Science

Syllabus

Primary

Grades 3, 4 & 5

Standards Based

Papua New Guinea
Department of Education

'FREE ISSUE NOT FOR SALE'

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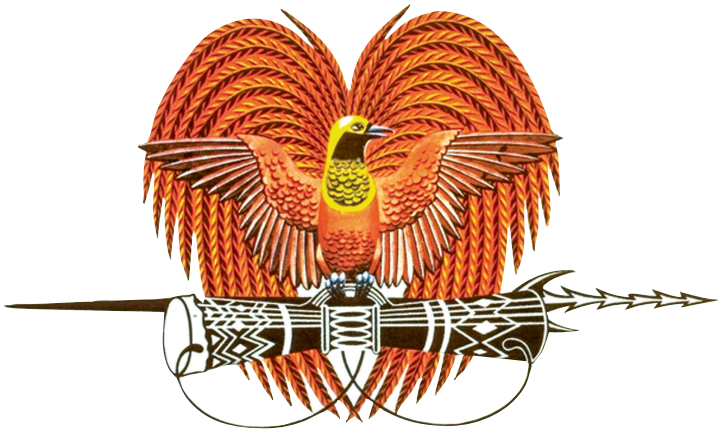

Papua New Guinea

Department of Education

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Contents

Secretary's Message

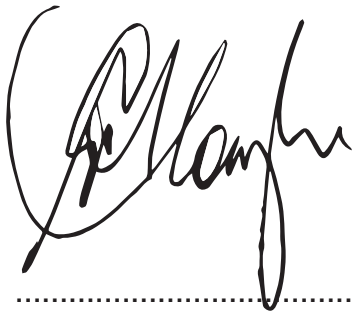
The development of the Primary Science Syllabus is a direct response to the government's directive through the Outcomes Based Education (OBE) exit report, (Czuba 2013). The report recommended for the phasing out of Outcomes Based Curriculum (OBC) and the introduction of Standards Based Curriculum (SBC) to raise standards in teaching and learning at all levels of schooling. The designing of courses in the curriculum have been done through reviewing, aligning, re-aligning and repositioning of the existing content in order to cater for the shift in the pedagogy.

Science is an important subject and a Key Learning Area in the implementation of SBC. The goal of the Science Curriculum is to ensure all students acquire relevant scientific concepts, skills and processes in order to be competent locally while at the same time working towards meeting the demands and competencies of the 21st Century.

The Science subject is fundamental in life and a pillar for the on-going and future development of this nation. Hence, it is critical to develop the learners' understanding of scientific concepts, skills and processes, and nurture the students' love for Science to enable them to be scientifically literate. It is about creating and monitoring interest in children to learn the basic and fundamental principles and processes in Science using resources in their own local environments with or without a conventional Science laboratory.

Teachers are encouraged to use the guided lessons in the teacher guides and other relevant resources to generate creative teaching and learning activities to deliver the Science content to the students.

I commend and approve this Science Syllabus for grades 3, 4 & 5 to be used in all Primary Schools throughout Papua New Guinea.



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DR. UKE W. KOMBRA, PhD
Secretary for Education

Introduction

The purpose of the Primary Science Syllabus is to help students to acquire basic science understanding, knowledge and skills in order for them to become scientifically literate over time, thus improving the level of scientific literacy in Papua New Guinea.

The content of the Grades 3, 4 & 5 syllabus has been designed to address issues on missing science concepts, lowering depth of knowledge of content, poor balance of representation between learning components including assessment and teaching and learning experiences.

This syllabus contains the national expectations for Science through the prescribed benchmarks for the level and grade. These benchmarks are national standards that all students must achieve at the end of each grade level of schooling.

In Science, all students must achieve the national standards as prescribed in the syllabus. Students at this grade level will study science through the content standards which are organised into three (3) strands. These strands are:

- Life
- Physical Science
- Earth and Space

Primary Science is timetabled for 165 minutes per week for Grade 3, 4 & 5. Teachers can use the time allocation to construct their timetable or programs.

Rationale

The environment of Papua New Guinea is remarkably diverse and rich with animal and plant species. Some of the species of forests and coral reefs are among the richest in the world. This diverse environment, which includes forests, grasslands, mangroves, swamp and coastal marine environment support all forms of life, including people. The country is rich in natural resources that support economic development, such as abundant forests and large reserves of minerals like gold, copper, oil and gas. Marine resources are also plentiful and diverse, including tuna, barramundi, prawns and lobsters. These resources must be used wisely for the benefit of the whole community now and in the future.

The nature of science includes scientific concepts and explanations that are based on logical thinking; are subject to rules of evidence and are consistent with observational, inferential, and experimental evidence. Moreover, the nature of science is open to rational critique and is subject to refinement and change with the addition of new scienctific evidence. The nature of science includes the concept that science can provide explanations about nature, can predict potential consequences of actions, but cannot be used to answer all questions.

Studying science helps us to understand the interactions between the different components of the natural and physical world. Science enables us to also understand and live in harmony with the natural world. It helps us to contribute responsibly to the development of the human-made world.

Aims

The Primary Science subject aims to develop appropriate and positive attitudes and relevant skills to enable students to solve problems and make informed decisions about their future. Their intellectual development is paramount for a fast developing nation. Therefore, the aims of Primary Science are to ensure that students are equipped with the knowledge about the world of science and its contributions to humankind and technological developments.

The Science aims are to:

- prepare students towards using scientific knowledge and methods and to solve problems in daily situations,
- provide students with basic scientific concepts to help them understand themselves and the world around them,
- provide students with practical experiences in understanding the importance of sustainable development practices in their own environment,
- provide students with opportunities to learn about and appreciate the interdependence of all living things in the environment,
- provide students with opportunities to develop skills, habits of mind and attitudes necessary for scientific inquiry and,
- provide students with experiences which build on their interest in and stimulate their curiosity about their environment.

National Benchmarks

National Benchmarks are standards that all students must achieve at the end of each grade or level of their schooling. For basic education, it takes place at the end of Elementary 2, Grade 5 and 8.

The benchmarks are linked to the content standards, performance standards and assessment tasks outlined in the syllabuses.

Overarching National Benchmarks

At the end of Grade 12 , students are expected to know and be able to;

- experience the richness and wonders of knowing about and understanding the natural world,
- use appropriate scientific processes and principles in making personal decisions,
- engage confidently in public discourse and debate about matters of scientific and technological concern and
- increase their economic productivity through the use of knowledge, understanding and skills of a scientifically literate person in their careers.

The National Standard for Science

Students understand and appreciate the interconnectedness between the physical, biological and technological world. They will acquire knowledge, skills and values to make informed decisions in relation to the sustainable management and use of their resources, social media and information technology for the benefit of all.

The Science Curriculum Standard

The National Curriculum Standards for Papua New Guinea ensures that students:

- develop competences in scientific enquiry and practical skills - including computer literacy to enable them to use critical and creative thinking skills to solve problems
- develop positive attitudes, concepts, intellectual and manipulative skills that will help them to understand and solve problems.

Teaching and learning at this level must be focused on the national standards that students must achieve at the end of grade 5. Teachers have a responsibility to ensure that the content standards they teach and the classroom practices they use give all students the opportunity to reach their potential.

Level Benchmarks

The grade level benchmarks are the standards which when measured should be achieved by all students at the end of grade 5.

At the end of grade 5, students will know and be able to:

- describe the differences of the physical features of living things,
- describe patterns of growth of living things through out the different stages of their life cycles,
- demonstrate an understanding of the functions of the different parts of the human body,
- develop an understanding of the relationship and survival of organisms in their habitats,
- demonstrate an understanding of the flow and transfer of heat from a hotter to a colder region,
- show an understanding of simple electric circuits, their symbols and the flow of current in an open and closed circuit,
- describe the effects of force of magnetism on objects,
- demonstrate an understanding of force, motion and energy using simple machines,
- measure length, temperature, volume, mass, distance and time using appropriate devices,
- describe the physical and chemical reactions of the three states of matter,
- describe Earth as the provider of resources that supports all living things,
- explain the importance of soil for all living things,
- give a simple description of the different stages of the water cycle,
- describe the sun as the major source of energy for all living and non-living things and
- demonstrate an understanding of the moon reflecting light from the sun.

