

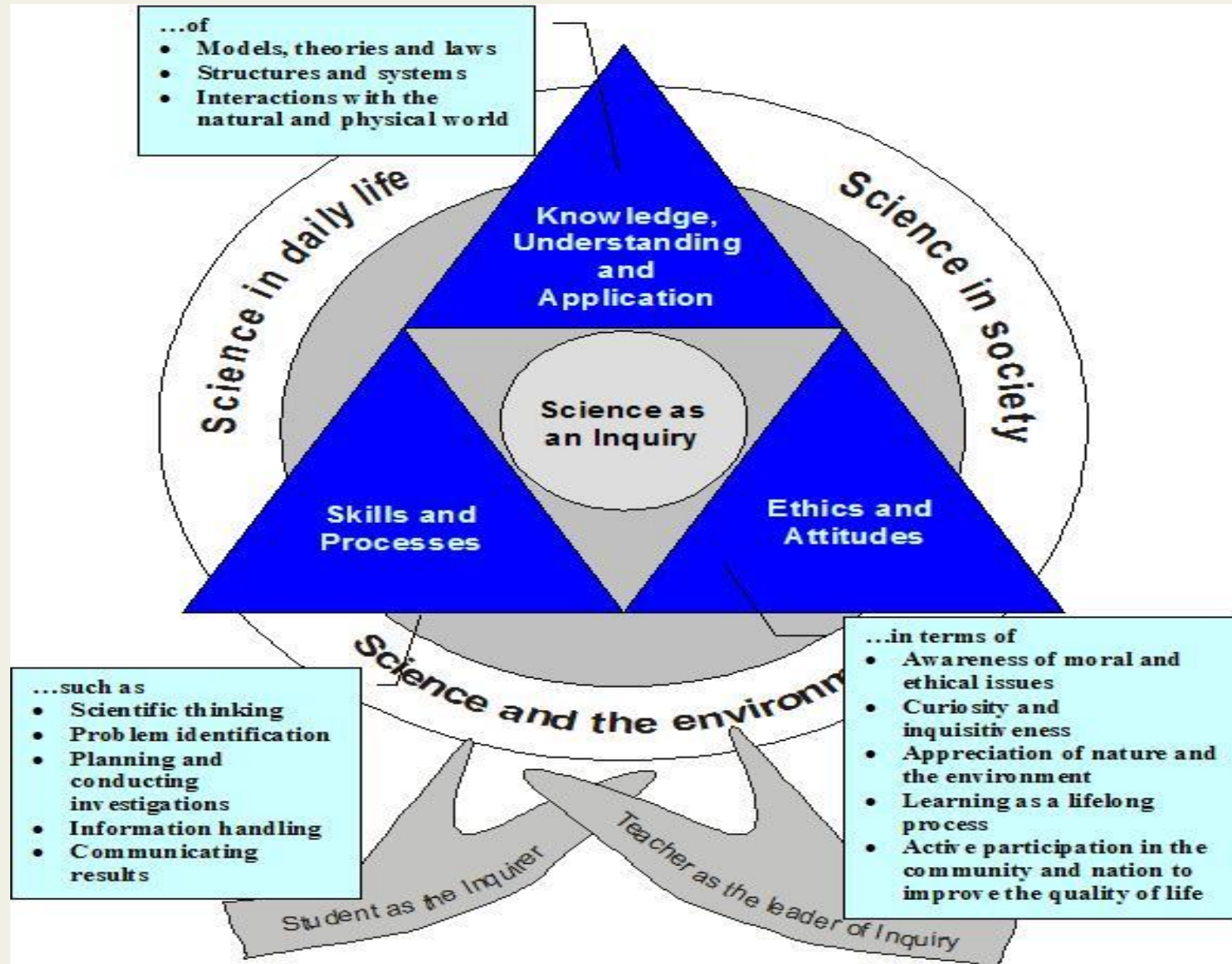
Curriculum Briefing

Primary 4 Science

12 Jan 2023

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Subject Head Science

Primary Science Framework



21st Century Competencies Framework



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

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)

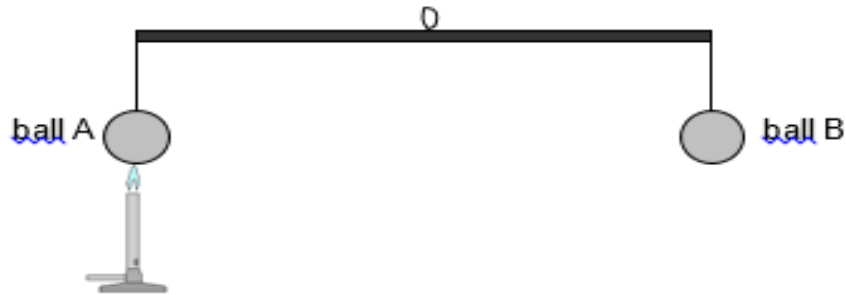
Why does your evidence
support your claim?

(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 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?
- ☐ **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.

