



South Sudan

# Primary Science

# 5

Primary Science has been written and developed by Ministry of General Education and Instruction, Government of South Sudan in conjunction with Subjects experts. This course book provides a fun and practical approach to the subject of Science, and at the same time imparting life long skills to the pupils.

The book comprehensively covers the Primary 5 syllabus as developed by **Ministry of General Education and Instruction.**

Each year comprises of a **Pupil's Book** and **teacher's Guide.**

The Teacher's Guides provide:

- Full coverage of the national syllabus.
- A strong grounding in the basics of Science.
- Clear presentation and explanation of learning points.
- A wide variety of practice exercises, often showing how Science can be applied to real-life situations.
- It provides opportunities for collaboration through group work activities.
- Stimulating illustrations.



All the courses in this primary series were developed by the Ministry of General Education and Instruction, Republic of South Sudan. The books have been designed to meet the primary school syllabus, and at the same time equipping the pupils with skills to fit in the modern day global society.

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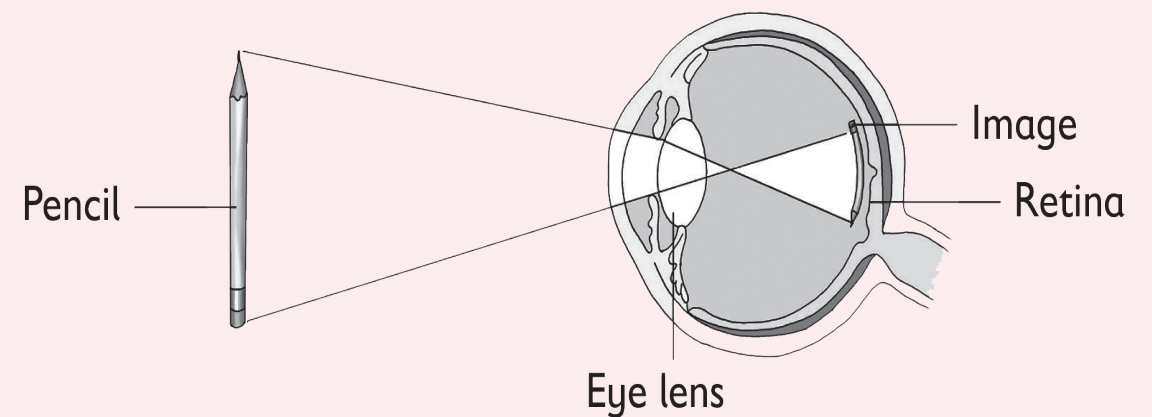


South Sudan

# Primary Science

# 5

Teacher's Guide



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# Science

## Teacher's Guide 5

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## FOREWORD

I am delighted to present to you this Teacher's Guide, which is developed by the Ministry of General Education and Instruction based on the new South Sudan National Curriculum. The National Curriculum is a learner-centered curriculum that aims to meet the needs and aspirations of the new nation. In particular, it aims to develop (a) Good citizens; (b) successful lifelong learners; (c) creative, active and productive individuals; and (d) Environmentally responsible members of our society. This textbook, like many others, has been designed to contribute to achievement of these noble aims. It has been revised thoroughly by our Subject Panels, is deemed to be fit for the purpose and has been recommended to me for approval. Therefore, I hereby grant my approval. This Teacher's Guide shall be used to facilitate learning for learners in all schools of the Republic of South Sudan, except international schools, with effect from 4th February, 2019.

I am deeply grateful to the staff of the Ministry of General Education and Instruction, especially Mr Michael Lopuke Lotyam Longolio, the Undersecretary of the Ministry, the staff of the Curriculum Development Centre, under the supervision of Mr Omot Okony Olok, the Director General for Quality Assurance and Standards, the Subject Panelists, the Curriculum Foundation (UK), under the able leadership of Dr Brian Male, for providing professional guidance throughout the process of the development of National Curriculum, school textbooks and Teachers' Guides for the Republic of South Sudan since 2013. I wish to thank UNICEF South Sudan for managing the project funded by the Global Partnership in Education so well and funding the development of the National Curriculum, the new textbooks and Teachers' Guides. I am equally grateful for the support provided by Mr Tony Calderbank, the former Country Director of the British Council, South Sudan; Sir Richard Arden, Senior Education Advisor of DfID, South Sudan. I thank Longhorn and Mountain Top publishers in Kenya for working closely with the Ministry, the Subject Panels, UNICEF and the Curriculum Foundation UK to write the new textbooks. Finally, I thank the former Ministers of Education, Hon. Joseph Ukel Abango and Hon. Dr John Gai Nyuot Yoh, for supporting me, in my role as the Undersecretary, to lead the Technical Committee to develop and complete the consultations on the new National Curriculum Framework by 29 November 2013.

