Solomon Islands

Primary Science

TEACHER'S GUIDE Year 2

ALWAYS LEARNING

PEARSON

Solomon Islands

Primary Science

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Contents

Introduction to this Teacher's Guide

Teaching young children

Young children are very curious and want to find out about the world around them so they love to do science. However, at this stage they cannot read. The Year 2 Learner's Resource Book has some writing, but the learners will not be able to read much of it. The writing is there to guide the teacher and the teacher can read it to the learners and add more explanation when it is needed in English, Pijin or their own vernacular. Use the language that the learners find easiest to understand. When you are giving instructions to the learners it is important to keep them as simple as possible and repeat them a number of times.

Science is meant to be active, with learners carrying out activities, and the Year 2 Learner's Resource Book has plenty of activities. The activities are simple, fun and do not require special equipment. This Teacher's Guide gives you some extra information to help you do all of the activities.

We hope you enjoy teaching science to your Year 2 learners.

Using this Teacher's Guide

This Teacher's Guide supports the *Solomon Islands Primary Science Year 2 Learner's Resource Book*. It is meant to give you ideas, not to tell you exactly how to teach. The exact methods and timing you use will vary according to your own circumstances.

The chapters of this Teacher's Guide correspond to the chapters in the Learner's Resource Book. Each chapter is presented in three sections. The first section contains the sub-strand statement and the learning outcomes and indicators for the Learner's Resource Book chapter. The bracketed letters after the outcomes indicate the type of domain covered by the general learning outcomes. There are four domains: understanding (U), knowledge (K), values (V) and skills (S). The information in this section is taken from the Primary Science syllabus.

The second section of each chapter provides support information for the teacher about each of the activities in the Learner's Resource Book. It is presented in table format.

- Column 1 lists important Science processes and skills being developed by each activity.
- Column 2 lists any resources that are needed for the activity and also refers to *Explore Science* .
- Column 3 provides information for teachers about conducting the activity.
- Column 4 gives the reference to the relevant pages in the Learner's Resource Book.

The third section of each chapter lists the answers to the activities and assessment activities in the Learner's Resource Book.

At the beginning of this Teacher's Guide you will find information on:

- outcomes-based education and the learner-centred approach
- the approach of the Learner's Resource Book
- the Learner's Resource Book and the syllabus
- teaching methods
- assessment—recording, monitoring and reporting
- resources required for Science
- the links between Primary Science and other subjects.

At the end of the Teacher's Guide are copies of forms to be used for recording, monitoring and reporting individual and class achievement.

Outcomes-based education and the learner-centred approach

This Teacher's Guide is written for a Learner's Resource Book and syllabus that follow the outcomes-based approach to learning. This approach has been adopted by the Ministry of Education and Human Resources Development and the Curriculum Development Division as part of the new curriculum for Basic Education from Years 1 to 9.

The basis of this approach is that learners should acquire knowledge, understanding, skills, values and attitudes that will be useful to them later in life. The approach is based on the needs of the learners rather than the needs of the subject. The emphasis is not on the traditional content of the subject, but on choosing those elements of the subject that will be useful and valuable to learners. The curriculum is learner-centred rather than subject-centred.

This learner-centred approach contrasts with the teacher-centred approach that has been common in the past. The emphasis is on learners learning for themselves with the guidance of the teacher rather than being taught by the teacher. This means active learning in which learners do things that help them to find out for themselves, think about and draw on their own knowledge and experience, make observations, do experiments and carry out practical tasks. This can be called "learning by doing".

Syllabuses, textbooks and teacher's guides refer to "learners", which suggests active participation in the process, rather than "students", which suggests passive reception of knowledge. One way to understand the learner-centred approach is to think of the more traditional approach of our schools as "banking education". In banking education, the teacher regards the learners as empty vessels that need to be filled with knowledge. The learners are then tested by being asked to reproduce the knowledge the teacher has given them. This method relies a lot on the learner listening to the teacher, copying notes from the board, learning the notes and reproducing them later. Learners can often do this successfully without understanding fully what they are writing and reading.

The present outcome-based and learner-centred approach can be called "problem-posing education". This assumes that the learners already have their own ideas, knowledge and skills based on previous experience in school or elsewhere. The job of the teacher is to build on this by posing problems to the learners that make them think about their own ideas and experiences, as well as adding new knowledge and skills. Learners are also exposed to experiences by being asked to observe reality outside the classroom, look at pictures or diagrams, examine statistics and read passages, and so gain knowledge and develop ideas for themselves. They are then expected to express these in their own words, not those of the teacher, to prove that they have really understood what they have learnt. Learners are encouraged to be responsible for their own learning, to think for themselves and to form their own ideas and opinions. They are encouraged to become critical thinkers and to be able to face new challenges and situations for themselves. Learning becomes a cooperative effort between the learner and the teacher. This approach also emphasises the use of multiple intelligences. In addition, education is seen not just as a way of passing on knowledge and skills, but a way of forming the kinds of values and attitudes that will make children good and responsible citizens in the future.

The approach of the Learner's Resource Book

The Learner's Resource Book, therefore, is based on these principles. It is not just a summary of the factual knowledge and concepts of the subject. In addition to the content, there are activities for the learners to do and these activities form an essential part of the learning process. It is no longer good enough to simply read the book. Learners must also do the activities in the book.

In the past, activities were often included only at the end of chapters, and learners and teachers often ignored these and moved on to the next "content" section. In these books, the activities are part of the text and must be completed in order to fully learn from the book. Some sections or chapters start with an activity to encourage learners to find out information, think about their own experiences and knowledge, or practise skills for themselves.

There are also many activities based on discussions that encourage learners to form their own ideas. This is to help in the development of desirable values and attitudes.

Many of the activities are to be done in groups. This is to encourage interaction among the learners, as they can often learn as much from each other as they can from the Learner's Resource Book or the teacher.

The Learner's Resource Book and the syllabus

The Learner's Resource Book is structured according to the strands and sub-strands of the syllabus. Each chapter is based on one or more sub-strands, and the order of the chapters follows the order of the sub-strands of the syllabus.

Within the individual chapters, however, the order of the outcomes in the sub-strand of the syllabus is not necessarily followed. Each sub-strand of the syllabus outlines the knowledge, understanding, skills and attitudes—that is, the outcomes—we want learners to achieve. The Learner's Resource Book gives guidance about how the learners might best achieve these outcomes. The best way to do this is not always to follow the exact order of the outcomes in the syllabus. In teaching, therefore, you should usually follow the order of presentation in the Learner's Resource Book rather than the order of outcomes in the syllabus. As long as the outcomes are achieved, you have reached your goal.

The Learner's Resource Book contains many illustrations: photos, pictures, maps, diagrams and statistics. These are not just included for decoration—they are often just as important as the words.

Timing of the syllabus

The time available for Year 2 Science is five periods of 40 minutes per week. While some teachers may find they do not have time to complete all the activities in the Learner's Resource Book, others may complete them all with time to spare. If you do not have time, leave out some sections and move on to the next topic. Do not spend so long on one topic that you miss other topics altogether. Try to teach at least some of every strand of the syllabus. If you have very quick learners, make up extra exercises that challenge them to think about the topic in greater depth.

Some chapters of the Learner's Resource Book cover one sub-strand of the syllabus. Other chapters cover two or more sub-strands that are related to each other and are best taught together.

As explained earlier, the order of topics in the chapters does not always follow the order of the outcomes in the syllabus. As a teacher, therefore, you should follow the Learner's Resource Book rather than the syllabus, and use the syllabus as a guide to what the learners should finally achieve.

Yearly program planner

The yearly program planner shows the Year 2 learning program for the Primary Science course and the suggested teaching times based on eight teaching weeks per term and 32 teaching weeks per year.

Term 1											Term 2								
Week	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Year 2		**Our senses** LL, 32 periods, 8 weeks										**Forms of energy** EC, 32 periods, 8 weeks								
		The five senses: • Hearing • Touching • Taste • Smell • Seeing or sight • Animal senses										• Seeing and hearing • Musical instruments • Light • Electricity • Movement energy								

Term 3											Term 4								
Week	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Year 2		**Materials for specific uses** NPM, 24 periods, 6 weeks						**Gardening** F, 8 periods, 2 weeks				**Gardening** F, 12 periods, 3 weeks			**Shadows** EB, 20 periods, 5 weeks					
		• Materials • Materials and uses • Materials in Solomon Islands						• Good gardening • Good soil • Water				• Sunlight • Compost • Gardening tools • Caring for garden tools • Growing new plants			• Shadows • Our shadow changes • Using shadow sticks • Here is a poem • Shadow puppets					

LL Life and Living
EC Energy and Change
NPM Natural and Processed Materials
F Farming
EB Earth and Beyond

Teaching methods

The following are some teaching methods or approaches you can use to facilitate effective learning in your classroom. Planning and good preparation are important for effective application of these methods.

Fieldwork and excursions

Fieldwork is any work outside the classroom. Fieldwork helps learners to link classroom learning to real-world experience outside the classroom. Here learners are instructed to apply the skills of observation, investigation, interviewing etc. as a means of collecting information about the topic of study for themselves, thus achieving the outcomes of the syllabus in more practical and realistic ways. This is very important in science for teaching learners about the real world around them.

Fieldwork is particularly important in the outcomes approach, which aims to link learning to the real needs of the learners. Fieldwork, therefore, is an essential part of teaching, not an optional extra.

To ensure an effective and successful outcome, you must consider important aspects of fieldwork, such as good classroom preparation and planning, an effective process of carrying out actual work in the field and follow-up work in the classroom.