Level Benchmarks

Grade 3

Grade 3 benchmarks are the standards which when measured should be achieved by all students at the end of grade 3.

At the end of grade 3, students will know and be able to:

- describe the changes in growth and physical features of living things,
- explain how living things use their body parts to feed and move,
- describe the interaction and relationship between living things and their environment,
- recognise that energy has multiple forms and can be changed from one form to another,
- understand and explain that objects are seen when light is reflected from them,
- understand that magnets repel and attract each other and other magnetic materials,
- develop a basic understanding of simple machines and the change of movement when force is applied,
- recognise household examples of solids, liquids and gases,
- demonstrate an understanding of solutions, mixtures and other substances,
- describe the Sun as the main source of heat and light on Earth and relate its movement to the position of shadows,
- identify and describe the importance of natural resources,
- describe the structure of the Earth and
- explain the importance of soil for all living things.

Grade 4

Grade 4 benchmarks are the standards which when measured should be achieved by all students at the end of grade 4.

At the end of grade 4, students will know and be able to:

- explain the different stages in the life cycle of plants and animals commonly found in their immediate environment,
- explain the functions of muscles, bones and the joints,
- explain the interdependence of living and non-living things using a specific habitat and community,
- recognise sound as a form of energy produced by vibration,
- demonstrate an understanding of the flow of an electric current in a simple circuit,
- describe the difference between force and motion,
- describe the uses of simple machines,
- identify and describe the composition and importance of air,
- compare the differences in physical and chemical changes using common substances,
- observe and compare differences in temperatures of the changes of state of water,
- explain the importance of soil as an important natural resource,
- describe factors affecting weather changes,
- describe the natural process of the water cycle and
- explain the movement and phases of the moon.

Grade 5

Grade 5 benchmarks are the standards which when measured should be achieved by all students at the end of grade 5.

At the end of grade 5, students will know and be able to:

- describe the conditions necessary for plant growth,
- compare the life cycles of common animals,
- describe the different stages of growth of humans from a baby to an adult,
- describe the interdependence of living things in a food chain and food web,
- describe sunlight as the primary source of energy for all living things,
- explain the transfer of heat energy into other forms of energy,
- identify and explain the functions of the parts of a simple electric circuit,
- demonstrate an understanding of parallel and series circuits,
- describe the effects of force on changes in motion ,
- explain the important uses of levers,
- describe the changes in temperature of the three states of matter,
- demonstrate an understanding of combustion and rusting as common examples of chemical changes,
- demonstrate an understanding of the solar system,
- describe rock and fossil formation,
- describe the formation of clouds and
- explain the effects of weather and seasons on living things.

Schools, clusters, districts and provinces are encouraged to set their own benchmarks and monitor these in order to work towards achieving the national benchmarks.

Curriculum Principles

Curriculum principles identify, describe and focus attention on the important concerns that must be addressed when developing the curriculum at all levels of schooling. They are based on significant cultural, social and educational values and beliefs.

The principles of the Standards Based Curriculum (SBC) include the following:

- A clear focus on the exit of learning attainment of the national benchmarks after each grade level
- A clear, understandable, consistent and progressive learning development
- Complements the National Education Standards that are aligned to career pathways and lifelong living after school
- Built upon the strengths and weaknesses of the Outcomes Based Curriculum learning outcomes.

The PNG National Curriculum Standards are based on the following underpinning principles:

1. Integral Human Development
2. Our Way of Life
3. Teaching and Learning
4. Science Guiding Principles

1. Integral Human Development

The Philosophy of Education for Papua New Guinea as described in the Matane Report acknowledges the National Goals and Directive Principles in the National Constitution and is consistent with Vision 2050 and Education for Sustainable Development.

Papua New Guinea is a rapidly changing society and faces many challenges. To face these effectively, an individual must strive to become an integrated person and to work with others to create a better community.

The process of integral human development calls for a National Curriculum, which helps individuals to:

- identify their basic human needs
- analyse situations in terms of these needs
- see these needs in the context of spiritual and social values of the community and
- take responsible actions based on these needs.

The success of a National Curriculum requires the integrated involvement of all agents of education such as the home, church, school, and community. Within the National Curriculum, teachers must integrate

knowledge, skills, values and attitudes to allow students to achieve the desired expectations of integral human development.

2. Our way of Life

Cultural relevance focuses on the richness and diversity of Papua New Guinean cultures and languages. These cultures and languages are examined within their own unique contexts, and within historical, contemporary, and future realities. Our traditional life is based on a holistic perspective that integrates the past, present and future. Papua New Guineans live in sophisticated, organised, and self-sufficient societies. Our customs and traditions constitute a cultural mosaic, rich and diverse, including different cultural groups that are unique and are featured in the National Curriculum.

The National Curriculum should enable students to:

- demonstrate , understand and practice the values, beliefs, customs, and traditions of Papua New Guinea,
- demonstrate, understand and apply the unique Papua New Guinean communication systems,
- demonstrate and recognise the relationship between Papua New Guineans and the global communities,
- recognise, accept and practice Papua New Guinean arts as forms of cultural expression,
- give examples of the diversity and functioning of the social economic, and political systems of Papua New Guineans in traditional and contemporary societies and
- describe the evolution of human rights and freedom as they relate to the people of Papua New Guinea.

3. Teaching and Learning

The expectations for all students set forth through the *National Curriculum Standard Framework* strongly emphasise intellectual discipline and high standard attainments through relevant curriculum content. The Standards Based Curriculum teaching and learning approach emphasises the connections between subject areas and the skill to be acquired and used overtime. The students should develop the ability to reason, analyse, solve problems, apply knowledge, and communicate effectively.

Teachers must create learning environments that are conducive for their students. At this level students learn better when teachers plan and organise interactive and participatory lessons. Students must be encouraged to ask questions and respond by using science processes through activities that focus on the transfer of concepts. The natural and physical environments are informal science laboratories settings, therefore, simple activities such as observations, explorations and experiments can be carried out in their own environment.

4. Science Guiding Principles

The Science guiding principles identify, describe and focus attention on the important concerns that must be addressed when developing and implementing the Science subject content. These are based on significant cultural, social and educational values, beliefs and norms.

Science is for everyone

The recognition of proactive relationships between science and society means that individuals should be engaged in positive participatory activities for the benefit of their societies or communities. This principle aims to educate individuals to be scientifically literate in order to make informed decisions about their environment and for the benefit of their own wellbeing and that of others in the community they live in.

Learning Science is an active process

Students learn and acquire science knowledge when they describe objects and events, ask questions, construct explanations of natural phenomena and test these explanations in many different ways. They also learn to communicate their ideas to others. In the National Science Education Standards, the term "active process" refers to physical and mental activities.

Sustainability

The natural environment of Papua New Guinea is as diverse as its cultures. It is often a harsh natural and physical environment that places challenges on its people through extreme climatic conditions and natural disasters. This means that at times people place heavy demands on the few resources that are available. The risk of these practices means that the environment can be damaged without people realising the long-term effects. The environment is currently under threat from rapid population expansion and misuse of resources through over logging and abuses associated with mining, overfishing, dynamiting reefs and dumping toxic wastes.

The study of science will guide students to appreciate, respect and value their natural environment. It will give the skills and knowledge to identify problems and issues and to act to sustain the use of resources in Papua New Guinea.