The Ministry of General Education and Instruction, Republic of South Sudan, is most grateful to all these key stakeholders for their overwhelming support to the design and development of this historic South Sudan National Curriculum. This historic reform in South Sudan's education system is intended to benefit the people of South Sudan, especially the children and youth and the future generations. It shall enhance the quality of education in the country to promote peace, justice, liberty and prosperity for all. I urge all Teachers to put this textbook to good use.

May God bless South Sudan. May He help our Teachers to inspire, educate and transform the lives of all the children and youth of South Sudan.



Deng Deng Hoc Yai, (Hon.)

**Minister of General Education and Instruction, Republic of South Sudan**

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## Book organisation

This teacher's guide is organised into two main sections.

Part 1 is the general introduction section detailing information on competence-based curriculum and pedagogical issues.

The main elements of Part are:

- **Background information** to the new curriculum - It gives a brief overview of the general requirements of the new South Sudan competence-based curriculum including the guiding principles, the competences the learners are expected to acquire and cross cutting issues to be addressed during learning.
- **Basic requirements for an effective Science lesson** - It highlights the teacher's and learner's roles for effective teaching and learning of Science, teaching and learning resources and grouping learners for learning and teaching methods.

Part 2 provides a unit -to - unit guide to the teacher on how to facilitate learners to acquire the knowledge, skills and attitudes envisaged in each unit. This part is therefore structured into units.

The main elements of each unit guide are:

- **Unit heading**
- **Unit outcome**
- **Contribution to learner's competencies:**

The section explains how the unit will facilitate the learner to acquire the specified competencies.

- **Cross cutting issues to be addressed:** The section outlines the specific cross cutting issues that will be addressed through infusion as the learners do activities and interact with concepts planned for the unit. This is meant to make you conscious and be on the lookout for suitable opportunities throughout the teaching and learning process in the entire unit to address the cited cross cutting issues. Note that a unit may not necessarily address all the cross cutting issues outlined in the curriculum.

- **Teaching methodologies**

The section lists down the main teaching and learning methods that the teacher can employ in the unit.

- **Background information**

This section outlines key knowledge, skills, attitudes and values that learners

need to have acquired earlier that will facilitate easier acquisition of the new knowledge, skills, attitudes and values envisaged in the unit. It also guides the teacher on how to find out that the learners possess them before they start learning the concepts in the unit, and how to help learners in case they do not possess them.

- **Suggested teaching and learning activities**

This section provides you with guidance on how to facilitate learners to learn by doing the activities outlined in the learner's book. It also guides you on how to assess the process of learning.

### **Background information on the new curriculum**

The aim of the South Sudan Competence-based Curriculum is to develop in the learners competencies that will enable them interact with the environment in more practical ways.

It clearly defines the knowledge, skills and attitudes that the learner should acquire by doing the specified learning activities.

### **Learning competences to be attained**

Competencies are statements of characteristics that learners should demonstrate, which indicate they have the ability to do something to the required level of performance.

The following are the four competencies envisaged in this curriculum:

## **1. Critical and creative thinking**

Science lessons and activities facilitate learners to acquire these competencies by giving them opportunities to:

- Plan and carry out investigations, using a range of sources to find information.
- Sort and analyse information and come to conclusions.
- Suggest and develop solutions to problems, using their imaginations to create new approaches.
- Evaluate different suggested solutions.