This means you must go and look at the area you plan to do fieldwork in before you do it, and decide exactly what you want learners to observe and do when they go there. In preparation for the visit, make sure learners understand the purpose of the visit and know what to look for and what to find out. A lot of the work can then be done by learners working in groups to answer the questions, without too much help from you. The activities in the Learner's Resource Book will often provide the basis for a questionnaire.

Fieldwork takes time and may have to be fitted in after the normal teaching time—in an afternoon or even a weekend. Learners can often fill in questionnaires during their own time by looking at their own area—either after school or, in boarding schools, during the holidays.

Fieldwork is difficult in town schools but should not be ignored. You may have to rely on questionnaires to help learners to do the fieldwork in their own time, as described above. For instance, learners can be encouraged to go out at weekends and look at a river or stream, the sea and coastline, or a farming area. Assignments can also be given for learners to do in their home areas during holidays—this helps them to realise that what they are learning applies to their home area.

Group work

Learners take a more active role and talk naturally when they are allowed to work in small groups. In this way they can express their ideas rather than listening passively to the teacher, as is often the case in the whole class. Group work encourages learners to talk or do things for themselves as part of the learning process. Learners discuss, share views and interact in their learning in small groups and present their collective work to the class. To ensure effective learning during group work, preparation and class management are important for teachers.

Group work must be properly organised and supervised. You must not use it as an excuse to sit back and let learners get on with it. However, learners will often not talk freely if they know the teacher is listening, so you must leave groups to talk on their own. Sometimes it is even effective to walk out of the classroom for a while to give groups a chance to get going without you listening.

The role of the teacher in group work is as follows.

- **Choose the topic.** Groups can only discuss topics that they know something about, and that allow a range of points of view or opinions. You cannot discuss a topic such as "How are volcanoes formed?" because there is only one answer to the question and answers are right or wrong. You can discuss "How can people who live near volcanoes prepare for what to do if the volcano erupts?" There are many different answers and each learner can have different ideas.

- **Set the objective.** Make sure groups know exactly what to discuss and have a set of clear questions to answer. It is not enough just to say "discuss this topic".
- **Organise the groups.** Groups should be small enough for everyone to be able to talk. They should usually be mixed—different island groups, not all wantoks. It is good to mix girls and boys but do not do this if it leads to girls being too shy to talk. All-girl groups may sometimes be better.
- **Organise the seating.** Good discussion will take place only if learners face each other in a circle. You cannot have a discussion with someone's back! If possible, classrooms may be arranged by grouping desks in circles facing each other so group work is easy and no movement is necessary. In crowded classrooms you may allow some groups to have their discussion outside.
- **Circulate and listen to progress.** It is best to do this only after giving time for discussion to start. Try to make sure that everyone is given a chance to speak. If you see certain people dominating groups, intervene and ask others their ideas. If groups are having difficulty, give guidance by explaining the topic, give some extra questions or ask individuals their ideas. If groups are doing well on their own, do not interfere.
- **Decide on the language to be used.** In Year 2, most learners will want to use Pijin. It is best to let them do so or they may say nothing. There is nothing wrong with a local language if all in the group speak it, but try to get each group to report back their ideas at the end in English, either verbally or in writing.
- **Report back.** It is often a good idea to appoint a "chair", who will report back to the whole class at the end, but this is not always necessary. Each member may write their own ideas, or groups may just learn from the process of discussion.

Debate and discussion

Group work involves learners in debates and discussions, which are active ways of engaging learners in the learning. Learners are able to conduct and collect information through research to use in debates about a particular topic or share ideas with others in the classroom. They will learn a lot in this process. Discussion can take place in small groups or as a whole class. Debates are good for encouraging learners to form their own opinions about a topic. Even in Year 2 we should encourage this, using simple topics. At this level, debates should be informal, without trying to follow the strict parliamentary rules of debating.

Presentations

Role-play is a type of group work in which learners are given a part to play, in either a discussion or a story. Acting out a role-play encourages learners to participate, interact and learn through talking. Learners imagine themselves in the place of other people and try to think, act and talk as those people would act. Role-play is often best used at the end of a teaching topic, when learners have learnt quite a lot about a topic or about people in a different area. This helps them to think about the ideas, emotions and feelings of those people.

Simulation is similar to role-play, but the emphasis is on a situation rather than the people. Learners are given a situation that is similar to a real-life situation and learners can either be themselves acting in that situation or can act a role-play. For instance, learners are given a story about a dispute leading up to a fight in a school hall. They are asked to play the parts of the people in the story and act it out. This helps them to understand other people and how they feel and also to think about what they themselves would do in a similar situation. For a role-play or simulation to be successful, learners need enough time and information about the person and the situation to enable them to act and talk realistically.

Other types of presentations are:

- drama performances
- dance performances
- talks and reports
- poster presentations
- collage presentations
- cartoon presentations.

The outcomes approach is intended to teach attitudes and values as well as knowledge, understanding and skills. Role-play and simulation are particularly important in teaching attitudes and values.

Research interviews and questions

There are a number of ways of conducting research interviews with people to collect information about a topic, such as:

- organising informal chats
- preparing questions to ask particular people
- preparing standardised questionnaires that learners can use with small groups, asking the same questions to a large number of people and later converting the answers into statistical form.

Prepared questions are also useful for fieldwork and they can be used alone or with any of the above techniques to collect information.

Guest speakers

Asking people from outside the school with specialised knowledge and skills in particular topics to speak to the learners is one way of varying the normal classroom teaching and learning. Through this process, learners will appreciate the importance of specialised knowledge that other people in the community have.

Visits

If possible, try to visit areas that are relevant to the topic in the Learner's Resource Book. When you visit, make sure learners go with a questionnaire as they would for fieldwork, so they know what to look for and what to find out.

Case studies

A case study is a detailed study of a particular area or topic. A case study helps learners to translate the abstract topic in the syllabus into concrete reality, and so understand it better.

Assessment

Assessment is a process in which teachers gather, analyse and interpret assessment information and data. You should use such information and data to develop and implement enrichment support and intervention strategies to improve the teaching and learning processes in the classroom. It is important to assess the learners to know what stage they are at and the progress they make in the classroom. Assessment is an important ongoing process in teaching and learning and it should be used continuously, not only at the end of a topic.

Assessment should include formative assessment, which takes place throughout every teaching topic and every unit of the Learner's Resource Book. *Formative assessment* emphasises continuous assessment as part of the teaching and learning process. "Assessment for learning" focuses on using assessment information to improve teaching and learning as an ongoing process. This helps you to monitor learners' progress on a continuous basis. The teacher should constantly observe and evaluate learners' achievements, collecting data on areas of improvement and new skills that they acquire. In doing this, teachers should focus on the general and specific learning outcomes stated in the syllabus. Learners should also be aware of what is being assessed, the assessment techniques being used, and the criteria used. Learners can then judge for themselves whether they are achieving the general and specific learning outcomes.

Summative assessment, for example a unit or chapter test, tells you what learners have learnt or can do after a whole section of teaching. This type of assessment focuses on "assessment of learning" and is directed at ranking learners from their performance on the learning outcomes. This will also help teachers to devise ways of improving the learners' performance in the classroom. These tests are important, but assessment should not be done only by test. Assessment must cover skills as well as knowledge. You should test whether learners can interpret a photograph as well as test the factual knowledge they have learnt.

Diagnostic assessment is the type of assessment that teachers are encouraged to do in order to identify the learner's ability or achievement level of a specific learning outcome. This helps you to identify the learner's ability and devise remedial tasks as an intervention strategy. Learners who have achieved the specific learning outcomes should be given enrichment support to encourage them to maintain their achievement level.

Assessment techniques

Some of the assessment techniques that can be used include the following.

Verbal assessment

- Answering questions
- Making a verbal report
- Interviewing

Practical assessment

- Participating in a field trip/excursion and collecting information
- Demonstrating a particular task
- Drawing, interpreting and using a map
- Analysing a photograph
- Collecting information

Group work assessment

- Participating in a group task and discussion
- Participating in a role-play and drama (Learners can be assessed on how they contribute to the discussion or role-play, possibly using a list of criteria for judgement.)

Other

Other assessment techniques include:

- observation of what individual learners do
- consultation with individual learners by asking them questions
- focused analyses of learners' work such as portfolios, or a collection of work they have done, to determine how each individual learner is performing in their learning process.

Assessment of specific learning outcomes using achievement levels

Learners' achievements in Primary Science will be reported in levels instead of marks. These levels of achievement are derived from curriculum outcomes in the Year 2 Science syllabus. Six levels are used to describe learners' achievement of the learning outcomes, ranging from L5, the highest, through L4, L3, L2 and L1 to L0, the lowest. These levels will be used for assessment of individual learning outcomes

Learners achieving at L0, L1 and L2 are considered to be at a critical level (Lc) and need urgent assistance. Learners in this category must be given remedial work in order to reach the curriculum benchmark. Learners achieving at L3+, which is a combination of L3 and L4, require assistance and must be given remedial work in order to reach the curriculum benchmark. Learners achieving at L5 are considered to have reached the curriculum benchmark and should be given enrichment support in order to maintain their high standard.

