

Science

Curriculum Statement

In science, students explore how both the natural physical world and science itself work so that they can participate as critical, informed, and responsible citizens in a society in which science plays a significant.

Paraparaumu Beach School

Essence Statement

Science is a way of investigating, understanding and explaining the world around us.

Note:

In the years 1-8, the required learning will be on the Nature of Science, the other strands provide the context for learning.

Learning goals:

At Paraparaumu Beach School students will...

Nature of Science

Understand that scientific knowledge is constantly changing.

Learn what science is and how scientists work.

Develop a sound understanding of scientific methods, process and skills.

Living World

Understand living processes, how living things interact with each other and the environment.

Planet Earth and Beyond

Understand earth systems, the solar system and the universe beyond.

Physical World

Understand a range of physical phenomena.

Material World

Understand properties of matter and the changes it undergoes.

Science Implementation Plan

Effective Pedagogy – What is Science About?

Science is a way of investigating, understanding and explaining our natural, physical world and the wider universe. In order to develop scientific knowledge, understanding and explanation, teaching and learning needs to involve:

- generating and testing ideas
- making observations
- carrying out investigations
- constructing models
- communicating and debating
- respect for evidence

Challenges which face our world can be considered from a scientific perspective.

(<http://scienceonline.tki.org.nz/What-do-my-students-need-to-learn>)

Guidelines for Classroom Programmes – How is Science Taught? How is Science Structured in the New Zealand Curriculum?

It is important that science is an interactive subject whereby hands on activities stimulate student interest in the area of study. As such, teachers will, wherever it is practicable, use appropriate investigation and communication experiences when growing science knowledge and understanding.

During science lessons, children will be encouraged to discuss, question, listen and problem solve, through activities that 'try out', challenge, change or replace ideas.

Practical investigations will enthuse, motivate and excite the children when learning about science.

A scientific approach to problem solving involves opportunities to observe, ask questions, discern patterns, hypothesise, plan, experiment, design, make, measure, discuss, analyse and evaluate results.

It is important that students develop skills, attitudes and values to build a foundation for understanding their world.

To assist the students in their learning, teachers may need to develop their own scientific knowledge.

'Teachable moments' and opportunities should be included where possible. A classroom science table or area may help to facilitate this.

The Nature of Science is the core strand which is interwoven throughout all other strands. The other strands, (Living World, Planet Earth and Beyond, Physical World, Material World) provide contexts for learning.

The Nature of Science

- Generate and test ideas
- Gather evidence
- Make informed decisions

Science Knowledge

Living World

Recognise that all living things have life processes, common and unique requirements, and adapt to, and interact with, their environment in particular ways.

Material World

Describe and group materials based on properties and recognise permanent and temporary changes in materials in everyday situations.

Physical World

Have explanations for a variety of physical phenomena such as light, sound, heat, magnetism, motion and energy.

Planet Earth and Beyond

Have understandings about the natural processes on Earth and the solar system, and the interdependence of air, land, water and life.

Science Fair

Year 7/8 syndicate will endeavour to hold a Science Fair every 2 years. Scientific method will be taught in the term prior to the fair.

Planning in Science at Paraparaumu Beach School

Unit planning will be based on the suggested school contexts and guided by the science area in the NZC.

Inquiry-based learning is the desired approach. It starts with exploration and questioning and leads to investigation into a worthy question, issue, problem or idea.

Syndicates will work from long term plans, unit plans, weekly plans.