## **2. Communication**

Science lessons and activities facilitate learners to acquire these competencies by giving them opportunities to:

- Read and comprehend critically a variety of types and forms of texts during research activities.
- Write reports on scientific investigations and activities.
- Speak clearly and communicate ideas and Science related information coherently.
- Listen and comprehend scientific facts presented by fellow classmates, group members, teachers and resources persons.
- Use a range of media, technologies and languages to communicate messages, ideas and opinions.

## **3. Cooperation**

Science lessons and activities facilitate learners to acquire these competencies by giving them opportunities to:



- Work collaboratively towards common objectives when doing activities.
- Be tolerant of others and respectful of differing views, when working together in groups.
- Adapt behaviour to suit different situations.
- Negotiate, respect others' rights and responsibilities and use strategies to resolve disputes and conflicts.
- Contribute to environmental sustainability.

#### **4. Culture and heritage**

Science lessons and activities facilitate learners to acquire these competencies by allowing them to:

- Take pride in identifying the diverse nature of the South Sudan society.
- Build understanding of the South Sudan heritage in relation to the rest of the world.
- Appreciate and contribute to the development of the South Sudan culture
- Value diversity and respect people of different races, religion, communities, cultures and those with disabilities.

#### **Cross-cutting issues to be addressed during learning**

These are issues that are of high national priority and hence have been incorporated in the learning process. The three cross-cutting issues should be addressed through the teaching and learning process are:

### **1. Environment and sustainability**

A well-conserved environment is obviously key to our health and survival. It is therefore important for you to make use of the opportunities that arise in the process of teaching and learning Science through activities to sensitise learners on the importance of conserving the environment. One way is by ensuring that the learners always dispose off the waste materials at the end of an activity in ways that do not pollute the environment.

### **2. Peace education**

Peace is critical for a society to flourish and for every individual to focus on personal and national development.

You need to be in the fore front in educating your learners on the need for peace, for example by encouraging group work in the learners activities and showing them ways of solving interpersonal problems peacefully that occasionally arise during interactions and discussions.

### **3. Life skills**

Learners need to progressively acquire some skills, abilities and behaviors that will help them to effectively deal with the events and challenges of every day life. Such skills include First Aid, communication skills, conflict resolution, basic ICT skills among others. You should as much as possible facilitate the learners to acquire these skills whenever an opportunity arises in the lesson execution.

Basic requirements for an effective

Science lesson

## 1. Teacher's role and basic skills for effective Science lesson

The teacher is the most important resource for an effective Science lesson.

### (a) Some key roles of a Science teacher.

- Organising the classroom to create a suitable learning environment.
- Preparing appropriate materials for learning activities.
- Engaging learners in a variety of learning activities.
- Encouraging and accepting learners' autonomy and initiative.
- Allowing learners' responses to drive lessons and shift instructional strategies.
- Familiarising themselves with learners' understanding of concepts before sharing their own understanding of those concepts.
- Encouraging learners to engage in dialogue, both with you and one another.
- Engaging learners in experiences that pose contradictions to their initial hypotheses and then encouraging discussions.
- Providing time for learners to construct relationships and create metaphors.
- Using a variety of teaching and assessment methods.
- Adjusting instructions to the level of the learners.

- Nurturing learners' natural curiosity.
- Motivating learners to make them ready for learning.
- Coordinate learners' activities so that the desired outcomes can be achieved.
- Assessing learners' activities and suggest solutions to their problems.
- Assist learners to consolidate their activities by summarising the key points learnt.

### (b) Key skills of a Science teacher:

- Creativity and innovation.
- Makes connections or relations with other subjects.
- A high level of knowledge of the content.
- Effective disciplining skills to adequately manage the classroom.
- Good communicator.
- Guidance and counselling.

### Learners' role in learning Science

Learning takes place only when the learner acquires the intended knowledge, skills and attitudes. As such, learning is a highly personal and individual process. Thus, a learner must be actively engaged in the learning exercise.

For active participation in learning, the learner should:

- Raise questions about what is observed.

