



Solomon Islands Government

SECONDARY SCIENCE SYLLABUS



Years 7 - 9

Ministry of Education and
Human Resources Development





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Foreword

This Science Syllabus is to be used by teachers to teach secondary Learners from Year 7 to Year 9 through out Solomon Islands. It builds upon concepts, skills, attitudes and values from primary school and links to concepts, skills, attitudes and values in science learning in secondary schools, thus providing a sound foundation for further scientific learning.

This Secondary Science Syllabus is a three (3) years program designed for the Secondary Education in Solomon Islands. It is designed to provide Learners opportunities to do basic training in Science from Year 7 to Year 9. It is as useful for those who leave school at the end of three years in their basic education as well as for those continuing into higher and further scientific studies.

Indigenous science is our livelihood, which we have inherited from the past generations. It consists of wealth of knowledge and skills about the way we live and interact with our environment. Therefore, modern science concepts should not be over-emphasised, such that they should replace our Indigenous scientific practices. Instead, they should complement our Indigenous scientific concepts and practices to improve our scientific knowledge, skills and attitudes to a level that will benefit us in our future livelihood. This can contribute to enhance our social and economic development. Science education provides a foundation for a highly knowledgeable, skilled and innovative workforce, which is crucial to address the needs of the industrial and technological advancement of Solomon Islands.

The challenge for science teachers is to use the syllabus to shape the learning experiences of all learners with the mind to support their development as independent and lifelong learners. Science teachers must always keep in mind the aims of teaching Science and effective integration of processed skills and attitudes as outlined in the secondary science syllabus.

As the Minister responsible for the provision of education services in the Solomon Islands, I now endorse this syllabus as the official document for teaching and learning of Science in Secondary Schools throughout the Solomon Islands.



Hon. Reuben Inoana Dick Ha'amori
Honourable Minister of Education, 2013
Ministry of Education and Human Resources Development

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- Secondary Science Advisory Committee members (2004 – 2009)
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Section 1. INTRODUCTION

The National Curriculum Statement states that Education is a lifelong learning process. In Solomon Islands, an outcome based education approach was adapted to develop the science syllabus and learning and teaching materials. The Science Syllabus has been designed using Learning Outcomes which identify the knowledge, skills, attitudes and values that all Learners should achieve and demonstrate by the end of Year Nine (Yr. 9). The syllabus integrates scientific and local knowledge to ensure the syllabus provides relevant skills and knowledge for all learners. Science is one of the national curriculum learning areas and builds on the teaching and learning of fundamental knowledge and skills from Year 1 to 6 in the Primary level.

Learning in science is fundamental to understanding the world in which we live and work. It helps people to clarify ideas, to ask questions, to test explanations through measurement and observation, and to use their findings to make predictions and establish the worth of an idea. It also involves investigating the living, physical, materials and technological components of the environment and creative processes of investigation and exploring natural and man-made processes in the environment. It also provide an opportunity for learners to investigate other scientist's constantly evolving body of knowledge and make important contributions to the decisions which are shaping our world and the world for future generations. The syllabus also provides learners with time and space to reflect on learning about the diverse systems of indigenous knowledge development and skills transfer practised for many years in the past. Learners can be able to explore inter-relationships between contemporary models of science and traditional ways of constructing knowledge in order to value both systems that sustains resources and life.

The syllabus emphasises learners working individually and in groups, in planning and conducting investigations. They evaluate issues and problems, identify questions for inquiry and draw evidenced based conclusions from their investigations. Through this problem solving process they develop their critical thinking skills and creativity. Learners are provided with experiences in making informed decisions about the environment, the natural and technological world and in communicating their understanding, ideas and perceptions. The practical nature of the subject must be emphasised through hands on activities that will occupy a substantial amount of time. All learners will be required to undertake research projects', hands on" practical investigations and other individual tasks. The Science Curriculum is designed to encourage all learners to continue their participation in Science education as a compulsory subject and beyond. With ability and interest in science, some will continue to study science as an integrated subject, some will study specialist science subjects and others may do both.

Assessment is an important component of teaching and learning and is integrated into the teaching and learning activities of science. The emphasis is on continuous assessment and as such will provide feedback to learners and the teacher on learner's progress towards achievements of the learning outcomes. It helps learners improve their standards of achievements by knowing what they need to do well and where they need to improve. In Science, teachers will gather evidence from learner's work during the course of the term and uses those continuous assessments to improve their teaching and learner's learning.

To promote a contemporary and comprehensive science education, this curriculum has been organized into learning strands. The four strands in science are: Life and living, Manufactured and processed materials, Energy and Change and Planet Earth and Beyond. These strands provides the broad learning contexts and are further subdivided into sub strands as units and topics in the Secondary Science curriculum.

Section 2. RATIONALE

The future development of Solomon Islands depends on the sustainable management and use of our natural resources. Agriculture, forestry, fishery, mining and manufacturing, to name a few, are sectors that are still developing, and these sectors require special skills to fully utilized and managed. A scientifically literate population, both rural and urban, is necessary to make both commercially viable and environmentally friendly decisions.

Science education should develop knowledge, understanding and skills to explain and make sense of the natural world, enabling people to make informed choices and responsible decisions as individuals and as part of the community. Science is important to our society and doing the appropriate science is critical to Solomon Islands. Scientific methods or the systematic enquiry are effective ways to explain natural phenomena and predict future events or develop new products.

Modern science education is seen as one that helps connect learners making senses of the natural world, their culture, society and work, and most of all with themselves. Learning basic science is essential to build knowledge [facts] to be used in practical science. Science practices evolve through repeated experimentation, patterns, making hypothesis and predictions. Ultimately, year 7-9 science focuses on all Learners developing scientific literacy in these main areas, life and living, materials, earth and beyond, energy forms and technology so that they become better-informed adults and aware of developments in these areas.

Indigenous science [IS] inherited from past generations provides us with a wealth of knowledge and skills about the way we live and interact with the environment. It [IS] show many skills that people use every day to solve problems, creativity, critical thinking, group work, effective use of technology and it value lifelong learning as well as being sensitive to ethical and cultural issues. The teaching and learning of other subjects like Agriculture, Home Economics, Technology, Health and Physical Education are very much dependent on a good foundation of basic science knowledge taught in Year 7-9 at Secondary school level.

Basic secondary science education in year 7-9 is a continuation from primary science where Learners learn to evaluate issues and challenges, identify questions for inquiry, draw evidence-based conclusions from information available and communicate findings accurately and effectively. Preparing learners for the future, require that more emphasis are placed on developing special skills to seek access to information and to organize information in ways that will be productive in resolving the changing issues of life and living. Achieving a better future for Solomon Islands will become a reality through improved scientific literacy levels of everyone. The secondary science education year 7-9 provides learners with a science foundation for better living, further education and formal work.

Section 3. AIMS

This syllabus aims to provide scientific understandings for all learners in Solomon Islands to enable them to use and apply what they learn in their own communities. The Science syllabus has an overall aim to present the scientific knowledge, skills, values and attitudes within the context of Solomon Islands society. The syllabus should fulfill two major purposes. Firstly, it provides useful scientific skills and knowledge for Learners who would leave school at the end of Year 9. Secondly, it offers a good science foundation for Learners who are able to continue further studies.

In broader terms, this syllabus will enable learners to develop:

- knowledge and understanding about their physical surroundings, the materials, plants and the animals of their world and themselves
- knowledge and understanding about the relationships and interactions between these physical and biological elements
- the ability to investigate and communicate scientifically and to use scientific knowledge for their own and their local community's advantage
- an appreciation of the changes and new approaches involved in learning science.

Specifically, the development of such knowledge, understanding and skills will enable learners to;

- think logically and satisfy their curiosity about the world around them
- plan and complete investigations and solve problems in a scientific manner
- compare similarities and differences between indigenous and modern scientific knowledge, values, observations and assumptions
- use their secondary science learning to prepare for tertiary education and direct employment
- develop their own opinions about the advantages or disadvantages of the use of science and technology
- appreciate the use of indigenous and modern scientific knowledge as a tool to understand, protect and preserve their culture and environment and to persuade others to do so.
- take appropriate action regarding the use and care of the environment and natural resources of Solomon Islands
- actively support ways in which science can usefully help in sustaining local resources for the benefit of all Solomon Islanders
- actively support and participate in good scientific knowledge that pose no threat to local resources and the community at large
- promote co-existence of all living organisms, including human beings
- live a healthy life and enjoy personal well being.

Section 4. SYLLABUS STRUCTURE

The structure of the syllabus for Years 7 to 9 for Secondary Science is presented in Section 12. It is a series of Strand and Sub-strand. Under the sub-strand is a general statement that gives specific areas of teaching and learning for the strand and sub-strand. It also gives the general learning outcome, specific learning outcome and assessment events. A template for the syllabus structure is provided here.

Subject: Science Year: Level Strand: Title		
<p>Strand: Title A Strand is the term for the main areas of study into which the subject is divided. In Science there are four (4) strands: <i>Life and Living</i>, <i>Natural and Processed Materials</i>, <i>Energy and Change</i> and <i>Earth and Beyond</i>.</p>		
<p>Sub-strand: Title (No. of periods) A Strand is divided into a Sub-strand. This is the specific study area of the <i>strand</i>. For example, within the Secondary Science “<i>Earth and Beyond</i>” Strand, there are four (4) Sub–strands in Year 7: This section contains the title of each Sub-strand.</p>		
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>General Learning Outcomes are general statements that state what learners will know, understand, or appreciate as a result of a learning activity. General Outcomes are usually expressed as <i>Knowledge (k)</i>, <i>Understanding (u)</i>, <i>Skills (s)</i>, <i>Attitudes (a)</i> or <i>Values (v)</i> :</p> <ul style="list-style-type: none"> ▪ know...(k) ▪ understand...(u) ▪ be able to do...(s) ▪ appreciate...(a/v) <p>The General Learning Outcome is coded (numbered) in the syllabus, for example:</p> <p>7.1.1 be able to work safely in the science laboratory (s)</p>	<p>Learners should be able to</p> <p>Specific Learning Outcomes are specific statements that specify what learners can do and demonstrate if they have achieved the Learning Outcomes. They are usually observable and measurable.</p> <p>The specific learning outcomes are coded (numbered) in the syllabus, learner books, teacher’s guide, learner’s record sheet, learner’s monitoring sheet and learner’s report sheet, for example:</p> <p>7.1.1.1 apply safety procedures when doing science experiment in science laboratory</p>	<p>Learners can be assessed on</p> <p>For selected Specific Learning Outcomes, there is a Suggested Assessment Event.</p> <p>This is a suggested way of assessing one or more Specific Learning Outcomes formally for the purposes of knowing and recording the learner’s achievement and progress.</p> <p>Other Specific Learning Outcomes will also be assessed but the assessment need not be recorded.</p> <p>Examples are given in this column</p> <p>Other activities or Assessment Events are also in the Learner’s Book</p>

Section 5. STRAND STATEMENTS

Introduction to Science

In Year Seven, learners are introduced to measurements and physical quantities such as length, volume, mass, density, force, pressure, distance, time and speed. They are also given the opportunity to learn about scientific processes, skills, basic equipments, laboratory rules and perform skill-based activities in simple investigations, practical experiments and fieldwork. This section is seen as the pivotal to all other strands so it was introduced at the beginning of secondary science.

Strand 1: Life and Living

Living things have great diversity of structure and lifestyle; they interact with each other and with the world in which they live. Learners collect information about the ways organisms live in order to develop an understanding of those structures, which enable living things to function effectively in their environments. Learners identify patterns of interactions within environments. They recognize that these interactions contribute to the dynamics of environments. The key concepts of the Life and Living strand are: (i) the characteristics of an organism and its functioning are inter-related, (ii) evolutionary processes have given rise to a diversity of living things, which can be grouped according to their characteristics, and (iii) environments are dynamic and have living and non-living components, which can interact.

Strand 2: Natural and Processed Materials

All materials have properties that are determined by their underlying structures. Materials are grouped according to different properties. Learners study the ideas that scientists have about the structures of materials. They investigate the properties of materials; how the properties change; and the effect of changes on the usefulness of materials. They interpret data on factors, which affect the rate at which materials react. The key concepts of the Natural and Processed Materials strand are: (i) the properties and structures of materials are interrelated, (ii) patterns of interactions between materials can be identified and used to predict and control further interaction, and (iii) the uses of materials are determined by their properties, some of which can be changed under certain conditions.

Strand 3: Energy and Change

The World in which we live is been molded by forces, which influence the motion, shape, behavior and energy of objects. The efficient control of energy transfer and transformation is integral to the organization and development of life. Learners explore the effects of forces in their lives. They consider methods of harnessing energy, the way energy is used, and the social and environmental consequences of energy use. The key concepts of the Energy and Change strand are: (i) the forces acting on objects influence their motion, shape, behavior and energy in interactions and changes, (ii) energy is transferred and transformed but is not created or destroyed, and (iii) there are different ways of obtaining and utilizing energy and these have different consequences.

Strand 4: Earth and Beyond

The universe, of which the Earth is a part, has many components. Learners explore ideas about the dynamic nature of the earth, solar system and universe. They develop an understanding of the scales of time and space over which events on the earth and in the universe occur. They investigate the many ways in which living things use the Earth, solar system and universe as resources and recognize the effects of this use. The key concepts of the Earth and Beyond strand are: (i) the earth, solar system and universe are dynamic systems, (ii) events on earth, in the solar system and in the universe occur on different scales of time and space, and (iii) use of resources by living things to meet their needs has effects or impacts on the earth, the solar system or the universe.

Section 6. PROCESSES AND SKILLS

This table presents the range of analytical approaches and methods of science learning : Observing; Communicating ; Measuring ; Predicting ; Inferring ; Following procedures ; Classifying ; Interpreting data ; Formulating hypotheses; Working with others and Designing experiments. It shows the progression of these skills through the three (3) years of the secondary science-learning program.

Year	Planning Investigations	Conducting Investigations	Processing Data	Evaluating and Monitoring	Reporting and Communication
	The learner:	The learner:	The learner:	The learner:	The learner:
7	<p>plan simple scientific investigation</p> <p>predict expected results for scientific investigation</p>	<p>follow procedures and instructions when conducting investigations</p> <p>observe organize and use scientific equipment correctly</p> <p>classify, measure, collect and record data accurately</p>	<p>observe, classify, display data and draw scientific conclusion</p>	<p>Evaluate and monitor activities in investigations or experiments and communicate expected outcome</p> <p>observe, assess monitor and communicate dangers when conducting experiment</p>	<p>communicate ideas, observations, debate and make group discussion using correct language</p> <p>write and communicate as a team</p> <p>write and communicate laboratory report</p>
8	<p>plan scientific investigation</p> <p>predict expected results for scientific investigation</p>	<p>conduct experiment and investigation to solve scientific problems</p> <p>compare and suggest ways of solving problems and give explanations</p>	<p>observe, make comparison and classify scientific information using drawing, graphical and other forms</p>	<p>observe, assess, monitor and communicate dangers when conducting experiment</p>	<p>explore the environment and communicate as individuals as well as a team</p> <p>write and communicate a laboratory report</p>
9	<p>plan scientific investigations</p> <p>predict expected results for scientific investigations</p> <p>identify variables, control and observation</p> <p>predict outcomes of experiment</p>	<p>use simple scientific equipment when conducting scientific investigations</p> <p>record data in simple tables, diagram for reporting scientific activities and experiments</p> <p>conduct and record observations for writing a scientific report</p>	<p>present and interpret data</p> <p>observe and identify trends, pattern and differences</p> <p>organize, classify and summarize data</p>	<p>observe, monitor and identify difficulties experience in conducting investigation</p>	<p>communicate scientific ideas to others by written oral, graphical and other forms</p> <p>explore the environment and communicate as individual as well as a group</p> <p>write and communicate a laboratory report</p>

Section 7. CONTRIBUTION TO KEY LEARNING OUTCOMES

This syllabus contributes significantly to the main Key Learning Outcomes. The specific learning outcomes lay the foundation to the Key Learning Outcomes.

Key Learning Outcomes	Secondary Science Contribution
1. Culture promotion Awareness of the Solomon Islands culture; in particular, the promotion of the concept of 'unity in diversity', the need for equity, and inclusiveness.	Traditional scientific knowledge and skills ; their integration with the western scientific knowledge and skills ; the importance of traditional technologies for appropriate use of the environment and its resources.
2. Lifelong learning Realization that learning is a lifelong experience, encouragement of innovation, creativity, and a positive view of learning after school.	Investigations and experiments develop open-mindedness, curiosity, creativity, and a capacity to solve problems in everyday life.
3. Ethics, good citizenship and national unity Development of positive, moral and ethical values, with respect to others, based on personal integrity and social responsibility ; focused on : values education ; civics and citizenship ; peace and reconciliation.	The development of a sense of responsibility, and orientation towards preservation of the country's natural resources and environment are the intended learning outcomes of the sub strands in the program. Development of values and attitudes, promoting peace, unity in our diverse and multi-ethnic society.
4. Technology Use of appropriate traditional and modern technology to improve livelihoods and community standards of living.	The concepts and understanding developed in this syllabus will contribute towards good understanding of how equipment and electrical appliances operate; the basis of industrial processes; and application of practical strategies for the improvement of livelihoods.
5. Entrepreneurship The development of entrepreneurial skills for making a living through initiative and creativity.	The syllabus is concerned with solutions of practical problems, the application of learning, exploring phenomena, thinking laterally, developing strategies for problem solving and making predictions. The emphasis on practical skills may be used in productive ways and is fundamental for job creation and to discourage destructive ways as studied in science.
6. Personal, Social and Health development Development of interactive skills, social sensitivity, free and fare working environment, better health awareness and good practices.	The concepts and understanding developed in this syllabus will encourage working collaboratively, being open minded and receptive to new ideas as part of the science processes; acting responsibly and evaluating environmental impacts that are related to health practices.
7. Environment, conservation and climate change Development of knowledge, positive attitudes and values toward the preservation and conservation of the environment as well as, adaptation and management of the effects of climate change. This will include understanding of the hazards and planning, and management of the impacts of disasters.	The concept in the syllabus offers learners to appreciate the importance of looking after your environment. A clean environment reduces the risk of getting ill. The syllabus also offers knowledge and skills to preserve and conserve our resources that are important to small island state like ours. Learning the scientific knowledge about the causes of climate changes is paramount to make informed decisions about the adverse impact it has on all living organisms.
8. Development of the whole person Holistic development of a person mentally, socially, spiritually and physically as well as to care for the environment with good health practice	The syllabus offers holistic approach to the learner; it provides basic scientific knowledge to live harmoniously with the environment and people around.

Section 8. LEARNING, TEACHING AND ASSESSMENT

8.1 Learning and teaching approaches

8.1.1 General

The secondary school years are important for building on learner's understanding of the content, skills, attitudes and values in Science. It builds upon concepts, skills, attitudes and values from primary school and links to concepts, skills, attitudes and values in higher science learning. It provides a sound foundation for further scientific learning and develops confidence in learners about what they can do in science and an appreciation of what science is and what scientists can do.

The Science syllabus uses a learner-centered approach as a way to guide and facilitate Learners' learning. A learner-centered approach provides Learners with the opportunity to practice and develop critical thinking, problem solving, decision-making as well as acquiring a range of practical skills and knowledge. A learner-centered approach means that teaching and learning approaches need to be flexible to cater for individual differences and learning should be relevant and meaningful to the experiences and needs of the Learners. This is an approach that allows teachers to be more flexible in determining the most effective ways to help all Learners achieve learning outcomes. Learners learn best through active involvement through observation, interaction, experimentation, carrying out investigations and research.

In Science, Learners are encouraged to think critically about what they are learning and to take responsibility for their learning. They learn to teach each other and to learn from each other: to work cooperatively in groups and to work individually. In this way, they will know that learning has a serious purpose. They enjoy using a wide range of resources and developing a wide variety of skills and techniques. Learners learn how to communicate well with others, how to work things out for themselves and how to get the information they need. They become confident when given the opportunity to use their knowledge and skills to solve problems and make effective decisions.