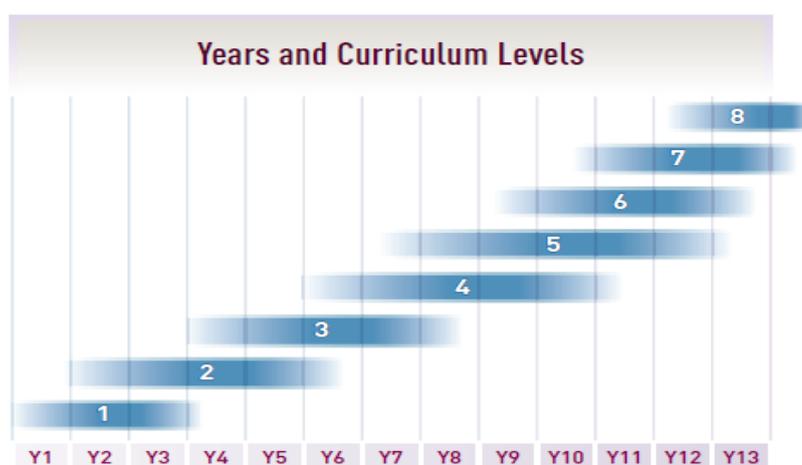
The planning templates will vary depending on the needs of each syndicate and the selected teaching approach.

Planning templates should include: level, duration, P.B.S. Learning Goals, achievement objectives, strand, context, learning intentions, learning outcomes, possible learning experiences, key competencies, values, principles, assessment, and resources.

Student Achievement in Science at Paraparaumu Beach School

Level expectations

Indicated below is the expected New Zealand Curriculum level that students should be working at in science.



Assessment in Science at Paraparaumu Beach School

Assessment at Paraparaumu Beach School is used to ensure and monitor student progress. The type of assessment used will be varied, it will be appropriate to the purpose, and provide meaningful information that will guide and support the direction of on-going teaching and learning.

Assessment should facilitate learning and focus on outcomes that contribute to scientific literacy.

Formative assessment is an integral part of learning and teaching and is a powerful tool for enabling students to learn. It allows the teacher to check for understanding during a topic and to provide feedback and feed-forward. The tools used in science are:

- Anecdotal notes
- Prior learning

Summative assessment allows teachers to evaluate a student's progress up to the point the assessment takes place and provides a summary of their strengths and needs. The assessment results can be used for students reports, also it can be analysed and the information used for target setting. The tools used in science are:

- Syndicate developed assessment sheets which relate to the learning outcomes for each unit
- Anecdotal notes
- Peer assessment
- Self-assessment

Reporting in Science at Paraparaumu Beach School

Reporting in science will occur through written reports and will be on the following aspects:

- Feedback on the students achievement
- The level of student's effort and participation

Science Resources at Paraparaumu Beach School

All science resources and equipment is stored in the central resource room, and sorted according to their appropriate strand.

Resources include Ministry publications that support the curriculum. The following handbooks are readily available: Investigating in Science, Making Better sense of Planet Earth and Beyond, Making Better Sense of the Material World, Making Better Sense of the Living World, and Making Better Sense of the Physical World.

Books, posters and equipment to support learning contexts, school library books, School Journals and Connected Journals are also a valuable resource. On-line resources are available. P.B.S. has access to National Library and Mana Education resources.

When purchasing resources that relate to a school-wide need, the curriculum team leader applies to the principal for funds. If the resource is a syndicate requirement the funding comes from pre- allocated syndicate funds.

Appendices

- Contexts
- Building Science Concept booklist
- Useful words to help write learning intentions

Science

Paraparaumu Beach School Contexts

Year 1 - 2		Year 3 - 4		Year 5 - 6		Year 7 - 8	
Odd Year	Even Year	Odd Year	Even Year	Odd Year	Even Year	Odd Year	Even Year
Nature of the World							
<u>Material World</u> <i>Suggested Contexts</i> <ul style="list-style-type: none"> Matter of State Fizzing and Foaming Chemist in the Kitchen Magnets 	<u>Living World</u> <i>Suggested Contexts</i> <ul style="list-style-type: none"> Animals Mini-beasts Life cycles Zoo Plants Rocky Shore Sandy Shore 	<u>Planet Earth and Beyond</u> <i>Suggested Contexts</i> <ul style="list-style-type: none"> Matariki Planets Space Carter Observatory Our Land 	<u>Physical World</u> <i>Suggested Contexts</i> <ul style="list-style-type: none"> Magnets 	<u>Material World</u> <i>Suggested Contexts</i> <ul style="list-style-type: none"> Slime and Ooze 	<u>Living World</u> <i>Suggested Contexts</i> <ul style="list-style-type: none"> Kapiti Island Marine Reserve Animal Classification Bird Classification Plant Classification 	<u>Planet Earth and Beyond</u> <i>Suggested Contexts</i> <ul style="list-style-type: none"> Environmental Science Astronomy <u>Physical World</u> <i>Suggested Contexts</i> <ul style="list-style-type: none"> Flight Electrical 	<u>Nature of Science</u> <ul style="list-style-type: none"> Scientific Method Science Fair