Teaching and Learning

Learning science can be enjoyable and more meaningful when teachers allow their students to learn by being engaged in all theory and practical experimental activities at this grade level. Students will learn to use various skills such as observation, reasoning, communication and problem solving skills to enable them to demonstrate their understanding of the world they live in. Their learning experiences will help them to progress and achieve the different levels of competencies as stated in the content standards.

The complexity of the standards of learning increases as students move from one grade to another. Their understanding of the different areas in science through the Standard Statements given for each grade level also increases in relation to this progression.

Teachers in primary school should refer to the content standards for teaching and learning from the strands and units in the syllabus. They should develop relevant activities to achieve the standards required for each grade level.

Safety for Primary Students

Teachers must know how to apply safety procedures when engaging students in practical experiments and other activities that require them to follow safety guidelines. At this level, students will be carrying out activities that will require them to interact with and in their environment. Therefore, teachers must ensure that correct safety guidelines and care is taken seriously in the planning and teaching of their lessons.

The following list of situations will require appropriate safety procedures :

- Observing wildlife: handling living and preserved organisms and coming in contact with natural hazards, such as poison ivy, ticks, mushrooms, insects, poisonous plants and snakes,
- Engaging in field activities in, near or over bodies of water,
- Handling glassware, sharp objects or other breakable objects,
- Using open flames or heat to conduct experiments,
- Working in or with direct sunlight (sunburn and eye damage) and
- Observing and handling chemicals and other hazardous substances such as strong acids.

Process Standards

Process standards are the processes and skills that students are expected to learn and be able to do within the context of the science content. The separation of the process standards from the content standards is intentional. In doing so we want to make explicit the idea that what students are doing while they are learning science is extremely important.

Skills and Processes

In this syllabus, teachers are encouraged to provide opportunities for students to learn the concepts and integrate inquiry skills. They use appropriate processes to understand the natural phenomena around them.

Skills

Engage in activities by:

- *Formulating hypothesis*
  The skill of making a general explanation for a related set of observations or events. It is an extension of inferring.

- *Generating possibilities*
  The skill of exploring all the alternatives, possibilities and choices beyond obvious or preferred ones.

- *Predicting*
  The skill of assessing the likelihood of an outcome based on prior knowledge of how things usually turn out.

Collecting and presenting evidence by:

- *Observing*
  The skill of using our senses to gather information about objects or events. This also includes the use of instruments to extend the range of our senses.

- *Using apparatus and equipment*
  The skill of knowing the functions and limitations of various apparatus, and developing the ability to select and handle them appropriately for various tasks.

Reasoning - making meaning of information and evidence by:

- *Comparing*
  The skill of identifying the similarities and differences between two or more objects, concepts or processes.

- *Classifying*
  The skill of grouping objects or events based on common characteristics.

- *Inferring*
  The skill of interpreting or explaining observations or pieces of data or information.

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

Evaluating
The skill of assessing the reasonableness, accuracy and quality of information, processes or ideas. This is also the skill of assessing the quality and feasibility of objects.

Communicating
The skill of transmitting and receiving information presented in various forms- written, verbal, pictorial, tabular or graphical.

Process
Processes are complex operations which call upon the use of several skills. At the primary level, the processes expected of students are:

- *Creative Problem Solving*
  This is a process of analysing a problem and choosing an innovative and relevant solution in order to remedy or alter a problem situation.

- *Decision-Making*
  Decision making is the process of establishing and applying a criteria to select among seemingly equal alternatives. The process of establishing criteria involves consideration of the consequences and values.

- *Investigation*
  This involves formulating questions or hypothesis, devising fair methods and carrying out those methods to find out answers to the questions to verify the hypothesis.

There is no definite sequence of priority amongst the skills and processes listed above. For example, observation may lead to hypothesising but at other times a hypothesis can lead to observation. All the skills and processes listed above are seen as part of the total process of scientific inquiry. In science teaching and learning, effort should be directed at teaching explicitly each of the skills through the use of appropriate activities. Further effort should be directed to helping students integrate some or all of the skills in scientific inquiry. The skills and processes can be introduced in grade 3. Once introduced, these skills and processes should continue to be further developed at the higher levels.

The table below shows the different types of processes and skills that teachers can use in the activities. Teachers are encouraged to guide students to master certain skills at the end of each grade.

Grade									
E1	E2	3	4	5	6	7	8		
***	***	***	***	***	***	**	**	Observing	BASIC PROCESSES
*	**	**	**	**	***	**	**	Communicating	
**	**	***	***	***	***	**	***	Inferring	
**	**	**	*	*	**	**	***	Classifying	
	*	**	**	**	**	**	***	Measuring	
			*	*	*	*	**	Using Numbers	
**	**	**	**	*	**	**	**	Predicting	
						*	*	Using Space/Time Relationships	
				**	**	**	**	Interpreting Data	INTEGRATED PROCESSES
					*	*	*	Defining Operationally	
				**	*	**	**	Controlling Variables	
				**	*	**	**	Hypothesising	
						*		Experimenting	

The number of asterisks denotes the amount of emphasis given to each process skill in each year level.

* Emergent ** Progressive *** Mastery

Attitudes and Values

In all scientific inquiry, the following attitudes are encouraged:

- curiosity – the desire to explore the environment and question what they find,
- creativity - suggest innovative and relevant ways to solve problems,
- integrity - handle and communicate data and information with integrity
- objectivity - seek data and information to validate observations and explanations objectively,
- open-mindedness - accept all knowledge as tentative and willing to change their view if the evidence is convincing,
- perseverance - pursue a problem until a satisfactory solution is found and
- responsibility - show care and concern for living things and awareness of the responsibility they have for the quality of the environment.

Opportunities should be given in the classroom for students to freely ask questions and be encouraged to ask both closed and open ended questions. This will enable teachers to gather information about the students' level of knowledge and understanding.

Content Overview

The Primary Science content is organised into three (3) strands. Each strand identifies a particular aspect of Science that shows a progression of learning from one grade to the next.

Each strand is further organised into units and topics to allow the content standards, performance standards and assessment tasks to be implemented.

Strand 1: Life

This strand is about living things and the natural environment. Students are given the opportunity to build their understanding of the natural world around them through direct experiences with living things, their life cycles and habitats. These experiences emerge from the sense of wonder and natural interests of students who often ask questions such as:

- How do plants get their food?
- How many different plants are there?
- Why do some animals eat other animals?
- What is the largest plant?

An understanding of the characteristics of organisms, life cycles of organisms, and the interactions among all components, living and non-living of the natural environment begins with questions such as these and an understanding of how individual organisms maintain and continue life.

The concepts about characteristics of organisms develop from basic concepts of living and non-living things. In junior grades, many children associate “life” with any objects that are active in any way. This view of life develops into one in which movement becomes the defining characteristic. Eventually other concepts are incorporated such as eating, breathing, and reproducing to define life.

Strand 2: Physical Science

The Physical Science strand introduces students to increase their understanding of the characteristics of objects and materials they use every day. Through observation, manipulation, and classification of common objects, children reflect on the similarities and differences of these objects. As a result, their single-word descriptions lead to increasingly richer verbal descriptions.

Describing, grouping, and sorting solid objects and materials is possible early in this grade level. By grade 5, distinctions between the properties of objects and materials can be understood in specific contexts, such as the use of simple machines to do work in the home.

Students are further engaged in simple activities that enable them to understand the concepts of force and motion. They will describe and manipulate objects by pushing, pulling, throwing, dropping and rolling.

They also begin to focus on the position and movement of objects: describing location as up, down, in front or behind and discovering the various kinds of motion and forces required to control objects.
Students experiment with light, heat, electricity, magnetism and sound to help them understand that phenomena can be observed, measured, and controlled in various ways.

Strand 3: Earth and Space

This strand is in two parts:

1. Earth - which refers to the surface of planet earth and the resources that are found in it
2. Space - refers to the heavenly bodies and their cycles.