8.1.2 Safety

Taking reasonable precautions to ensure the safety of teachers and learners is essential. Familiarize with materials and the situations in science teaching and learning which may have some risk to their own or their Learners' safety is vitally important. Putting teachers or Learners at risk by carrying out any experiment or activity if they are not very sure about the risks being taken or the precautions required must be taken into account. If teachers are in any doubt about the safety of an experiment or an activity, they should not carry out that experiment or that activity. Instead they should contact a more experienced teacher or the head of department or even the Principal Curriculum Development Officer for Science where convenience. Advice on the safety precautions for specific instances where extra care is required by teachers and learners will be provided in the teacher's guides and learner's also in some sections in the syllabus.

8.1.3 Integration of indigenous knowledge, scientific processes and skills

The integration of our indigenous scientific knowledge across the syllabus to capture the cultural norms, beliefs, values and uniqueness of Solomon Islands is paramount. The use of learner's prior knowledge on their culture and environment is fundamental for the understanding of scientific concepts, abstract ideas and concepts in social and applied science. Integration of scientific processes, skills, the use of equipment and the history in science is very important in understanding the science content in the national curriculum. It is essential for teachers to integrate these aspects in the teaching and learning of science.

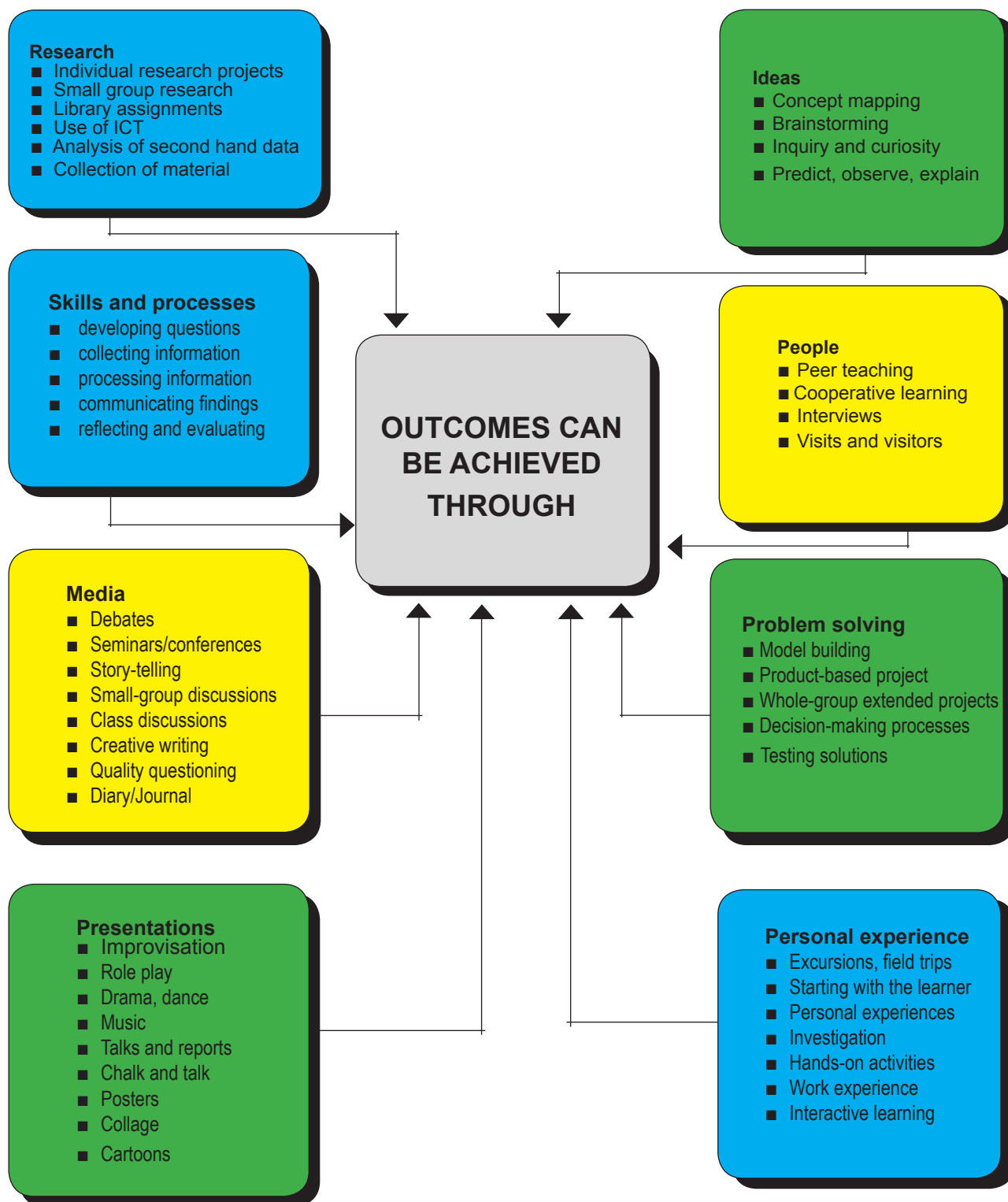
8.1.4 Science and Society

Science as a '*way of knowing*' is shaped by the ways in which humans understand natural phenomena. On these understandings, humans make decisions about science and its applications which have short and long-term implications for the entire planet. Students study the relationship between the nature and direction of science and society's perspectives and values. They construct understandings of the manner in which scientific knowledge is developed and the influence of historical and cultural factors on science.

The key concepts of science and society are historical and cultural. These factors influence the nature and direction of science which, in turn, affects the development of society. Science as a '*way of knowing*' is shaped by the ways that humans construct understandings and make decisions about the ways science is applied. This has short- and long-term implications for the environment, communities and individuals.

8.1.5 Teaching Strategies

A range of strategies for helping learners to achieve the overall learning outcomes are shown below. They are grouped into 8 categories.



8.2 Links with other subjects

Subject	Link Description
Agriculture	The study of living things and how they interact with the surrounding environment and the important aspects of understanding soil properties, animal systems and plant systems as studied in Agriculture.
Social Studies	The study of climate, weather, and rock types is fundamental in understanding the environment and geological forces that explain causes of earthquakes, tsunamis and volcanoes as studied in Social Studies.
Technology	The understanding of material technology is fundamental to the appreciation of local materials in the environment, including solar power as studied in Technology.
Business Studies	The study of plants and animals as our important natural resources helps us to appreciate them being key players in our national economy as studies in Business Studies
Home Economics	The understanding of human systems including digestive systems and nutrition is fundamental in understanding related sub strands studied in Home Economics.
Physical Education	The understanding of first aid, human skeletal, circulatory and respiratory systems is fundamental in understanding safety, health, fitness and human anatomy studied in Physical education.
Health Education	The understanding of human systems and diseases is fundamental in understanding good habits and healthy life style, as studied in health education.
Arts and Culture	The understanding of culture is fundamental in understanding and applying of the existing indigenous scientific knowledge in every day life.
Mathematics	The understanding and use of mathematical skills and calculation is fundamental in understanding and applying Scientific knowledge, skills, attitudes and values.
English	The understanding and use of English is fundamental in understanding and applying scientific knowledge, skills, attitudes and values.
Christian Education	The partly and/or unanswered questions and observation of scientists in the natural world lead to search further beyond the scientific theories. Christian Education study helps us Christians to appreciate God's divine creation of all things we have around us in nature.

8.3 Sensitive Issues

Controversial and sensitive issues such as gender, religious differences and cultural beliefs must be considered in the teaching and learning processes. These issues are debatable and involve a wide range of views, opinions, interests and values. Science teachers are expected to be aware of such issues and to treat them in a sensitive manner.

In a class, there will always be learners who come from different backgrounds with different cultural and religious beliefs, customs and values. There might even be some learners with minor disabilities in the class. It is, therefore, the teacher's responsibility to take into account such diversities and to make necessary adjustments whenever the need arises in the process of planning, teaching, and learning.

8.4 Assessment Recording, Monitoring and Reporting

8.4.1 General

The main purpose of assessment is to improve student learning. Assessment needs to be **for** learning as well as **of** learning. It is used to evaluate and improve teaching and learning, report achievement and provide feedback to Learners on their progress.

Assessment measures *Learners' achievement of learning outcomes* as described in this syllabus. It is the ongoing process of identifying, gathering and interpreting information about Learners' achievement of the learning outcomes.

For teaching and learning to be outcome-based, teachers need to plan their teaching and assess learner performances in relation to outcomes using selected criteria derived from those outcomes.

Assessment in this syllabus involves focusing less on whether a learner has "passed" or "failed" and more on what outcomes a learner has achieved and in which areas further support is required.

8.4.2 Assessment, Monitoring and Reporting

A learner's achievement in Science at the end of year 9 will be assessed by a written science examination against the broad learning outcomes. Assessment of student progress towards achieving these broad outcomes is cumulative throughout years 7, 8 and 9 using specific outcomes for each unit. The national examination will be sat by all year 9 Learners throughout the Solomon Islands.

During the course of each sub-strand, learners must complete the suggested assessment event specified for the unit or each sub stand. Teachers will expand each task and provide clear guidelines to Learners for how the task will be completed and how the criteria will be applied.

The assessment tasks and criteria in each unit of the learners textbook ensure that there is a common focus for internal assessment in the subject across schools while allowing for flexibility in the design of tasks. A variety of tasks are specified to give Learners the opportunity to demonstrate all the broad learning outcomes in different ways and to improve the validity and reliability of the assessment.

It is important that teachers plan the teaching and learning sequence so that there is a balanced spread of assessment during the unit. Some tasks, such as investigations or case studies can be designed so that they are completed over a period of time rather than at the end of the unit. Other tasks can be done immediately after the relevant section of the unit has been covered.

8.4.3 Suggested Assessment Strategy and Criteria

Type of assessment	Assessment Strategy	Assessment Criteria Learners should be assessed on
Practical Experiments	Weigh or measure an object Read a chart or thermometer Use a piece of equipment Demonstrate a technique Perform an experiment	The ability to write appropriate titles, aims and objectives; brief statements of what to do and what the learner is expected to find; the ability to follow instruction; the ability to design and use a product, the ability to collect, record, calculate, analyze and interpret data; the ability to use equipment correctly; accurately and clearly, draw scientific conclusions and recommendations.
Oral Presentation	Make a verbal report Explain an event or procedure	The ability to make clear introduction; clarity of voice; clear instruction; clear explanation; link to scientific concepts and clear summary on scientific conclusion and recommendations
Research Investigation	Conduct simple guided research or an investigation Simple library research on a topic	Brief statements on aims and objectives; and what to do and what the learner is expected to find; the ability to follow instruction; the ability to design and use a product, the ability to collect, record, calculate and analyze and interpret data; the ability to use equipment correctly; accurately and clearly, draw scientific conclusions and recommendations.
Written test Assignments Home work Quiz	Provide a written report Write short answer in response to questions Complete a written test Perform a calculation from data provided	The ability to answer questions correctly; apply correct use of formula and units; clear explanations and link with scientific concepts and clear scientific conclusion.

8.4.4 Recording and Reporting

Teachers must keep **accurate** and **consistent** records of learner's achievements of the learning outcomes by recording the results of the suggested assessment events. They must report these achievements in fair and accurate way to *parents, guardians, teachers* and *Learners*. The teacher must have a particular format/design in which recording of learners achievements are. Suggested recording methods includes anecdotal notes in a journal or diary, checklists, portfolios of learners work, progressive records and work samples with comments written by the teacher.

The purpose of reporting is to give information to learners about the extent to which they have achieved the expected learning outcomes. Reporting also gives feedback to teachers and parents. For every sub strand, the learning and teaching situation will have many assessment activities. Each sub strand of this syllabus presents at least one example of an assessment event.

The assessment events will be used to build a report on the learner's achievement over a period of time. A record of the learner's achievement of learning outcomes must be recorded in the form of a report.

8.4.5 A record of the learner's achievement of learning outcomes must be recorded in the form of a report (*Sample only*)

	Semester One									Semester Two								
Strands	1	1	2	2	3	3	4	4		1	1	2	2	3	3	4	4	
Assessment Event	Finding volume of objects								End of term									End of term
Names																		
Joe Blow	A1		PA 1	A	PA2	A	A	A		A		PA3	A	NA	A	A	PA4	

KEY:

A = LO Achieved

PA (PA 1 - 4) = LO Partially Achieved
PA1, PA2, PA3 and PA4

NA = LO Not Achieved

Section 9. CURRICULUM PROFILE

This section contains a brief explanation on the required time allocation and the number of periods per day and per week. It also outlines the time allocation for teaching the secondary Science syllabus.

Notes:

- 1) All periods are 40 minutes. There should be 8 periods per day, 40 periods per week.
- 2) All subjects are compulsory. All subjects must be continuously assessed through the Suggested Assessment Events in the main syllabuses. At present only English, Maths, Science and Social Studies are assessed nationally in year 9.
- 3) All learners will take Core Home Economics and Core Technology, 2 periods per week each, and will have a choice between Extension Home Economics and Extension Technology for a further 2 periods.
- 4) Personal development subjects are grouped together. Schools may either timetable 2 periods per week for each through out the course or block the periods so learners take more periods of one subject at one time and more periods of another subject later e.g. 4 periods of P.E. one semester and 4 periods of Health the next semester.

Suggested Secondary Curriculum Profile: Years 7 - 9

Subject	Periods per week	Total time in minutes per week	% of total timetable (1600 mins)	Status
Academic subjects				
English	5	200	12.5	Compulsory assessed
Mathematics	5	200	12.5	Compulsory assessed
Science	4	160	10.0	Compulsory assessed
Social Studies	4	160	10.0	Compulsory assessed
Total Academic	18	720	45.0	Compulsory assessed
Practical/vocational subjects				
Agriculture	4	160	10.0	Compulsory assessed
Business Studies	4	160	10.0	Compulsory assessed
Home Economics/ Technology	2 core each = 4 plus 2 extension, either H.E. or Technology	160 80	10.0 5.0	Compulsory assessed
Total Practical/ vocational	14	560	35.0	Compulsory assessed
Personal development subjects: Christian Education Arts and Culture Physical Education Health	8	320	20.0	Compulsory assessed
Total	40	1600	100	

Section 10. SCOPE AND SEQUENCE

The scope and sequence in science features the strand and sub-strand. Strand them is selected areas within the strand that captures the main area of study. The sub-strand codes give the scope within the strand and it progresses throughout from year 7-9.

Strand: Life and Living

Sub - strand	Year		
	7	8	9
Classification	7.2.1 - 7.2.6		
Cells Structure	7.7.1 - 7.7.9		
Living Systems	7.10.1 - 7.10.7	8.2.1 - 8.2.9 8.5.1 - 8.5.5	9.2.1 - 9.2.6 9.4.1 - 9.4.20
Ecology	7.12.1 - 7.12.6	8.5.6 - 8.5.10	9.5.1 - 9.5.5

Strand: Natural and Processed Materials

Sub - strand	Year		
	7	8	9
Atoms, Elements and Compounds	7.9.1 - 7.9.7	8.8.1 – 8.8.4	
Chemical Reaction		8.3.1 – 8.3.5	9.7.1 - 9.7.4
Changes	7.3.1 - 7.3.6 7.6.1 - 7.6.7		
Periodic Table		8.10.1 – 8.10.7	
Materials			9.3.1 – 9.3.7

Strand: Energy and Change

Sub - strand	Year		
	7	8	9
Energy	7.4.1 - 7.4.6		
Light and Colour	7.8.1 - 7.8.6		
Simple Machine and Stability		8.1.1 - 8.1.7	
Heat and Sound		8.6.1 - 8.6.12	
Electricity		8.11.1 - 8.11.4	
Magnets and Electromagnets			9.1.1 - 9.1.6
Communicating Technology			9.9.1 - 9.9.5

Strand: Earth and Beyond

Sub - strand	Year		
	7	8	9
Our Planet Earth	7.5.1 - 7.5.1.7 7.11.1 - 7.11.10	8.7.1 - 8.7.	
Atmosphere, Weather and Climate		8.4.1 - 8.4.9	9.6.1 - 9.6.
Minerals in Solomon Islands			9.8.1 - 9.8.10

Section 11. LEARNING PROGRAMME PLANNER

This section shows the entire learning program for the year 7-9 of the Secondary Science course and the suggested teaching times based on 17 Teaching Weeks per Semester and 34 Teaching weeks per Year in Year 7-9.

Year 7

SEMESTER ONE								
Weeks (17)	1	Week 2 - 6 (5 weeks)	Week 7 - 8 (2 weeks)	Week 9 - 11 (2 weeks)	Week 12 (1 week)	Week 13 - 14 (2 weeks)	Week 15 - 18 (4 weeks)	Week 19 - 20
Periods	Y E A R 7 							

Year 8

SEMESTER ONE								
Weeks (17)	1	Week 2 - 4 3 weeks	Week 5 - 7 3 weeks	Week 8 - 10 3 weeks	Week 11 - 12 2 weeks	Week 13 - 16 4 weeks	Week 17 - 18 2 weeks	Week 19 - 20
Periods	Y E A R 8	12 periods	12 periods	12 periods	8 periods	16 periods	8 periods	R E V I S I O N A N D E X A M
		Energy and Change	Life and Living	Natural and Processed Materials	Earth and Beyond	Life and Living	Energy and Change	
		8.1 Simple Machine, Structure and Stability The Ramp The Lever The Pulley System Gears Structures	8.2 Human Body Systems (I) Digestive System Circulatory System Respiratory System Excretory System	8.3 Chemical Reactions and Everyday Uses What are Chemical Reactions Reaction Types Rate of Chemical Reactions Importance of Chemical Reactions in our daily lives	8.4 Atmosphere, Weather and Climate Atmosphere Water Cycle Climate and Weather	8.5 Plant Processes and Marine Ecosystems <u>Plant Processes</u> Photosynthesis Respiration Transport Systems <u>Marine Ecosystems</u> Coral Reef Ecosystem inter-tidal Zone Ecosystem Mangrove Ecosystem	8.6 Heat and Sound Heat Energy Conduction, Convection and Radiation Sound energy, Waves, and Vibration The Human Ear	
SEMESTER TWO								
Weeks 17	21	Weeks 22 - 24 3 weeks	Weeks 25 - 27 3 weeks	Weeks 28 - 31 4 weeks	Weeks 32 - 35 4 weeks	Weeks 36 - 38 3 weeks	Week 39 - 40	
Periods	Y E A R 8	12 periods	12 periods	16 periods	16 periods	12 periods	R E V I S I O N A N D E X A M	
		Earth and Beyond	Natural and Processed	Life and Living	Natural and Processed Materials	Energy and Change		
		8.7 The Fragile Earth Major Geological Forces Volcanoes, Earthquakes and Tsunami	8.8 Small Particles of Matter Atoms, Electrons, Protons, and Neutrons Atomic Structures	8.9 Microbes and Malaria Parasite The Microscope Types of Microbes Reproduction of Microbes	8.10 Periodic Table Families of elements Patterns in the Periodic Table	8.11 Electricity Static Electricity Moving Electricity Safety with Electricity Cost of Electricity		

Year 9

SEMESTER ONE							
Weeks (17)	1	Week 2 - 4 3 weeks	Week 5 - 7 3 weeks	Week 8 - 11 4 weeks	Week 12 - 15 4 weeks	Week 16 - 18 3 weeks	Week 19 - 20
Periods	Y E A R 9	12 periods	12 periods	16 periods	16 periods	12 periods	R E V I S I O N A N D E X A M
		Energy and change	Life and Living	Natural and processed material	Life and living	Life and living	
		9.1 Magnets and Electromagnets	9.2 Sense and Control	9.3 Materials	9.4 Human Body Systems (II)	9.5 Human Effects on Ecosystems	
		Magnets and Properties Magnetic Fields Electromagnets and Application	Sight and hearing Smell, taste and touch Responding	Properties of metals and non metals Corrosion of metals Pure metals and Alloys Reactions of metals with dilute acids Plastics and fibres	Skeletal System Reproductive System Nervous System Endocrine System	Effects of humans civilization on the ecosystems Ecosystem Conservation	
SEMESTER TWO							
Weeks 17	21	Week 22 - 24 3 weeks	Week 25 - 27 3 Weeks	Week 28 - 29 2 weeks	Weeks 30 - 31 2 weeks	Week 32 - 38 7 weeks	Week 39 - 40
Periods	Y E A R 9	12 periods	12 periods	8 peridos	8 periods	R E V I S I O N A N D E X A M	
		Earth and Beyond	Natural and Processed Materials	Earth and Beyond	Energy and Change		
		9.6 Climate Change and Environmental Issues	9.7 More Chemical Reactions	9.8 Mineral and Energy Sources	9.9 Communicating Technology		
		Climate change Other global environmental concerns Climate change and challenges	Equations and Formulas Balancing Chemical Equations State of Reactants and Products	Mineral resources in Solomon Islands Energy resources in Solomon Islands	Electromagnetism Waves in communication Communication network Electronics		