- Suggest solutions to the problems observed.
  - Take part in planning investigations with appropriate controls to answer specific questions.
  - Carry out investigations to search for answers with the help of materials in search of patterns and relationships while looking for solutions to problems.
  - Working collaboratively with others, communicating their own ideas and considering others' ideas.
  - Expressing themselves using appropriate Science terms and representations in writing and talk.
  - Engaging in lively public discussions in defense of their work and explanations.
  - Applying their learning in real-life contexts.
  - Reflecting critically about the processes and outcomes of their inquiries.
- Resource persons
  - Firms such as hydroelectric power stations, engineering firms among others

### **(a) Classroom as a learning environment**

A Classroom generally refers to the place where learning takes place. Learners learn from everything that happens around them, such as the things that they hear, see, touch, taste, smell and manipulate.

#### **Classroom organization**

It is important you make the classroom an attractive and stimulating environment. This can be done by:

- Carefully arranging the furniture in the classroom in an organised way, to allow free movement of learners and you.
- Putting up learning and teaching aids on the walls. Examples are wall charts, pictures and photographs.
- Displaying teaching models.
- Providing objects of examination for example cover slides.
- Having a display corner in the classroom where learners display their work.
- Setting a corner for storing materials so as not to obstruct learners or distract them.
- Spreading out the learners evenly so that they do not interfere with one another's activities.
- Setting up the materials or

### **Teaching and learning resources**

These refer to things that the teacher requires during the teaching process. They include:

- The classroom
- Textbooks
- Wall charts and wall maps
- Materials and apparatus

### **Various tools and equipment**

- Science models

experiments for the series of lessons or activities going on for a number of days or weeks in a location where they do not interfere with other daily activities.

- Organising the sitting arrangement such that learners face the lighted areas of the room.
- Choosing the most appropriate location for you and the chalkboard such that they are visible to all learners and that you have a good view of all learners in the class.

### **b) Apparatus and materials**

For learners to study Science through the activity method, a number of materials and apparatus are required. The important role played by materials in learning has been felt for centuries. This is noted for instance in the old Chinese proverb that says:

When I hear, I forget,

When I see, I remember.

When I do I understand.

Since Science is a highly practical subject, materials help you to convey your points, information or develop skills simply and clearly and to achieve desired results much faster.

Some of the materials that you require for activities and investigations can be collected from the local environment.

Many others can be improvised while some have to be purchased. Whether collected, improvised or purchased, there are certain materials that are

valuable to have around almost all the time.

These include:

#### **i) Sciencekit**

A Science kit is a special box containing materials, apparatus and equipment necessary to conduct an array of experiments. The content of the kit depends on the curriculum requirements per level. Most Sciencekits are commercially available and target particular levels of learners. However, you are encouraged to come up with a kit based on the syllabus requirements.

#### **ii) Models**

A model refers to a three-dimensional representation of an object and is usually much smaller than the object. Several models are available commercially in shops. Examples of Science models include models of body parts, animals among others. These models can be purchased by schools for use during Science activities.

#### **iii) Resource persons**

A resource person refers to anybody with better knowledge on a given field. Examples include health practitioners such as doctors, nurses and laboratory technologists, agricultural extension officers, environmental specialists among others. Depending on the topic under discussion organise to invite a resource person in that area to talk to learners about the topic. The learners should be encouraged to ask as many questions as possible to help clarify areas where they have problems on.

#### iv) Improvisation

If each learner is to have a chance of experimenting, cheap resources must be made available. Complicated apparatus may not always be available in most schools. Such sophisticated equipment made by commercial manufacturers are usually expensive and majority of schools cannot afford them. You are therefore advised to improvise using locally available materials as much as possible.

#### vi) Scheduling learning activities and venues

Some of the activities suggested in the learner's book need good planning and scheduling in order to get accurate results. The teacher should therefore think ahead while making the scheme of work so that the prevailing weather pattern and the most appropriate timing are considered..

#### Grouping learners for learning activities

Most of the Science activities suggested in the Learner's book are carried out in groups and therefore the teacher should place 2 or 3 desks against each other and then have a group of learners sitting around those desks.

In certain activities, the teacher may wish to carry out a demonstration. In this case, the learners should be sitting or standing in a semicircle, or arranged around an empty shape of letter "U" such that each learner can see what you are doing clearly and without obstruction or pushing. If the learners are involved in individual work, each

learner can work on the floor or on the desk or a portion of the desk if they are sharing. In this case, they need not face each other.