Level	Assessment criterion	Judgement criterion	Achievement award
L5	Statement to identify the fifth and highest level of achievement	Criteria for judging learner's achievement	Achieved (A) Full mastery of learning outcome
L4	Statement to identify the fourth level of achievement		Partially Achieved (PA4) Substantial mastery of learning outcome
L3	Statement to identify the third level of achievement		Partially Achieved (PA3) Moderate mastery of learning outcome
L2	Statement to identify the second level of achievement		Partially Achieved (PA2) Minor mastery of learning outcome
L1	Statement to identify the first level of achievement		Partially Achieved (PA1) Minimal mastery of learning outcome
L0	Statement to identify the lowest and last level of achievement		Not Achieved (NA) No mastery of learning outcome

Assessment criteria as achievement levels

Following is an example of an assessment criteria framework for a specific learning outcome in Year 2 Science. The statements in the table are assessment criteria for the specific learning outcome 2.1.1.1. Each of the six levels describes the achievement of the learner.

Level	Assessment criterion	Judgement criterion	Achievement award
L5	List the five human sense organs correctly	Able to list the five human sense organs correctly	Achieved (A) Full mastery of learning outcome
L4	List four human sense organs correctly	Able to list four human sense organs correctly	Partially Achieved (PA4) Substantial mastery of learning outcome
L3	List three human sense organs correctly	Able to list three human sense organs correctly correctly	Partially Achieved (PA3) Moderate mastery of learning outcome
L2	List two human sense organs correctly	Able to list two human sense organs correctly	Partially Achieved (PA2) Minor mastery of learning outcome
L1	List one human sense organ correctly	Able to list one human sense organ correctly	Partially Achieved (PA1) Minimal mastery of learning outcome
L0	Unable to list any of the five human sense organs	Not able to list any human sense organ at all	Not Achieved (NA) No mastery of learning outcome

Note: For outcomes involving understanding we need to assess both factual knowledge (the ability to state or list something without explaining it) and understanding (the ability also to explain the topic). We are not usually assessing only factual knowledge.

Recording learners' achievements

Teachers are encouraged to keep accurate records of both individual learners and the whole class. At the end of each assessment event, individual records of achievements must be recorded using the approved recording template. The recommended recording template is shown in Appendix 3.

Keeping up-to-date and accurate records is very important for monitoring and reporting learners' performance, progress and achievements. It is also useful for teachers to use and show the records during meetings with parents, the learner and other key stakeholders.

Monitoring individual learner and class achievements

With accurate records, teachers are able to monitor the learning performance, progress and achievement of individual learners and the whole class. You should monitor individual learners' performance, progress and achievements at the end of each assessment event. As you continue to assess more outcomes, the learning pathway of each learner can be mapped and tracked during a term or semester in any one year. This information is useful for providing advice to parents, the learner and other key stakeholders.

In order to identify strengths and weaknesses of individual learners in the classrooms, you need to keep accurate records of the performance of all learners in the class against the performance of an assessed outcome at the end of an assessment event. In this way you can identify whether individual learners have achieved, partially achieved or not achieved the outcome for a particular assessment event. Using this simple monitoring technique, you can identify learners who need enrichment support and those who need remedial work to help them achieve the standards required by the national curriculum. The recommended monitoring template is shown in Appendix 4.

Reporting individual learners' achievement

With accurate records and effective monitoring systems, teachers are able to compile and make a balanced, accurate and fair report on the learners' performance, progress and achievements in a given assessment period. The type of reporting system recommended by the Ministry of Education requires more description of the learners' performance. This means that the report must also provide a descriptive account of the learners' achievement.

The reporting system no longer uses marks or grades; instead you need to specify whether a learner has achieved, partially achieved or not achieved the assessed outcome. You should indicate this with an A, a PA (1–4) or an NA on the approved reporting form. At the end of each assessment period, you need to give an overall achievement level for the learner. This is essential for the calculation of the overall award. The overall achievement level is calculated as a gross points average, whereby the values of the outcomes assessed are added and divided by the number of outcomes assessed. The value of each overall achievement level is equivalent to an award of attainment for the learner. The recommended reporting template is shown in Appendix 8.

Calculating progressive achievement levels for formative and summative assessment

To calculate the progressive achievement level for formative assessment, add the values of achievement levels for all outcomes assessed during the formative component of the assessment and divide by the number of outcomes assessed. The number you get is the progressive achievement level for the learner for formative assessment. Similarly, to calculate the progressive level for summative assessment, add the value of achievement level for all outcomes assessed in the summative component of the assessment and divide by the number of outcomes assessed. The number you get is the progressive achievement level for the learner for summative assessment.

Calculation of overall achievement levels using formative and summative assessments

To calculate the overall achievement for each individual learner, add progressive achievement levels for formative and summative assessment and divide by two. The number you get is the overall achievement level for the learner for that specific assessment period. The overall achievement level attained corresponds to an overall award for the learner (you should round off the calculated values to the nearest whole number). The award will be issued to the learner in the form of a coloured certificate in recognition of the learner's achievement.

The table below shows achievement levels, awards and certifications.

Overall achievement level	Performance descriptor	Achievement awards	Certificate position	Colour code	Objective grading system
Level 5	Learner is competent with 95–100% of the outcomes	Achieved with excellence	Gold	Yellow	A
Level 4	Learner is competent with 80–94% of the outcomes	Achieved with merit	Silver	Green	B
Level 3	Learner is competent with 50–79% of the outcomes	Achieved with minimum standards	Bronze	Blue	C
Level 2	Learner is competent with 20–49% of the outcomes	Achieved below minimum standards	Critical level	No award	D
Level 1	Learner is competent with less than 20% of the outcomes	Achieved far below minimum standards	Critical level	No award	E
Level 0	Learner is not competent. Did not achieve outcomes	Not achieved	Critical level	No award	F

Translation of the National Achievement Standards within individual subjects

The National Achievement Standards can be translated and adapted within individual subjects and is determined by the knowledge content, processes and skills taught, learnt and assessed during an assessment period for each academic year. For example, specific Science knowledge content, processes and skills taught, learnt, assessed and achieved by each learner should be reported clearly with an appropriate achievement award, grade and percentage attained using the National Achievement Standards framework. The report should provide specific Science knowledge content, processes and skills attained by each learner for a specific assessment period. Such attainments can be measured against the curriculum standards and benchmarks prescribed in the Primary Science Syllabus and the Science prescription handbook.

Meetings with parents, learners and other stakeholders

Teachers and the school administration are encouraged to consult parents, learners and other stakeholders to discuss the performance, progress and achievements of learners and suggest ways that learners can improve. This is a very important process because it involves giving proper feedback to both the learner and the teacher. The school administration can organise consultative meetings between teacher and parent, as well as teacher, parent and learner. If you have kept accurate records of the learner's performance, progress and achievements you will be able to identify the learning progress and pathway of the learner, and therefore determine appropriate remedial work for each learner. You will also then need to provide results after each remedial work has been carried out with the learner. Conducting such very important meetings will give parents and key stakeholders confidence for their children to be educated in our schools. These meetings are important links with parents and other key stakeholders.

Resources for Primary Science

Following is a list of materials and equipment required for Primary Science. Learners can collect many of these items. The school should use some of its grant money to buy the other items in the shops. They are all available.

Aluminium foil
Balloons
Balls
Batteries
Bowls
Buckets
Bulbs
Candles
Chalk
Coins
Corks
Cotton thread
Crayons
Drinking glasses
Erasers
Feathers
Fishing line
Glass jars
Globe of the Earth or football
Ice cube trays
Ice-cream cartons
Jars
Jugs
Kerosene
Kettle
Large plate
Matches
Metal bottle tops
Mirrors
Nails
Nursery boxes
Paper clips
Pencils
Pens
Pins
Plastic bags
Plastic basins
Plastic cups
Plastic sheet
Plasticine or Blu Tack
Rubber bands
Ruler
Scissors
Screw
Seeds of various types
Sellotape
Small stones
Soil mixture
String
Thin sticks
Tins
Torches
Wires
Wood

Links between Primary Science and other subjects

Many other subjects cover topics or skills that are similar to or related to the topics and skills we teach in science. It is important that you are aware of these and, when you teach a topic or use a skill, you point out to learners that they have also learnt about this or will learn about this in another subject.

Below is a list of some of the topics or skills in other subjects that you should be aware of.

Other subjects: sub-strand and level		Science sub-strand and level
Health Education	**Year 2** Growing up Safety in community and public places Healthy food for healthy growth Healthy school, home, community and public places	**Year 2** Using our senses Gardening
	Year 4 Looking after our water	**Year 4** Solubility
	Year 5 Clean safe water for living Making healthy food choices	**Year 5** Clean drinking water Crops and animals for food
Social Studies	**Year 2** Resources and economic activities Goods and services	**Year 2** Gardening – Things that make farming successful
	Year 3 Weather and seasons	**Year 5** The Earth's revolution, rotation and seasons
	Year 4 Transport	**Year 5** Energy sources and energy changes
	Year 6 Using and managing resources	**Year 5** Gardening skills

Chapter 1 Our senses

Strand: Life and Living

Suggested periods: 32 (8 weeks)

Sub-strand statement:

Living things use their senses to help them survive. They use their senses to see, hear, smell, touch and taste. These senses make animals aware of their surroundings and changes in their surroundings. They help them to find food and mates and avoid enemies and other danger.

General learning outcomes

Learners should:

2.1.1 know their five senses (K)

2.1.2 understand how living things use their senses (U)

2.1.3 appreciate that the senses help animals to survive in their surroundings. (V)

Specific learning outcomes

Learners should be able to:

2.1.1.1 list the five human sense organs

2.1.2.1 name the five sense organs of the body and what they do

2.1.2.2 identify objects and materials using the senses of hearing, seeing, touching, smelling and tasting

2.1.3.1 observe how different animals behave when they sense danger and identify the sense organs that help them.