Section 12. DETAIL SYLLABUS

12.1 Science Year 7 Syllabus

Subject: Science		Year: 7	Strand: Introduction to Science										
Sub-strand: 7.1 What is Science?		No. of Periods: 20											
<p>Science is finding out about how things work and why things happen the way they are. To explain how things work, we observe and do experiment or investigation. Scientific experiments or investigation is done in a systematic way. We used our five senses to help us carry out experiments, observation and investigation. In carrying out scientific experiments and investigations basic safety measures should be observed.</p> <p>Physical quantities are measured in terms of standardized units. Appropriate instruments must be used to measure the different quantities.</p>													
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events											
<p>Learners should</p> <p>7.1.1 be able to work carefully and safely in the science laboratory (s)</p> <p>7.1.2 know the basic laboratory safety rules (k)</p> <p>7.1.3 know the meaning of living and non-living things (k)</p> <p>7.1.4 know the main branches of science (k)</p> <p>7.1.5 be able to show two types of observations (s)</p> <p>7.1.6 understand the terms infer and predict (u)</p> <p>7.1.7 know the basic science laboratory equipment (k)</p> <p>7.1.8 be able to show scientific report writing (s)</p>	<p>Learners should be able to</p> <p>7.1.1.1 apply safety procedures when doing science experiments in the science laboratory</p> <p>7.1.2.1 list the basic laboratory safety rules</p> <p>7.1.3.1 describe living and non-living things</p> <p>7.1.4.1 describe the four main branches of science</p> <p>7.1.5.1 demonstrate the two types of Observation (Qualitative and Quantitative)</p> <p>7.1.6.1 explain inferring and prediction</p> <p>7.1.7.1 list and draw basic science laboratory equipment</p> <p>7.1.8.1 write a scientific report of a simple science experiment that has been carried out</p>	<p>Learners can be assessed on</p> <p>1. describe how to deal with the two situations in the science laboratory in a safely manner: a. broken beakers b. spilt acid</p> <p>2. state 5 characteristics of living things</p> <p>3. measure the extension of the spiral spring for each 50g mass added to it. a. draw a diagram of the equipment you use. b. record the measurements in a table as shown below.</p> <table><tr><th>Mass (g)</th><th>Extension (cm)</th></tr><tr><td>50</td><td></td></tr><tr><td>100</td><td></td></tr><tr><td>150</td><td></td></tr><tr><td>200</td><td></td></tr></table> <p>c. describe pattern observed in the data collected.</p> <p>4. express five benefits of science in your, village, school and town</p>		Mass (g)	Extension (cm)	50		100		150		200	
Mass (g)	Extension (cm)												
50													
100													
150													
200													

Subject: Science		Year : 7	Strand: Introduction to Science
Sub-strand: 7.1 What is Science?		No. of Periods: 20	
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events	
<p>Learners should</p> <p>7.1.9 know how to measure accurately (k)</p> <p>7.1.10 be able to use balances (s)</p> <p>7.1.11 know the five senses (k)</p> <p>7.1.12 be able to plan scientific experiments (s)</p> <p>7.1.13 appreciate benefits provided through science (a)</p>	<p>Learners should be able to</p> <p>7.1.9.1 state the appropriate units used for these measurements; length, height, distance, mass, time, speed, volume and temperature</p> <p>7.1.10.1 demonstrate the use of balances; beam balance and electronic balance</p> <p>7.1.11.1 list the five sense that scientist used for observation</p> <p>7.1.12.1 design a scientific experiment to solve a scientific problem</p> <p>7.1.13.1 describe at least five benefits science brought about in our daily lives today</p>	<p>Learners can be assessed on</p>	

Subject: Science Year: 7 Strand: Life and Living		
Sub-strand: 7.2 Classification of living things		No. of Periods: 8
This sub-strand deals with characteristics of living things. Plants and animals can be grouped or classified into different groups according to their characteristics. Scientists normally use keys to identify particular organisms. The main groups of living things are: <i>animals, plants, fungi, protists, and monerans</i> .		
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>7.2.1 know the characteristics of living things (k)</p> <p>7.2.2 know that living things grouped (classified) according to their body features (k)</p> <p>7.2.3 be able to use binomial nomenclature system of classification (s)</p> <p>7.2.4 understand the classification of vertebrates and invertebrates (u)</p>	<p>Learners should be able to</p> <p>7.2.1.1 describe the main characteristics of living things; Use energy, use air, breath, produce waste, respond to stimuli and grow</p> <p>7.2.2.1 identify the five main groups of living things as; -animals, plants, fungi, protist and monera</p> <p>7.2.2.2 state levels of classification (Kingdom, Phylum, Order, Family, and Genus and Species)</p> <p>7.2.2.3 name a domestic animal using the binominal nomenclature (Genus and Species)</p> <p>7.2.3.1 use a 2-choice key to classify domestic animal and plants</p> <p>7.2.4.1 explain what are vertebrates and invertebrate</p> <p>7.2.4.2 identify and give examples of vertebrates (mammals, amphibians, reptiles, mammals and fish)</p>	<p>Learners can be assessed on</p> <p>1. list in order the level of the classification</p> <p>2. identify the following animals as vertebrates or invertebrates. a. rat, b. starfish, c. snail, d. frog, e. human, f. shark, g. rhinoceros beetle, h. possum, i. earth worm</p> <p>3. explain the terms flowering and non-flowering plants. Give one local examples of each of the plant types</p>

Subject: Science		Year: 7	Strand: Life and Living
Sub-strand: 7.2 Classification of living things		No. of Periods: 8	
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events	
<p><i>Learners should</i></p> <p>7.2.5 know flowering and non-flowering plants (k)</p> <p>7.2.6 know fungi, monera and Protista (k)</p>	<p><i>Learners should be able to</i></p> <p>7.2.4.3 identify and give examples of different invertebrates</p> <p>7.2.5.1 identify and name a flowering and non-flowering plant</p> <p>7.2.5.2 draw the parts of a flower (differentiate male and female parts of flower)</p> <p>7.2.6.1 identify and give examples of fungi, monera and protista</p>	<p><i>Learners can be assessed on</i></p>	

Subject: Science Year: 7		Strand: Natural and Processed Materials
Sub-strand: 7.3 Solids, Liquids, and Gases		No. of Periods: 12
<p>This sub-strands deals with solids, liquids and gases. These are different forms of a substance (matter). These forms of substance are inter-changeable under given conditions. These changes are physical changes. Physical change makes the substance looks very different but it is the same thing. Another type of change is called chemical change. Chemical change, the substance(s) formed into a totally new substance.</p>		
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>7.3.1 know that everything surrounding us is made up of matter (k)</p> <p>7.3.2 understand the different states of matter (u)</p> <p>7.3.3 be able to investigate physical changes (s)</p> <p>7.3.4 be able to show that in a physical change the mass of the substance remains the same, only particles rearranged (s)</p>	<p>Learners should be able to</p> <p>7.3.1.1 state that matter is a substance that has mass and occupies space</p> <p>7.3.1.2 use the idea of <i>particle movement</i> to explain the difference between the three states of matter: <i>solids, liquids</i> and <i>gases</i></p> <p>7.3.3.1 investigate and explain the changes caused by heating and cooling of <i>solids, liquids</i>, and <i>gases</i></p> <p>7.3.3.2 draw a simple particle diagram to show the change of state from one form to another</p> <p>7.3.3.3 use a thermometer to measure temperature of rain water and boiling water</p> <p>7.3.4.1 conduct an experiment to observe that in a physical change the properties of the materials change, but the mass remains unchanged: <i>melting of ice cubes</i></p>	<p>Learners can be assessed on</p> <p>1. list different examples of a solid liquid and gas</p> <p>2. describe what happens to the particles when water boils</p> <p>3. perform a candle burning activity and describe the changes observed. Classify each change observed as physical or chemical changes</p> <p>4. demonstrate the use of thermometer to record temperature of hot water and explain why it is more accurate than feeling with your hands</p>

Subject: Science Year: 7		Strand: Natural and Processed Materials
Sub-strand: 7.3 Solids, Liquids, and Gases		No. of Periods: 12
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>7.3.5 be able to demonstrate the difference between a physical change and chemical change (s)</p> <p>7.3.6 appreciate the significant of solid, liquid and gas in everyday life (a)</p>	<p>Learners should be able to</p> <p>7.3.5.1 perform the following activities. To see the difference between physical change and chemical change: <i>boiling an egg, burning of wood to charcoal, keeping an unripe tomato to ripen</i></p> <p>7.3.6.1 express with illustration how the process of change of state help with drying of wet clothes</p>	<p>Learners can be assessed on</p>

Subject: Science Year: 7 Strand: Energy and Changes		
Sub-strand: 7.4 Energy		No. of Periods: 4
<p>This sub-strand deals with energy. Energy is the ability to do work. There are different forms of energy including gravitational, elastic, electrical, heat and sound. Energy can, neither, be created nor destroyed, but can be changed from one form to another. The source of all energy is the sun. Renewable energy sources are sources that are continually replenished or restocked. These energy sources include energy from sun, water, wind, geothermal and biomass. The non-renewable energy sources cannot be replenished, once they used up, you have to find another source somewhere else. These non-renewable energy sources include fuel such as oil, coal and natural gas.</p>		
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>7.4.1 be able to show that energy is the ability to do work (s)</p> <p>7.4.2 know that there are different forms of energy (k)</p> <p>7.4.3 be able to show that energy can changed from one form to another (s)</p> <p>7.4.4 know that the total amount of energy remains the same during energy transformations (k)</p> <p>7.4.5 appreciate the use of forms of energy in our daily lives (a)</p>	<p>Learners should be able to</p> <p>7.4.1.1 demonstrate that energy is used when work is done; Example, boiling an egg, lifting a book, digging a hole</p> <p>7.4.2.1 identify and describe different forms of energy; Heat, sound, elastic, electrical</p> <p>7.4.3.1 demonstrate energy transformation in the following situations; lighting a match, dropping a coconut, kicking a soccer ball, writing in the book, brushing your hair</p> <p>7.4.4.1 state the law of conservation of energy; “Energy cannot be created nor destroyed, but can be changed from one form to another”</p> <p>7.4.5.1 identify the form of energy in the following activities; music from radio, stretching rubber band, boiling water, using firewood, heating water using electrical jug</p>	<p>Learners can be assessed on</p> <p>1. list down the different forms of energy you experience or see at home or around you</p> <p>2. write down the different forms of energy when firewood is burning</p> <p>3. perform the following activities: listening to music, pulling rubber band, boiling of cassava, etc. And say what form of energy they produce</p> <p>4. name a non-renewable energy sources used in your home or village and explain the advantages of using the non-renewable energy</p>

Subject: Science Year: 7 Strand: Energy and Changes		
Sub-strand: 7.4 Energy		No. of Periods: 4
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>7.4.6 know that energy sources can be renewable or non-renewable (k)</p>	<p>Learners should be able to</p> <p>7.4.6.1 identify and describe the renewable and non-renewable energy sources</p>	<p>Learners can be assessed on</p>

Subject: Science Year: 7		Strand: Earth and Beyond
Sub-strand: 7.5 Our Planet Earth		No. of Periods: 8
<p>This sub-strand deals with our planet [Earth]. The materials our planet is made of. The earth is made of different layers of materials, from its centre to its surface. The surface of the earth consists of solid mass of rock called the “plates”. These plates can move horizontally (sideways) and vertically (up wards). The plates change in size as materials may be added to their edge when they come together or push back to the earth. The earth consists of many types of rocks and minerals. The three main types of rocks are <i>igneous</i>, <i>sedimentary</i>, and <i>metamorphic</i>. Each rock type is formed in a different way from each other.</p>		
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>7.5.1 know that the earth has a series of layers from the centre to its surface (k)</p> <p>7.5.2 know that the earth's layers are made up of different materials (k)</p> <p>7.5.3 be able to show the various layer of the earth (s)</p> <p>7.5.4 know that the crust of the earth forming the “plates” which float on the liquid layers (mantle) can move (k)</p> <p>7.5.5 appreciate that earthquake, volcano, and tsunami are natural processes occurring in the earth's layers (a)</p> <p>7.5.6 know that a mineral is a natural substance in which the particles are arranged in patterns (k)</p> <p>7.5.7 know that an Ore is a rock or mineral (k)</p>	<p>Learners should be able to</p> <p>7.5.1.1 in a diagram, draw the layers of the earth in the correct order: <i>crust, mantle, outer and inner core</i></p> <p>7.5.2.1 describe the various layers of the earth in terms of their <i>material</i> state</p> <p>7.5.3.1 model the different layers of the earth using; <i>boiled egg or germinating coconut fruit</i></p> <p>7.5.4.1 state that volcanic activities and earthquakes are caused by the movements of the earth's plates</p> <p>7.5.5.1 identify signs or indicators of these natural processes to help us prepare to avoid or minimize disastrous consequences when they occur</p> <p>7.5.6.1 state that minerals are building blocks of rocks</p> <p>7.5.7.1 identify common rocks and describe the minerals they contain</p>	<p>Learners can be assessed on</p> <p>1. draw a cross section diagram of planet earth and label:</p> <ol style="list-style-type: none"> crust mantle (outer and inner) core (outer and inner) lithosphere, and asthenosphere <p>2. identify a sample of any of the three types of rocks, and explain how it is formed in a simple diagram</p> <p>3. outline the evidence that suggests that Earth's core is liquid</p> <p>4. explain what you should do when an event such as earthquake, volcano and tsunami occurs</p>

Subject: Science Year: 7		Strand: Earth and Beyond
Sub-strand: 7.5 Our Planet Earth		No. of Periods: 8
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>7.5.8 be able to show that minerals can be identify using their properties (s)</p> <p>7.5.9 appreciate the use of valuable minerals in our society (a)</p> <p>7.5.10 know that there is a continuous process of change between rock types (k)</p> <p>7.5.11 understand that weathering and erosion are natural process that changes face of the earth (u)</p> <p>7.5.12 know that human activities cause weathering and erosion process (k)</p>	<p>Learners should be able to</p> <p>7.5.8.1 use moh's <i>scale of hardness</i> to identify common minerals</p> <p>7.5.9.1 identify the valuable minerals such as; gold, diamond, nickel</p> <p>7.5.10.1 identify and describe the three types of rocks; <i>igneous, sedimentary</i> and <i>metamorphic</i></p> <p>7.5.10.2 illustrate the process of <i>rock- cycle</i> using a schematic diagram</p> <p>7.5.10.3 give examples of rock weathering and erosion processes</p> <p>7.5.11.1 list and explain types of weathering; physical and chemical weathering</p> <p>7.5.12.1 identify the different human activities that cause weathering and erosion</p>	<p>Learners can be assessed on</p>

Subject: Science			Year: 7			Strand: Natural and Processed Materials												
Sub-strand: 7.6 Solutions, Solvents, and Solutes			No. of Periods: 16															
<p>This sub-strand deals with solutions and mixtures. When two or more pure substances mixed together it forms a mixture. Some pure solid substances (solids) dissolve in liquids (solvent) to form a solution. While some pure substance do not dissolve in liquids. Water is a universal solvent. Mixtures can be separated by physical and mechanical methods. Water as universal solvent is very important to our life. For example our body is made of about 90% water. And we need to drink clean water every day. Traditionally we have methods of water purification.</p>																		
General Learning Outcomes			Specific Learning Outcomes			Suggested Assessment Events												
<p>Learners should</p> <p>7.6.1 know pure substance, solutions and mixture (k)</p> <p>7.6.2 be able to make different solutions (s)</p> <p>7.6.3 be able to separate insoluble and soluble substances from mixtures (s)</p>			<p>Learners should be able to</p> <p>7.6.1.1 identify some examples of the three types of mixtures; i. solutions (salt and water), ii. suspensions (sand and water) iii. colloids (milk in water)</p> <p>7.6.2.1 produce a solution by dissolving solute in a solvent. i. sugar (solute) in water (solvent) ii. salt (solute) in water (solvent) iii. klin powder(solute) in water (solvent)</p> <p>7.6.3.1 select appropriate methods and separate substances from mixtures; i. insoluble substances: decanting, sieving, filtering, gravity separation, centrifugation, magnet use. ii. soluble substances; <i>evaporation, distillation, chromatography, and centrifugation</i></p>			<p>Learners can be assessed on</p> <p>1. write methods to separate the following substances:</p> <table><tr><th>Substances</th><th>Separating method</th></tr><tr><td>Sand from sand water mixture</td><td></td></tr><tr><td>Water from salt solution</td><td></td></tr><tr><td>Salt from salt-water-mixture</td><td></td></tr><tr><td>Drugs from prepared medicines</td><td></td></tr></table> <p>2. identify and explain two uses of filtration at your home</p> <p>3. explain why should people safe water? Design and present a poster to promote reducing water waste at your home</p> <p>4. explain why we must keep our water source from contamination</p>			Substances	Separating method	Sand from sand water mixture		Water from salt solution		Salt from salt-water-mixture		Drugs from prepared medicines	
Substances	Separating method																	
Sand from sand water mixture																		
Water from salt solution																		
Salt from salt-water-mixture																		
Drugs from prepared medicines																		

Subject: Science Year: 7 Strand: Natural and Processed Materials		
Sub-strand: 7.6 Solutions, Solvents, and Solutes		No. of Periods: 16
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>7.6.4 know some hazardous solvents and solutions (k)</p> <p>7.6.5 appreciate the process of getting clean drinking water (a)</p> <p>7.6.6 be able to show local purification method (s)</p> <p>7.6.7 understand importance of sewage purification (u)</p>	<p>Learners should be able to</p> <p>7.6.4.1 identify common <i>solutions</i> and <i>solvents</i> around you that are hazardous</p> <p>7.6.5.1 select sources of clean drinking water for human use</p> <p>7.6.6.1 use local water purification methods. Settling and decanting</p> <p>7.6.7.1 identify methods of sewage treatment and explain it's important</p>	<p>Learners can be assessed on</p>

Subject: Science		Year: 7	Strand: Life and Living																						
Sub-strand: 7.7 Introduction to Cells			No. of Periods: 12																						
This sub-strand deal with living things which are made up of small parts called cells. We can see cells with the aid of microscope. Without a cell there is no life. In living things the cells are arranged in groups. These groups of cells are called tissues. Tissues do a particular job. Cells form into more cells by cell division. Collections of tissues in living things make an organ. Collection of organs makes system. A group of body system makes up an organism.																									
General Learning Outcomes		Specific Learning Outcomes	Suggested Assessment Events																						
Learners should		Learners should be able to	Learners can be assessed on																						
7.7.1 know the parts and uses of the microscope (k)		7.7.1.1 identify the parts of the microscope and describe their uses; <i>eye piece, objective lens, stage, coarse adjustment knob, fine adjustment knob, light source, diaphragm, stage clips and revolving nosepiece</i>	1. list the main parts of a compound microscope																						
7.7.2 demonstrate how to use the microscope correctly (s)		7.7.2.1 perform steps for the correct use of the microscope	2. construct a table like the one shown here to compare <i>animal</i> and <i>plant</i> cells. Make sure you include the similarities and some differences. Complete the table by stating whether cell part is present or absent																						
7.7.3 understand that all living things are made up of cells (u)		7.7.2.2 prepare a simple specimen using onion skins and observe	<table><tr><th>Features</th><th>Animal cell</th><th>Plant cell</th></tr><tr><td>1. Nucleus</td><td></td><td></td></tr><tr><td>2. Cell membrane</td><td></td><td></td></tr><tr><td>3. Cytoplasm</td><td></td><td></td></tr><tr><td>4. Cell wall</td><td></td><td></td></tr><tr><td>5. Chlorophyll</td><td></td><td></td></tr><tr><td>6. Large Water Vacuole</td><td></td><td></td></tr></table>		Features	Animal cell	Plant cell	1. Nucleus			2. Cell membrane			3. Cytoplasm			4. Cell wall			5. Chlorophyll			6. Large Water Vacuole		
Features	Animal cell	Plant cell																							
1. Nucleus																									
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5. Chlorophyll																									
6. Large Water Vacuole																									
7.7.4 know plant cells and animal cells (k)		7.7.3.1 explain that a cell is the smallest (basic) unit of all living things	3. evaluate whether it is better to be a single-celled organism or to be made up of lots of specialized cells																						
		7.7.4.1 identify the basic parts of a living <i>animal</i> and <i>plant</i> cell																							
		7.7.4.2 identify parts <u>present</u> in a plant cell, but, <u>absent</u> in an animal cell																							