Students are naturally interested in everything they see around them- soil, rocks, streams, rain, clouds, rainbows, sun, moon, and stars. They are encouraged to observe closely the things in their environment. They must take note of their physical properties, distinguish one from another and develop their own explanations of how things become the way they are.

As they become familiar with their world, they can be guided to observe changes including cyclic changes, such as night and day and the seasons. They will predict trends, such as growth and decay and the unpredictable changes in weather and climate. They will observe the sun, the moon and other stars in the night sky, and may observe too, the appearance of meteors.

Students are aware that the earth's surface is composed of rocks, soil, water, and living organisms. A closer look will help them identify many additional properties of earth materials. By carefully observing and describing the physical properties of different rocks, students will begin to see that some rocks are made of a single substance, but most are made of several substances. In later grades, the substances can be identified as minerals. Understanding rocks and minerals is extended to the study of the source of the rocks, such as sedimentary and metamorphic.

Strand, Unit and Topic Overview

The table below outlines the strands, units and topics for the Primary Science. It shows the progressive development of concepts from grade three to grade five.

Strands	Unit	Topic		
		Grade 3	Grade 4	Grade 5
Life	**Unit 1: Plants**	• Parts of Plants and their functions	• Life Cycle of Plants	• Plant Growth
	Unit 2: Animals	• Parts of Animals and their functions	• Life Cycle of Animals	• Reproduction and Heredity of Animals
	Unit 3: Human Body		• Skeletal and Muscular System	
	Unit 4: Interaction and Relationship in the Environment	• Observing our Environment	• Living things in The Environment	• Habitat & Adaptation • Energy in Food
Physical Science	**Unit 1: Energy**	• Energy • Light • Magnets	• Sound • Electricity 1	• Heat • Electricity 2
	Unit 2: Force & Motion	• Moving Objects	• Force, Motion and Machines	• Motion and Machines
	Unit 3: Matter	• Properties of Matter • Substances and Mixtures	• Air • Matter Changes	• Chemical Change
Earth and Space	**Unit 1: Our Earth**	• The Earth • Rocks • Soil	• Importance of Soil for Human Beings	• Rocks, Minerals and Fossils
	Unit 2: Weather & Climate		• Observing Weather	• Weather and Seasons
	Unit 3: Space	• Observing the Sun	• Observing the Moon	

Content Standards

Content Standards are broad statements of what students need to know, understand and be able to do. They create a clear outline of the essential knowledge, skills and understandings that students need to master in Science. They define the breadth and depth of knowledge, skills and processes, attitudes and values that are to be taught in the strands, units and topics from grade three to grade five. The statements are student centred and are written in terms that enable them to be demonstrated, assessed, measured and monitored out and show progression from one grade to the next.

A numerical code has been given to each of the content standards. This does not indicate any intended sequence or hierarchy of the content standards. Rather, it is a classification system to facilitate simplicity of reference. Each content standard is numbered with three-digits such as **4.2.3.** This refers to a content standard from grade 4, strand number 2, content standard 3.

Grade 3	Grade 4	Grade 5
Strand 1: Life		
3.1.1 Investigate and explain parts of plants and state their functions	**4.1.1** Identify and explain the different stages in the life cycle of plants.	**5.1.1** Investigate and understand the conditions necessary for seed germination and plant growth.
3.1.2 Investigate and explain body parts of animals and state their functions.	**4.1.2** Identify and explain the different stages in the life cycle of animals.	**5.1.2** Understand that living things reproduce to ensure continuity of their kind.
3.1.3 *(Not prescribed for this grade)*	**4.1.3** Investigate and identify the relationship between the structure and movement of the human body.	**5.1.3** *(Not prescribed for this grade)*
3.1.4 Investigate and describe the interaction between living and non- things in the environment.	**4.1.4** Investigate the interdependence of living things within specific habitats.	**5.1.4** Investigate the adaptation of living things in different habitats.
3.15 *(Not prescribed for this grade)*	**4.15** *(Not prescribed for this grade)*	**5.1.5** Investigate and explain the energy pathway from the Sun through to the living things.
Grade 3	**Grade 4**	**Grade 5**
Strand 2: Physical Science		
3.2.1. Describe how energy changes from one form to another.	**4.2.1.** Investigate the properties and characteristics of sound.	**5.2.1.** Investigate and explain the properties of heat energy.
3.2.2 Investigate and describe the properties and the effects of light when it strikes an object.	**4.2.2** Investigate the flow of electric currents using simple circuits.	**5.2.2**. Investigate and identify the properties of electric circuits.
3.2.3 Investigate and explore the characteristics and functions of magnets.	**4.2.3** Differentiate between force and motion and identify the characteristics and uses of simple machines.	**5.2.3** Investigate and explain changes in motion of objects and the regularity of levers.

3.2.4. State the uses of simple machines and explain how force is applied on objects	**4.2.4** Investigate and explain the properties of air and the change in volume and pressure when compressed.	**5.2.4** Investigate relationships between the three states of matter and heat
3.2.5 Investigate and identify the properties of objects by examining their weight and volume	**4.2.5** Investigate physical and chemical changes in matter including changing states of water	**5.2.5** Investigate and recognise the fundamentals of chemical changes in matter
3.2.6 Investigate and describe methods used to separate substances in mixtures	**4.2.6** (*Not prescribed for this grade)*	**5.2.6**(*Not prescribed for this grade)*
Grade 3	**Grade 4**	**Grade 5**
Strand 3: Earth and Space		
3.3.1 Identify the composition of the Earth and explain the use of natural resources	**4.3.1** Investigate and explain the importance of soil for living things	**5.3.1** Investigate the characteristics and properties of rocks and minerals
3.3.2 Investigate and describe properties of rocks and minerals	**4.3.2** Investigate and describe the factors that affect weather changes and the processes involved in the water cycle	**5.3.2** Investigate weather and seasons and the effects they have on living things and the environment
3.3.3 Investigate and explain the characteristics of soil and its importance to living things	**4.3.3** Observe and present using diagrams the different phases of the moon in the night sky	**5.3.3** **(**Not prescribed for this grade)
3.3.4 (*Not prescribed for this grade)*	**4.3.4** (*Not prescribed for this grade)*	**5.3.4** (*Not prescribed for this grade)*
3.3.5 Observe and describe the movement of the sun over a period of time		

Content Expansion

The content expansion is organised by grades. This section contains the expansion of the content standards into:

- Performance standards and
- Assesment tasks.

Performance Standards - Each content standard in this syllabus is accompanied by a set of performance standards. A performance standard is a descriptive statement of the knowledge and skills that students can display as they work towards the achievement of the content standard . They demonstrate a range of skills that contribute to the achievement of the content standards. They assist teachers to monitor student progress within a level and to make on-balance judgements about the achievement of these standards.

Teachers may wish to develop their own performance standards. Alternatively, they may adapt and or modify the Performance Standards where appropriate. Each performance standard gives explicit descriptions or explanations of what is to be done during the teaching and learning process in order to achieve the content standards. The performance standards are coded as a), b), c) and so forth.

Assessment tasks - Each content standard has assessment task(s) which are assessment ***for*** learning and assessment ***as*** learning. Assessment ***as*** and assessment ***for*** are also known as formative assessments and assessment ***of*** learning is also known as summative assessment.

Assessment tasks are numbered as 1, 2, and 3. They are written in terms that enable them to be demonstrated, assessed, measured and monitored to show students' understanding of the intended standards.

Grade 3 - Content Description

The grade 3 standards are focused in giving opportunities to students to closely observe the world around them. Students ask questions that demonstrate curiosity about the world around them. They select and use information from prior knowledge and also use knowledge from other people in their communities. They make observations and take notes of their explorations. They describe the steps taken to answer questions and give an account of their findings.

In the strand 'Life', the focus of learning is based on parts and function of plants and animals. It is important that students also demonstrate their understanding of the interdependence of living things in specific environments.