Grouping learners for learning has increasingly become popular in recent years. In fact, the shift from knowledge-based to competence curriculum will make grouping the norm in the teaching process.

Learning grouping can be formed based one or a number of the following considerations:

- Similar ability grouping.
- Mixed ability grouping.
- Similar interests grouping.
- Common needs grouping.
- Friendship grouping.
- Sex-based grouping.

Grouping learners in a Science class has several advantages. They include:

- The individual learner's progress and needs can easily be observed.
- The teacher-learner relationship is enhanced.
- A teacher can easily attend to the needs and problems of a small group.

Materials that were inadequate for individual work can now be easily shared.

- Learners can learn from one another.
- Cooperation among learners can easily be developed.

- Many learners accept correction from the teacher more readily and without feeling humiliated when they are in a small group rather than the whole class.
- Learners' creativity, responsibility and leadership skills can easily be developed.
- Learners can work at their own pace.

The type of "grouping" that a teacher may choose may be dictated by:

- The topic or task to be tackled.
- The materials available.
- Ability of learners in the class (fast, average, slow).

### **Class size**

There is no method or approach to teaching that is appropriate to all lessons. A teacher should, therefore, choose wisely the method to use or a combination of methods depending on the nature of the topic or subtopic at hand.

### **Teaching methods**

There are a variety of possible methods in which a teacher can help the learners to learn. These include:

- a) Direct exposition
- b) Discovery or practical activity
- c) Group, class or pair discussion
- d) Project method
- e) Educational visit or field trips

- f) Teacher demonstration
- g) Experimentation or research

The particular technique that you may choose to use is influenced by several factors such as the:

- Particular group of learners in the class.
- Skills, attitudes and knowledge to be learned.
- Learning and teaching aids available.
- Local environment.
- Teacher's personal preference
- Prevailing weather condition.
- Requirements of Science syllabus

### **(a) Direct exposition**

This is the traditional way of teaching whereby the teacher explains something while the learners listen. After the teacher has finished, the learners may ask questions. However, in a competence-based curriculum, this technique should be used very minimally.

### **(b) Guided Discovery**

In this technique, encourage learners to find out answers to problems by themselves. You do this by:

- Giving learners specific tasks to do.  
Giving learners materials to work with.
- Asking structured

or guided questions that lead learners to the desired outcome. Sometimes learners are given a problem to solve

and then left to work in an open-ended manner until they find out for themselves.

This is the most preferred method of teaching in the implementation of Competency- Based curriculum.

### **(c) Group or class discussion or pair work**

In this technique, you and learners interact through question and answer sessions most of the time. Carefully select your questions so that learners are prompted to think and express their ideas freely, but along a desired line of thought. The method leads learners from the known to unknown in a logical sequence; and works well with small groups. The method boosts confidence in learners and improves interpersonal and communication skills.

The main disadvantage of this method is that some learners maybe shy or afraid to air their opinions freely in front of you or their peers. It may give them more confident learners a chance to dominate the others.

### **(d) Project method**

In this approach, you organize and guide a group of learners or the whole class to undertake a comprehensive study of something in real life over a period of time such as a week or several weeks.

Learners using the project method of studying encounter real life problems, which cannot be realistically brought into a normal classroom situation. A project captures learners' enthusiasm, stimulates their initiative

and encourages independent enquiry. If you are using the project method, ensure that the learners understand the problem to be solved and then provide them with the necessary materials and guidance to enable them carry out the study.

The main disadvantage of this method is that if a project is not closely supervised, learners easily get distracted and therefore lose track of the main objective of their study. Studying by the project method does not work well with learners who have little or no initiative.

### **(e) Educational visits and trips/ nature walks**

This is a lesson conducted outside the school compound during which you and the learners visit a place relevant to their unit of study. An educational visit/ or nature walk enables learners to view their surroundings with a broader outlook that cannot be acquired in a classroom setting. It also allows them to learn practically through first- hand experience. In all “educational visit or nature walk lessons”, learners are likely to be highly motivated and you should exploit this in ensuring effective learning. However, educational visits are time consuming and require a lot of prior preparation for them to succeed. They can also be expensive to undertake especially when learners have to travel far from the school.