Subject: Science Year: 7 Strand: Life and Living		
Sub-strand: 7.7 Introduction to Cells		No. of Periods: 12
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>7.7.5 know that a living cell has parts which do specific jobs (k)</p> <p>7.7.6 know that a collection of cells make up a tissue (k)</p> <p>7.7.7 appreciate the functions of specialized cells in both plants and animals (a)</p> <p>7.7.8 know that some living organism is made up of only one cell (k)</p> <p>7.7.9 be able to show that the living organism's body is made up of millions of different types of cells (s)</p>	<p>Learners should be able to</p> <p>7.7.5.1 state the function of each part of a cell:</p> <ul style="list-style-type: none"> i. chloroplast - makes food. ii. nucleus - controls all cell activities, iii. cell wall – gives strength and shape iv. cell membrane – control the movement of material in and out of the cell v. cytoplasm – contain all the other parts (organelles) and give the shape of the cell <p>7.7.6.1 state that a group of cells make a tissue, a group of tissues make an organ, a group of organs make a system</p> <p>7.7.6.2 identify examples of different living;</p> <ul style="list-style-type: none"> i. tissues (muscle, skin, bone), ii. organs (lung, heart, liver), iii. systems (reproductive, digestive) <p>7.7.7.1 identify the different specialized cells in animals and plants and state their functions</p> <p>7.7.8.1 identify and recognize different types of single cell organisms</p> <p>7.7.9.1 use a diagram to show the developmental stages from cells to organ</p>	<p>Learners can be assessed on</p>

Subject: Science		Year: 7	Strand: Energy and Change
Sub-strand: 7.8 Light and Colours		No. of Periods: 12	
<p>This sub-strand deals with light and colours. The Sun is the main source of natural light. However, some organisms produce their own light. Light rays travel in a straight line. When a light ray hits a flat surface it reflects back at an angle. You see images in mirrors because of reflection of light. Light rays bend when they enter a different medium. They either bend towards the normal or away from the normal. Light also produces different colours. These colours produced when light rays are separated. We see these colours in a rainbow or when light is passed through a prism.</p>			
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events	
<p>Learners should</p> <p>7.8.1 know luminous and non luminous object (k)</p> <p>7.8.2 appreciate the use of luminous objects in our everyday life (a)</p> <p>7.8.3 be able to show that light travels in a straight line and it bends as it enters different mediums (s)</p> <p>7.8.4 be able to show reflection of light from plane and curved surfaces (s)</p> <p>7.8.5 be able to use curved mirrors, and lenses (s)</p>	<p>Learners should be able to</p> <p>7.8.1.1 identify luminous and non-luminous objects</p> <p>7.8.2.1 describe different uses of some important luminous objects in our everyday life eg; kerosene lamps, light bulbs, torch light, sun, fireflies etc</p> <p>7.8.3.1 use simple experiments to demonstrate that light travels in a straight line eg; casting shadow using sunlight or torch light, see through straight and bend pipe</p> <p>7.8.3.2 demonstrate bending of light rays by passing it through dense glass medium</p> <p>7.8.4.1 conduct simple experiments to show reflection of light on plane and curved surfaces</p> <p>7.8.5.1 draw different types of lenses and show light rays as they move away from the lenses</p>	<p>Learners can be assessed on</p> <p>1. draw and label a diagram showing the: a. incident ray and b. reflected ray</p> <p>2. name all the different colours of the rainbow</p> <p>3. describe what happen to the water drops to cause a rainbow</p> <p>4. construct one or more colour wheels and study the effect of mixing various colour in different proportion</p>	

Subject: Science Year: 7 Strand: Energy and Change		
Sub-strand: 7.8 Light and Colours		No. of Periods: 12
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>7.8.6 be able to show that we see objects because light scattered from them enters our eyes (s)</p> <p>7.8.7 know that the seven main colours of white light form the colour spectrum and that red, blue and green are the primary colours (k)</p>	<p>Learners should be able to</p> <p>7.8.5.2 demonstrate use of curved mirrors and lenses eg; rear view mirrors as safety mirrors in vehicles, security mirrors in shop and super markets in telescope binocular and microscopes</p> <p>7.8.6.1 demonstrate that dark surfaces absorb light and white surfaces reflect light eg; pass light through black and white surfaces</p> <p>7.8.7.1 recognize the rainbow as the natural spectrum of colour</p> <p>7.8.7.2 use a prism (or water trough and mirror) to observe the spectrum</p>	<p>Learners can be assessed on</p>

Subject: Science Year: 7 Strand: Natural and Processed Materials		
Sub-strand: 7.9 Elements, Compounds and Mixtures		No. of Periods: 12
<p>This sub-strands deals with elements compounds and mixtures. An element is a pure substance, which contains only one kind of particle. A compound is a substance, which contains more than one kind of element chemically joined together. A mixture is a substance that also contains more than one element or material but they do not joined chemically. Mixtures can be separated physically by various methods depending on a type of mixture. While compounds cannot be separated physically, but can be separated through chemical means.</p>		
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>7.9.1 know that an element consists of only one kind of particle (k)</p> <p>7.9.2 know that elements are either metals or non metals (k)</p> <p>7.9.3 know that a compound is a substance formed by combining two or more elements chemically (k)</p>	<p>Learners should be able to</p> <p>7.9.1.1 give some examples of elements in the environment; i. aluminum - in cans, boats and foil ii. gold - in earrings, wedding rings and medals iii. silver - in coins and medals iv. iron - in rod, roofing sheet</p> <p>7.9.2.1 give examples of metal and non-metal elements; metals – aluminum non-metal – carbon, oxygen sulfur</p> <p>7.9.2.2 identify some properties of metal and non-metals; Metal – conduct electricity, ductile and malleable, shiny, strong Non – metal - dull appearance, poor conductors of heat and electricity</p> <p>7.9.3.1 identify examples of common household compounds; water, salt, sugar, washing powder, soap</p>	<p>Learners can be assessed on</p> <p>1. assess whether a <u>mixture</u> or a <u>compound</u> is formed: a. cordial is diluted with water b. bread is burnt c. caramel topping is added to milk to make a milkshake d. white PVA glue combines with air to form a hard clear substance e. an iron nail rusts.</p>

Subject: Science Year: 7 Strand: Natural and Processed Materials		
Sub-strand: 7.9 Elements, Compounds and Mixtures		No. of Periods: 12
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>7.9.4 be able to show that a mixture is made from a two or more substances but NOT chemically combined (s)</p> <p>7.9.5 be able to separate mixtures by physical methods (s)</p> <p>7.9.6 understand that compounds can only be separated by chemical processes (u)</p> <p>7.9.7 appreciate the ability of elements to form compounds (a)</p>	<p>Learners should be able to</p> <p>7.9.4.1 produce mixtures from common substances; coffee and sugar, water and sugar, gravel sand, water and lemon</p> <p>7.9.5.1 separating mixtures using different physical methods; <i>evaporation (salt and water)</i>, <i>-filtration (mud and water)</i></p> <p>7.9.6.1 illustrate and explain that it is difficult to separate a compound once it is formed example; flour, sugar, yeast and water from bread</p> <p>7.9.7.1 state the elements that combine to form water</p>	<p>Learners can be assessed on</p>

Subject: Science		Year: 7	Strand: Life and Living
Sub-Strand: 7.10 Living Structures and Processes		No. of Periods: 12	
<p>This sub-strand deals with living structure and process. All living things grow, reproduce and respond to their environment. Reproduction is the process in all living things that enables continuation of life. There are two kinds of reproductive system – asexual and sexual. Asexual reproduction involves one parent and sexual reproduction involves two parents. Animals and plants have special systems for the reproductive functions. In flowering plants the flower is the reproductive system which produces fruits and seeds. Seeds germinate to make new plant.</p>			
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events	
Learners should	Learners should be able to	Learners can be assessed on	
<p>7.10.1 know that there are two kinds of reproduction (k)</p> <p>7.10.2 know forms of asexual and sexual reproduction (k)</p> <p>7.10.3 be able to show that a flower is the reproductive part of a plant (s)</p> <p>7.10.4 know that seeds are part of the plant that will germinate and grow into a new plant (k)</p>	<p>7.10.1.1 identify some living things that reproduce:</p> <p>i. sexually –human, fish, mango</p> <p>ii. asexually –banana, potato</p> <p>7.10.2.1 identify living organisms that asexually reproduces by; budding, splitting, vegetative regeneration and spores</p> <p>7.10.2.2 state that in sexual reproduction each parent (male & female) produces special sex cells which join together to form a new organism</p> <p>7.10.2.3 name some animals which reproduce sexually by;</p> <p>i. externally –fishes, frogs</p> <p>ii. internally –humans, birds, snakes</p> <p>7.10.3.1 perform dissection of a flower to identify the reproductive parts, eg; hibiscus flower</p> <p>7.10.4.1 identify parts of a seed as; Testa, cotyledon, embryo, plumule and radicle</p>	<p>1. match the following organisms to the type of asexual reproduction they use:</p> <p>a) bacteria fragmentation/ regeneration</p> <p>b) yeast budding</p> <p>c) fern fission</p> <p>d) starfish spores</p> <p>2. describe an advantage of asexual reproduction over sexual reproduction</p> <p>3. collect and dissect a hibiscus flower. Draw and label the male and female parts and explain the functions of each parts to the process of reproduction</p> <p>4. draw a labeled diagram of the life cycle of a typical plant and explain the importance of each stage of the life cycle</p>	

Subject: Science Year: 7 Strand: Life and Living		
Sub-Strand: 7.10 Living Structures and Processes		No. of Periods: 12
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>7.10.5 appreciate that seed dispersal contributes to plant distribution (a)</p> <p>7.10.6 be able to show germination in plant (s)</p> <p>7.10.7 understand that plant reproduction have stages (u)</p>	<p>Learners should be able to</p> <p>7.10.5.1 identify a range of seed dispersal methods; wind, animal, water, & explosion</p> <p>7.10.6.1 carry out the germination process of corn and bean seeds (hypogeal and pigeal)</p> <p>7.10.7.1 draw the sequence of events in the life cycle of a plant; mature plant, flowering, pollination & fertilization, seeding, germination, & new young plant develops</p>	<p>Learners can be assessed on</p>

Subject: Science		Year: 7	Strand: Earth and Beyond
Sub-strand: 7.11 Earth and the solar system		No. of Periods: 12	
<p>This sub-strand deals with the Earth and the solar system. The solar system consists of the Sun, Planets and their Moons. Numerous comets, asteroids and meteoroids are also found in the solar system. The Sun is the centre of the solar system. It is the source of energy in the form of heat and light being supplied to the Planets. Our Earth is one of those planets. Each Planet move or orbit in their own paths around the sun. The Earth's orbit lasts for a year-365 days for one revolution. The Planets also spin, as if a ball on a stick. The Earth's spin lasts for a day-24 hours. The earth has one body moving around it, the Moon. The moon's orbit around the earth lasts for a month-28, 30, 31 days. It also influences the high tide and low tide of the Earth's ocean.</p>			
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events	
Learners should	Learners should be able to	Learners can be assessed on	
7.11.1 know the solar system is made of Sun, Moon and the Planets (k)	7.11.1.1 describe the theory of the solar system 7.11.1.2 list down the Planets in order of their distance from the Sun 7.11.1.3 describe characteristic of the nine Planets	1. unscramble these planet names of the solar system. a. PETENUN b. SUNEV c. ARMS d. RATUNS e. ITUPREJ f. SUNRAU g. TEHAR h. RECYRUM	
7.11.2 know your planets in the solar system (k)	7.11.2.1 state the mass, diameter, surface, atmosphere, gravity, surface temperature, period of rotation, tilt axis, distance from the sun, time to orbit the sun and their moon(s) of the Planets in the solar system	2. identify which planets have: a. moons? b. ring systems? c. methane in their atmosphere?	
7.11.3 know that the planets move around the Sun while the moon moves around planets (k)	7.11.3.1 describe the movement of the planets around the sun 7.11.3.2 Identify planets that have Moons	3. explain what is meant by the term 'Earth's axis'	
7.11.4 know the properties and importance of the Sun to life on Earth (k)	7.11.4.1 state the properties of the Sun; mass, diameter, gravity, surface temperature, period of rotation, tilt of axis		

Subject: Science Year: 7 Strand: Earth and Beyond		
Sub-strand: 7.11 Earth and the solar system		No. of Periods: 12
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>7.11.5 understand the different types of solar eclipses (u)</p> <p>7.11.6 be able to show that the earth tilts as it revolves around the Sun (s)</p> <p>7.11.7 know that the earth spins on its axis as it revolves around the Sun (k)</p> <p>7.11.8 know that our planet has its own moon (k)</p> <p>7.11.9 be able to draw the phases of the moon (s)</p> <p>7.11.10 know the eclipse of the moon (k)</p>	<p>Learners should be able to</p> <p>7.11.4.2 list the importance of Sun to life on Earth</p> <p>7.11.5.1 describe the different solar eclipses; total solar eclipse, partial solar eclipse and annual solar eclipse</p> <p>7.11.6.1 model the earth's spin on its axis</p> <p>7.11.7.1 state that it takes 24 hours for the earth to make one complete spin on its axis 7.11.7.2 demonstrate day and night, using the globe of the earth</p> <p>7.11.8.1 state that our moon takes 28 days to orbit the earth 7.11.8.2 state the properties of the moon ; <i>mass, diameter, gravity, surface temperature, period of rotation, tilt of axis</i></p> <p>7.11.9.1 draw the different phases of the moon 7.11.9.2 record the phases of the moon at this time of the year at your school 7.11.9.3 explain how the phases of the moon affects low tide and high tide on planet earth</p> <p>7.11.10.1 describe and draw the phase of lunar eclipses</p>	<p>Learners can be assessed on</p>

Subject: Science		Year: 7	Strand: Life and Living
Sub-strand: 7.12 Ecosystems		No. of Periods: 8	
<p>This sub-strand deals with the ecosystem. Life of an organism depends on other organisms and their physical environment. Success of organisms in the environment depends on how well an organism is adapted to the environment. Many organisms have developed over time many features that allow them to survive successfully in their environment. In an ecosystem, food is the source of nutrients to organism. Nutrients pass from organism to the other through the food chain.</p>			
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events	
<p>Learners should</p> <p>7.12.1 know that an ecosystem is made up of living and non-living things that interact with each other in a particular area (k)</p> <p>7.12.2 know that the different levels within a biosphere and biomes (k)</p>	<p>Learners should be able to</p> <p>7.12.1.1 identify examples of local ecosystems in your community eg; mangrove, forest, river, coral reef and ocean</p> <p>7.12.1.2 identify examples of other ecosystems example; deserts and grassland</p> <p>7.12.1.2 give an example of an organism interacting with:</p> <p><u>i. a living things</u></p> <p>a. a cow feeds on a grass</p> <p>b. birds nesting in branches of the mangrove trees</p> <p><u>ii. non-living things</u></p> <p>a. fish breath air in water</p> <p>b. chicken drinks water</p> <p>7.12.2.1 identify levels of the biosphere and the biomes</p>	<p>Learners can be assessed on</p> <p>1. state whether the following statements are true or false.</p> <p>a. all organisms can produce their own food</p> <p>b. heterotrophs can produce their own food</p> <p>c. animals that eat plants are primary producers</p> <p>d. carnivores eat herbivores</p>	

Subject: Science		Year: 7	Strand: Life and Living
Sub-strand: 7.12 Ecosystems			No. of Periods: 8
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events	
Learners should	Learners should be able to	Learners can be assessed on	
7.12.3 know abiotic factors that influence survival of organisms within an ecosystem (k)	7.12.3.1 give common examples of organism, and identify abiotic factors that influence their survival. i. mangrove tree- salinity, nutrients, ii. bonito- ocean, salt water, temperature iii. hard coral- sunlight, algae, current iii. mosquito – water, air		
7.12.4 understand how energy is transferred in food chains and food webs in an ecosystem (u)	7.12.4.1 draw and describe food-chains and food-webs in the following ecosystems; mangrove, coral reef, deep-sea, and rain forest 7.12.4.2 identify the origin of the energy and describe the energy flow in the food chain or food web		
7.12.5 understand that there are different types of interactions between organisms (u)	7.12.5.1 identify and explain different types of interactions between living organisms		
7.12.6 be able to show plant and animal distribution in the ecosystem (s)	7.12.6.1 conduct a survey and map out the distribution of plants and animals in one of their local ecosystem		

12.2 Science Year 8 Syllabus

Subject: Science		Year: 8	Strand: Energy and Change
Sub-strand: 8.1 Simple Machine Technology		No. of Periods: 12	
<p>This sub-strand deals with simple machine technology. The structure of an object determines its stability. An object is in stable equilibrium (balanced) when its centre of gravity is above its base. A small machine allows a small force (effort) to overcome a large force (load). This is the principle of the machine. A machine that increases force gives a mechanical advantage. A machine that increases movement gives an advantage called velocity ratio. Complex machines are made up of many simple machines joined together. Machines transfer energy and do work.</p>			
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events	
Learners should	Learners should be able to	Learners can be assessed on	
8.1.1 know that a simple machine transfers energy and does work (k)	8.1.1.1 identify examples of simple machines in their community; lever, pulley, wheels and axles, incline planes, gears	1. identify the <i>effort</i> , <i>load</i> and <i>pivot</i> in the following simple machines at work: a. a wheelbarrow loaded with sand and being pushed	
8.1.2 understand work done by levers (u)	8.1.2.1 explain that the transfer of energy does the work in simple machines. Use a lever (e.g. <i>crowbar lifting a rock</i>)	b. a crowbar is used to break the rock	
	8.1.2.2 list three classes of lever systems and identify the (<i>effort</i> , <i>load</i> , & <i>pivot</i>) positions in each system	c. a tin-opener opening a tin of taiyo	
8.1.3 be able to show the turning force in a lever (s)	8.1.3.1 demonstrate that the turning forces in a lever is the forces applied times distance from the pivot		
	8.1.3.2 use a See-saw arrangement to demonstrate the turning force effects in levers		
8.1.4 understand the ratio of <i>effort</i> to <i>load</i> gives a machine its mechanical advantage (u)	8.1.4.1 calculate the mechanical advantage by dividing the load by the effort for different simple machines		

Subject: Science Year: 8		Strand: Energy and Change
Sub-strand: 8.1 Simple Machine Technology		No. of Periods: 12
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>8.1.5 be able to show that a simple machine helps us to reduce effort to do many everyday jobs (s)</p> <p>8.1.6 be able to show the stability of an object (s)</p> <p>8.1.7 know that building structure are designed carefully so that they are stable (a)</p>	<p>Learners should be able to</p> <p>8.1.4.2 calculate the velocity of a pulley system by dividing the distance moved by the load by distance moved by the lever</p> <p>8.1.5.1 perform the following tasks to demonstrate the use of simple machine;</p> <ul style="list-style-type: none"> i. remove the nail from a timber using a hammer (lever) ii. carry stones in a wheel-barrow (lever) iii. dig potato using sticks iv. open a soft drink bottle <p>8.1.5.2 identify simple machines Which;</p> <ul style="list-style-type: none"> i. multiply (increase) force (eg, tap knob, door knob) ii. multiply (increase) speed (eg, bicycle gears, fan belt in vehicle) <p>8.1.6.1 locate the centre of gravity of a hanging object</p> <p>8.1.6.2 demonstrate that changing the centre of gravity of an object affects its stability</p> <p>8.1.7.1 identify examples of building structures or large objects that are stable or unstable in your local community or school</p>	<p>Learners can be assessed on</p>