The strand 'Physical Science is about matter and its' relationship with energy, force and motion. Types of energy, the concepts on force and

motion and its relationship with simple machines is also introduced.

The strand 'Earth and Space' is about the earth and its natural resources and the wonders of the universe. The knowledge about soil, rocks and minerals and its importance to life is about understanding the relationship between living and non-living things. The Sun is a star and the main source of energy that is transformed into heat and light on Earth.

Strand 1: Life

Unit 1: **Plants**

Content Standard	**3.1.1** Investigate and explain the parts of plants and state their functions.
Performance Standards	a) Use diagrams to identify common plants and label their parts: roots, stem, leaves, and flowers. b) Organise and observe verbal discussions and oral presentations of the functions of each plant part: roots, stem, leaves, and flower. c) Classify plants in terms of flower, leaves, stem, and roots. d) Identify and state the basic needs for plants to grow. e) List the uses of plants.
Assessment Tasks	1. Draw a flowering plant and label its parts. 2. Write a simple description of the parts of a flowering plant.

Unit 2 : **Animals**

Content Standard	**3.1.2** Investigate and explain body parts of animals and state their functions.
Performance Standards	a) Identify and describe the body parts of animals including insects, fish, amphibians, reptiles, birds and mammals. b) Describe how animals use their body parts to move and feed. c) Identify the basic needs of animals in order to stay alive.
Assessment Tasks	1. Label the main body parts of an animal or insect – choose a fish, frog, butterfly, bird, wallaby or cuscus. 2. Write a simple description of the parts of an animal.

Unit 3: **(Not prescribed for this grade)**

Unit 4: **Interaction and Relationship in the Environment**

Content Standard	**3.1.4** Investigate and describe the interaction between living and non- living things in the environment.
Performance Standards	a) Identify and describe components of different environments. b) Differentiate between natural and man-made environment. c) Classify things in the environment into living and non-living . d) Describe the relationship between living and non-living things in the environment. e) Identify places where plants and animals live. f) Explain how living things depend on the environment.
Assessment Tasks	1. Name two types of natural environments in Papua New Guinea. 2. Name plants and animals that live in these two types of natural environment.

Strand 2: Physcial Science

Unit 1: **Energy**

Content Standard	**3.2.1** Investigate how energy changes from one form to another.
Performance Standards	a) Describe the way energy is changed from one form to another. b) Identify types of energy used everyday.
Assessment Task	1. List the types of energy used every day.

Content Standard	**3.2.2** Investigate and describe the properties and effects of light when it strikes an object.
Performance Standards	a) Identify and list some sources of light. b) Describe the properties of light. c) Classify materials as stopping all light, stopping some light, or allowing light to pass through. d) Explain why we can see objects. e) Explain how shadow is formed and why the shape of shadow is similar to the real objects.
Assessment Task	1. From a list of materials, identify which materials will allow light to pass through, stop some light and stopping all light. 2. Describe what happens when an object blocks the path of light?

Content Standard	**3.2.3** Investigate and explore the characteristics and functions of magnets.
Performance Standards	a) Identify magnetic and non-magnetic materials. b) Investigate the properties and effects of magnets. c) Examine the strong and weak points of a bar magnet. d) Explore and understand that the Earth acts like a big magnet. e) Investigate the direction of North and South by using a magnet. f) Apply the knowledge about magnets to daily life.
Assessment Task	1. Identify and describe objects that are attracted to a magnet. 2. Explain why more objects stick to certain places on the magnet?

Unit 2 : **Force and Motion**

Content Standard	**3.2.4** State the uses of simple machines and explain how force is applied on objects.
Performance Standards	a) Investigate and explain the properties of force. b) Identify different types of forces. c) Describe and interpret how force works on objects. d) State the function of simple machines – levers, ramps and pulleys. e) Compare and describe different types of machines used in daily life.
Assessment Task	1. List the different effects of force on objects. 2. Draw a simple machine and explain its uses.

Unit 3 : **Matter**

Content Standard	**3.2.5** Investigate and identify the properties of objects by examining their weight and volume.
Performance Standards	a) Define and explain matter. b) Classify different types of matter based on their physical properties. c) Compare the properties of different matter in terms of weight and volume. d) Measure the weight of matter by changing its conditions in terms of shape and volume.
Assessment Tasks	1. Arrange objects in order of size and weight. 2. What happens to the weight of the object when the shape changes?

Content Standard	**3.2.6** Investigate and describe methods used to separate substances in mixtures.
Performance Standards	a) Observe and describe the properties of mixtures. b) State examples of mixtures in daily life. c) Define and explain mixtures and substances. d) Demonstrate the different methods of separating mixtures – filtering and sieving.
Assessment Tasks	1. State one or two examples of mixtures. 2. Perform the two methods of separating mixtures.

Strand 3: Earth and Space

Unit 1: **Our Earth**

Content Standard	**3.3.1** Identify the components of the Earth and explain the use of natural resources.
Performance Standards	a) Identify the composition of the Earth. b) Identify and explain natural resources. c) Classify different types of natural resources on the Earth. d) Describe how human beings use natural resources in daily life.
Assessment Task	1. List the uses of a natural resource.

Content Standard	**3.3.2** Investigate and describe properties of rocks and minerals.
Performance Standards	a) Define and explain the differences between rocks and minerals. b) Observe and describe different types of rocks and minerals. c) Identify the components of rocks. d) Classify different types of rocks.
Assessment Tasks	1. Describe the differences between rocks and minerals. 2. Describe rocks according to colour and hardness.

Content Standard	**3.3.3** Investigate and explain the characteristics of soil and its importance to living things.
Performance Standards	a) Explain and describe the composition of soil. b) Compare the characteristics of sandy soil, clay soil, and loamy soil in terms of physical properties and water drainage. c) Classify soil into clay, loamy, and sandy soil. d) Discuss importance of soil for living things.
Assessment Tasks	1. Classify various soil types according to their characteristics. 2. Investigate which soil holds more water.

Unit 3: **Space**

Content Standard	**3.3.5** Observe and describe the movement of the sun over a period of time.
Performance Standards	a) Explain what the sun is and identify the types of energy that comes from it. b) Describe how the sun is important for all living things. c) Relate the movement of the position of the shadow with the movement of the sun. d) Explain why the sun moves from the East to the West. e) Identify which parts of the Earth is day or night by using a model of the Earth.
Assessment Task	1. Observe and record the lengths of shadows at mid-morning, mid-day and mid-afternoon.

Grade 4

The grade 4 standards emphasise the importance of using and analysing information, and carrying out simple experiments to confirm the ideas or theories. Students can mathematically present information from the simple experiments conducted by constructing picture, bar, column and basic line graphs.

In Life science, students are introduced to life cycle processes and the interdependence of living things in a habitat. They are given the opportunity to study the anatomy of the human body. In physical science they are introduced to the basic principles of electricity, sound and the concept of force and motion. They will understand the uses of the different types of simple machines. Matter and substances, its relationship to chemical and physical changes is also introduced.

The Earth, the Moon and the Sun and their importance to all living things in the different environments is introduced in this unit. The phenomena about nature, weather, climate and seasons are further studied in this grade. The importance of natural resources and its' sustainability for the benefit to all living things in Papua New Guinea is an important aspect of study in this grade.

Strand 1: Life

Unit 1: **Plants**

Content Standard	**4.1.1** Identify and explain the different stages in the life cycle of plants.
Performance Standards	a) Observe the stages of plant growth over a period of time. b) Describe the life cycle of plants. c) Sketch the growth of plants at each stage of its life cycle .
Assessment Task	1. Label the different stages of growth in the life cycle of a plant.