### **(f) Demonstration lessons**

In a demonstration, you or a

laboratory technician show the learners an experiment, an activity or a procedure to be followed when investigating or explaining a particular problem. The learners gather around you where each learner can observe what you are doing. It is necessary to involve the learners in a demonstration, for example by:

- Asking a few learners to assist you in setting up the activity.
- Requesting them to make observations.
- Asking them questions as you

progress with the demonstration.

This will help to prevent the demonstration from becoming too teacher-centred.

When is a demonstration necessary?

You may have to use a demonstration, for example when:

- The experiment or procedure is too advanced for learners to perform.
- The experiment or procedure is dangerous.
- The apparatus and materials involved are delicate for learners to handle.



Refer to learner's book page 1 to 22

Learn about	Key inquiry questions
<p>Learners should draw on their experience at home and in previous lessons to understand the relationship between germs and sanitation. They should investigate using a wide variety of sources, discuss and write about how common human parasites are spread and understand how this can be controlled. They should learn about how to develop a healthy lifestyle for themselves and their families, the concept of health hazards and risk, and know about common legal and illegal drugs and their types. As a result they should be in a position to explain the importance of hygiene and their responsibility to develop a healthy lifestyle.</p>	<ul style="list-style-type: none"> <li>• How are germs related to sanitation?</li> <li>• Why should we keep our environment clean?</li> <li>• Why are human parasites common in places with poor sanitation?</li> <li>• How are common human parasites spread and controlled?</li> <li>• Why should we promote healthy lifestyle?</li> <li>• How can health hazards be avoided?</li> <li>• How can you differentiate common drugs and their types?</li> </ul>

Learning outcomes		
Knowledge and understanding	Skills	Attitudes
<ul style="list-style-type: none"> <li>• Understand the relationship between germs and sanitation</li> <li>• Know about common human parasites, how they are spread and controlled</li> <li>• Understand healthy lifestyle and concept of health hazards, common drugs and their types</li> </ul>	<ul style="list-style-type: none"> <li>• Recording and presenting group findings</li> <li>• Investigate causes of health hazards, drugs and their types</li> <li>• Use reference books and the internet to access information</li> <li>• Classify common drugs and their types</li> </ul>	<ul style="list-style-type: none"> <li>• Practice proper hygiene</li> <li>• Promote methods of controlling common human parasites</li> <li>• Appreciate the practices that promote good health lifestyle</li> <li>• Show genuine interest as they conduct investigation.</li> </ul>

**Contribution to the competencies:**

Critical and Creative thinking: as they investigate drugs and their types

Communication: how to carry out these health measures and gain skills in group work

Co-operation: working in groups

**Links to other subjects:**

Environment and sustainability: Environmental protection

Life Skills: drugs

**Introduction to the unit**

This unit enables learner to state the relationship between germs and sanitation, name common human parasites, how they are spread and their control measures.

The learners will also be able to develop a healthy lifestyle for themselves and families, state common health hazards and risks and how to avoid them as well as distinguish between legal and illegal drugs and their types. Also recognize and practice measures of curbing the spread of human parasites as well as will help learners make informed choices about their general well-being.

There are both words and pictures in the textbook, and as you learners are developing their skills, it is important to read the text with them. Encourage learners to ask questions to clarify their understanding and enable more learners to respond to these questions where appropriate.

It is helpful to have some key words on posters or boards around the learning

space if possible so that they get used to seeing them and familiar with spellings. Learners could develop this collection as they progress through the unit.

**Competencies to be developed****1. Critical and creative thinking**

This will be developed as learners investigate drugs and their types, common human parasites how they are spread and how they can be controlled.

**2. Communication**

This will be developed during group discussions and practical activities. This will help learners to improve on their language use as they discuss and present ideas on item tasks. Encourage learners to take part in discussions as well as answering of questions.

**3. Co operation**

This will be developed as learners work harmoniously in groups. Encourage learners to work independently as well

as co-operate with others and work in teams. Encourage them to be tolerant of others, to negotiate and respect other's rights and responsibilities as well as to contribute to environmental sustainability.

## Cross-cutting issues

### 1. Environmental awareness and sustainability

Environmental protection: This will be addressed as learners look at reasons for keeping our environment clean. Encourage learners to protect their environment by always ensuring proper sanitation.