Subject: Science		Year: 8	Strand: Life and Living									
Sub-strand: 8.2 Body Systems (I)			No. of Periods: 12									
This sub-strand deals with digestive, circulatory, excretory and respiratory systems. Digestive system breaks down food we eat to give the nutrients our body needs. Circulatory system carries food and oxygen to the body cells. Urinary (excretory) system removes waste fluids. Respiratory system transfers oxygen to the blood and removes carbon dioxide out of the body.												
General Learning Outcomes		Specific Learning Outcomes	Suggested Assessment Events									
Learners should		Learners should be able to	Learners can be assessed on									
8.2.1 know that food provide the body with different types of nutrient (k)		8.2.1.1 identify common local food that provide the following nutrients; i. carbohydrate - potato, taro, corn ii. protein- fish, chicken, beans iii. fat and oil- nuts, coconut iv. vitamin- vegetables, fruits v. minerals - table salt, eggs, nuts 8.2.1.2 describe the function of the main food types; protein, fat and oil, carbohydrate, vitamins and minerals	1. state two substances that contain little or no nutrients yet are essential for good health 2. identify the part of the digestive system which: a. is the longest b. food stays in for the longest period of time c. is like a cement mixer d. contains the caecum e. contain the ileum 3. identify the description which matches the blood vessel.									
8.2.2 know that the digestive system breaks down food and absorbs food nutrients (k)		8.2.2.1 draw and identify the parts of the human digestive system; mouth, esophagus, stomach, liver / gallbladder, pancreas, small intestines (consisting of duodenum, and ileum) colon, rectum, anal canal 8.2.2.2 describe the main processes in the digestive system; i. physical/mechanical breakdown of large food ii. chemical breakdown of food iii. absorption of food iv. assimilation of food nutrients v. elimination of unused food materials	<table border="1"><thead><tr><th>Blood vessels</th><th>Description</th></tr></thead><tbody><tr><td>Veins</td><td>High pressure</td></tr><tr><td>Arteries</td><td>Fine tubes near cells</td></tr><tr><td>Capillaries</td><td>Return blood to heart</td></tr></tbody></table> 4. outline how the following waste are produced; a. carbon dioxide b. water c. urea		Blood vessels	Description	Veins	High pressure	Arteries	Fine tubes near cells	Capillaries	Return blood to heart
Blood vessels	Description											
Veins	High pressure											
Arteries	Fine tubes near cells											
Capillaries	Return blood to heart											

Subject: Science			Year: 8			Strand: Life and Living												
Sub-strand: 8.2 Body Systems (I)						No. of Periods: 12												
General Learning Outcomes		Specific Learning Outcomes		Suggested Assessment Events														
Learners should		Learners should be able to		Learners can be assessed on														
8.2.3 know that the circulatory system consists of the heart, blood, & blood vessels (k)		8.2.3.1 identify from a diagram; i. the heart ii. blood vessels (arteries, veins, & capillaries)		5. identify the body part that matches each function														
8.2.4 know the main functions of the heart (k)		8.2.4.1 describe the two main functions of the heart; i. pumps deoxygenated blood to the lungs to collect oxygen ii. pumps oxygenated blood to all body parts		<table><tr><th>Body parts</th><th>Functions</th></tr><tr><td>Heart</td><td>Filter blood</td></tr><tr><td>Kidney</td><td>Allow urine to reach storage area</td></tr><tr><td>Ureters</td><td>Tube which allows urine to leave the body.</td></tr><tr><td>Bladder</td><td>Urine storage</td></tr><tr><td>Urethra</td><td>Pumps blood around the body</td></tr></table>			Body parts	Functions	Heart	Filter blood	Kidney	Allow urine to reach storage area	Ureters	Tube which allows urine to leave the body.	Bladder	Urine storage	Urethra	Pumps blood around the body
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8.2.5 know the different components of the blood (k)		8.2.5.1 name the four components of the blood; red blood cells, white blood cells, blood platelets, blood plasma		6. state the difference between inhalation and exhalation														
8.2.5.2 describe the main function of the component of the blood; red blood cells, white blood cells, blood platelets, blood plasma		8.2.6.1 identify from a diagram the main parts of the excretory system; kidney, ureter, bladder, and urethra																
8.2.6 know that excretion is the removal of waste material from the body (k)		8.2.6.2 state that urea is the main waste product of the body																
8.2.7 know the human respiratory system (k)		8.2.7.1 describe that the respiratory system takes in oxygen gas from the air through our nose and mouth and removes carbon dioxide gas from the body also through our nose and mouth																

Subject: Science Year: 8		Strand: Life and Living
Sub-strand: 8.2 Body Systems (I)		No. of Periods: 12
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>8.2.8 be able to show that respiratory system involves movement of air in and out of the body (s)</p> <p>8.2.9 understand the mechanic of inhalation and exhalation (u)</p> <p>8.2.10 know that energy is released from food during the process of cellular respiration (k)</p>	<p>Learners should be able to</p> <p>8.2.7.2 identify from a diagram the main parts of the respiratory system</p> <p>8.2.8.1 perform; <i>inhalation</i> (breathing-in), and <i>exhalation</i> (breathing-out)</p> <p>8.2.9.1 explain the cause of breathing; Inhalation – <i>Diaphragm and intercostals muscles contact; volume of the thoracic cavity is increase; increase volume, decrease pressures, air rushes in</i> Exhalation – <i>Diaphragm and the intercostals muscle relax; volume of the thorax cavity is decrease; decrease volume means increase pressure; air rushes push out</i></p> <p>8.2.10.1 describe cellular respiration and write chemical equation for the reaction</p>	<p>Learners can be assessed on</p>

Subject: Science Year: 8 Strand: Life and Living		
Sub-strand: 8.2 Body Systems (I)		No. of Periods: 12
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should 8.2.11 know the health problems associated with the body systems (<i>k</i>)	Learners should be able to 8.2.11.1 list the common health problem associated with: <ul style="list-style-type: none"> i. digestive system - diarrhea, constipation ii. circulatory system-heart attack, high blood pressure iii. excretory system-kidney failure iv. respiratory system- asthma, cough and tuberculosis (TB) 8.2.11.2 list local medicines use to treat the diseases Caution (<i>Do not apply the suggested medicine without the advice of parents or guidance</i>) 8.2.11.3 list modern medicine to treat the diseases Caution (<i>Do not apply the medicine without the advice of a Doctor or Nurse</i>)	Learners can be assessed on

Subject: Science Year: 8		Strand: Natural and Processed Materials
Sub-strand: 8.3 Chemical Reactions and Everyday Uses		No. of Periods: 12
<p>When substances combine to form new substances we say that a chemical reaction has taken place. Some chemical reactions are fast; others are slow. Factors influencing rate of reaction are temperature, amount in reaction (concentration), catalysts, and size of particles (surface area.) Chemical reactions occur constantly in and around us.</p>		
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>8.3.1 know that in a chemical reaction materials react to form new substances (k)</p> <p>8.3.2 know that many different types of chemical reactions happen naturally (k)</p> <p>8.3.3 be able to show different types of chemical reaction happening around us (s)</p>	<p>Learners should be able to</p> <p>8.3.1.1 state that in a chemical reaction materials/substances combined together (react) to produce a new substance called <i>products</i></p> <p>8.3.1.2 state in a chemical equation that reactants are on the left hand side and products are on the right hand side (e.g. reactants → products) Use word equations only</p> <p>8.3.2.1 identify some basic chemical reactions that are happening around us and state the reactants and products; i. rusting of iron nails, mixing ii. lemon juice with coral, iii. burning of firewood, iv. chewing betel nut v. lime making</p> <p>8.3.3.1 demonstrate the reactions and write word chemical equation for the reactions; i. rusting of iron nail, ii. lemon juice with coral iii. burning of firewood, iv. chewing of beetle nut, iv. lime making (baking of coral)</p>	<p>Learners can be assessed on</p> <p>1. classify the following as examples of chemical or physical change. a. cutting up pineapple fruit b. cooking ring cake c. burning of fire wood d. melting ice cube e. freezing water f. water evaporating</p> <p>2. write the word equations for the processes of: a. photosynthesis and b. cell respiration</p> <p>3. investigate the rate of reaction(how fast reaction occurs) for this following; a. temperature b. surface area</p>

Subject: Science Year: 8 Strand: Natural and Processed Materials		
Sub-strand: 8.3 Chemical Reactions and Everyday Uses No. of Periods: 12		
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>8.3.4 understand that some chemical reactions occur faster than others (u)</p> <p>8.3.5 appreciate the importance of chemical reactions to our daily lives (a)</p>	<p>Learners should be able to</p> <p>8.3.4.1 explain factors that influence the rate of chemical reactions; temperature, concentration, catalyst, and surface area</p> <p>8.3.5.1 express the importance of chemical reactions in our daily lives; photosynthesis process, cellular respiration process and rusting process</p>	<p>Learners can be assessed on</p>

Subject: Science		Year: 8	Strand: Earth and Beyond
Sub-strand: 8.4 Atmosphere, Climate, Weather		No. of Periods: 8	
This sub-strand deals with the atmosphere, climate and weather. The atmosphere is the thick layer of gases surrounding the earth. The atmosphere consists of four (4) layers- (<i>troposphere, stratosphere, mesosphere and ionosphere</i>). Climate is the average weather for long period of time in a particular area or region. Weather is state of the atmosphere at particular place and time with respect to variables such as temperature, rainfall, moisture, wind speed and pressure.			
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events	
Learners should	Learners should be able to	Learners can be assessed on	
8.4.1 know that the space above the earth's surface is the atmosphere (k)	8.4.1.1 identify from a diagram the different layers of the atmosphere; troposphere, stratosphere, mesosphere and ionosphere	1. draw and label the different layers and gases of the atmosphere	
8.4.2 know that the atmosphere consist of different gases (k)	8.4.2.1 identify the main gases in the different layers of the atmosphere; troposphere, stratosphere, mesosphere and ionosphere	2. draw and label the water cycle	
8.4.3 know that the troposphere contains essential gases for living organisms (k)	8.4.3.1 identify three essential gases for living organisms in the troposphere layer as; oxygen, carbon dioxide, nitrogen	3. record and interpret daily rainfall for a one week period a. which day has the highest and lowest rainfall and temperature in the week? b. explain the importance of weather to everyday life	
8.4.4 understand that convection currents and expansion of gases cause atmospheric patterns (u)	8.4.4.1 explain land and sea breezes by reference to concepts of gas expansion, convection, and heating		
8.4.5 know that the wind is a result of the air movement (k)	8.4.5.1 use a diagram to describe the pattern of air movement		
8.4.6 know the development of tropical cyclone (k)	8.4.6.1 describe the formation of tropical cyclone and its pathway		

Subject: Science		Year: 8	Strand: Earth and Beyond
Sub-strand: 8.4 Atmosphere, Climate, Weather		No. of Periods: 8	
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events	
<p>Learners should</p> <p>8.4.7 understand the different climatic zones in the world (u)</p> <p>8.4.8 be able to measure different daily weather conditions (s)</p> <p>8.4.9 appreciate the significance of water and water cycle to plants and animals (a)</p>	<p>Learners should be able to</p> <p>8.4.7.1 explain on a world map different climatic zones caused by the patterns of heating and cooling of the earth's surface</p> <p>8.4.8.1 measure the daily temperature, rainfall air pressure wind speed and moisture in your area and other areas</p> <p>8.4.9.1 express the importance of water to you and other organisms</p> <p>8.4.9.2 express the importance of water cycle</p>	<p>Learners can be assessed on</p>	

Subject: Science		Year: 8	Strand: Life and Living
Sub-strand: 8.5 Plant Processes and Marine Ecosystems		No. of Periods: 12	
<p>This sub-strand is about plant processes and marine ecosystems. Green plants undergo photosynthesis using carbon dioxide, water and light to produce glucose. The green pigment in the leaves is the chlorophyll. Chlorophyll absorbs light for photosynthesis. Plants release energy from the breakdown of food (glucose) by aerobic respiration. The plant root hairs absorb water and minerals (essential for plant growth) from the soil. Special vessels in plants transport nutrients and food.</p> <p>The marine ecosystems include the ocean, coral reef, mangroves and all organisms (plants and animals) in the ecosystem. Marine plants and animals are important sources of food for Solomon Islanders. The inter-tidal zone is the area from the high tide water mark (HTWM) to the low tide water mark (LTWM). The coral reef covers the shallow part of the ocean.</p>			
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events	
<p>Learners should</p> <p>8.5.1 know that plants are the primary producers for life on earth (k)</p> <p>8.5.2 know that plants carryout the process of photosynthesis (k)</p> <p>8.5.3 be able to show that the plant has special vessels for the transport of food, nutrients, and water (s)</p> <p>8.5.4 know that root hairs absorb water and mineral from the soil to all different parts of the plant (k)</p> <p>8.5.5 know that plants carry out cellular respiration to produce energy for its cells (k)</p> <p>8.5.6 know that the marine ecosystem has abundance sources of food types (k)</p>	<p>Learners should be able to</p> <p>8.5.1.1 state that plants are the primary producers in an ecosystem</p> <p>8.5.2.1 describe that photosynthesis occurs in the presence of chlorophyll in green leaves</p> <p>8.5.2.2 write the photosynthesis reaction in words</p> <p>8.5.3.1 demonstrate that plants have special vessels for food, nutrients, and water transport</p> <p>8.5.4.1 identify from a labeled diagram the main parts of the root hairs</p> <p>8.5.5.1 describe cellular respiration and write the word equation for the process</p> <p>8.5.6.1 describe the different common marine ecosystems; i. mangrove ,ii. inter-tidal Zone iii. coral reef, iv. deep-sea</p>	<p>Learners can be assessed on</p> <p>1. prepare an experiment to show the movement of water through the <u>xylem vessels</u> using a young pawpaw leaf and coloured solution</p> <p>2. write a scientific report on the above experiment</p> <p>3. write down 3 different ways that your community uses to protect marine resources from over exploitation</p>	

Subject: Science Year: 8 Strand: Life and Living		
Sub-strand: 8.5 Plant Processes and Marine Ecosystems		No. of Periods: 12
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p><i>Learners should</i></p> <p>8.5.7 understand that the different ecosystems support different types of organism (u)</p> <p>8.5.8 be able to show that pollution affects species diversity and abundance (s)</p> <p>8.5.9 know that there are different methods used to protect our ecosystem (k)</p>	<p><i>Learners should be able to</i></p> <p>8.5.6.2 identify any five (5) marine organisms living within the different marine ecosystems</p> <p>8.5.6.3 identify any five (5) food sources from the different marine ecosystems</p> <p>8.5.7.1 explain the adaptation of organism to their ecosystem; i. mangrove trees – Specialize roots to withstand salt water ii. fish – gills to separate air from water</p> <p>8.5.8.1 investigate and compare the species diversity and abundance in polluted and non polluted in any of the marine ecosystems; i. mangrove, ii. inter-tidal iii. coral reef, iv. deep water ocean</p> <p>8.5.9.1 describe different local methods used to protect our marine resources; i. use of selected fishing techniques, ii. banning of fishing ground for period time iii. harvesting certain marine species only</p>	<p><i>Learners can be assessed on</i></p>

Subject: Science Year: 8		Strand: Life and Living
Sub-strand: 8.5 Plant Processes and Marine Ecosystems		No. of Periods: 12
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	Learners should be able to	Learners can be assessed on
<p>8.5.10 understand that marine organisms depend on each other for their survival (u)</p>	<p>8.5.10.1 draw food-chains for organisms in the: a. mangrove, b. inter-tidal zone c. coral reef, d. deep water ocean</p> <p>8.5.10.2 describe at least two symbiotic relationship in the coral reef ecosystem, example; i. sea anemones and the clown fish, ii. shark and remora fish</p>	
<p>8.5.11 be able to show the external and internal fish anatomy (s)</p>	<p>8.5.11.1 dissect a fish</p> <p>8.5.11.2 identify, draw and label the external and internal parts of a fish; External parts: mouth, eye, nostril, operculum, (gill cover) spiny dorsal fin, soft dorsal fin, caudal fin (tail), pectoral fin, pelvic fin, scales, vent, anal fin, lateral line Internal parts: kidney, swim bladder, gonads(eggs), spinal cord, spine, brain, gills, heart, liver stomach, intestine</p>	
<p>8.5.12 know the different methods of fishing (k)</p>	<p>8.5.12.1 describe methods of fishing in your community</p> <p>8.5.12.2 describe non-sustainable fishing in your community</p>	
<p>8.5.13 appreciate environmentally friendly method of fishing (a)</p>	<p>8.5.13.1 express the importance of sustainable fishing in your community</p>	

Subject: Science Year: 8 Strand: Energy and Change		
Sub-strand: 8.6 Heat and Sound		No. of Periods: 4
<p>This sub-strand deals with Heat and Sound. Heat is the condition of being hot or cold. Heat is a form of energy that associates with the movement of atoms or molecule in the material. Higher the temperature, faster the movement of the atoms or molecule in the material and hence greater the energy present in the material. Conduction carries heat through solid. Convection carries heat through liquids. Radiation carries heat through empty space. Heat energy cause expansion of matter. Sound is formed by sound vibration of particles. Sound energy travels through solids, liquids, and gases. Sound does not travel through empty space.</p>		
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>8.6.1 know that heat is a form of energy (k)</p> <p>8.6.2 understand that heat transfer by conduction, convection and radiation (u)</p> <p>8.6.3 be able to show heat transfer (s)</p> <p>8.6.4 be able to show that heat can cause expansion of matter (s)</p> <p>8.6.5 appreciate that heat gives us heat energy (a)</p>	<p>Learners should be able to</p> <p>8.6.1.1 state that heat is caused by movement of atoms or molecules in the material and produces energy</p> <p>8.6.2.1 explain that heat energy is transferred by <i>conduction, convection and radiation</i></p> <p>8.6.3.1 demonstrate heat transfer by <i>conduction, convection and radiation</i></p> <p>8.6.4.1 demonstrate expansion and contraction of metallic material when heated or cooled down</p> <p>8.6.4.2 explain how the particles of materials take up more space when they are heated</p> <p>8.6.5.1 express ways that heat energy is used in your life; example;</p> <ul style="list-style-type: none"> i. heat energy is used to cook food; ii. heat energy is used to keep warm body; iii. heat energy is used to make things 	<p>Learners can be assessed on</p> <ol style="list-style-type: none"> 1. draw a particle diagram to illustrate <u>conduction</u> in a metal rod 2. identify what makes the sound when each of the following is being played: <ul style="list-style-type: none"> a. wooden drum b. panpipe c. guitar d. keyboard

Subject: Science Year: 8		Strand: Life and Living
Sub-strand: 8.5 Plant Processes and Marine Ecosystems		No. of Periods: 12
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>8.6.6 know that vibration of particles of matter causes sound waves (k)</p> <p>8.6.7 know the sound hearing range (k)</p> <p>8.6.8 know that sound travel through different medium (u)</p> <p>8.6.9 be able to show different sound media (s)</p>	<p>Learners should be able to</p> <p>8.6.6.1 describe sound caused by vibrating particles</p> <p>8.6.6.2 state that sound has pitch and loudness</p> <p>8.6.6.3 list 4 local materials as source of sound in the order of increasing pitch</p> <p>8.6.6.4 state that sound need medium to travel: <i>solid, liquid and gas</i></p> <p>8.6.6.5 state that sound moves as a wave, formed by compression and rare-fractions of particles</p> <p>8.6.7.1 identify the sound hearing range of our ears between 20 - 20,000 hz</p> <p>8.6.8.1 describe the speed of sound in solid, liquid and gas</p> <p>8.6.9.1 demonstrating using different media, how sound travel;</p> <ul style="list-style-type: none"> i. string, telephone (solid) ii. listening to radio (air) iii. clapping hands under water (liquid) 	<p>Learners can be assessed on</p>

Subject: Science Year: 8 Strand: Life and Living		
Sub-strand: 8.5 Plant Processes and Marine Ecosystems		No. of Periods: 12
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should 8.6.10 know the different parts of the ear (k) 8.6.11 know the functions of the parts of the ear (k) 8.6.12 appreciate that talking produce sound waves (a)	Learners should be able to 8.6.10.1 identify and labeled the main parts of a human ear; pinna, outer ear canal, eardrum, hammer, anvil, stirrup, semicircular canals, nerve, cochlea and eustachian tube 8.6.11.1 describe the function of the main parts of the ear; outer ear canal, eardrum, hammer, semicircular canal, nerve and cochlea 8.6.12.1 express ways sound affects our life; example: i. sound gives us direction ii. sound gives us instruction iii. sound makes us wake up iv. sound makes us feel excited	Learners can be assessed on