Unit 2 : **Animals**

Content Standard	**4.1.2** Identify and explain the different stages in the life cycle of animals.
Performance Standards	a) Identify the life cycle of different animals such as butterflies, frogs, chickens, fish and dogs. b) Compare the similarities and differences of life cycles of different animals.
Assessment Task	1. Draw and label the life cycle of an animal.

Unit 3: **Human Body**

Content Standard	**4.1.3** Investigate and identify the relationship between the structure and movement of the human body.
Performance Standards	a) Describe how the bones and muscles work in the human body. b) Identify the main function of bones, muscles and joints in the human body. c) Describe the mechanism of movement of the arm in terms of bones, muscles and joints.
Assessment Task	1. Draw the bones, joints and muscles of the arm and hand.

Unit 4: **Interaction and Relationship in the Environment**

Content Standard	**4.1.4** Investigate the interdependence of living things within specific habitats.
Performance Standards	a) Explain how and why living things depend on each other in the environment in terms of food and shelter by examining a food chain. b) Identify and explain how human beings depend on other living things in terms of food, shelter and clothing for survival. c) Identify and describe ways of protecting and sustaining the environment.
Assessment Tasks	1. Match pictures of plants and animals with their habitats. 2. Carry out a survey and present information on a simple bar graph about the number of living things found in a specific environment. 3. Draw a food chain to show how living things depend on others for their own survival.

Strand 2: Physical Science

Unit 1: **Energy**

Content Standard	**4.2.1** Investigate the properties and characteristics of sound.
Performance Standards	a) Explain that sound is a kind of energy that we can hear. b) Identify the differences between echo, pitch and volume. c) Demonstrate how sound is transmitted by vibrating through objects.
Assessment Task	1. Make a simple instrument that produces sound – can be a traditional musical instrument.

Content Standard	**4.2.2** Investigate the flow of electric currents using simple circuits.
Performance Standards	a) Define electricity and identify sources and uses of electricity. b) Demonstrate how to make a simple circuit and explain the flow of current in an open and closed circuit. c) Explain through demonstration the flow of an electric current using a light bulb. d) Demonstrate and explain the use of conductors and insulators.
Assessment Tasks	1. Sort items into two groups; conductors and insulators. 2. Draw a diagram of a simple circuit and label its components (no symbols involved).

Unit 2: **Force and Motion**

Content Standard	**4.2.3** Differentiate between force and motion and identify the characteristics and uses of simple machines.
Performance Standards	a) Investigate and explain the relationship between force and motion. b) Describe motion based on speed, direction and distance. c) Measure motion of an object in terms of time, distance and speed. d) State the characteristics of different simple machines such as levers, inclined planes, screws, pulleys, wheel and axle and wedges. e) Classify and give examples of the different types of simple machines and their uses in daily life.
Assessment Tasks	1. Demonstrate the relationship between force and motion. 2. Draw a simple machine and state its function.

Unit 3: **Matter**

Content Standard	**4.2.4** Investigate and explain the properties of air and the change in volume and pressure when compressed.
Performance Standards	a) Demonstrate ways to find out the presence of air around us. b) Describe and explain properties and characteristics of air. c) Explain and describe the composition of air. d) Explain what happens to the volume and pressure when air is compressed.
Assessment Task	1. Explain why air is important to plants and animals.

Content Standard	**4.2.5** Investigate physical and chemical changes in matter including the changes of states of water.
Performance Standards	a) Demonstrate and explain the difference between physical and chemical changes. b) Identify the characteristics of physical and chemical changes. c) Observe and describe the changes in the states of water in relation to the changes in temperature. d) Explain the relationship between temperature, states of water and volume. e) Investigate the melting and boiling points of water.
Assessment Tasks	1. List examples of physical and chemical changes that occur in their homes. 2. Measure the temperature of boiling water and present using a line graph.

Strand 2: Earth and Space

Unit 1: **Our Earth**

Content Standard	**4.3.1** Investigate and explain the importance of soil for living things.
Performance Standards	a) Explain the importance of soil and its uses to all living things. b) Identify and describe types of soil pollution. c) Discuss how soil pollution affects the Earth and its inhabitants. d) Suggest ways to conserve soil. e) Explain ways in which soil can be protected.
Assessment Task	1. Explain the importance of soil for all living things. 2. Identify ways to reduce soil pollution.

Unit 2: **Weather and Climate**

Content Standard	**4.3.2** Investigate and describe the factors that affect weather changes and the processes involved in the water cycle.
Performance Standards	a) Describe types of weather. b) Identify the factors that affect weather. c) Identify and describe examples of how weather affects human activities. d) Define and describe the water cycle process. e) Identify the different examples of things that cause water pollution. f) Investigate and discuss how to conserve and protect water.
Assessment Tasks	1. Match pictures of instruments used to measure weather conditions with the conditions the instrument measures. 2. Draw a chart to show the different processes involved in the water cycle. 3. Explain ways of keeping water clean.

Unit 3: **Space**

Content Standard	**4.3.3** Observe and present using diagrams the different phases of the moon in the night sky.
Performance Standards	a) Explain the properties of the Moon. b) Observe and describe the movement of the moon. c) Identify and describe the different phases of the moon.
Assessment Task	1. Observe and draw the phases of the moon and present as a calendar.

Grade 5

The grade 5 standards emphasise the importance of selecting appropriate instruments for measuring and recording observations. Students are introduced to concepts of sound and light and the tools used for studying them. Key concepts of matter and the properties of matter are defined in greater detail.

The grade 5 standards focus on student growth in understanding the nature of science. This scientific view defines the idea that explanations of nature are developed and tested using observation, experimentation, models, evidence and systematic processes.

Strand 1: Life

Unit 1: **Plants**

Content Standard	**5.1.1** Investigate and understand the conditions required for seed germination and plant growth.
Performance Standards	a) Explain what plants need in order to grow. b) Plant, observe and record the growth of a seed from the time of germination. c) Explain how plants make food through the process of photosynthesis.
Assessment Task	1. Identify what is needed by plants to make their own food.

Unit 2 : **Animals**

Content Standard	**5.1.2** Understand that living things reproduce to ensure continuity of their kind.
Performance Standards	a) Identify and explain the reproduction process of different animals- dogs, fish, frogs and birds. b) Explain male and female reproductive organs in human beings. c) Compare and explain the process and organs of reproduction in human and animals (Birds). d) Identify the differences of reproductive process between human and birds. e) Identify and describe the hereditary characteristics, similarities and differences in animals.
Assessment Tasks	1. Name some male and female reproductive organs of animals. 2. Classify animals according to how they reproduce.

Unit 4: **Interaction and Relationship in the Environment**

Content Standard	**5.1.4** Investigate the adaptation of living things in different habitats.
Performance Standards	a) Identify and explain the different types of habitats. b) Identify living things in the different habitats. c) Explain why different living things adapt to different environments.
Assessment Task	1. Identify and classify animals according to their habitats.

Content Standard	**5.1.5** Investigate and explain the energy pathway from the Sun through to the living things.
Performance Standards	a) Explain why living things need food. b) Explain and understand that the Sun is the main source of energy for living things. c) Draw food chains and a food web to explain the use of energy from the sun to all living things.
Assessment Task	1. Draw a simple food chain and label the producers and the consumers.

Strand 2 : Physical Science

Unit 1: **Energy**

Content Standard	**5.2.1** Investigate and explain the properties of heat energy.
Performance Standards	a) Define and explain heat as a form of energy. b) Identify the sources of heat and explain its everyday uses. c) Explore the different uses of heat transfer in daily life. d) Define and measure temperature using standard units.
Assessment Tasks	1. Explain the different ways in which heat can be transferred. 2. Explain the use of a thermometer and how to take measurement of temperature.