### 2. Life skills:

This will be addressed as learners develop a healthy lifestyle for self and family, as they learn how to recognize health hazards and risks and how to avoid them and as they learn how to take responsibility to develop a health lifestyle.

## Meaning of new words

- **Germs** – diseases causing micro-organisms.
- **Sanitation** – this is the provision of clean drinking water and facilities and services for safe disposal of human urine and faeces.
- **Parasite** – This is a living organism that lives in or on the body of

another living organism and obtains food from it.

- **Healthy lifestyles** – These are daily habits that promote a healthy life.
- **Health hazards** – These are things both living and non-living which pose danger to life.
- **Health risks** – These are substances which increase the likelihood of developing a disease or injury.
- **Drug** – This is a substance which is either a chemical or has a chemical and which when taken alters the normal functioning of the body.
- **Illegal drugs** – These are the chemical substances which the government has prohibited their sell in the country.
- **Depressants** – These are drugs that lower or reduce arousal in various parts of the brain.
- **Stimulants** – These are drugs which activate the mind and body of the user.

**Hallucinations** – They make the user see images, hear sounds and feel sensations that seem real but do not exist

## **I.1 Germs and sanitation**

### **Activity 1.1**

*Refer to learner's book page 1*

Make sure that the necessary teaching aids are available. These include: photographs, pictures, video clips and wall charts showing common places where germs live such as public toilets, door handles, garbage pits, toothbrush holders, handshakes, covers of fruits and vegetables.

Introduce the lesson by reminding the learners of what they learners in primary four about care for the environment and rubbish.

Give learners time to look at the pictures A, B, C and D on learners book and also to answer the questions that follows.

Create time to take them through learning point to clarify further.

### **Assessment opportunities**

#### **Observation**

Observe as learners do the activity. Are they able to identify the pictures?

#### **Conversation**

Talk to learners as they discuss the questions. Do they have points in their discussions?

#### **Product**

Are they able to answer all the questions asked in the activity

### **Activity 1.2**

*Refer to learner's Book page 2*

This lesson is about learners comparing clean and dirty environment. Allow learners to have time and look at the pictures. Let them compare picture 1 against picture 2 in each row. Listen to their reasons as they give the comparison. Clarify further using learning point of learners book.

### **Assessment opportunities**

#### **Observation**

Observe as learners do the activity. Are they able to identify the pictures?

#### **Conversation**

Talk to learners as they discuss the questions. Do they have points in their discussions?

#### **Product**

Are they able to answer all the questions asked in the activity?

### **Activity 1.3**

*Refer to learner's book page 3*

This lesson is about learner's role playing. Ensure that the teaching aids are available. Introduce this topic by reminding learners on what they learnt in the previous lessons. Let learner's role playing activities A to F as indicated in learner's book. Watch keenly as they are role playing. Remind them making mistake is part of learning and they should not be afraid of making mistakes as they do the activities. Correct learners where necessary. Clarify further by using learning point of learner's book.

## **Assessment opportunities**

### **Observation**

Observe as learners do the activity. Are they able to role play?

### **Conversation**

Talk to learners as they discuss the questions. Do they have points in their discussions?

### **Product**

Are they able to answer all the questions asked in the activity?

## **Answers to check your progress 1.1**

*Refer to learner's book page 5*

1. Toilet, unwashed fruits, dirty hands, long nails, dustbin
2. Dirty
3. Cut
4. Clean or wash
5.
  - a) Keeps flies away
  - b) Keeps fruits clean
  - c) Ensure we do not swallow germs when we eat
  - d) Keeps away germs in our school compound
6. Award marks if learners are able to specify the germ associated with each activity.

## **1.2 Common human parasites**

### **Activity 1.4**

*Refer to learner book page 6*

This activity requires the learners to study the parasites as indicated in

learners book. Just before they start doing the activity, remind them of what parasite is. Give them time to identify the parasites and also answer the study questions that follow. Explain further to the learners by referring to the main points of learner's book.

## **Assessment opportunities**

### **Observation**

Observe as learners do the activity. Are they able to identify the parasites?

### **Conversation**

Talk to learners as they discuss the questions. Do they have points in their discussions?