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Make observations, apply knowledge and communicate in words.	*Explore Science* pages 132–7	**Activity 1** Ask learners how they see, smell, taste, touch and hear. This is a good way to find out what they already know. When you have discussed the five senses and listened to the learners' ideas, they can do the activity. They tell the teacher or a group member which of the five senses goes with each picture of a sense organ.	Page 2
Follow instructions, make observations and communicate in words.	*Explore Science* pages 132–7 Blindfolds	**Activity 2** Learners can work in groups for this activity. Show learners what to do by organising one group: one learner wears a blindfold and five or six friends make a circle around them and take turns clapping. The other groups can organise themselves in the same way. When all the learners have had a turn wearing the blindfold, ask: Which sense organ was most important? Could you hear the clapping from all parts of the circle?	Page 3
Make observations and communicate in words and pictures.	*Explore Science* pages 132–7	**Activity 3** Take the learners outside for this activity. This activity involves the learners listening carefully to the sounds outside the classroom, so it is important that they are quiet. They may find it easier to close their eyes. They may hear a number of things, such as traffic, the sea, insects or birds. When they have completed their observations they can report what they heard to each other in pairs and to the class. Ask the learners to do drawings of some of the things they heard.	Page 3
Make observations and apply knowledge.	*Explore Science* pages 132–7	**Activity 4** Ask learners to look at the pictures in the Learner's Resource Book and say which sounds they would hear if they were in the picture. Ask learners to try making the sounds they would hear. For example, they could mimic a dog barking.	Page 4

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Make observations and apply knowledge.	*Explore Science* pages 132–7 Ice cubes, bowls of water	**Activity 5** For this activity, learners will have to work quickly, so it is best to explain the activity before they begin. Ask learners to put their fingers in water and say what it feels like (cool). Give each group an ice cube. Ask them what it feels like (cold). This activity will help the learners to understand that they have a strong sense of touch in their fingertips because this is where most of the touch receptors in our bodies are.	Page 5
Make observations and classify objects.	*Explore Science* pages 132–7 Rough stones	**Activity 6** Ask the learners to touch surfaces that are smooth, such as glass, or rough, such as a stone. Ask them to describe what the glass and stones feel like. By the end of this activity, learners should know the words 'rough' and 'smooth' and be able to use them appropriately. You can try different materials to check their understanding.	Page 6
Make observations and communicate in words.	*Explore Science* pages 132–7 Plastic bags and a range of different objects to touch	**Activity 7** Put different objects (such as a spoon, a ball, a crayon) into opaque plastic bags. Include some rough and smooth objects so that learners can identify these properties. Safety: Do not use sharp objects. Give each group one of the bags. The learners pass the bag around the group and, without looking inside, identify one object using only their sense of touch. At the end of the activity show learners the objects. This activity is fun if you can prepare different bags for different groups. The groups can swap bags.	Page 7

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Make observations and classify objects according to taste.	*Explore Science* pages 132–7 Plastic cups (three per group), one with salty water, one with sugary water and one with lime juice added, and plastic spoons	**Activity 8** This activity can be carried out in groups of five or six. Give each group three plastic cups: one with salty water, one with sugary water and one with lime juice added. Without looking, the learners taste each of the liquids using a plastic spoon. They decide what the taste is and report back to the group. Important: Wash the spoons after each use. Talk about the different tastes. When learners say 'salty', 'sweet' and 'sour', ask them to name other foods or drinks that have these tastes. Ask: What part of our bodies do we use to taste things (tongue)? What is the sense called (taste)?	Page 8
Make observations and classify objects according to smell.	*Explore Science* pages 132–7 Blindfolds, toothpaste, onions, perfume and other things to smell	**Activity 9** This activity can be carried out in groups of five or six. One learner in the group is blindfolded. The others give the blindfolded learner different things to smell. They report what they smell to the group. Ask: What is the smell like? Is it a good smell or a bad smell? What does it make you think of? Ask: What part of our bodies do we use to smell things (nose)? What is the sense called (smell)? What can affect our sense of smell (a cold)?	Page 9
Make observations and communicate in words and pictures.	*Explore Science* pages 132–7	**Activity 10** Take the learners into the schoolyard for this activity. Ask them to identify three things to talk about when they come back to class. Back in class, ask some learners to describe one or two objects they observed outside. Ask learners to draw the objects they observed in their exercise books.	Page 10

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Communicate in words.	*Explore Science* pages 132–7 Blindfolds	**Activity 11** This activity is designed to help learners understand what it is like to be blind. This activity also helps to develop communication skills. The learners work in pairs, with one communicating to the other who is blindfolded. They help the blindfolded partner to move across the room without banging into the furniture. When one learner has completed the activity they can swap roles. Afterwards ask some learners to describe to the class what it was like to have no sight.	Page 10
Make observations and apply knowledge.	*Explore Science* pages 132–7	**Activity 12** Ask the learners to look at the pictures in the Learner's Resource Book and explain to the teacher or a partner which senses and sense organs go together.	Page 11
Make observations and apply knowledge.	*Explore Science* pages 132–7	**Activity 13** Ask the learners to look at the pictures of the different animals and identify their sense organs.	Page 12
Make observations.	*Explore Science* pages 132–7	**Activity 14** Take the learners into the schoolyard for this activity. Ask one or two learners to try to get close to a bird or a flying insect while the rest of the class observes. Ask: Why is it difficult to get close to these animals? What senses do the animals use to help them detect danger or something coming towards them? Most learners will recognise that the main sense that these animals use is their sight. Explain that birds and insects also use hearing. Explain that birds have ears, but we cannot see their ears. Explain that insects pick up vibration and many communicate by sounds even if they don't have ears.	Page 13

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Summarise what has been learnt in the chapter.		**Chapter review** Go through the chapter review to revise the work covered in each of the sections. Refer to the appropriate pages in the Learner's Resource Book if learners do not understand any review statements.	Page 14
		Concept map Review the concept map with learners to ensure they understand the key concepts covered in the chapter.	Page 14
		Revision (assessment) Give the learners time to complete the revision activity in this chapter.	Page 15

Activities and assessment answers

Activity 1

Learners point to the pictures and name the sense:

a smell
b hearing
c taste
d seeing
e touch

Activity 2

Learners' answers will vary.

3 ears

Activity 3

Learners' answers will vary.

Activity 4

a a dog barking
b a bird singing
c children laughing and talking
d a boat engine
e a woman playing the guitar
f a man chopping wood
g a car horn

Activity 5

1 The water feels cool or warm.
2 The ice cube feels cold.

Activity 6

1 The glass feels smooth.
2 The stone feels rough.

Activity 7

Learners' answers will vary, depending on the objects you choose.

Activity 8

1 Something salty, something sweet and something sour. Check that learners have correctly named the tastes.
2 Learners' taste preferences will vary.

Activity 9

Learners' answers will vary, depending on the things you choose for them to smell.

Activity 10

Learners' answers and pictures will vary.

Activity 11

Learners will probably find it difficult wearing the blindfold and trying to direct their friend.

Activity 12

Hear See Touch Taste Smell

Activity 13

Check that learners point to the eyes, ears and noses of the animals.

Activity 14

1 The bird will fly away before the learner gets close.
2 The insect will fly away or hop away before the learner gets close.

Revision questions

1 eyes
2 fingers
3 tongue
4 ear
5 nose

Chapter 2 Energy

Strand: Energy and Change

Suggested periods: 32 (8 weeks)

Sub-strand statement:

There are different types of energy, e.g. light, sound, heat and movement. Energy comes from different sources. Sound can come from clapping hands. Light can come from a torch. The effects of sound and light energy can be experienced in musical instruments and objects forming shadows. Electricity is another form of energy that has important uses for humans. We use energy every day in our activities, for example when we walk or run.

General learning outcomes

Learners should:

2.2.1 know which sense organs detect light and sound (K)

2.2.2 understand that simple musical instruments produce musical sounds (U)

2.2.3 know that light passes through some materials and not others (K)

2.2.4 recognise that shadows form when an object blocks the light (K)

2.2.5 be aware that electrical appliances can be dangerous (K)

2.2.6 be aware that the harder a toy car is pushed, the faster it will move and the further it will go. (K)

Specific learning outcomes

Learners should be able to:

2.2.1.1 draw the parts of the body that detect sound and light

2.2.2.1 give 2 examples of both traditional and modern musical instruments and explain how they produce sound

2.2.3.1 give an example of a material that allows light to pass through and one that does not

2.2.5.1 explain that electricity in the home can be dangerous

2.2.6.1 demonstrate what happens to a toy car when it is given a hard push and a gentle push.

Note

Energy is a very difficult idea for children and many adults. So at this level it is better not to talk about energy in general, only about particular types of energy. This is why you will not see the word "energy" appearing very often in the Learner's Resource Book. Instead we talk about light, heat, sound and electricity and avoid using the word "energy". The chapter will help learners to become familiar with certain types of energy so that it is easier for them to understand the idea of energy in general and different types of energy later on.