Content Standard	**5.2.2** Investigate and identify the properties of electric circuits.
Performance Standards	a) Demonstrate and explain the types of electrical circuits. b) Identify circuit components and their symbols. c) Explain the direction of an electric current in a series and parallel circuit. d) Demonstrate and explain the brightness of the bulbs when connected in a parallel or a series circuit. e) List examples of daily use of electric circuits.
Assessment Tasks	1. Demonstrate and explain the brightness of the light bulb when it is connected in a series and a parallel circuit 2. Using symbols, draw a series circuit with two dry cells and two bulbs.

Unit 2: **Force and Motion**

Content Standard	**5.2.3** Investigate and explain changes in motion of objects and the regularity of levers.
Performance Standards	a) Explain the relationship between force and change in motion of a moving object in terms of speed and direction. b) Explain fulcrum, load and effort using a lever. c) Discover the relationship between distance and force in terms of the position of effort from the load and the position of effort from the fulcrum. d) Demonstrate the regularity of levers to balance by using a beam balance. e) Identify examples of the uses of levers in daily life.
Assessment Task	1. Identify and list examples of the uses of levers in daily life.

Unit 3: **Matter**

Content Standard	**5.2.4** Investigate relationship between the three states of matter and heat.
Performance Standards	a) Explain the physical properties of solids, liquids and gases in terms of their shape. b) Investigate the process of changes in states - solid to liquid, liquid to gas and gas to liquid, liquid to solid. c) Describe the relationship between change in temperature and change in states of matter.
Assessment Task	1. Draw a simple diagram to show changes in matter of common substances.

Content Standard	**5.2.5** Investigate and recognize the basic facts about chemical changes in matter.
Performance Standards	a) Describe and differentiate physical and chemical change. b) Observe chemical changes in matter in relation to combustion and rusting. c) Identify and explain examples of chemical changes in daily life.
Assessment Task	1. Identify and state physical and chemical change that occur naturally.

Strand 2 : Earth and Space

Unit 1: **Our Earth**

Content Standard	**5.3.1** Investigate the characteristics and properties of rocks and minerals.
Performance Standards	a) Identify the composition of rocks. b) Discover the characteristics of different types of rocks. c) Classify different types of rocks into igneous, sedimentary and metamorphic rocks d) Identify and list common minerals found in PNG. e) Identify the physical characteristics of different minerals. f) Identify and describe examples of the uses of rocks and minerals in daily life. g) Define and present a simple description of the basic process of fossil formation.
Assessment Tasks	1. Describe the formation of rock. 2. List common minerals and where they are found in PNG.

Unit 2: **Weather and Climate**

Content Standard	**5.3.2** Investigate weather and seasons and the effects they have on living things and the environment.
Performance Standards	a) Identify and explain the different types of clouds. b) Discuss how clouds affect weather and make predictions of the weather by observing movement of the clouds. c) Identify and list the types of seasons in Papua New Guinea and the world. d) Explain the characteristics of each season in relation to living things. e) Discuss how weather and seasons affect living things and human activities.
Assessment Tasks	1. Observe and draw different types of clouds. 2. Write a poem to describe weather, climate or season. 3. Draw pictures to show different types of plants and animals in different seasons.

Assessment and Reporting

Good assessment is an integral part of good instruction. The most effective teaching align the content standards with instruction and assessment.

In Standards Based Curriculum, assessment is viewed not only as a final product (summative), but more importantly as a continual process (formative) that provides pupil performance data to teachers and students regarding their progress towards achieving the intended standards.

What is Assessment?

The term ‘’assessment” is generally used to refer to all activities teachers use to help students learn and to monitor and measure student progress. It is an ongoing process.

Purpose of Assessment

The purpose of Assessment is to inform:

- Students about their progress and achievements in their learning
- Teachers of the progress of students learning in order to adjust teaching and planning to improve students’ learning
- Parents and guardians, about their children’s progress and achievements
- Schools, province and NDOE to make decisions about how to improve the quality of teaching and learning in the education system
- Other educational institutions and the communities about the standards of teaching and learning strategies, curriculum and resource allocation that may affect students’ learning.

The overall assessment is seen as an integral part of the learning and teaching program rather than a separate process.

Types of Assessments

There are three types of assessments in the Standards Based curriculum. These are;

- Assessment *as* / in
- Assessment *for* and
- Assessment *of*

Assessment ***as/in*** and Assessment ***for*** are also known as Formative Assessments and Assessment ***of*** is also known as summative assessment.

Assessment *as or in* learning

Assessment ***as*** or ***in*** Learning is the use of a task or an activity by the teacher in his/her everyday teaching to allow students the opportunity to use assessment to further their own learning. Self and peer assessments allow students to reflect on their own learning and identify areas of strength and weakness. These tasks offer students the chance to set their own personal goals and advocate for their own learning.

Assessment *for* Learning

Assessment ***for*** Learning, also known as classroom assessment, is different. It is an ongoing process that arises out of the interaction between teaching and learning. It is not used to evaluate learning but to help learners learn better. It does so by helping both students and teachers to see:

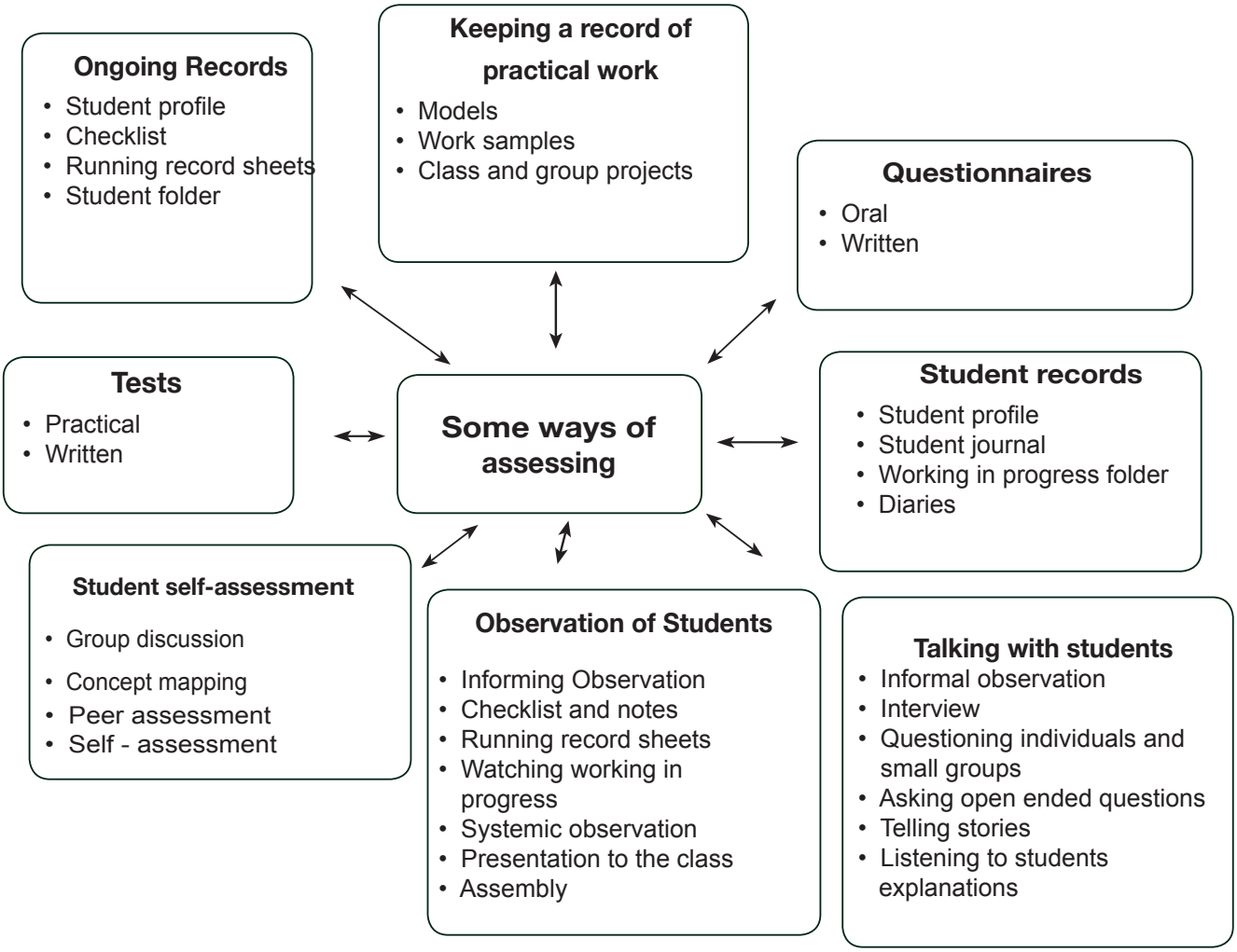
- the learning goals and criteria
- where each learner is in relation to the goals
- where they need to go next, and
- ways to get there.