Overview of the Primary Science Syllabus

Themes	Lower Block (P3 & 4)	Upper Block (P5 & 6)
Diversity	<ul style="list-style-type: none">• Diversity of living and non-living things• Diversity of materials	
Cycles	<ul style="list-style-type: none">• Cycles of Plants and Animals (Life Cycles)• Cycles in matter and water (Matter)	<ul style="list-style-type: none">• Cycles in plants and animals (Reproduction)• Cycles in matter and water (Water)
Systems	<ul style="list-style-type: none">• Plant system (Plant parts and functions)• Human system (Digestive system)	<ul style="list-style-type: none">• Plant transport system• Human system (Respiratory and circulatory systems)• Cell system• Electrical system
Interactions	<ul style="list-style-type: none">• Interaction of forces (magnets)	<ul style="list-style-type: none">• Interaction of forces (Frictional, gravitational forces, force in springs)• Interaction within the environment ((food chain /web, Adaptation, Man's impact & environment)
Energy	<ul style="list-style-type: none">• Energy forms and uses (light and heat)	<ul style="list-style-type: none">• Energy forms and uses (photosynthesis)• Energy conversion

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 :
- 5) Worksheet 1 : Misconception
Worksheet 2 : MCQ
- 6) Worksheet 3 : Open-ended
- 7) Learning Log: Topical reflections (concept map:last reflection)
by pupil for each unit
- 8) Learning Log: Pupil's self-evaluation of their own
learning(checklist)

P4 Science

Written Assignments

- 1) Science Activity book (Cycles, System, Energy)
- 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

Enrichment

Learning Journey @ Science Centre Singapore (Term 3): Light

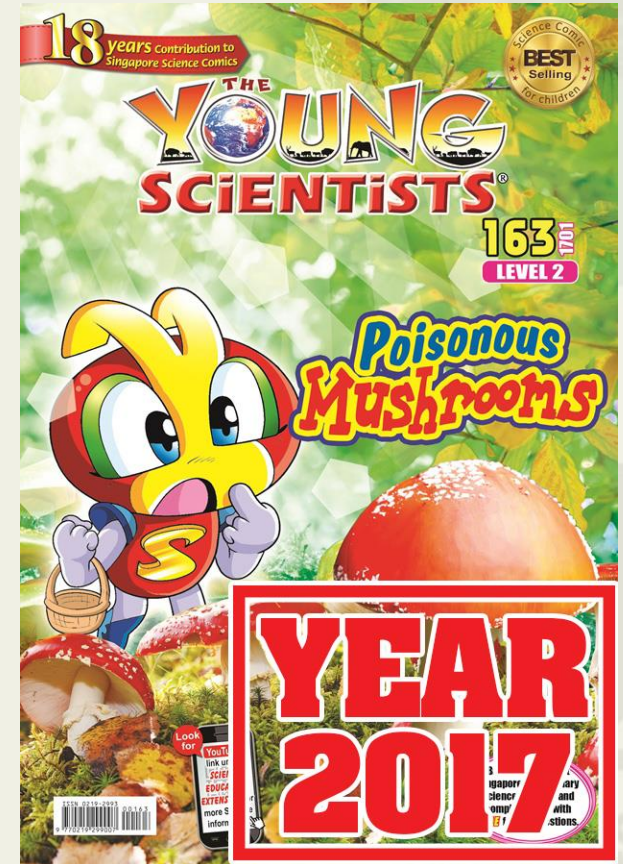


P4 Science

Enrichment

Science Supplementary Reading
Material (Optional):
The Young Scientists (Level 2)

Online Subscription via:



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

P4 Science

Sony Creative Science Award (SCSA)

Objective:

- To encourage P4 pupils to embark on their creative toy making journey
- To impart selected elements of Design Thinking Skills to pupils.
- To allow pupils to build Science knowledge and apply scientific concept and skills learnt.

P4 Science

RGPS Family Science Programme

- RGPS Family Science Club

<https://www.facebook.com/rgpsfamilyscienceclub/>



MICROBES GASTRONOMIC affair



26TH SEPTEMBER 2015 | 1000 - 1230

KITCHEN LAB @ SCIENCE CENTRE SINGAPORE

[\$40 PER FAMILY PAIR]

Do you know not all bacteria and fungi are disease-causing microbes that make us sick? Do you know some of them are important in helping us make many different kinds of delicious and nutritious food that we love? Uncover the secrets of the more than a thousand-year-old food production method, fermentation and learn how bacteria and fungi convert sugars into other amazing products through fun experiments and bread baking! So join us for a unique family bonding workshop created specially for you, by you!



Kindly register at:
www.regonline.sg/rgpsMGA



A new family bonding programme co-organised by

Bubbly Bubbles Party!

Super Bubble Reelpe
Bubble Science
Longest Lasting Bubble

Bubbles fascinate both children and adults with their beautiful shapes and rainbow colours. Such simple ingredients – soap and water – create mesmerizing examples of both geometry and chemistry. Do you know the 'secret' ingredient to strong and bouncy super bubbles? Come and join us in the Bubbly Bubbles Party where the 'secret' ingredient and the science behind these captivating bubbles shall be unveiled! Team up, brainstorm and create your team's very own bubble magic and put it to test in the Longest-lasting Bubble Challenge!