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Make observations.	*Explore Science* pages 226, 246–7, 252	**Activity 1** Learners identify two of our most important sense organs, our ears and our eyes. Explain that our ears and eyes help us to sense the environment by detecting two types of energy: light, which we detect with our eyes; and sound, which we detect with our ears. Learners could work in pairs, looking at one another's ears and eyes.	Page 17
Follow instructions, make observations and communicate in words.	*Explore Science* pages 252–3 Sheets of A4 paper	**Activity 2** Demonstrate how to make a 'hearing trumpet' from a sheet of paper. Learners can investigate how a hearing trumpet affects how they hear. Tell them to move the trumpet around so that they can hear different sounds.	Page 18
Make observations and communicate in words.	*Explore Science* pages 252–3	**Activity 3** Ask the learners to look at the pictures of the different animals and identify what they are. Ask them to look at their ears and explain how their ears are different from human ears. Explain that most animals can hear much better than humans.	Page 19
Make observations.	A dog or a cat	**Activity 4** Learners can do this activity at home or in school time if there is the opportunity to observe a cat or dog. Ask them to watch the animal and observe what happens to its ears when there are different sounds. They can try whistling to see if this causes the animal to move its ears. Encourage some learners to tell the class about the observations they made at home.	Page 20

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Make observations and apply knowledge.	*Explore Science* pages 252–5	**Activity 5** The learners should be able to recognise the panpipes and the wooden drum. Explain that to play the panpipes you need to blow over the holes, but to play the wooden drum you have to hit it with a drumstick.	Page 21
Follow instructions, make observations and communicate in words.	*Explore Science* pages 252–5 Panpipes and wooden drums	**Activity 6** If possible, bring panpipes and a drum to class and ask learners to bring these instruments to class if they have them at home. Ask learners to demonstrate how to play these instruments. Encourage learners to notice that each instrument makes a very different sound.	Page 21
Follow instructions, make observations and communicate in words.	*Explore Science* pages 254–5 Glass or plastic bottles, water	**Activity 7** Bring to class a number of bottles. Glass bottles are best, but plastic bottles will do. Learners may be able to help by bringing in bottles from home. Place five or six bottles in a row and fill them with different amounts of water as shown in the Learner's Resource Book. Then let the learners investigate how they can make sounds with the bottles. If they blow across the top of the bottles, they can make a sound like panpipes. They can tap glass bottles with metal spoons to make a different sound. Ask the learners which bottles give the highest and lowest sounds or notes. The bottle with the most water in it will give the highest note and the bottle with the least water will give the lowest note. Explain that we call this the 'pitch' of a note, and that the pitch can be high or low.	Page 22
Make observations and communicate in words.		**Activity 8** Ask the learners what the instruments are and how they are played. Individual learners should be able to tell the class if they have played either of these instruments or if they have seen them played and where.	Page 23

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Make observations and apply knowledge.	*Explore Science* pages 254–5 A guitar	**Activity 9** Bring a guitar to class. Ask the learners how they would make a sound with the guitar. They should know that they need to pluck the string to make a note. Show them how to make a note and how to change the note by using a finger to press down on the string to change its length. Demonstrate how to change the note by shortening the string, by making it tighter, or by plucking a thicker string. In each case, ask learners if the note gets higher or lower. The shorter the string, the higher the note; the thicker the string, the lower the note; the tighter the string, the higher the note.	Page 23
Make observations and apply knowledge.	*Explore Science* page 250	**Activity 10** Light is a form of energy that allows us to see. Most solid objects block light and this creates a shadow. Objects that block light are said to be "opaque". Some materials, such as glass, allow light to pass through them and this is why we use glass to make windows. Materials that let light pass through them are said to be "transparent" and do not make a shadow. Take the learners into the schoolyard for this activity. Ask them to look for materials that block light and make shadows. Their bodies will block light, but so will walls, buildings, trees and other plants. Ask learners to find a material that will let light pass through it and will not form a shadow, such as plastic sheeting in roofs, glass in windows and bottles.	Page 25

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Make observations.	*Explore Science* pages 244–5 A torch	**Activity 11** So far learners have done activities on two types of energy—light and sound. This activity relates to another type of energy—electricity. Electricity is a very difficult concept for young learners, so at this stage simply take them on a walk around the school and show them a range of things that use electricity both from batteries (a torch is a good example) and the mains. Explain that mains electricity from plugs and switches is very dangerous and can even kill you. Learners will do much more on electricity in later years.	Page 27
Make observations, apply knowledge and communicate in words.	*Explore Science* page 236 Toy cars	**Activity 12** This activity looks at another type of energy—the energy of movement. This is also called "kinetic energy". At this stage learners should simply investigate how to make a toy car move. Do not tell them how to do this; ask them how they would do it. Then ask them how they would make the car move further and faster. When they have done this, you can explain that the harder they push the car, the faster and further it will go.	Page 28
Summarise what has been learnt in the chapter.		**Chapter review** Go through the chapter review to revise the work covered in each of the sections. Refer to the appropriate pages in the Learner's Resource Book if learners do not understand any review statements.	Page 29
		Concept map Review the concept map with learners to ensure they understand the key concepts covered in the chapter.	Page 29
		Revision (assessment) Give the learners time to complete the revision activity in this chapter.	Page 30

Activities and assessment answers

Activity 1

1 The first picture shows an ear. The second picture shows an eye.

2 We need our eyes to sense light, which lets us see. We need our ears to sense sound. They allow us to hear.

Activity 2

The "hearing trumpets" should allow the learners to hear sounds better because they direct the sound energy into their ears.

Activity 3

1 **a** a cat
b a dog
c a horse

2 These animals have outer ears that act like "hearing trumpets" because they can move their ears to direct sounds into their inner ears.

Activity 4

The learners may observe that dogs and cats 'prick up' their ears when they hear certain sounds and may move their head and ears in the direction of a sound to hear it better.

Activity 5

1 **a** panpipes
b a wooden drum
Both of these should be familiar to learners.

2 To play the panpipes, we need to blow across the holes. To play the drum, we need to strike it with drumsticks.

Activity 6

Learners can demonstrate how to make sounds with the instruments. They should note that different instruments make very different sounds.

Activity 7

2 Blowing across the top of the bottles will make the air inside vibrate and give a sound like panpipes. Learners can also tap the bottles with a metal object to give a different sound.

3 The bottles are most like the panpipes in the Solomon Islands.

Activity 8

1 **a** a guitar
b a keyboard
c a drum
d a whistle

2 To play a guitar, a person has to pluck the strings. To play a keyboard, a person has to press the keys. To play the drums a person has to beat it (with drumsticks). If a person blows a whistle it will make a sound.

Activity 9

Learners play notes on a guitar by plucking the strings.

Activity 10

Learners find materials that block the light and materials that let the light pass through.

Activity 11

Learners point to or list things that use electricity.

Activity 12

Learners can make a toy car move by pushing it. They can make it go further by pushing it harder.

Revision questions

The energy types in the pictures are:

a a candle—light energy
b a wall switch—electrical energy
c someone playing a guitar—sound energy
d a toy car moving—movement energy.

Chapter 3 Materials and uses

Strand: Natural and Processed Materials

Suggested periods: 24 (6 weeks)

Sub-strand statement:

Different properties of materials often determine their uses. Some properties of common materials and objects we use include: hardness, strength, weight, resistance to fire or water. The use of different materials for different purposes depends on these special properties. For example, iron is used to make bush knives because it is strong and hard and we can make it sharp.

General learning outcomes

Learners should:

2.3.1 list examples of materials used for different purposes (K)

2.3.2 recognise that different objects are made from different materials (K)

2.3.3 appreciate that different materials are used for different purposes. (V)

Specific learning outcomes

Learners should be able to:

2.3.1.1 identify the materials from which 3 specific objects are made

2.3.2.1 give reasons why different materials are used for different purposes

2.3.3.1 carry out an investigation into the properties of some materials, for example strength, weight and waterproof, and relate the properties to their uses.

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Make observations. Identify objects, their uses and the materials they are made from.	*Explore Science* pages 40–9 Pictures from magazines or books of everyday objects made from metal, wood, paper or plastic	Give some explanation of materials and their properties before you begin work on this chapter. This chapter will give you an opportunity to increase the learners' vocabulary of materials and properties. **Activity 1** This activity introduces the learners to materials. Ask learners to identify a number of everyday objects from the pictures. Ask them to say what materials the objects are made from. Extend the activity by providing further pictures from books or magazines. Ask the learners why the objects are made from the different materials.	Page 32
Make observations. Identify objects, their uses and the materials they are made from. Communicate in words and pictures.	*Explore Science* pages 40–9	**Activity 2** This activity reinforces Activity 1. Learners look at some of the actual objects they saw in the pictures. Ask them to examine objects in the classroom, such as chairs and windows. Encourage them to touch the objects and describe them. Then ask them to identify the materials the objects are made from. Ask why these materials were used. Assist learners to draw and label each object in their exercise book.	Page 33
Make observations. Identify objects, their uses and the materials they are made from. Communicate in words.	*Explore Science* pages 40–9 A range of different objects made from different materials	**Activity 3** This activity reinforces Activities 1 and 2 by using actual objects provided by the teacher. Use as many objects as you have available. The learners can touch the objects, as this is a form of observing. Ask: What is this? What do you think it is made from? Why do you think it is made from this material? Assist learners to draw and label each object in their exercise book.	Page 33