Subject: Science Year: 8 Strand: Earth and Beyond		
Sub-strand: 8.7 The Fragile Earth		No. of Periods: 12
<p>This sub-strand deals with the fragile earth. The earth is made up of layers - molten materials near the centre and solid rocks near and at the surface. The solid layer is the Lithosphere. It floats on the mantle (molten layer.) The solid crust consists of huge pieces called plates. The movement of these plates produces great forces. This is plate tectonic. The results of these forces are geological events such as earthquakes and volcanoes. Scientists believed that the earth is about 4.5 billion years old.</p>		
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>8.7.1 know earth's layers and movement of earth's plates (Plate tectonic) (k)</p> <p>8.7.2 understand the different types of earth's plate movement (u)</p> <p>8.7.3 be able to show model of plate tectonic (s)</p> <p>8.7.4 know the geological features (k)</p> <p>8.7.5 know the units to measure strength of earth quakes (k)</p>	<p>Learners should be able to</p> <p>8.7.1.1 describe the main Earths Layers: Crust, <i>Mantle and Core</i></p> <p>8.7.1.2 describe that Lithosphere is made of solid rock (plates) that continues to move</p> <p>8.7.2.1 explain the movement of the earths plates:</p> <ol style="list-style-type: none"> pulling away dives slide horizontally plate interact <p>8.7.3.1 construct models to demonstrate plate tectonic:</p> <ol style="list-style-type: none"> pulling away dives slide horizontally tectonic plates <p>8.7.4.1 describe the geological features which are results of tectonic activities:</p> <ol style="list-style-type: none"> earthquakes volcanoes fault lines <p>8.7.5.1 identify the level on the <i>Richter & Mercalli</i> scales which show the strength of earthquakes</p>	<p>Learners can be assessed on</p> <ol style="list-style-type: none"> explain the meaning of tectonic plate draw and label the cross-section of an eruptive volcano

Subject: Science Year: 8 Strand: Earth and Beyond		
Sub-strand: 8.7 The Fragile Earth		No. of Periods: 12
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p><i>Learners should</i></p> <p>8.7.6 know the cross - section of erupting volcano (k)</p> <p>8.7.7 appreciate that the seismic wave develops within Solomon Islands is measured by Geology Division (a)</p> <p>8.7.8 know that the earth has been in existence for a very long time (k)</p>	<p><i>Learners should be able to</i></p> <p>8.7.6.1 draw and label a cross-section of an erupting volcano</p> <p>8.7.7.1 make a visit to Geology office close to you school</p> <p>8.7.7.2 display in class pictures of earth quake and volcano in Solomon Islands</p> <p>8.7.8.1 describe different geological times scale of the earth</p> <p>8.7.8.2 describe fossils and their use to predict the ages of rocks</p>	<p><i>Learners can be assessed on</i></p>

Subject: Science		Year: 8	Strand: Natural and Processed Materials
Sub-strand: 8.8 Small Particles of Matter		No. of Periods: 12	
This sub-strand deals with elements as building block of matter. Elements are made of the same type of atoms. An atom has protons, neutrons in the centre and electrons outside the atom. These particles- electrons, protons, and neutrons determine the structure of an atom.			
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events	
Learners should 8.8.1 know that elements are building blocks of matter (k) 8.8.2 know that an element is made up of the same type of atom (k) 8.8.3 be able to show the structure of an atom (s) 8.8.4 appreciate atomic model developed by scientist (a)	Learners should be able to 8.8.1.1 give examples of elements (first 20 elements in the periodic table and the common element such as; silver, zinc, lead, mercury copper and iron 8.8.1.2 write the symbol of first 20 elements and the common element such as; silver, zinc, lead, mercury copper and iron common ones 8.8.2.1 identify common elements such as; Aluminium foil, iron nail, gold medal, silver medal 8.8.3.1 draw diagrams of the first 20 atoms, show nucleus (with neutrons and protons) and electrons 8.8.3.2 use common everyday material to construct a model of an atom 8.8.4.1 name the scientists and their contributions towards the understanding of atoms and elements	Learners can be assessed on 1. write down the first 20 elements 2. draw and label the structure of the first 20 elements	

Subject: Science		Year: 8	Strand: Life and Living
Sub-strand: 8.9 Microbes and Malaria Parasite		No. of Periods: 12	
There are tiny living things called micro-organisms. Many of this micro-organism we cannot see with our eyes. However, we can see them through a microscope. There are five main groups of micro-organisms (microbes)- <i>Bacteria, Fungi, Protists, Virus</i> and <i>Algae</i> . These microbes have different methods of reproduction. Some microbes cause diseases while other microbes are useful to us. Those microbes that cause diseases are called germs. There are modern and traditional medicines for treatment of diseases caused by germs.			
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events	
Learners should	Learners should be able to	Learners can be assessed on	
8.9.1 know that all ecosystems have tiny living things called micro-organisms (microbes) (k)	8.9.1.1 identify examples of each of the five microbes; bacteria, fungi, protists, virus, & algae	1. explain the difference between: <i>a. micro</i> and <i>b. macro</i> organisms	
8.9.2 be able to use a microscope and observe microbes (s)	8.9.2.1 demonstrate proper use of microscope 8.9.2.2 observe microbes in prepared slides and microbes from water sample from pond under a microscope 8.9.2.3 classify the microbes under the five main groups	2. draw and label the life cycle of the Malaria parasite	
8.9.3 understand micro-organism reproduction (u)	8.9.3.1 explain different methods of microbe reproduction: i. bacteria – binary fission ii. yeast – budding iii. virus – injecting DNA into the host cell.		
8.9.4 know that some microbes are harmful and useful (k)	8.9.4.1 identify two examples of <i>harmful bacteria, virus protozoa and fungus</i> and state the disease they cause 8.9.4.2 identify two example of useful bacteria		

Subject: Science Year: 8 Strand: Life and Living		
Sub-strand: 8.9 Microbes and Malaria Parasite		No. of Periods: 12
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>8.9.5 be able to show life cycle of microbe that causes malaria (s)</p> <p>8.9.6 know the treatment of some diseases (k)</p> <p>8.9.7 appreciate the continuous work of scientist in the improvement of medicine and also our traditional ways of treating diseases (a)</p>	<p>Learners should be able to</p> <p>8.9.4.3 describe the useful bacteria in; i. nitrogen fixation (converting nitrogen in the atmosphere into nitrates) ii. fermentation (making of wine)</p> <p>8.9.5.1 draw a simple diagram to illustrate the life-cycle of the plasmodium (malaria parasite) in the human blood and liver</p> <p>8.9.6.1 state a range of treatments for malaria: i. modern treatments ii. traditional treatments caution . do not apply any treatment with doctors advise . do not apply any traditional treatment without you parents advise</p> <p>8.9.7.1 express the different taste of the old Malaria tablets compare to the new malaria tablets and traditional medicine</p>	<p>Learners can be assessed on</p>

Subject: Science Year: 8		Strand: Natural and Processed Materials
Sub-strand: 8.10 Periodic Table		No. of Periods: 12
<p>This sub-strand introduces the Periodic Table to the learners. The periodic table is very important in the study of chemistry. The arrangement of the elements in the periodic table is special. Elements are placed in their column or row because of their properties. Columns in the Periodic Table are called “group numbers”, while rows are “period number”. “Mass number” indicates the total number of proton and neutrons in an atom. “Atomic number” indicates the number of protons or electron in an atom.</p>		
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>8.10.1 know that Periodic table contain all element found on earth (k)</p> <p>8.10.2 know the back ground history of the Periodic Table (k)</p> <p>8.10.3 know the general arrangement of the Periodic table (k)</p> <p>8.10.4 know the “Mass Number and Atomic Number” of an atom (k)</p> <p>8.10.5 show the arrangement of the electrons around the nucleus of an atom (s)</p>	<p>Learners should be able to</p> <p>8.10.1.1 describe that the Periodic Table is special table with names (symbols) of all the elements found on the Earth</p> <p>8.10.2.1 state that Dmitri Mendeleev in 1869 first published the Periodic table</p> <p>8.10.3.1 state that;</p> <ul style="list-style-type: none"> i. columns are “group numbers” ii. rows are “period numbers” iii. metals are generally on the right and non-metals are on the left of the Periodic Table <p>8.10.4.1 state that the ‘<i>Mass Number</i>’ of an element is the number of protons plus the number of neutrons in an atom</p> <p>8.10.4.2 state that the atomic number is the number of protons or electrons in an atom</p> <p>8.10.5.1 draw the structure of the first 20 elements and write the electronic configuration of the atoms</p>	<p>Learners can be assessed on</p> <ol style="list-style-type: none"> 1. define the mass number and atomic number of an atom 2. differentiate metals from non-metals

Subject: Science Year: 8 Strand: Natural and Processed Materials		
Sub-strand: 8.10 Periodic Table		No. of Periods: 12
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>8.10.6 understand that atoms combined together to form molecules or compounds (u)</p> <p>8.10.7 appreciate that all materials around us are made of the elements in the Periodic Table (u)</p>	<p>Learners should be able to</p> <p>8.10.6.1 explain the formation of a simple molecules or compounds (use very simple example such as Hydrogen H₂, Oxygen O₂, Carbon dioxide CO₂ and Water H₂O)</p> <p>8.10.7.1 express that all things both living and non living are made up of atoms</p>	<p>Learners can be assessed on</p>

Subject: Science Year: 8 Strand: Energy and Change		
Sub-strand: 8.11 Electricity		No. of Periods: 12
<p>This sub-strand deals with electricity. An object is electrically charged when it has more electrons than protons. Rubbing materials together causes electrons to move between the materials. Charged objects generate electrical force. Electrical charges move in a complete circuit. Most household appliance uses electricity. It is important to take great care when using household appliance to avoid electrical accidents.</p>		
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>8.11.1 know that an object can be electrically charged by friction (k)</p> <p>8.11.2 understand that electrons move in a wire in a circuit (u)</p> <p>8.11.3 appreciate that safety is very important in handling of electrical appliances (a)</p> <p>8.11.4 be able to show that electricity is very expensive in the Solomon (s)</p>	<p>Learners should be able to</p> <p>8.11.1.1 state that static electrical charge is produced by rubbing different materials together;</p> <ul style="list-style-type: none"> i. comb and hair ii. ruler and arm <p>8.11.2.1 explain the flow of electrons in a simple <i>electric circuit</i></p> <p>8.11.2.2 illustrate the flow of electron using a <i>simple circuit</i></p> <p>8.11.3.1 express safety measures in handling household appliances;</p> <ul style="list-style-type: none"> i. TV and video deck ii. urn or heater iii. radio & amp speakers iv. rice cooker v. hair clipper <p>8.11.4.1 determine the average cost of using electricity for a month in several household in Honiara and other Provincial centers.</p> <ul style="list-style-type: none"> i. obtain reading from electricity bill ii. obtain reading from “cash power” 	<p>Learners can be assessed on</p> <ol style="list-style-type: none"> 1. name the components of an electric circuit 2. discuss safety measures to be taken when using electricity

12.3 Science Year 9 Syllabus

Subject: Science Year: 9 Strand: Energy and Change		
Sub-strand: 9.1 Magnets and Electromagnets		No. of Periods: 16
<p>This sub-strand deals with magnets and electromagnets. Magnets exert invisible forces. The forces are strong enough to push or pull without touching. The forces are called magnetic forces. A magnet has two poles called North and South poles. A magnetic field is an area around the magnet where the force exists. Magnetic fields attract metals over a short distance only. The earth is the biggest magnet with magnetic fields attracting the compass. When magnetic fields are caused by electric currents, vice-versa. We call this electromagnetism. Electromagnets attract metals and have many uses in our lives.</p>		
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should 9.1.1 know that magnet has two poles and have attracting and repelling forces (k) 9.1.2 be able to show the attracting and repelling forces of magnets (s) 9.1.3 be able to show that a magnetic force is a <i>non-contact</i> force (s) 9.1.4 be able to show that magnetic field-lines are areas around the magnet (s) 9.1.5 understand that the earth is the biggest magnet (u)	Learners should be able to 9.1.1.1 state that the two ends of magnets are called North (N) and South (S) pole 9.1.1.2 demonstrate using a magnet; i. like poles repel (N-N, S-S) ii. unlike poles attract (N-S, S-N) 9.1.3.1 demonstrate using iron nails to show that a magnetic force is a non-contact force 9.1.4.1 demonstrate the path that a magnetic field takes around a magnet using iron filings and paper 9.1.4.2 demonstrate using the compass to show the direction of the field-lines 9.1.5.1 explain the needle of the compass always point towards the Earth's geographical north pole (south magnetic pole)	Learners can be assessed on 1. draw the magnetic field for a bar magnet 2. find out the use of electromagnets in simple electrical device such as mobile phones and doorbells 3. predict what the Earth's core is made up of, given the Earth has a magnetic field

Subject: Science Year: 9 Strand: Energy and Change		
Sub-Strand: 9.1 Magnets and Electromagnets		No. of Periods: 16
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>9.1.6 be able to show that magnetic fields are caused by electricity, vise versa (u)</p> <p>9.1.7 appreciate that electromagnets can be used in many useful appliances and equipment for our daily lives (a)</p>	<p>Learners should be able to</p> <p>9.1.6.1 use a simple circuit with a compass to show that magnetic field is generated when electric current passes through</p> <p>9.1.7.1 list different appliances that use electromagnet; radio, video, speakers</p>	<p>Learners can be assessed on</p>

Subject: Science		Year: 9	Strand: Life and Living
Sub-Strand: 9.2 Sense and control		No. of Periods: 12	
Our eyes allow us to see things. Our ears work by detecting sound waves. Ears also sense the position of our head, helping us to keep our balance. We use our nose to breathe air and also to smell things. Our tongue allows us to find out whether the juice is sweet or sour. Our skin protects the surface of our body and also tells us to move from a very cold place to a warm place.			
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events	
Learners should 9.2.1 know that humans have five senses (k) 9.2.2 know parts of the human body that is responsible for the senses (k) 9.2.3 know the function of the main internal parts of the sensory organs (k)	Learners should be able to 9.2.1.1 identify the five human senses: sight, hearing, smell, taste and touch 9.2.2.1 identify different parts of the body that responsible for our senses; sight - eye hearing - ear nose - smell tongue - taste skin - touch 9.2.3.1 describe the main functions of the internal parts of the human eye, nose ear and tongue Eye: cornea, pupil, iris, lens, vitreous humour, blind spot, optic nerve, sclera, retina Ear: pinna, outer ear canal, eardrum, hammer, anvil, stirrup, semicircular canals, nerve, cochlea and eustrachain tube Nose: external nose Nasal cavity, cilia Tongue: tip, dorsal and lateral surface Skin: epidermis, dermis and fat layer	Learners can be assessed on 1. draw and label the diagram of the eye 2. describe the function of each of the following parts of the ear: eardrum, semi-circular canals and ossicles	

Subject: Science Year: 9 Strand: Life and Living		
Sub-Strand: 9.2 Sense and control		No. of Periods: 12
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>9.2.4 be able to show the different part of tongue that is responsible for different taste (s)</p> <p>9.2.5 understand the problems associated with human sense organs (u)</p> <p>9.2.6 understand ways to deal with sensory problems (u)</p> <p>9.2.7 be able to show simple stimulus-response exercise (s)</p>	<p>Learners should be able to</p> <p>9.2.4.1 demonstrate the part of the tongue responsible for; sour, bitter and sweet taste</p> <p>9.2.5 explain the problems associated with the body parts eye - long and short sightedness ear- deafness</p> <p>9.2.6.1 explain the use of different lenses to resolve eye i. short sightedness ii. long sightedness</p> <p>9.2.6.2 explain ways to solve hearing problems</p> <p>9.2.7.1 perform simple stimulus-response exercise such as; i. put hands in hot water ii. piercing the skin with a "sharp" pin CAUTION . use warm water and blunt pin</p>	<p>Learners can be assessed on</p>

Subject: Science Year: 9 Strand: Natural and Processed materials		
Sub-Strand: 9.3 Materials		No. of Periods: 16
Metals are conductors, non-metals are insulators. Semi-metals behave like metal and non-metals. Metal can react with air this is call rusting and metal also react with acid to produce salt and hydrogen gas. Plastic and fibre are non-metallic substances that are made mainly of carbon atoms. Plastics are used in many manufacturing products that are useful for our daily uses.		
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should 9.3.1 know that metals, semi-metals and non-metals have their unique properties (k) 9.3.2 be able to show that the corrosion of metals is caused by environmental factors (s) 9.3.3 be able to show rates of reaction between dilute acids (s)	Learners should be able to 9.3.1.1 identify the different properties of metals: <i>hardness, malleability, ductility, density and conductivity</i> 9.3.1.2 identify properties of Non-metals as: <i>poor conductor, dull, brittle, low melting and boiling point.</i> 9.3.1.3 state that semi-metals have both metallic and non-metallic properties 9.3.2.1 demonstrate the corrosion process using iron nails in conditions e.g. i. iron nail in water ii. iron nail in oil iii. iron nail in air 9.3.3.1 perform reaction between metals and dilute acids and compare the rate of reactions. metal: <i>Na, Mg, Al, Ca, Fe and Zn</i> dilute acids: <i>Hydrochloric acid, Sulfuric acid and Nitric acid.</i> <i>[0.1M]</i> <i>Use any acid that is available.</i>	Learners can be assessed on 1. differentiate the properties of metals and non-metals 2. draw a table and write down the advantages and disadvantages of using plastics and metals 3. write and balanced chemical reaction of metal and acid reactions E.g.2 $\text{HCl} + \text{Mg} \rightarrow \text{MgCl}_2 + \text{H}_2$

Subject: Science Year: 9 Strand: Natural and Processed materials		
Sub-Strand: 9.3 Materials		No. of Periods: 16
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should 9.3.4 know the different uses of <i>alloys</i> in the community (k) 9.3.5 know the two main types of plastics (k) 9.3.6 be able to show examples of plastics (s) 9.3.7 be able to show examples of fibers (s) 9.3.8 appreciate the different uses of plastics in the community (a)	Learners should be able to 9.3.4.1 identify different types of alloy materials found around the school and community and state; i. what metals they made of ii. uses of the alloys 9.3.5.1 state the two main types of plastics; i. thermoplastic ii. thermosetting plastic 9.3.5.2 state the materials used to make the plastics 9.3.6.1 display the two types of plastic; <i>thermoplastic</i> and <i>thermosetting</i> plastic 9.3.6.2 draw the structures of the two types of plastics 9.3.7.1 display different kind of textile fibers; cloths and wool 9.3.8.1 express the advantage and disadvantage of the uses of plastics	Learners can be assessed on

Subject: Science Year: 9 Strand: Life and living		
Sub-Strand: 9.4 Body Systems (II)		No. of Periods: 16
<p>This sub-strands deals with skeleton, reproduction, nerves and endocrine. The human body is made up of different systems that work together for normal body functions. The skeleton system consists of bones and muscles; they support and enable the body to move. The human reproductive system makes the continuation of life possible. When gametes from male and female parents combine, a new offspring is formed. The nervous system controls and co-ordinates all the parts of the body. It is the most complex of all the body systems. The endocrine system uses chemical messages called hormones to transfer information around the body.</p>		
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>9.4.1 know that the human skeleton is made up of different parts (k)</p> <p>9.4.2 know the function of the human skeleton system (k)</p> <p>9.4.3 know the different types of joints of the human skeleton system (k)</p> <p>9.4.4 know that bones join to each other and to the muscles (k)</p> <p>9.4.5 understand that muscles produce movement of joints and bones (u)</p>	<p>Learners should be able to</p> <p>9.4.1.1 identify five different parts of the skeleton system; skull, limbs, ribcage, girdles, vertebral column</p> <p>9.4.2.1 describe the three main functions of the human skeleton system; Support, Protection and Movement</p> <p>9.4.3.1 describe the three main types of joints of the human skeleton system; hinge joint – elbow and knee ball and socket – shoulder and hip pivot – neck and spine on the hip bone</p> <p>9.4.4.1 state that muscles are joined to the bone by tendons</p> <p>9.4.4.2 state that bones are joined to each other by ligaments</p> <p>9.4.5.1 explain that muscle can contract (get shorter and fatter) or relax (become longer and thinner) to cause movement</p>	<p>Learners can be assessed on</p> <p>1. state the three main functions of the human skeleton system</p> <p>2. identify the major male and female hormones and where possible state what each hormone does in the body?</p> <p>3. what is an antagonistic pair? Explain how antagonistic muscles work to cause movement in animals</p> <p>4. describe a situation in which the response of the body is controlled by both the nervous and endocrine system</p>