Come and experience the bubbly fun for both the young and the young at heart!

Date : 27 Aug 2016 (Saturday)
Time : 10am - 12.30pm
Venue: EcoLab, Science Centre Singapore
Cost : \$11.65 per family pair

Register now at
www.regonline.sg/RGPsBubbles2016

sciencecentresg
www.science.edu.sg
15 Science Centre Road, Singapore 119270 (near Science Centre)

ADVENTURE IN SOIL-TITUDE

26 AUG 2017, SAT
09.30AM TO 11.30AM
Eco Lab, Science Centre Singapore
\$11.77 per parent & child pair

Tried growing plants only to be greeted with one that starts to wilt? We know that plants require water, essential exchange of gases and sunlight to flourish. However, are these all that they require? Fret not! Join us in exploring the finest details of improving the growth conditions of your favourite plants! What are you waiting for? Sign up!

Registration starts on 17th August 2017
Kindly register at www.regonline.sg/rgpssoil2017

sciencecentresg
www.science.edu.sg
15 Science Centre Road, Singapore 119270 (near Science Centre)

WOBBLY JELLY FUN

Join us for an adventure into the world of Wobbly Jelly!

Discover the science behind how different states of matter could be combined to create something new through easy and fun hands-on activities such as jelly and jam-making.

The sweet and colourful jelly is not just fun party food! Did you know that it is also used as an important tool for scientific research and Forensic Science that helps to solve crimes?

Come and experience the unique family bonding workshop, Wobbly Jelly Fun, by registering online for one of the following sessions!

Date: 25 March 2017 (Saturday)
Time: Session 1 : 0930 - 1130
Session 2 : 1330 - 1530
Venue: Kitchen Lab (KidsSTOP™)
Cost: \$511.77 per parent & child pair per session

Registration opens on 24 Feb 2017 from 7.30 a.m. onwards.
Kindly register at:
www.regonline.sg/rgpswobblyjelly

sciencecentresg
www.science.edu.sg
15 Science Centre Road, Singapore 119270 (near Science Centre)

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

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.	Feedback on the pupil's performance.		
▪ 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.			

For Self-Evaluation (By pupil) - Put a (✓) in the box.

How well have I understood the science ideas/concepts?

1- Science ideas I understood the least

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

4 - Science ideas I understood the most

	Science Ideas/ concepts	1	2	3	4
1	I am able to identify our main source of heat.				
2	I am able to state the unit of measurement of temperature.				
3	I am able to differentiate between heat and temperature.				
4	I am able to show an understanding that heat flows from a hotter region to a colder region until both reach the same temperature.				
5	I am able to relate the change in temperature of an object to the gain of heat from hotter region or loss of heat to cooler region by the object.				
6	I am able to relate the change in state of a solid, a liquid and a gas to heat gain and heat loss.				
7	I am able to relate expansion and contraction to heat gain and heat loss.				
8	I am able to relate the change in volume of matter to expansion and contraction.				
9	I am able to recognize that some materials allow heat from hotter region to pass through them to colder region faster than the <u>others</u> .				
10	I am able to identify good and poor conductors of heat.				
11	I am able to recognize the objects of different mass will contain different amount of heat when exposed to the same amount of heat over same <u>period of time</u> .				
12	I am able to recognize that the different amount of contact surface area of object with heat source or exposed surface area of object to heat source will gain different amount of heat/ will gain heat at different rate				
13	I am able to apply 'CER' technique to <u>craft</u> my scientific explanation.				
14	I am able to determine the aim, hypothesis, IV, DV and CVs of an investigative protocol				



TIME FOR REFLECTION!

*When you reflect, spend time and think deep to make sense of
What you have learnt,
Why you learnt,
How you learnt,
How you apply the knowledge and skills learnt in real life.*

My reflection on learning: Before the start of unit lesson

- What do I already know about this topic?
- What do I want to find out?
- What are the questions that I have for this unit?

Assigned as homework before the introduction of the unit

My reflection on learning: After the unit lesson

- What are the scientific concept(s) that I have learnt in this topic?
- How can the scientific concepts that I have learnt in this topic be applied in daily life? Explain in detail.
- What is/are the previous wrong science concepts(s) that I had which have been corrected?

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

Parent's Signature: _____

Date: _____

Rubrics: Designing a Scientific Experiment

Name: _____

Class: _____

Topic: _____

Date: _____

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

Rubrics related to the activity

	Performance Criteria	Self	Peer	Teacher
1	There is a testable question for the experiment			
2	<u>Research</u> (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)
Format	Open-ended: 5 questions	3 questions on 1) Life Science 2) Physical Science	Section A (MCQ): 25 questions Section B (OE) : 13 questions
Duration	50 min	30 min	1 h 30 min
Overall Weightage	15%	15%	70%

Science Teachers :

- 4AB - Ms Tan Li Peng
- 4C - Mrs Claire Tay
- 4D - Mdm Janice Yeo
- 4E - Ms Tan Li Peng
- 4F - Mdm Teng Mui Noi
- 4G - Mdm Janice Yeo
- 4HI - Mdm Aishah Aris
- 4EI - Mrs Claire Tay



Thank You