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Make observations. Identify objects, their uses and the materials they are made from. Communicate in words.	*Explore Science* pages 40–9	**Activity 4** The learners can work in pairs for this activity, telling each other what the objects are, what materials they are made from and why the materials have been used to make them. Move around the classroom, listening to the pairs explaining these things. Summarise the answers towards the end of the lesson.	Page 34
Follow instructions, make observations and draw conclusions.	*Explore Science* pages 40–9 A bucket of water, some stones and some small pieces of wood	**Activity 5** This is a simple problem solving activity. The learners test the wood and stones to see which floats and then decide whether wood or stone is better for building a boat. Learners can test other materials that float, such as polystyrene, and materials that sink, such as metal. They can use some of the floating materials to build a simple boat and play with it. Some learners may ask why metal is used to build large ships since it sinks. The reason large ships float is because they are full of air, which helps them stay afloat.	Page 35
Follow instructions, make observations and draw conclusions.	*Explore Science* pages 40–9 Sheets of A4 paper	**Activity 6** The learners may need help to make their paper planes. When learners have finished making their paper planes, take them outside. They can throw their planes to see how far they go. Ask the learners to make planes of different shapes and decide which is the best shape for a paper plane. The best shape for a paper plane is generally one with a pointed front, long slim body and wings that are not too big. Learners can draw pictures on, or decorate, their paper planes when they have finished making them.	Page 36

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Make observations and communicate in words.	*Explore Science* pages 40–9 Plastic buckets, water, sand	**Activity 7** The learners examine the plastic bucket and use it to carry some things, including water and sand. Ask: Why is plastic good for making buckets? Why would cardboard or stone not be good for making buckets?	Page 37
Follow instructions, make observations and draw conclusions.	*Explore Science* pages 40–9 A teddy bear or other soft toy, paper, plastic bags, scissors, water	**Activity 8** Tell the learners a simple story about a teddy bear who wants to visit his friend. It is raining and teddy does not want to get his fur wet. Ask if paper or plastic would be best for making teddy's new coat. The learners can test their ideas. Give each group a sheet of paper, a sheet of plastic cut from a plastic bag and some water. Ask them to test the materials and decide which is better for teddy's coat. When they have done this activity they can draw teddy in his new plastic coat.	Page 37
Make observations.	*Explore Science* pages 40–9 Optional: sago palm leaves	**Activity 9** Note: You will need to make the necesary preparations for this activity before the lesson, especially if you are planning to leave the school grounds. If possible, take the learners to look at a roof made of sago palm leaves. Ask: Why do people make roofs out of sago palm leaves? Give the learners a sago palm leaf and allow them to handle it. Ask: Is it heavy or light? Is it strong? Pour some water onto it and see what happens.	Page 38
Make observations.	*Explore Science* pages 40–9	**Activity 10** Note: You will need to make the necesary preparations for this activity before the lesson, especially if you are planning to leave the school grounds. If possible, take the learners out to look at a roof made of corrugated iron or zinc. Ask: Why are people now making more roofs from this material? How is it different from sago palm for making a roof?	Page 38

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Make observations.	*Explore Science* pages 40–9 A wooden carving	**Activity 11** If possible, bring in a wooden carving to class and let the learners handle it. Ask: What is the carving made from? Why were these materials chosen?	Page 39
Summarise what has been learnt in the chapter.		**Chapter review** Go through the chapter review to revise the work covered in each of the sections. Refer to the appropriate pages in the Learner's Resource Book if learners do not understand any review statements.	Page 40
		Concept map Review the concept map with learners to ensure they understand the key concepts covered in the chapter.	Page 40
		Revision (assessment) Give the learners time to complete the revision activity in this chapter.	Page 41

Activities and assessment answers

Activity 1

The objects and materials are:

a Windows are made of glass.
b Chairs are made of wood.
c Scissors are made of metal.
d Spoons are made of plastic.
e Books are made of paper.

Activity 2

Learners' answers and pictures will vary.

Activity 3

Learners' answers will vary depending on the objects you supply.

Activity 4

The objects have the following functions:

a metal knife—metal is hard and can be made sharp to cut things.
b plastic bucket for carrying water—plastic is strong and waterproof and can be moulded into different shapes easily.
c cloth shirt—cloth is soft and comfortable to wear. It is easy to cut into different shapes and it can be washed.
d wooden chair—wood is strong and can be cut into different shapes.
e glass window—we can see through glass and it lets in the light.

Activity 5

1 The wood should float and the stone should sink.
2 Wood is a better material for making boats.

Activity 6

1 Learners' paper planes will vary.

2 Paper is good for making paper planes because it is light. We make real planes from metal. It is much heavier than paper, but planes have very strong engines and a special shape to help them fly.

Activity 7

1 We use buckets to carry liquids such as water, as well as other things.

2 Buckets are made of plastic because plastic is light, strong and waterproof and can be made into different shapes easily.

Activity 8

1 The learners can test the paper and plastic by dripping water on them. The paper will absorb the water and become very soft and tear. The water will run off the plastic and will not soak in. The plastic is a better material for teddy's coat.

2 Learners' drawings will vary.

Activity 9

1 Sago palm is still used for making roofs in the Solomon Islands, so the learners will be familiar with this material.

2 The leaves are light, but they are strong and water runs off them so they are very good for roofing. Sago palm does not cost anything, but it takes a lot of time and effort to make a roof from sago palm. The leaves must be dried before they can be used for roofing.

Activity 10

1 Zinc or corrugated iron is being used more and more for making roofs in the Solomon Islands.

2 Corrugated iron lasts longer than sago palm and it is much easier and less time consuming to put a corrugated iron roof on a house than to make one from sago palm leaves. So, although it costs more and it does eventually rust, people find it easier to use as roofing for their buildings.

Activity 11

1 Most carvings in the Solomon Islands are made from wood. Most wooden carvings in the Solomon Islands are made from kerosene wood, but some are made from ebony or mahogany. Some carvings are made from stone.

2 Wood is strong, but it can be shaped into different shapes using sharp tools. It also looks good. Ebony and mahogany look very good, but are very expensive woods. The carvers also use shells to decorate the carvings. These days most carvings are sold to tourists.

Revision questions

1 The window is made of glass so we can see through it.

2 The raincoat is made of plastic so it is waterproof and we keep dry.

3 The boat is made of wood so it floats.

Chapter 4 Gardening

Strand: Farming

Suggested periods: 20 (5 weeks)

Sub-strand statement:

Successful gardening needs good soil, water, sunlight, tools, and good-quality planting material. Gardening tools and equipment must be cared for. Young plants and cuttings must be properly planted and looked after.

General learning outcomes

Learners should:

2.4.1 understand that good soil, water and sunlight are needed for successful gardening (U)

2.4.2 know some soils can be improved (K)

2.4.3 know the basic tools used for gardening (K)

2.4.4 appreciate the importance of caring for tools (V)

2.4.5 appreciate that some young plants and cuttings need shade when planted. (V)

Specific learning outcomes

Learners should be able to:

2.4.1.1 list three basic things needed for successful gardening

2.4.2.1 add compost to soils to improve them

2.4.3.1 list three necessary tools for successful gardening

2.4.4.1 explain how to care for some gardening tools

2.4.5.1 describe three examples of planting materials (stem cuttings, seeds or piece of roots) and how to care for them when they begin to grow.

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Make observations.	Clear plastic bottles or jars (with lids if possible), soil samples, water	**Activity 1** Demonstrate this activity before the learners carry it out. Clear plastic bottles are best, as they will not break. Shake the soil and water mixture well and let it stand for about two hours, although it may take a bit longer for all of the different layers to settle. The learners should observe that the heaviest materials, such as stones, sink to the bottom fastest and the very fine particles in the soil take some time to settle. Some organic material, such as leaf litter, will float.	Page 43
Make observations.	Watering cans	**Activity 2** This activity simply involves taking the class out to the school garden and demonstrating how to water the plants growing there. Ask: What will happen to the plants if they do not get any water? Explain that it is important not to give the plants too much water or they could die.	Page 44
Follow instructions, make observations and draw conclusions. Communicate in pictures.	Seeds such as beans or corn, plastic cups or seed trays and soil	**Activity 3** Demonstrate to the class how to plant a bean seed in a tray or a plastic cup of soil. It is a good idea to put some small holes in the bottom of the plastic cup so that if learners give the seed too much water the water can drain away. The learners can plant their own bean seeds and water them a little each day. As the seeds grow, the learners can draw pictures of the young plants and the teacher can help learners to measure them.	Page 45

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Make observations.	An empty, clean oil drum or large plastic bucket with the bottom removed; plastic sheeting or wooden cover with air holes; vegetable scraps	**Activity 4** Show the learners how to make a compost bin. Ask a local garage for an oil drum that has been cleaned, with the top and bottom removed. A large plastic bucket with the bottom removed can also be used. Place the bin in a corner of the school garden furthest away from any buildings. You will need to make a cover for the top of the bin. This can be a plastic sheet, but a wooden cover is better. The cover and the bin should have some holes punched in them to allow air in. Once the bin has been set up the learners can begin to throw vegetable scraps into it. It is important not to throw plastic waste into the bin. Ask the learners why this is. Also, avoid putting any meat into the bin as this can attract rats and snakes. Once the bin has lots of vegetable scraps in it, lots of insects and other small invertebrates will begin living in it and some fungus may start to grow. Explain that this is a good thing as these living things start to break down the vegetable matter and turn it into soil. It is good to pour some water into the bin at the start of each week as this helps to speed up the breakdown of the vegetable matter.	Page 47
Make observations and apply knowledge.		**Activity 5** Point to the pictures in the Learner's Resource Book and ask: Do you know what these tools are? Have you ever used any of these tools? If so, the learners can tell the class how they use them.	Page 48

