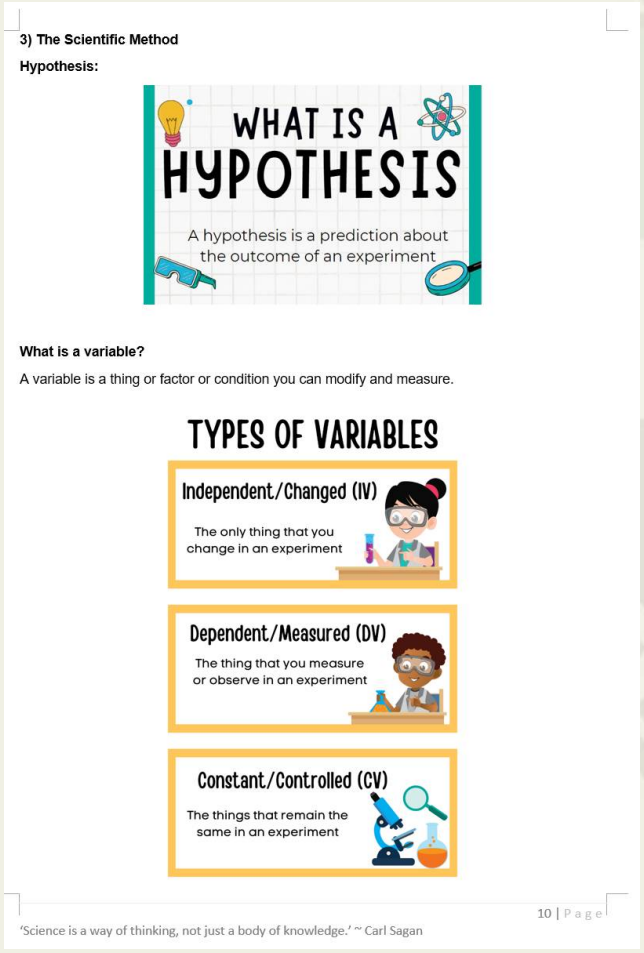
NOTE : Topical Worksheets will be returned for parents' checking and signature upon completion of each topic.

Worksheets are to be filed in the Science File

P4 Science

RGPS Student Science Resource Book





P4 Science

Enrichment

Science Supplementary Reading Material (Optional):

The Young Scientists (Level 2)

Online Subscription via:

https://youngscientistsreader.com.sg/product-category/subscriptions/

P4 Science

Enrichment

Online Young Scientist Badge

•Pupils can complete self-directed activities, conduct hands-on experiments, research STEM topics, and collaborate with peers or family to earn online badges through the Young Scientist Badge Scheme

https://youngscientist.sscglobal.com.sg/login/index.php

What do pupils do?

- **Access Portal** – Use the online platform to explore self-directed activities and multimedia content. Sign in using the user-id and password provided by the science teacher.

- **Submit Work** – Upload task responses, experiment findings, and reflections for review.

- **Earn Rewards** – Receive **online badges** for completed tasks, plus optional **physical badges and certificates**

P4 Science

Sony Creative Science Award (SCSA)

Objective:

- **Engage & Inspire:** To motivate P4 pupils to begin a creative hands-on toy-making project.
- **Develop Process Skills:** To impart foundational elements of the Design Thinking methodology.
- **Apply Scientific Learning:** To enable pupils to construct and apply relevant science concepts and skills

Viridis Programme

Objectives:

- Develop a deep, actionable understanding of sustainability.
- Equip pupils with skills to assess, advocate for, and improve local environments.
- Cultivate a lifelong ethos of responsible stewardship.

ASSESSMENT MODES

- **FORMATIVE ASSESSMENT**
  (includes open resource assessment for identified topics)
- **SUMMATIVE ASSESSMENT**

ASSESSMENT MODES : FORMATIVE ASSESSMENT

Purpose:

- ❖Provides pupils continual feedback during the instructional and learning process to help pupils actively manage and adjust their own learning.
- ❖Non-graded.
- ❖Helps the pupils to answer these questions:
  - *"Where am I going?"*
  - *"Where am I now?*
  - *"How can I close the gap?"*

Through:

- ✓Teacher/ Self and peer assessment on identified performance tasks using rubric indicators
- ✓Teacher's feedback on identified qualities of pupil's learning on topical unit content page
- ✓ Pupils' self evaluation of own learning for each topic
- ✓Pupils' reflection of own learning for each topic

Feedback From the Science Teacher:

ASSIGNMENT	Needs improvement	Sometimes	Most of the time
▪ **Completed** assignments and **submitted on time.**			
▪ **Took initiative** to **clarify doubts by asking questions** in class.			
▪ Able to provide scientific explanation by making an **accurate and complete claim** which is **supported with appropriate and sufficient evidence; provides accurate and complete reasoning** that **links evidence to claim** which includes **appropriate and sufficient scientific concepts/principles**			
▪ Made concerted effort to **do timely corrections.**			
▪ **Updated** the content page			
▪ **Organised** the **complete** set of unit worksheets for filing.			

Feedback on the pupil's performance.

After the completion of the topic:

Parent's Signature: _____ **Date :** _____

TIME FOR REFLECTION!

Before the start of unit lesson

- What do I already know about the various plant parts and their functions?
- What are the questions that I have about plant parts and their functions?