Assessment *of* Learning

Assessment ***of*** Learning is the use of a task or an activity to measure, record and report on a student's level of achievement in regards to specific learning expectations such as unit tests and end of term or year exams.

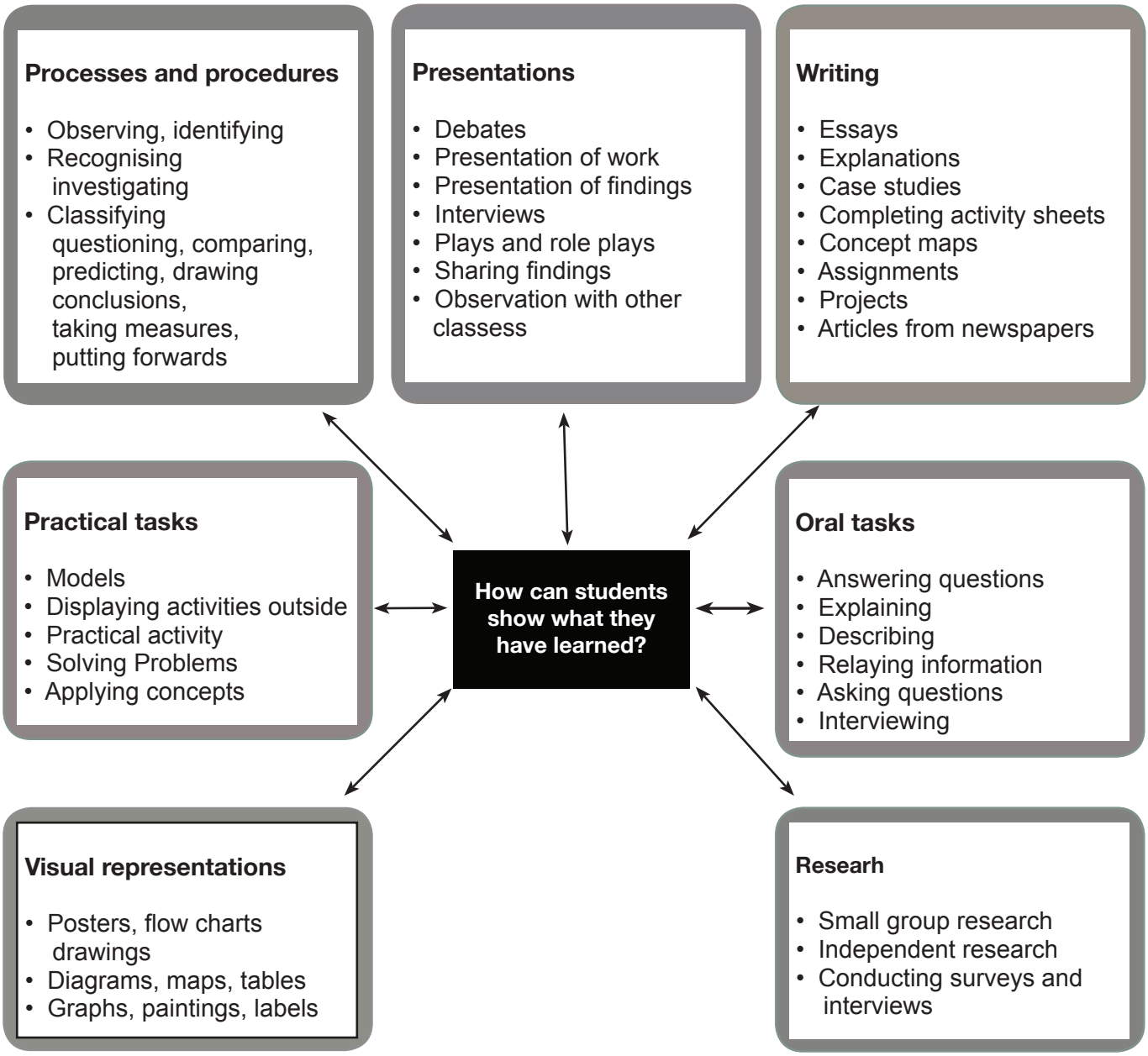
Methods of assessment

Assessment is an integral part of students learning and can be done using different methods. Below are some of these methods.



Recording, Reporting and Evaluating

Assessment is an integral part of students learning and can be demonstrated in many ways. Below are some of these ways.



Glossary

Words	Definitions
Assessment	Activities teachers use to help students learn and to monitor their progress.
Assessment As/In Learning	Is a design to inform students what they will do well and what they need to improve on daily/weekly bases as an integral part of everyday teaching and learning such as exercise, activities or experiments students do or practice in each lesson.
Assessment For Learning	A common form of assessment. It is an ongoing process that arises out of the interaction between teaching and learning. Also referred to as formative assessment.
Assessment Of Learning	Provides a summary of students learning over a set period of time and is generally carried out at the end of a course or project. Sometimes it is referred to as summative assessment and are evaluative.
Assessment Strategies	Different styles and ways of assessing students work.
Assessment Tasks	On-going test of knowledge, skills and attitudes/values gained throughout the particular unit or topic.
Benchmark	A benchmark is a required standard or yardstick in which something is measured against. In the national curriculum, it is set to evaluate and validate the standard of curriculum as well as the effectiveness of teaching and learning at the end of each level of schooling. In PNG, Benchmarking is referred to as assessment of content standards at the end of each level of schooling such as Elementary 2, Grade 5 and Grade 8.
Classify	To group things based on common characteristics.
Content Standard	A broad statement of what students need to know, understand, and be able to do as intended by the syllabus. They define the breadth and depth of knowledge, skills and processes and attitudes and values that are to be taught in the strand, unit or topic.
Compare	To identify similarities and differences between objects, concepts or processes.
Describe	To state words (using diagrams where appropriate) the main points of a topic.
Differentiate	To identify the differences between the objects, concepts or processes.
Identify	To select and or name the object, event, concept or processes.
Investigate	To find out by carrying out experiments.
Performance Standards	A descriptive statement of the knowledge and skills that students may display as they work towards the achievement of the content standard. The performance standards are examples only. Performance standards make content standards operational.
Process standard	The process and skills that students will are expected to learn and be able to do within the context of science content.
Standards Based Education	Is an academic program in which clearly defined academic content, performance standards are aligned. It spells out what schools and communities need to do to ensure achievement of expectations. It is a philosophical concept that is centered on the process of planning, developing, delivering, monitoring and improving education programs.
Standard Based Curriculum	Is a cumulative body of knowledge and set of competencies that form the basis for a quality education.
Standard	A standard is a level of quality or achievement, especially a level that is thought to be acceptable. It is something used to measure or estimate the quality or degree of something, for example, how good a piece of work is.
Standards Based Education Assessment	Is a learning system and is a systematic and ongoing process of collecting and interpreting information about students achievements.
Scientific Inquiry	Refers to activities through which students develop knowledge and understanding of scientific ideas as well as understanding how scientists study natural world.

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