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Make observations. Communicate.	A range of garden tools	**Activity 6** The teacher can bring in some actual tools to the class and let the learners examine them. Care should be taken to ensure that the students handle any sharp tools with care. Ask the learners what the tools are and take them to the school garden so that learners can explain and demonstrate how to use each of the tools. Once the learners have identified the tools, the teacher should explain to them why it is important to care for them properly so that they do not rust.	Page 49
Make observations and communicate in words and pictures.	A range of garden tools	**Activity 7** Arrange for the class to visit a local garden. Ask a local gardener to talk to the class about growing different crops, the tools that are used and how the tools are cared for. When the learners get back to class they can draw some gardening tools and explain to the class what each tool is used for.	Page 49
Follow instructions and manipulate materials.	Various seeds, cuttings and roots	**Activity 8** New plants can grow from seeds (for example, beans, peanuts and corn), from roots (for example, kumara) and from cuttings (for example, sugar cane). The learners can work in groups. Give each group some seeds, some cuttings or some roots. The groups can plant these in different parts of the school garden. Each group should prepare the soil properly for planting, plant and tend their crop by ensuring it is watered. When the plants have grown big enough, the group can harvest their crop and share it with the rest of the class.	Page 51

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Summarise what has been learnt in the chapter.		**Chapter review** Go through the chapter review to revise the work covered in each of the sections. Refer to the appropriate pages in the Learner's Resource Book if learners do not understand any review statements.	Page 52
		Concept map Review the concept map with learners to ensure they understand the key concepts covered in the chapter.	Page 52
		Revision (assessment) Give the learners time to complete the revision activity in this chapter.	Page 53

Activities and assessment answers

Activity 1

2 The soil will form different layers when it is shaken in water. Small stones will sink to the bottom first, followed by finer material. Different soil types will have different amounts of stones and fine material.

3 Check learners' drawings.

Activity 2

Demonstrate how to water plants in the school garden using a watering can. Most plants need some water every day or two, but too much water can kill plants, particularly when they are young.

Activity 3

Demonstrate how to plant seeds and care for them. The learners can then plant and grow their own seeds, and draw them as they grow. Check learners' drawings.

Activity 4

Learners can visit the compost bin every two or three days and come back to the class and tell their friends what they see.

They may find insects like cockroaches living in the bin. This is a good thing as these insects break down the vegetable matter and help to turn it into compost, which is good for the soil.

Activity 5

1 The tools in the photographs are:

- **a** a cane knife
- **b** a hoe
- **c** a spade
- **d** a fork

2 A cane knife is for cutting plants down or harvesting them. A hoe is for breaking up the soil and removing weeds. A spade is for digging holes in soil. A fork is for breaking up the soil.

Activity 6

The answer to this activity will depend on the tools you bring to class.

Activity 7

All tools should be cleaned after use to stop them rusting. Coating them with some oil also stops rusting. The learners' drawings will depend on what they see during the garden visit, but they are likely to see hoes, cane knives and forks.

Activity 8

Informally assess how well the learners follow instructions and tend their crops during this activity.

Revision questions

1 Plants need good soil, water and air.
2 We can use seeds, roots and cuttings to grow new plants.
3 We need to clean garden tools to stop them from rusting and becoming damaged.

Chapter 5 Shadows

Strand: Earth and Beyond

Suggested periods: 20 (5 weeks)

Sub-strand statement:

Shadows form whenever light cannot pass through an object. The size, shape, position and direction of a shadow changes as a result of the position of the Sun in the sky. The shadow you form in the morning Sun is much longer and lies on one side (westerly direction) than one that forms at around noon which lies directly below you and is smaller.

General learning outcomes

Learners should:

2.5.1 know that shadows change in size and shape as the Sun moves across the sky (K)

2.5.2 predict the direction of a shadow based upon the position of the Sun (U)

2.5.3 appreciate that the Sun rises in the east and sets in the west. (V)

Specific learning outcomes

Learners should be able to:

2.5.1.1 observe and interpret the size and shape of shadows at different times of the day

2.5.2.1 demonstrate the direction of a shadow using a shadow stick

2.5.3.1 name the direction where the Sun rises and sets.

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Make observations.	*Explore Science* page 250	**Activity 1** This activity is best done at the beginning of the day when it is not too hot and shadows are longer in the morning than at midday. Ask the learners to examine their own shadow and the shadows of their friends. When they return to the classroom the learners can draw pictures of themselves and their shadows. Check that their observations are correct. Often children draw features like eyes on shadows. The shadows should just be black and have no features. They should also be joined to the feet of the person being drawn.	Page 55
Make observations.	*Explore Science* page 250	**Activity 2** This is a fun activity to allow the learners to explore their shadows further and build on Activity 1. Explain to the learners that shadows are formed when something blocks the Sun's rays. In this case it is their body that is blocking the rays of the Sun and making a shadow.	Page 56
Make observations.	*Explore Science* page 250	**Activity 3** This is another fun activity about shadow formation in which the learners use their hands to make different shadow shapes. It also involves learners in some creativity and helps develop observational skills as the learners have to observe the shadows made by their friends and decide what they are. This activity is best done early or late in the day when the Sun is lower in the sky and it is not too hot.	Page 57

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Make observations and communicate in pictures.	*Explore Science* page 250 Chalk	**Activity 4** This activity should be started as soon as school begins, when the Sun is low in the sky. The learners go to the schoolyard and work in pairs. One of each pair chalks around the shadow of their partner. The pairs repeat this at midday, going back to the same shadow and chalking around their shadow again. Then finally, at the end of the school day, they chalk around their shadows for the last time. The learners can copy the chalk marks into their exercise books. Ask: How has your shadow changed? Why does your shadow start the day long, become short at midday and long again towards the end of the school day? The learners should observe that their shadows are long in the morning, become shorter at midday and get longer again in the afternoon. This is because the Sun is low in the sky in the morning, it is high in the sky at midday and is low again in the afternoon. Explain that the Sun rises in the east and sets in the west and as it gets higher then lower in the sky during the day, the length and direction of shadows changes. Encourage the learners to observe their shadows very early in the morning before they come to school and late in the evening after they have left school because just after the Sun rises and before it sets are the times when their shadows will be longest.	Page 58

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Follow instructions, make observations and communicate in words.	*Explore Science* page 250 Plastic bottles, sand, sticks and chalk	**Activity 5** This activity reinforces the learning in Activity 4 by showing that shadow length changes during the day. It is a very similar activity, but uses a shadow stick instead of the body to make a shadow. The learners can make shadow sticks by filling plastic bottles with sand and putting sticks into these. They can then chalk around the shadow made by the stick at three different times during the day: early morning, midday and late afternoon. They should find that the shadow made by the stick changes size and direction in the same way as the shadow made by their bodies in the previous activity. Again ask the learners why the shadow has changed during the day. They should be able to explain this in terms of the height and direction of the Sun at the different times of day. Reinforce that the Sun rises in the morning in the east and sets in the evening in the west. In later years the learners will learn that this is due to the rotation of the Earth on its axis. When they have done this activity, read the poem 'My Shadow' in the Learner's Resource Book with the class.	Page 59
Make observations and communicate in words.	*Explore Science* page 250 Stiff card, scissors, sticky tape, sticks and sheet for a screen, a torch	**Activity 6** It is possible to make shadow puppets by cutting out cardboard shapes and attaching these to sticks as shown in the Learner's Resource Books. It is best to use stiff card to make the shapes. These can then be held behind a sheet of white cloth or paper near a window to produce shadows.	Page 61
Make observations and communicate in words.	*Explore Science* page 250	**Activity 7** Use the screen from Activity 6 to play a game in which the learners have to guess the objects from their shadows. The learners can also bring in objects to use in this activity.	Page 61

Processes and skills	Resources	Teacher's support notes	Learner's Resource Book
Summarise what has been learnt in the chapter.		**Chapter review** Go through the chapter review to revise the work covered in each of the sections. Refer to the appropriate pages in the Learner's Resource Book if learners do not understand any review statements.	Page 62
		Concept map Review the concept map with learners to ensure they understand the key concepts covered in the chapter.	Page 62
		Revision (assessment) Give the learners time to complete the revision activity in this chapter.	Page 63

Activities and assessment answers

Activity 1

1 No.

2 Yes.

3 Black.

Activity 2

Learners' shadows will vary.

Activity 3

Learners' shadow shapes will vary.

Activity 4

Learners' chalk outlines will vary depending on the times of the day.

Activity 5

1 and **2** Learners' chalk outlines will vary.

3 The direction of the shadow will change too.

The learners should be able to relate this to the height of the Sun by the end of Activities 4 and 5.

Activity 6 and 7

These activities are fun and creative and involve observation. They should also reinforce the idea that for shadows to form, we need light and something that blocks some of the light rays.

Revision questions

- Picture 1 shows the child's shadow in evening.
- Picture 2 shows the child's shadow in the morning.
- Picture 3 shows the child's shadow at midday.

Appendix 1: Glossary of terms

The glossary in the Learner's Resource Book lists important words and concepts for each chapter. Each of these words is printed in bold where it first appears in the Learner's Resource Book. You may need to explain other difficult words to learners.

Learners should be encouraged to use the glossary whenever they come across a word in bold that they do not know or understand clearly, but they do not need to learn the definition. They should make sure they understand the word and then practise using it for themselves. The real test is being able to use the word correctly in a sentence, not being able to repeat the definition.

The glossary from the Learner's Resource Book is repeated in the following pages.