For Self-Evaluation (by pupil) – After the topic

How well have I understood the science ideas/concepts? Put a (✓) in the box.
1 - Science ideas I understood the **least** 4 - Science ideas I understood the **most**

	Science Ideas/ concepts	1 (least)	2	3	4 (most)
1	I am able to **identify** the different parts of a plant and **state** their functions.				
2	I am able to **compare** the characteristics of the different plant parts.				
3	I am able **appreciate and show concern** by being responsible towards plants.				
4	I am able to **determine** the aim, hypothesis IV, DV and CVs of an investigative protocol.				
5	I am able to **apply** 'CER' technique to craft my scientific explanation [CER: C – Claim, E – Evidence, R – Reasoning]				

Post-lesson REFLECTIONS

- What are the scientific concept(s) I have learnt about plant parts and their functions?
- How can the scientific concept(s) that I have learnt about plant parts and their functions be applied in daily life? Explain in detail.
- What is/are the previous wrong science concept(s) that I had which had been corrected?

Assigned as homework before the introduction of the unit

Provide opportunity for the pupil to take charge of her own learning.

Assigned as homework upon the completion of the unit : concept mapping

Rubrics related to the activity

Raffles Girls' Primary School
Science
Rubics: Designing a Scientific Experiment

Name: _____ Class: _____

Topic: _____ Date: _____

Assessment*
*(*put a tick if criteria is observed)*

	Performance Criteria	Self	Peer	Teacher
1	There is a testable question for the experiment			
2	Research (literature review) was done to learn more about the question.			
3	The design of the experiment tests the hypothesis.			
4.	A list of all necessary materials and apparatus was included.			
5	A detailed step-by-step procedure is included.			
6.	The procedures were written clearly enough so that another person could repeat the experiments			
7.	The procedures shows that repeated trials were done			
8.	Data were collected and recorded for each trial			
9.	An appropriate graph was created to display the data			
10	Conclusion were drawn using the data and refer back to the hypothesis			
11.	A 3 or more sentence was written explaining and describing what was discovered or learned			

Assessment Modes :Summative

Type	Weighted Assessment 1 Term 2	Weighted Assessment 2 *(Science Practical Test) Term 3	End of Year Exam (EYE) Term 4
Format	Open-ended: 5 questions	3 questions on 1) Life Science 2) Physical Science	Section A (MCQ): 27 questions Section B (OE) : 11 questions
Duration	50 min	30 min	1 h 30 min
Overall Weightage	15%	15%	70%

**Note : Practical test papers will not be issued for take-home. This is because a significant component of the assessment resides in the hands-on experiment, which is not captured on the paper. To support learning, teachers will review all papers in class, providing detailed feedback on Areas for Improvement (AFI) to guide pupil development.*

P4 Science

Help Your Child to Develop Skills of An Independent Learner

(A) Self-Management Skills:

*-to help them to gain skill to **self-regulate** where they monitor, control and direct aspects of their learning for themselves; to overcome the lure of procastination and reduce stress*.

1) Goal setting

•ability to set realistic, relevant, challenging and manageable goals

2) Time and Resource-management

•ability to manage their own time and resources
•ability to prioritise activities and tasks
•ability to break things into small, manageable pieces

3) Focus & Discipline

•ability to focus on the task in hand and work through distractions and exercise self-discipline to complete task
•ability to distribute study instead of cramming

4) Mind and Body

•ability to take care of oneself – eat, sleep, rest and exercise properly
•ability to recognise cause(s) of stress and manage it.

P4 Science

Help Your Child to Develop Skills of An Independent Learner

(B) Thinking Skills:

-To help them create meaning, gain understanding, make judgements, make good decision, self- analyse and reflect

1) Identify purpose

•ability to identify purpose for reasoning

2) Make decision

•ability to make decisions considering relevant implications and consequences.

3) Ask relevant questions

•ability to ask a range of relevant questions

4) Evaluate Evidences

•ability to recognise and evaluate evidence offered to support claims.

P4 Science

Help Your Child To Develop Skills Of An Independent Learner

(C) Information Skills:

-***Empower them as learners and enable them to :***

1) recognise information needed

•ability to recognise their own lack of knowledge and skills and need to obtain further information or deepen their understanding

2) locate relevant information

• ability to locate relevant information from a range of resources

3) recognise and select appropriate sources

•ability to choose appropriate information sources

4) identify prior knowledge

•ability to reflect on the existence of prior knowledge and experiences, showing awareness of one's tendency to count assumptions as prior knowledge

5) reflect and evaluation

•ability to reflect on their own learning skills, evaluate progress and set further goals

6) apply Information

•ability to apply information to meet the original intent, construct understanding or solve problem

P4 Science

THE ROLE OF PARENTS

- Be a role model for learning
- Practise what your child learns at school
- Tune into how your child learns
- Set aside time to monitor their work and get them to review their daily work. DO NOT TAKE OVER THE HOMEWORK/PROJECT
- Connect what your child learns to everyday life and to the world
- Help your child to take charge of his learning.
- Refrain from over-scheduling your child.
- Limit media exposure.
- Provide emotional and moral support and encouragement

P4 Science

Useful Websites

https://www.brainpop.com/

http://www.bbc.co.uk/bitesize/ks2/science/

Science Video- Eureka!

https://www.youtube.com/playlist?list=PL07249EFA9038FDC1

- ***These short video programmes use comic animation to illustrate and present physical Science concepts***

Bill Nye The Science Guy

https://www.youtube.com/user/TheRealBillNye/videos

- ***These are live action Science educational videos.***

Thank You