Subject: Science Year: 9		Strand: Life and living
Sub-Strand: 9.4 Body Systems (II)		No. of Periods: 16
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	Learners should be able to	Learners can be assessed on
<p>9.4.6 be able to show antagonistic muscle movement in parts of the body (s)</p> <p>9.4.7 understand antagonistic muscle movement of the parts of the body (u)</p> <p>9.4.8 know the different parts of the human reproductive systems (k)</p> <p>9.4.9 understand the function of parts of the human reproductive systems (u)</p> <p>9.4.10 understand the stage of puberty (u)</p> <p>9.4.11 understand the phases of the menstrual cycle (u)</p>	<p>9.4.6.1 demonstrate that lifting of the arm is an antagonistic muscle movement</p> <p>9.4.7.1 explain that muscles work in pair, with one contracting while the other relaxes. This is antagonistic pairs; one of the muscles can always contract to move a joint</p> <p>9.4.8.1 identify the parts of the male and female reproductive organs; Male: penis, testicle, urethra, prostate and bladder Female: vagina, cervix, uterus, fallopian tube and ovary</p> <p>9.4.9.1 describe the functions of the parts of reproductive system; Male: testicle, urethra, prostate and bladder Female: cervix, uterus, fallopian tube and ovary</p> <p>9.4.10.1 explain the physical change that occurred in male and female at puberty that due to release of hormones (testosterone and estrogen)</p> <p>9.4.11.1 draw a diagram of the menstrual cycle and explain the three main phases; i. follicle ii. ovulation iii. Luteal</p>	

Subject: Science Year: 9		Strand: Life and living
Sub-Strand: 9.4 Body Systems (II)		No. of Periods: 16
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>9.4.12 know the processes from gametes to birth (k)</p> <p>9.4.13 know the problems associate with the reproductive systems (k)</p> <p>9.4.14 know the nervous system (k)</p> <p>9.4.15 know the central and peripheral nervous system (k)</p> <p>9.4.16 know that the nerves are made of neurons (k)</p> <p>9.4.17 be able to show simple reflex arc (s)</p> <p>9.4.18 know that the endocrine system passes messages in the form of chemicals (<i>hormones</i>) to the target organs of the human body (k)</p>	<p>Learners should be able to</p> <p>9.4.12.1 draw a diagram to describe the reproductive stages from fertilization to birth</p> <p>9.4.13.1 identify the problems associated with male and female reproductive systems diseases, infertility, cancer and cysts</p> <p>9.4.13.2 describe ways to avoid having reproductive problems</p> <p>9.4.14.1 describe the main parts of the nervous system</p> <p>9.4.15.1 describe the functions of brain, spinal cord, sensory receptor and nerves</p> <p>9.4.16.1 describe using diagram sensory, motor, & inter neurons</p> <p>9.4.16.2 describe the main functions of sensory, motor and inter neurons</p> <p>9.4.17.1 demonstrate simple reflex arc; tap just below the knee cap of a friend sitting on a table with a hanging leg</p> <p>9.4.18.1 define the terms: hormones, endocrine glands, endocrine system, and target organs</p>	<p>Learners can be assessed on</p>

Subject: Science Year: 9 Strand: Life and living		
Sub-Strand: 9.4 Body Systems (II)		No. of Periods: 16
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>9.4.19 know that each hormone produced by the endocrine glands (k)</p> <p>9.4.20 appreciate the importance of family planning (a)</p>	<p>Learners should be able to</p> <p>9.4.19.1 identify and describe the functions of endocrine glands and the hormones they produce: pituitary, thyroid, adrenal, pancreatic, ovary, testes and liver</p> <p>9.4.20.1 express the benefits of family planning</p>	<p>Learners can be assessed on</p>

Subject: Science Year: 9 Strand: Life and living		
Sub-Strand: 9.5 Human effect on Ecosystems		No. of Periods: 8
<p>This sub-strand deals with the human effects on the ecosystem. Deforestation, development of towns, animal overgrazing, used of chemical mining and plantation practices are some activities that are affecting the ecosystem. Also introduction of non-local (invasive) species into the local ecosystem puts pressure on indigenous species. We must act now to conserve our fragile ecosystem.</p>		
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>9.5.1 know that increasing human population and activities cause destruction to ecosystems (k)</p> <p>9.5.2 know that most human activities cause pollution to the environment (k)</p> <p>9.5.3 be able to show introduced species can be harmful to local or native species (k)</p> <p>9.5.4 know that endangered species is one that their population is declining (k)</p> <p>9.5.5 understand the purpose of conservation (u)</p>	<p>Learners should be able to</p> <p>9.5.1.1 identify human activities that causes environmental problems in your community; deforestation, development of township, animal overgrazing, use of chemicals, mining and plantation practices</p> <p>9.5.2.1 identify types of pollution in your school or local community; water pollution, air pollution, soil pollution and sea pollution</p> <p>9.5.3.1 conduct research to investigate introduced species in Solomon Islands and describe its negative impact on local species; example of introduced organisms; toads, miner-birds, tilapia and rain-tree</p> <p>9.5.4.1 name at least one local species that is in danger of extinction, example; leatherback sea turtle</p> <p>9.5.5.1 explain the purpose of conservation</p> <p>9.5.5.2 identify methods or ways of conservation, both short and long term</p>	<p>Learners can be assessed on</p> <p>1. identify human activities and describe how it affects ecosystems in the environment</p> <p>2. describe ways to protect and conserve the environment in which we live?</p>

Subject: Science Year: 9 Strand: Earth and Beyond		
Sub-Strand: 9.6 Climate Change and environmental issues		No. of Periods: 12
<p>This sub-strand deals with climate change and other environmental issues. The cause of climate change is believed to be a result of increasing concentration of green house gases in the atmosphere subsequently affecting global temperature. The increase in global temperature has resulted in changing weather pattern. Also in this sub-strand we deal with the ozone layer, its role and threat. The other environmental issue that is also looked at is the nuclear radiation. Controlled nuclear radiation can be useful. However, can also be extremely dangerous if it is not controlled.</p>		
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>9.6.1 know that the Earth's atmospheric temperature depends on the green house gases (k)</p> <p>9.6.2. understand the role of green house gases (u)</p> <p>9.6.3 understand the cause and effect of increased concentration of green house gases in the atmosphere (u)</p> <p>9.6.4 know that El Nino is causing weather extremes (k)</p> <p>9.6.5 know that the ozone layer protects life on earth from harmful materials from the sun (k)</p> <p>9.6.6 understand that the ozone layer is depleting (u)</p>	<p>Learners should be able to</p> <p>9.6.1.1 name the green-house gases; water vapour, carbon dioxide, methane, nitrous oxide and ozone</p> <p>9.6.2.1 explain the role of green house gases in the atmosphere; water vapour, carbon dioxide, methane, nitrous oxide and ozone</p> <p>9.6.3.1 explain the cause and effects of <i>increased</i> concentration of green house gases in the atmosphere</p> <p>9.6.3.2 explain ways in which we can help to reduce the greenhouse gas concentration</p> <p>9.6.4.1 state the effects of <i>El-Nino</i> in the South American, Australia and the Pacific region</p> <p>9.6.5.1 state that <i>ozone</i> is a gas that occurs naturally in the stratosphere</p> <p>9.6.6.1 explain the cause of ozone layer depletion</p>	<p>Learners can be assessed on</p> <p>1. describe the causes and effects of sea level rise in Solomon Islands and state the safety measures to be taken</p> <p>2. what is meant by El-Nino?</p> <p>3. list 4 evidence to suggest that global warming is real</p> <p>4. conduct an activity which demonstrates the sea level rise for example, the melting of ice cube into a bucket of water. The ice cube must not be placed different position from the bucket</p>

Subject: Science Year: 9 Strand: Earth and Beyond		
Sub-Strand: 9.6 Climate Change and environmental issues		No. of Periods: 12
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p><i>Learners should</i></p> <p>9.6.7 know that climate change is affecting many people (k)</p> <p>9.6.8 appreciate the importance of, both, National and International forums on environmental degradation and climate change (a)</p>	<p><i>Learners should be able to</i></p> <p>9.6.6.2 explain the effect of Ozone-layer-depletion on living organisms</p> <p>9.6.7.1 describe the term “Climate Change”</p> <p>9.6.7.2 describe term resilience</p> <p>9.6.7.3 suggest ways to adapt to the changing environment caused by climate change</p> <p>9.6.7.4 identify specific means of climate change adaption in Solomon Islands and other Pacific countries</p> <p>9.6.8.1 identify one National or International forum on environmental degradation and climate change, and describe how the forum dealt with a specific environmental issue affecting the Solomon Islands and other Pacific Island countries</p>	<p><i>Learners can be assessed on</i></p>

Subject: Science Year: 9 Strand: Natural and Processed Materials		
Sub-Strand: 9.7 More Chemical Reactions		No. of Periods: 8
<p>Chemical reactions occur around us every day. We observe colour change or heat release during a chemical reaction. Chemical equations are scientific way of representing a reaction it shows reactants and products of a chemical reaction. Chemical equations are balanced to show equal number of each type of atom on both side of the equation.</p>		
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>9.7.1 know that chemical reactions occur every day around us, in our bodies, in plants and animals (k)</p> <p>9.7.2 be able to show simple chemical reactions using common everyday materials (s)</p> <p>9.7.3 Know balancing of simple chemical reactions (k)</p> <p>9.7.4 appreciate that chemical reactions is important to our life (a)</p>	<p>Learners should be able to</p> <p>9.7.1.1 describe four common chemical reactions that occur around us.</p> <ul style="list-style-type: none"> i. cell respiration ii. photosynthesis iii. rusting of Iron iv. burning of Carbon <p>9.7.2.1 perform the following chemical reactions and write word equations for each reaction performed:</p> <ul style="list-style-type: none"> i. burning of wood ii. burning of paper iii. metal & oxygen iv. acids & bases v. acids & carbonates <p>9.7.3.1 write balance chemical equations for simple chemical reactions</p> <p>9.7.4.1 express that our lives depend on the chemical reaction such as; cellular respiration and photosynthesis</p>	<p>Learners can be assessed on</p> <p>1. write down the chemical equation in photosynthesis</p> <p>2. write down correct balanced equations for the following chemical reactions:</p> <ul style="list-style-type: none"> a. burning of carbon b. iron metal ships rusting on the shallow reefs c. hydrochloric acid with sodium hydroxide <p>3. produce soap using oil and baking power e.g. sodium hydroxide (any salt)</p>

Subject: Science		Year: 9	Strand: Earth and Beyond
Sub-Strand: 9.8 Mineral and Energy Sources		No. of Periods: 12	
<p>This sub-strand deals with mineral and energy sources in Solomon Islands. Gold is one of the many minerals that are found in our islands. Geologists have discovered other minerals other than gold in other islands in the country. Currently some companies are undertaking mineral prospecting in our islands. Mineral is a very important resource, however, care must be taken when we extract it. Energy is important for Solomon Islands. The current main source of energy is fossil fuel. Scientist predicted that fossil fuel will run out soon. It is therefore, important that other alternative sources of energy (such as solar, coconut oil, wind, etc) are identified.</p>			
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events	
Learners should	Learners should be able to	Learners can be assessed on	
9.8.1 know that minerals formed naturally in the Earth (k)	9.8.1.1 describe that material in the Earth’s crust under very high temperature and pressure produce minerals	1. describe how gold is extracted at Gold-ridge mining in Guadalcanal	
9.8.2 know that there are different types of ores or mineral deposits in Solomon Islands (k)	9.8.2.1 name all the different types of ores and minerals found in the Solomon Islands	2. state at least one <i>economic</i> and <i>social</i> effect of mining activity <i>in</i> Solomon Islands	
9.8.3 be able to show methods of mineral mining (s)	9.8.3.1 demonstrate two types of gold mining methods in Solomon Islands: i. open mining (mining industry) ii. punning (villagers)		
	9.8.3.2 state the advantages and disadvantages of each type of mining i. closed mining ii. open and punning		
9.8.4 know the process of mineral extraction (k)	9.8.4.1 describe the important steps in the process of gold, aluminum, iron and nickel extraction		
9.8.5 appreciate that minerals brings economic benefit for our country (a)	9.8.5.1 state the value of gold exported from Solomon Islands in year 1998 - 2012		

Subject: Science Year: 9		Strand: Earth and Beyond
Sub-Strand: 9.8 Mineral and Energy Sources		No. of Periods: 12
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
<p>Learners should</p> <p>9.8.6 understand that mining activities can cause destructions to the natural environment (u)</p> <p>9.8.7 know that mineral resources are non-renewable resources (k)</p> <p>9.8.8 know the World's main produces of fossil fuel (k)</p> <p>9.8.9 know that there are alternative sources of energy to solve the "energy crisis" (k)</p> <p>9.8.10 know that nuclear energy is an alternative source of energy generated from nuclear radiation (k)</p>	<p>Learners should be able to</p> <p>9.8.5.2 state how much the government land owners are receiving from the export of gold from 1998 – 2012</p> <p>9.8.6.1 discuss both the negative and positive impacts of mining in Solomon Islands</p> <p>9.8.7.1 state that gold and other minerals found in Solomon Islands are <i>non-renewable resources</i></p> <p>9.8.8.1 list the main fossil fuel producer-countries in the world: <i>Saudi Arabia, Iraq, Iran, USA and Kuwait</i></p> <p>9.8.8.2 state that the Earth's 'energy crisis' is the situation where the world's fossil fuel deposit are running out</p> <p>9.8.9.1 describe the alternative sources of energy; solar, wind, coconut oil, waves, hydro, geothermal, and tidal and bio-fuel</p> <p>9.8.10.1 describe the sources of "nuclear energy"</p> <p>9.8.10.2 describe both the positive and the negative effects of nuclear radiation</p>	<p>Learners can be assessed on</p>

Subject: Science		Year: 9	Strand: Energy and Change
Sub-Strand: 9.9 Communicating Technology		No. of Periods: 10	
<p>This sub-strands deals with Electromagnetic spectrum which consists of a variety of electromagnetic waves. Light is one of the electromagnetic waves. Visible light enables us to see things with our eyes. The rest of the waves are invisible. X-rays, radio waves, and ultraviolet rays are some examples. Invisible rays can only be detected by machines such as mobile phones, radios, fax and many other modern types of equipment. Today's technology effectively uses electromagnetic waves, hence, making communication possible.</p>			
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events	
Learners should	Learners should be able to	Learners can be assessed on	
9.9.1 know the types of waves (k)	9.9.1.1 describe the two types of waves: Transverse and Longitudinal	1. describe the use of electromagnets in microphones, generators or vending machines	
9.9.2 understand that waves have different properties (u)	9.9.2.1 explain the properties of waves with the aid of a diagram; frequency, wavelength and amplitude	2. construct simple telegram, telephone or mobile phone and explain how it works	
9.9.3 know that electromagnetic spectrum contains variety of waves with different wavelengths and frequencies (k)	9.9.3.1 identify the different <i>wavelengths</i> and <i>frequencies</i> from the electromagnetic spectrum (i.e, from smallest to largest wavelength) Gamma ray, X-ray, ultra violet rays, visible light, infra-red, micro-wave, radio wave		
9.9.4 be able to show the use of electromagnetic waves in things we use in our daily lives (s)	9.9.4.1 display the electronic equipment that use the following waves: Gamma ray, X-ray, Ultra violet rays, Visible light, Infra-red, Micro-wave, Radio wave		
9.9.5 appreciate today's communication efficiency (a)	9.9.5.1 express analogue and digital signals and its uses		

Section 13. LEARNING AND TEACHING RESOURCES

This section contains a list of learner's books, teacher's guides and other learning and teaching resources for effective teaching and learning of Secondary Science syllabus for years 7 to 9.

No	Title	Publication Date	Publisher
1	Solomon Islands Science Year 7 Learner's book	2011	Pearson Ed., Australia
2	Solomon Islands Science Year 7 Teacher's Guide	2013	Pearson Ed., Australia
3	Solomon Islands Science Year 8 Learner's book	2013	Pearson Ed., Australia
4	Solomon Islands Science Year 8 Teacher's Guide	2013	Pearson Ed., Australia
5	Solomon Islands Science Year 9 Learner's book	2013	Pearson Ed., Australia
6	Solomon Islands Science Year 9 Teacher's Guide	2013	Pearson Ed., Australia

The physical quantities and their symbols to be used in the course and in the examination are as follows:
SI Basic Units

Quantity	Unit Abbreviation	Name of Unit	Unit Symbol	
Length	L	Metre	M	
Mass	m	Kilogram	Kg	
Time	t	Second	s	
Electric Current	I	Ampere	A	
Temperature	T	degree Celsius	° C	
Derived Units				Derivations (using unit symbols)
Area	A	square metre	m ²	
Volume	V	cubic metre	m ³	
Density	ρ	grams per cubic centimeter		g cm ⁻³
Force	F	Newton	N	kg m s ⁻²
Power	P	Watt	W	J s ⁻¹
Energy/Work/Heat	E	Joule	J	N m
Frequency	f	Hertz	Hz	Vλ ⁻¹ (s ⁻¹)
Potential Difference (Voltage)	V	Volt	V	J C ⁻¹
Pressure	p	Pascal	Pa	N m ⁻²
Resistance	R	Ohm	Ω	V A ⁻¹

Other units may be derived from these such as, m s⁻¹ for speed, m s⁻² for acceleration and J kg⁻¹ ° C⁻¹ for specific heat capacity.

Some quantities have different symbols in specific cases, λ for wavelength, K.E and P.E for kinetic and potential energy, d for displacement and a for acceleration

The following prefixes may be used with the basic units to denote an increase or decrease in amount.

kilo - (k) = 10³ , mega - (M) = 10⁶ , milli - (m) = 10⁻³ and micro - (μ) = 10⁻⁶ Because of convenience or common usage centi (c) = 10⁻² may be used with metres and deci (d) = 10⁻¹ with cubic metres although they are non-standard.

Notes on Formulas and Units

1. The S.I system of units should be used.
2. Learners are expected to be familiar with the use of negative indices in equations and in the description of units.
3. Examination questions may require the use of any one of the equations included in this syllabus document.
4. All equations may be included in the examination paper for selected use by candidates.

Waves	Unit	Forces	Unit
T = period	s	F = force	N
λ = wavelength	m	m = mass	kg
f = frequency	Hz	a = acceleration due to gravity	ms^{-2}
v = velocity	ms^{-1}		
$v = f\lambda$ $T = \frac{1}{f}$		$F = ma$	

Energy	Unit	Pressure in liquid and gases	Unit
E = energy	J	P = pressure	Nm^{-2}
E_p = potential energy (P.E)	J	ρ = density of liquid	kgm^{-3}
E_k = kinetic energy (K.E)	J	A = area	m^2
m = mass	kg	h = depth in a liquid	m
g = acceleration due to gravity	ms^{-2}	g = acceleration due to gravity	ms^{-2}
c = speed of electromagnetic waves	ms^{-1}	F = force	N
$E_p = mgh$ $E_k = \frac{1}{2}mv^2$ $E = mc^2$		$P = \rho gh$ $F = PA$	

Current	Unit	Mechanical work and power	Unit
V = voltage	V	W = work	J
I = current	A	F = force	N
R = resistance	Ω	d = distance	m
P = power	W	P = power	W
t = time	s	t = time	s
$V = IR$ $P = IV$ $E = VIt$		$W = Fd$ $P = \frac{W}{t}$	

Section 14. TOOLS AND EQUIPMENT

This section contains a list of tools, equipment and consumables for effective teaching and learning of Secondary Science syllabus for years 7 to 9.