A, B

blind not able to see

blow to make air move

boat an open vehicle, smaller than a ship, that moves on water

C

clay a kind of soil that hold water easily

clear can see through

cold without heat or warmth

compost a mixture of decaying leaves, vegetables, or manure that is used to improve garden soil

cool slightly cold; not hot or warm

D

dangerous likely to cause harm; not safe

deaf not able to hear

E

ear an organ of the body used for hearing

electricity a form of energy which travels through wires

eye an organ of the body used for seeing

F, G

fingers the five long parts at the end of the hand

float to sit on the surface of a liquid without sinking

H

hard not soft; solid

hear to receive sound with the ears

heavy having much weight

high reaching up a great distance

humus a material that is made up of partly decayed leaves and plants; humus adds nutrients to soil and helps it hold water

I, J, K

instrument (musical) a device used to produce musical notes

L

light the form of energy that makes it possible for the eye to see; the Sun produces light

long covering a great distance or time

low close to the ground

M

movement a motion or way of moving

music pleasant sounds made by voices or instruments

N

nose the organ of the body that controls breathing and smelling. The nose is in the middle of the face

O

object anything that has shape or form and can be seen or touched

P, Q

plane a machine that is heavier than air and that can fly; it has wings and engines

pluck to play on by pulling and letting go

press to put pressure on something

properties characteristics or features

puppet toy

R

roof the surface or covering on the top of a building

rough not smooth

S

salty having the taste of salt

sand tiny, loose grains of ground rock such as those you can see on beaches

see to use your eyes and receive images

senses any of five ways to experience your environment; the senses are touch, smell, taste, sight and hearing

shadow the dark image on a surface caused by something that blocks light from the Sun

shape the form of the outer edge of an object

short not long in size or time

smell to sense something by means of the nose

smooth not rough; even

soil the top layer of the Earth's surface; dirt

sour having a sharp taste caused by acid; lemons, vinegar, and yogurt are some things that are sour

strong difficult to break or damage

sunlight the light of the Sun; sunshine

sweet having a taste like sugar

T, U, V

taste to tell the flavour of something by putting it onto your tongue

tongue the organ in the mouth used for tasting and swallowing and also in speaking

tools instruments such as a hammer that are usually held with the hands; tools are used for doing work

touch to put one's hand or fingers on something in order to feel it

W, X, Y, Z

warm having some heat; not cold

Appendix 2: Lesson plan format

<table>
<tr><td colspan="2">Name of school:</td><td>Class teacher:</td></tr>
<tr><td colspan="2">Lesson title:</td><td>Date:</td></tr>
<tr><td colspan="3">Learning outcomes:
• What are the main things I want learners to learn and be able to do as a result of the lesson? How are lesson outcomes linked to syllabus outcomes?
• What are other things I want learners to learn as well?</td></tr>
<tr><td colspan="3">Lesson content:
• What are the key facts, concepts or procedures that I want learners to understand as a result of this lesson?</td></tr>
<tr><td colspan="3">Introduction:
• How will I get learners motivated, curious and ready to learn?
• This section should be allocated 3–5 minutes.</td></tr>
<tr><td>Teacher activities:
• What am I going to do during the lesson in order for learners to achieve the learning outcome?
• This section should be allocated 8–10 minutes.</td><td colspan="2">Learner activities:
• What are the learners going to do during the lesson in order for them to achieve the learning outcome?
• This section should be allocated 20–25 minutes.</td></tr>
<tr><td colspan="3">Conclusion:
• How will I bring the lesson to a logical and meaningful conclusion?
• This section should be allocated 5–7 minutes.</td></tr>
<tr><td colspan="3">Learner assessment:
• How will I know that learners have achieved what I wanted them to achieve?</td></tr>
<tr><td colspan="3">Lesson evaluation:
• How will I evaluate the success of the lesson?</td></tr>
<tr><td colspan="3">Lesson endorsement: (to be signed by Head of Department/Head Teacher/Principal)
Head of Department:
Head Teacher/Principal:</td></tr>
</table>

Appendix 3: Sample individual record form

Learner name:			**Year:**							**Class:**
Strand:			**Sub-strand:**							
Assessment event	**Specific learning outcome (use appropriate code)**		**Achievement levels (ratings)**							**Specific learning outcomes**: A = Achieved, PA = Partially Achieved, NA = Not Achieved Key: 0 = NA, 1–4 = PA, 5 = A
1	2.1.1.1	List the five human sense organs						*		A
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
Descriptive comments:										
Class teacher:		Signature:								Date:

Appendix 4: Sample class record form

Class:	Strand:	Sub-strand:	Year:

Specific learning outcomes: A = Achieved, PA = Partially Achieved, NA = Not Achieved															Individual comments on the learning progress in the class
Assessment event	1														
Learning outcome assessed (code)	2.1.1.1														
Denis	A														
Ian	A														
Jack	A														
James	A														
John	PA														
Joyce	PA														
Lionel	PA														Steady/satisfactory
Liza	NA														
Luke	NA														
Mary	A														Improved/excellent progress
Michael	PA														
Nancy	NA														
Peter	A														
Tom	NA														
Yates	NA														Not improved/slow progress
Overall comments:															

Class teacher:	Signature:	Date:

Appendix 5: Sample individual monitoring form

Learner name:						**Class:**	**Year:**
Strand:						**Topic/unit:**	
Sub-strand:							
Assessment event	**Specific learning outcomes: A = Achieved, PA = Partially Achieved, NA = Not Achieved**					**Remarks: comment on learning progress: improved, steady or not improved**	
	Code	**Outcome assessed**	**A**	**PA**	**NA**		
1	2.1.1.1	List the five sense organs	*			Improved from previous assessment	
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
Class teacher:						Signature:	Date:

Appendix 6: Sample class monitoring form

Class:			**Term/semester:**					**Year:**
Strand:								**Topic/unit:**
Sub-strand:								**Remarks: comment on learning progress: improved, steady or not improved**
Assessment event	**1**	**2**	**3**	**4**				
Specific learning outcome assessed (code)	2.1.1.1	2.1.2.1	2.1.2.2	2.1.3.1				
Mary Kau	NA	PA	A	A				Improved with excellent results
John Niga	A							
Liza Joe	NA							
Peter Glen	PA							
James Iro	PA							
Luke Bilo	A							

Class teacher:	Signature:	Date:

Appendix 7: Sample individual remedial work form

Learner name:			Class:			Term/semester:	Year:
Strand:			Sub-strand:				
Assessment event	Specific learning outcomes (use appropriate code)		A	PA	NA	Remedial work required	Results after remedial work
	Code	Outcome assessed					
1	2.1.1.1	List the five human sense organs		*		Learner to repeat the activity	Able to list the five senses
Class teacher:						Signature:	Date:

Appendix 8: Sample individual report form

Learner name:		**Class:**	**Term:**	**Year:**
Strand:	**Sub-strand:**		**Specific learning outcomes: Achieved (A), Partially Achieved (PA) or Not Achieved (NA)**	

Code	**Specific learning outcome assessed**	**A**	**PA**	**NA**
2.1.1.1	List the five human sense organs	*		

Descriptive remarks:

Strand:	**Sub-strand:**	**Specific learning outcomes: Achieved (A), Partially Achieved (PA) or Not Achieved (NA)**

Code	**Specific learning outcomes**	**A**	**PA**	**NA**

Descriptive remarks:

Results for summative assessment: The progressive achievement level for summative assessment is:

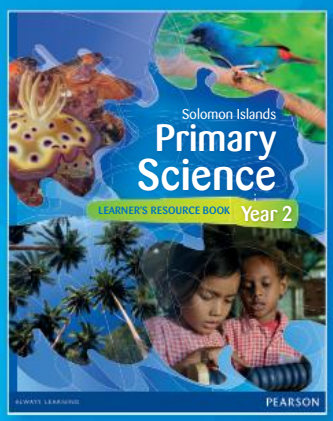
Appendix 8 (cont.)

Strand:	**Combination of sub-strands:**	**Specific learning outcomes: Achieved (A), Partially Achieved (PA) or Not Achieved (NA)**		
Code	**Specific learning outcomes**	**A**	**PA**	**NA**
2.1.1.1		*		
2.1.1.2			*	
2.1.1.3				*
Descriptive remarks from summative assessment:				
Overall achievement level:	Overall achievement award:			
School administration report on learner's behaviour and character				
Class teacher:		Signature:		Date:
Class teacher comments:				
Head Teacher/Principal:		Signature:		Date:
Head Teacher/Principal comments:				

Solomon Islands

Primary Science

TEACHER'S GUIDE Year 2



The *Solomon Islands Primary Science Year 2 Teacher's Guide* provides teachers with comprehensive support material to support the implementation of the *Key Learning Outcomes of the Primary Science Syllabus (2008)*, along with assistance in teaching a range of skills in science investigation and research.

Designed to be used alongside the accompanying *Solomon Islands Primary Science Year 2 Learner's Resource Book*, this Teacher's Guide provides teachers with detailed lesson plans, as well as advice on how to initiate the learners' hands-on investigations of the physical and living world and how to integrate the key skills and knowledge of each topic with the available resources in the Learner's Resource Book. In addition, the guide includes:

- support notes on processes and skills
- lists of required resources
- teacher support activities
- detailed Learner's Resource Book cross-references
- answers to the activities and assessment tasks.

This Teacher's Guide is a part of a series of materials for Solomon Islands Primary Science for Years 1–6. This series was developed as part of the Solomon Islands school curriculum reform between 2005 and 2013.

Throughout this guide there are page references to an excellent primary encyclopaedia, *Explore Science*, where teachers can find background information on each topic covered in the Learner's Resource Book. A copy of *Explore Science* accompanies this Teacher's Guide.

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