Building Science Concepts Books

Book	Level 1-2	CS	Book	Level 2-4	CS	Book	Level 3-4	CS	Book	Level 1-4	CS
57	Eggs	M	56	Bread	M	13	Aluminium	M,E	4	Animal Life Histories	L
18	Exploring Sound	P	41	Fossils	E	59	Bikes	P	3	Birds	L
37	Floating & Sinking	P	29	Solar Energy	P,E	64	Candles	M	48	Fabrics	M
25	Flowers, Fruits & Seeds	L	1	Waterways	E	40	Earthquakes	E	17	Flight	L,P
23	Fresh Food	L				27	Exploring Space	E	5	Fur, Feathers & Bark	L
63	Growing Plants Indoors	L				36	Heat on The Move	P	45	Slugs and Snails	L
58	Ice	M,P				47	Insulation	M,P	30	The Air Around Us	M,P
32	Introducing Metals	M				49	Invisible Forces	P			
35	Is This A Plant?	L				26	Making New Plants	L			
39	Is This an Animal	L				55	Mammals	L			
46	Keeping Warm	M,P				42	Marbles	P			
21	Life between the Tides	L				53	Moulds are Fungi	L,M			
10	Light and Colour	P				34	Parachutes	p			
14	Making Porridge	P				24	Preserving Food	M			
20	Our Star, the Sun	E				19	Properties Of Sound	P			
60	Rubbish	M				61	Recycling	M			
16	Sand, Salt & Jelly Crystals	M				11	Seeing Colour	P			
9	Shadows	M,P,E				6	Soil Animals	L			
43	Spring	L,E				62	Spiders Everywhere	L			
51	Standing Up	L,M,P				44	Spring Is A Season	L,E			
15	Where's the Water	M,P,E				50	Storms	L, E			
						7	The Bush	L			
						52	The Land Changes	E			
						8	The Moon	E			
						28	The Night Sky	E			
						22	Tidal Communities	L			
						38	Understanding Buoyancy	P			
						12	Volcanoes	E			
						31	Water and Weather	M,P,E			
						2	Weathering & Erosion	E			
						54	Windmills & Waterwheels	P			
						33	Working with Metals	M			

CS= Contextual Strand
 L= Living World
 M= Material World
 P= Physical Worlds
 E= Planet Earth and Beyond

Useful Words to Help Write Learning Intentions

Simple Action Words

Knowledge/Comprehension

Find, describe, compute, use, identify, illustrate, label, list, make, gather data, name, measure, recognise, state, tell, do, investigate, prepare, examine, classify.

More Complex Thinking

Application/Analysis

Prove, apply, compare, relate, justify, interpret, show, suggest, give examples, organise data, contrast, estimate, analyse, select, point out, arrange, differentiate, specify limitations, construct, discriminate, specify assumptions.

Original Thinking

Synthesis/Evaluation

Generalise from data, make predictions, make deductions, draw inferences, create, summarise, outline, compose, solve, recognise, integrate, compare, design, discover, produce a plan, discuss critically, propose reasons and defend and evaluate alternatives.

More Useful Words: recite, outline, explain, read out, recall, translate, provide examples of, justify, validate, sort, classify, measure, brainstorm, illustrate, model, mime, dance, act out, tap out, map, graph, hypothesise, innovate, investigate, question, reflect, research.

Beware of: understand, enjoy, appreciate, know, learn, feel, become aware of, develop interest in, grasp, become familiar with, develop sensitivity to, believe.