Description of Items

PHYSICS

1. Ammeter: Portable burn type with 50 / by 500 ma / 5A
2. Balance: electronic/digital, 2000g, capacity/1.0gmains/battery powered
3. Balance: electronic/digital, 2000g, capacity 0.1 grams
4. Ball and ring apparatus: wooden handle. IEC
5. Bar and gauge apparatus: wooden handle, to demonstrate metal expansion IEC
6. Bi-metallic strip: 150mm x 10mm x 1mm thick IEC
7. Barometer, Aneroid
8. Bulb, 2 Volt (filament)
9. Bulb, 6 Volt (filament)
10. Bottle, Reagent: 100mL
11. Bottle, Reagent: 250mL
12. Capacitor: 100 μ F, 500 μ F, 15,000 pF
13. Calorimetry copper nickel: plated with rim 75mm high by 50mm diameter
14. Cubes Kit: Cube set, 10mm, sets/6 (Al, Brass, copper, iron, lead, zinc), Wood 25mm pkt/20, Brass 20mm pkt/5, Aluminium 20mm pkt/5
15. Clips: alligator, pkt/150
16. Clips: crocodile, pkt/150
14. Clips: screw, pkt/150
15. Circuit board kit: 360mm squareboard with brass posts, connectors and electronic components
16. Conductivity ring: with 4 different metal strips, (iron, copper, brass, aluminium), with wax wells at outer ends-for comparing thermal conductivity IEC
17. Conducting apparatus –Iron filings (fine)
18. Electrode, Carbon 150mm x 6mm
19. Electrostatics, Cloth
20. Electrostatics Rod: 300mm x 100 mm (acrylic) Glass
21. Electrostatics Rod: 300mm x 100 mm (acrylic) Polystyrene
22. Electrostatics Rod: 300mm x 100 mm (acrylic) Ebonite
23. Field Compass
24. Galvanometer
25. Hand Magnifier: 75mm dia. 2X and 4X
26. Hydrometer:0.7 - 1.00 specific gravity hydrometer, 250mm, glass 1.0 - 1.35
27. Lenses, Glass, convex: 50mm dia, focal length 100mm
28. Lenses, Glass, convex: 75mm dia, 300mm length
29. Lense Bi-Concave: focal length: 50mm, 100mm, 200mm
30. Lense Bi-Convex: focal length: 50mm, 100mm, 200mm
31. Lens Holder
32. Lead set: 50cm of insulated wire fitted with alligator clips, set/6 (2 red, 2 black, 2 yellow)
33. Light Box & optical set
34. Magnetic compass, 39mm, diameter
35. Mass sets, (machined brass), Slotted, 9 of 50g, plus 50g hanger, total 500g (set)
36. Mass, brass slotted, 10g, 20g, 50g
37. Mass, brass slotted, 100g, 500g, 1kg
38. Mirrors Plain glass 75mm by 25mm
39. Magnet Horse Shoe, 25mm (for 1)
40. Magnet, Bar Type, 75mm Long
41. Pendulum Bob Brass: 20mm Dia, 25mm Dia
42. Power supply 2-12V 5.5Amps AC/DC

43. Set Pulleys: Single pulley, 50mm diameter, Double pulley, 50mm diameter ,Triple pulley, 50mm diameter
44. Set Prisms: 50mm height, 60° x 60° x 60°, 90° x 60° x 30° (32mm)
45. Set Rain Gauge, Plastic (Measures To 150mm Of Rainfall)
46. Set Refraction Block: glass rectangular
47. Ruler: wooden 1 M
48. Set Retort :stand & clamp, boss heads
49. Set Resistor, Variables (10 – 100 ohms)
50. Set each Resistor: 5 ohms, 10 ohms, 20 ohms, 50 ohms, 100 ohms, 1k ohms, 3k ohms
51. Silky spring
52. Sets Spring /Newton Balance: 0-20N, 0-2000g,05N/50g
53. Sets Stopwatch: digital 100th/sec
54. Solar Energy Kit
55. Screw Gauge Micrometer
56. Thermometer (Clinical) 35 - 42 C, mercury 110mm longs
57. Thermometer, mercury filled, -10 to + 110 °C,
58. Ticker Timer, Trolleys (sets)
59. Tuning Fork: chromatic set
60. Vernier caliper
61. Voltmeter, burn type 3/ 15 /300V DC:single, double, triple (ranges)
62. Wave Demonstration Kit
63. Wheatstone Bridge
64. coil each of different sizes, Wire, Copper, Connecting, Flexible, 50grams reel for coils and widings

CHEMISTRY

1. Beaker, Squat, Borosilicate Glass: 50mL, 100mL, 250mL, 500 mL
2. Beaker, Plastic: 50mL, 100mL, 250 mL, 500 mL
3. Burette, Conventional Type, (50ml, 100ml)
4. Dish evaporating: 100mL, 350mL
5. Distillation kit: 19/26 joint 46BU, an 11 piece set including flasks, liebig condensor, dropping funnel, connector tubes, stopper, thermometer pocket
6. Filter paper 90mm, pkt/100
7. set each Test tubes: boro65silicate plastic, 1.5mm, Australian Standard67, 100mm x 16mm with rim, box of 100
8. Set eachTest tubes: boro65silicate plastic, 1.5mm, Australian Standard67, 150mm x 16m 6m with rim, box 50
9. Set each Tubing, glass: soda 5-6/6-7/7-8mm O.D
10. Watch Glass: 100mm Dia., Soda Glass, Ground Edge
11. Wash Bottle: Plastic With Spout, 250mL
12. Boss head clamp
13. Bunsen Burner, LPG
14. Bench mats, non asbestos material, thickness 4.5mm 300 x 300 x 6mm
15. Crucibles, Porcelain, with Lid 40mm Dia. Depth 50mm(Tray/15)
16. Gauge, Wire
17. Set Dropper and teat
18. Laboratory and clamp
19. Mortar And Pestle, porcelain, 100mm dia.
20. pH meter digital waterprove
21. Set Pipette, graduated glass, borosilicate: 10mL x 0.1mL, 25mL x 0.1mL.

22. Pipette filler, To Fit All Size Pipettes
23. Pipette pump bulb
24. Pipe clay Triangle on wire frame, 50MM
25. Retort Stands And Accessories: Clamp, Boss Head, 600mm Rod, 120mm x 200mm Base
26. Spatulas, Steel, chattaway: 150mm x 18mm, with solid handle
27. Spatulas, Steel: 150mm long x 8mm wide, square one end, rounded and bent at the other end
28. Set Stoppers Rubber/Wood, 1 hole: 16mm, 19mm, 22mm, 24mm.
29. Set Stopper:Rubber/Wood, Solid pkt 10: 12mm, 15mm, 19mm, 20mm, 29mm, 32mm.
30. Set Stopper Rubber/Wood 2 holes: 17mm, 19mm, 22mm, 29mm, 32mm
31. Tripod Stand, 200mm High, 125 mm Side
32. Tongs, 220mm long: straight serrated jaws, steel
33. Testing clamp
34. Test tube holders, single peg type: 28mm, wood (10 to 49PCS)
35. Test tube Holders/ Rack: wooden, non-wooden, superb quality, 6 holes/6pegs.
36. Test Tube Brushes, 60mm dia.
37. Tubing Rubber: 10mm 10 x per metre, 12mm 10 x per metre

CHEMICALS

1. Aluminium Chloride L.R.Anh 500g
2. Aluminium Hydroxide 500g
3. Aluminium Oxide Calcined 500g
4. Aluminium Powder 100 g
5. Aluminium Sulfate L.R. 500g
6. Benedicts Solution Labchem, 500 mL
7. Bromine water 100mL
8. Calcium Carbonate(marble Chips) 500g
9. Calcium Chloride, fused, 500g
10. Calcium Hydroxide L.R. Kg
11. Calcium Granules dry Technical 100g
12. Calcium Nitrate 500g
13. Calcium Sulfate, hemi hydrate 500g
14. Calcium Oxide 500g
15. Copper Carbonate 500g
16. Copper Chloride 500g
17. Copper Metal, powder 500g
18. Copper Metal, turnings 500g
19. Copper Oxide 500g
20. Copper (II) Sulfate Technical, 1kg
21. Copper Nitrate
22. Eosin, 5 g
23. Hydrochloric Acid L.R. 2.5L
24. Hydrogen Peroxide 30% (100vol.) Technical, 500mL
25. Iodine 100g
26. Chloride Anhydrous 500g
27. Iron filings fine Labchem 500g
28. Iron Oxide (III) red Technical 500g
29. Silica Gel Self Indicating 500g
30. Silver Nitrate L.R 25g
31. Sodium Bicarbonate L.R 500g

32. Sodium Carbonate Anhydrous Technical 1kg
33. Sodium Chloride L.R 500g
34. Sodium Hydroxide 500g
35. Sodium Nitrate 500g
36. Sodium Sulfate Anhydrous 500g
37. Sulfur, 500g
38. Sulfuric Acid - 98% 2.5L
39. Tin Metal Foil 100g
40. Universal Indicator Sol pH 3-11, 100mL
41. Zinc Chloride 500g
42. Zinc Granules 500g
43. Zinc Nitrate 500g
44. Zinc Oxide 500g
45. Zinc Sulfate 500g
46. Whatman filter paper: 70 dia. per box, 110mm dia.
47. Whatman filter paper: 70 dia. per box, 150mm dia.

BIOLOGY

Equipment

1. Dialysis Tubing (ream)
2. Dissecting kit –set
3. Dissecting boards
4. Dissecting pins
5. First Aid KIT
6. Hydrometer
7. Microscope, Compound, Senior Student: power/mirror, 10 x eye piece, 10x, 40x, 100x objectives
8. Microscope, Junior Student Microscope: 10 x eye piece, 4x, 10x, 20x objectives
9. Microscope Slides: 75 x 25mm x 1.2mm pkt/50, Cover slips, acid washed, 22mm pkt/100
10. Microscope cover slip 22 x 22 mm pkt/100
11. Magnifying Glass
12. Oxygen meter (portable)
13. Probe straight handle, Forceps
14. Petri dishes 90mm x 15 plastic (500)
15. Syringes, plastic, 10mL pkt/10, 20mL pkt/10, 50mL pkt/10
16. Scalpels and Blades
17. Spectacles, safety, wrap around style, one piece cellar polycarbonate lens (1) (lab protective spectacles)
18. Tray, rectangular, polypropylene, 35mm x 35mm pkt/100
70mm x 70mm pkt/100

Charts:

19. Periodic Table: with symbols, atomic nos. , masses, electronic configuration (1470mm x 1070mm), as supplied to State Stores
20. Hazardous Chemicals
21. First aid
22. Laboratory Safety
23. The Digestive System
24. The Respiratory system

Prepared Slides: cross & transverse-sections

1. Mosquito pupa
2. Mosquito larva
3. Mosquito ova
4. Plasmodium
5. Red blood cells (human)
6. Leucocytes (human)
7. Kidney cells
8. Veins
9. Arteries
10. Capillaries
11. Skeletal muscles
12. Smooth muscles
13. Skin cells
14. Anaemic blood
15. Bacteria -staphylococcus, spiral, bacillus, cocci
16. Sperm (human)
17. Ova (human)
18. Cheek cell
19. Mitosis
20. Meiosis
21. Chromosomes
22. Vascular bundle
23. Stem
24. Leaf
25. Onion cell
26. Roots

Plastic Anatomy Models

1. Ear
2. Lungs
3. Kidneys
4. Eye
5. Skin, enlarged about 70 times, on base board
6. "Tiny Tim" Skeleton, manufactured from washable, unbreakable plastic, mounted on stand with key card.
7. Male and Female reproductive organs
8. DNA / RNA helical model

List of General Resources

ITEM

1. Plastic cups, knives and forks
2. Nails, Screws and pins
3. Colour pencils
4. Erasers
5. Crayons
6. Measuring jugs
7. Jars, bottles with lids
8. Empty containers and cans
9. Buckets
10. Lids (from Jars)
11. Cellotape
12. Glues
13. Glue stick
14. Scissors
15. Paper towels
16. Rulers
17. Metre sticks
18. Trundle wheels
19. Protractor
20. Set Square
21. Squared paper
22. Counters, marbles and stones
23. Modeling Clay
24. Paper clips
25. Food colouring
26. Straws
27. Coins
28. Plastic blocks
29. Cardboard
30. Balloons
31. Sieve
32. Sticky labels
33. Card
34. Elastic Bands
35. String
36. Thread
37. Needles
38. Split pins and safety pins
39. Torches
40. Batteries
41. Plastic bags
42. Toothpicks
43. Soap
44. Oil
45. Mirrors
46. Milk packets
47. Pieces of clothes
48. Egg cartons
49. Lime juice
50. Magnets
51. Rocks
52. Aluminum foil
53. Chalk
54. Cling Wrap
55. Candles
56. Pipe Cleaners
57. Blue tac
58. Vaseline
59. Wax Crayons
60. Match box
61. Styrofoam
62. Drawing pins
63. Stiff ends
64. Paint brushes
65. PVA wall paint
66. Sea shells
67. Blotting paper
68. Cloth pegs
69. Bolts and nuts
70. Small stones
71. Bamboo pipes
72. Sand
73. Pieces of wood
74. VinesCoconut shells
75. Sago palm leaves
76. Coconut frond stalks
77. Masking tapes
78. Soft drink bottles

Section 15. FORMATIVE AND SUMMATIVE ASSESSMENT

The Secondary Science Syllabus for Years 7 – 9 is written using the outcomes - based approach to education in Solomon Islands. This syllabus is based on an outcomes - based curriculum framework with a philosophy of a learner centred teaching pedagogy. It is based on learning outcomes as *curriculum standards*. These are *curriculum requirements* that should guide the planning for effective teaching and learning strategies as well as designing and setting of valid, fair and reliable assessments. These standards or curriculum requirements will become the *assessment benchmarks* for assessment at the school and national levels using both the formative and summative form of assessments.

Assessment is defined as a continued planned process of gathering, analysing and interpreting information and data about students learning. It is a process of seeking and interpreting evidences used by learners and their teachers, to identify where the learners are in their learning, and where they need to go to and how best to get there. It is important that teachers diagnose and identify learning abilities of the learners in order for them to develop and implement intervention strategies to improve both the learning process of learners and teaching approaches of the teachers. Teachers should support learners who have acquired the learning outcomes or curriculum requirements in order to maintain their level of performance and similarly assist learners who have not acquired the requirements with remedial tasks. This is to enable learners to acquire curriculum requirements and progressed on with their learning. Therefore such assessment strategy is aiming towards improving learning and teaching processes and should focus more on a learner centred teaching pedagogy.

The assessment component in this syllabus involves both internal and external assessments and national examinations. Such an assessment approach is sometimes referred to as formative and summative assessments. However, assessment of learning outcomes differs in some ways from the traditional way of assessing objectives using the norm – referenced assessment. Assessment of learning outcomes focuses more on the criteria – referenced assessment and will allow learners to compete against set and agreed curriculum standards. The emphasis is more on formative and diagnostic form of assessments because it is an ongoing assessment in the classroom. The assessment of learning outcomes will be based on achievement levels. These levels have descriptors of possible performance abilities or skills at different intellectual and hierarchical competencies for each of the learning outcome assessed. Teachers will then be able to identify achievement levels for each student and be able to set remedial tasks to assist underachieving learners. The assessment data and information should be recorded and kept in a systematic and orderly manner as learning records in the schools.

The assessment information and data gathered from such assessments can be used for improving the learning and teaching processes in the classroom and for making informed decisions regarding assessments in the schools and national assessments and examinations. Furthermore, such information and data will also inform the Curriculum Development Division (CDD) and National Examination and Standards Unit (NESU) of the Ministry of Education and Human Resources Development (MEHRD) as well as the School of Education and Humanities (SOEH) of the Solomon Islands National University (SINU) on how the prescribed or the intended curriculum was taught and learnt in schools and how best to improve both the teaching and learning processes and implementation of valid, fair and reliable formative and summative assessments.

It is the Ministry's plan to examine *all subjects* at the end of Year Nine (9), the final year level at the end of the Universal Basic Education in Solomon Islands. It would mean that all subjects offered in the national curriculum would need to offer school base assessment (SBA) as part of the formative or continuous/internal assessment. The SBA should be implemented as part of the teaching and learning processes and is focussed more on learner centred teaching philosophy. The purpose of having an SBA is for assessing skills that are not assessable in the summative and national examinations at the end of the term, semester or a year. Furthermore, such an

assessment approach is required to strengthen key components of the formative assessment, that is, to be more valid, fair and reliable in terms of having common assessment tasks (CAT) in a more organized manner as well as creating provisions for teacher designed assessment tasks (TDAT) to meet the learning needs of learners within the school context and learning environment.

Detailed information, guidelines and appropriate weightings for SBA and internal assessment for Secondary Science can be obtained from the subject prescription handbook.

Achievement Levels

Particular levels in the development of a learner towards a learning outcome; where the top level is the outcome.

Aims

Broad statement of what the curriculum or a syllabus hopes that learners will achieve as a result of the learning processes.

Assessment

Judging and describing the learning outcomes that learners have achieved.

Assessment event

An opportunity for a learner to demonstrate achievement on a specific learning indicator, usually recorded to give a record of learner's progress.

Attitude

Ideas or beliefs in what is right and wrong, good or bad. The way you think or feel about something.

Competency Levels

Similar to achievement levels, but usually referring to a stage in the development towards command of a particular skill.

Curriculum

All learning opportunities planned, guided and supported by the school. The curriculum includes all subjects taught and all other activities, including extra-curricular activities, which the learners take part in.

Entrepreneurial thinking

Considering and planning to start or organize a commercial enterprise involving a financial risk.

Improvisation

The process of making something from whatever resources are available rather than relying on resources or equipment bought or supplied. Doing something without advanced planning or practice.

Specific Learning Outcomes

Statement of an observable behaviour which shows that a learner has achieved some level of competence on a learning outcome.

Key Learning Areas

The main areas of learning considered important for all learners to be exposed to throughout the whole curriculum. All or most subjects will make some contribution to the achievement of each of these Key Learning Areas.

Learner

A person who is in the process of learning something, in our case in a school situation. In the outcomes-based syllabuses Learner is used rather than Student or Pupil.

Learner – centred

An approach to supporting learning that focuses on an individual learner or a group of learners rather than on the teacher. The Outcomes approach is learner-centred.

Learning

The process of finding, exchanging or being given information which leads to changes in, or an increase in, our knowledge, abilities or feelings.

Learning material

The core textbooks or other written material that presents the sequenced content for an entire course of study at a given Year level, at a conceptual level appropriate for the learners.

General Learning Outcome

A statement which specifies what the learner is expected to know, understand or be able to do, or the attitude or values expected to have developed as a result of a learning process.

Lesson

A simple, planned segment of instruction that takes place within a certain time – usually part of a unit of work. The school day in Primary schools is divided into a certain number of Lessons, similar to Periods in Secondary schools.

Outcomes-based

A curriculum or syllabus based on the setting and achievement of Outcomes, as explained above.

Period

A unit of time within the school day in a Secondary school, equivalent to a Lesson in Primary schools. The recommended length of a period in Secondary schools is 40 minutes.

Process skill

An action or reaction which a person performs in a competent way – with four component activities namely; perception, planning, recall of pre-requisite knowledge and execution

Programme of study

Detailed plan for teaching a course over a period of time.

Programme Planner

A tool which gives the overview of the planned course of study – showing the strands and sub strands of the overall course.

Rationale

Statement of the principles or reasons for the inclusion of a particular subject in the curriculum.

Scheme of work

Similar to a programme of study – usually linked to the syllabus.

Scope

The extent of the understanding, concepts, skills and attitudes or values to be acquired by a learner as a consequence of a particular course of study at a particular grade level.

Sequence

The order of the introduction or teaching of concepts and skills within a subject, which reflect the progression of understanding or competence over a period of time.

Strand

The areas of learning into which a course is divided. Each syllabus is divided into a number of Strands which continue throughout each year of the course. Each Strand concentrates on a different topic or theme within this area of learning each year. Each Strand is further divided into sub-strands.

Strand statement

Overall statement of the understanding, concepts, skills and attitudes intended to be acquired by learners for a particular strand of a course over the whole period of the course.

Strand year statement

Statement of understanding, concepts, attitudes and skills intended to be acquired by a learner within a particular strand during a specific year of study.

Strand theme statement

An alternative term for Strand Year Statement: statement of understanding, concepts, attitudes and skills intended to be acquired by a learner within a particular strand during a specific year of study.

Subject

One of the traditional categories in to which the content of a school curriculum is sub – divided; subjects derive strongly from the range of disciplines of knowledge.

Sub-strand

A sub-division of a strand dealing with a particular topic within that strand.

Syllabus

A document which prescribes the course of the study by learners within a given curriculum area or subject. The syllabus presents the strands, sub strands and their intended learning outcomes, as well as other guidance for teachers.

Teaching material

Range of teaching materials utilized by teachers to assist with the process of facilitating learning.

Value

Moral standard of behaviour; principles which govern a person's actions.

Vernacular Language

Language spoken by a group of people within a particular region or country. The vernacular languages of Solomon Islands are all the languages spoken by people as their first language or mother tongue. This now includes Pijin.

Section 17. REFERENCES

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