### **Product**

Are they able to answer all the questions asked in the activity?

## **Activity 1.5**

*Refer to learner's book page 8*

Introduce this lesson by reminding learners on what they learnt in the previous lesson. Ask them to name some of the parasites that they know of. Give them time to study picture A and B of learner's book. Also to do the study questions that follows. You can also improvise charts with more pictures of human parasites. As they do the activity, pose some questions that will make learners understand better. Use learners book to clarify further.

## **Assessment opportunities**

### **Observation**

Observe as learners do the activity. Are they able to identify the parasites that cause effects in the pictures A and B?

### **Conversation**

Talk to learners as they discuss the questions. Do they have points in their discussions?

### **Product**

Are they able to answer all the questions asked in the activity?

### **Activity 1.6**

*Refer to learner's book page 9*

In this activity, you expect learner to identify internal parasites that causes various diseases. Introduce this lesson by reminding learners what internal parasites are. If possible, give common example and ask them to name the diseases that it causes.

Give learners time to study picture A and B and answer questions that follows. Clarify further by using learner's book to give the main points.

## **Assessment opportunities**

### **Observation**

Observe as learners do the activity.

Are they able to identify the parasites?

### **Conversation**

Talk to learners as they discuss the questions. Do they have points in their discussions?

### **Product**

Are they able to answer all the questions asked in the activity?

### **Activity 1.7**

*Refer to learner's book page 10*

This activity is about prevention and control of human parasites. Come up with improvised charts explain more about this. Also if possible invite a resource person to explain more to learners. This activity also requires the learner to visit a nearby health center, as a teacher you are required to get permission from the right authority and also do a pre visit before the actual day of study. During the study, let learners ask questions and make observations, which will enable them to right a report.

## **Assessment opportunities**

### **Observation**

Observe as learners do the activity. Are they able to ask relevant questions?

### **Conversation**

Give learners time to talk to the resources person and also ask question to the relevant person during the visit.

### **Product**

Are learners able to write a good report?

## **Answers to check your progress 1.2**

*Refer to learner's book page 12*

1. Are organisms that live in or on our bodies.

2. a) Parasites that live outside the body  
b) Parasites that live inside our bodies
3. External: tick, lice and fleas. Internal: roundworm, tapeworm, liver fluke
4. Swellings
5. Hygiene

### 1.3 Health hazards and risks

#### Activity 1.8

*Refer to learner's book page 12*

Ensure that the teaching aids are available. i.e. photographs, pictures, video clips and wall charts. Introduce the activity by defining health hazards and risks to the learners. Give them time to study picture A to C of learners book and also to attempt study questions. Clarify further by explaining main points of learner's book.

#### Assessment opportunities

##### Observation

Observe as learners do the activity. Are they able to identify the pictures?

##### Conversation

Talk to learners as they discuss the questions. Do they have points in their discussions?

##### Product

Are they able to answer all the questions asked in the activity?

#### Activity 1.9

*Refer to learner's book page 13*

In this activity, learners will learn how to avoid health hazards and risks. Give learners time to study pictures of learner's book and discuss what they are able to see. Clarify further by referring to learner's book.

#### Assessment opportunities

##### Observation

Observe as learners do the activity. Are they able to identify the pictures?

##### Conversation

Talk to learners as they discuss the questions. Do they have points in their discussions?

##### Product

Are they able to answer all the questions asked in the activity?

#### Answers to check your progress 1.3

*Refer to learner's book page 14*

1. a) Are things which possess danger to our lives. b) Are things that increase the likelihood of developing a disease or injury.
2. a) Germs, parasites, smoking  
b) Blood pressure, stroke, heart attack
4. a) Improves heart rate  
b) Helps relax the body  
c) Gives the body nutrients that it needs  
d) Removes germs from the body

## **I.4 Drugs and drug abuse**

### **Activity I.10**

*Refer to learner's book page 16*

In this activity, learners are expected to differentiate between drugs and medicine. Improvise charts with more pictures of drugs apart from the ones displayed in the learner's book. Introduce the topic by defining drugs to the learners. Give them time to look and identify drugs in learner's book and also in the improvised chart. Learners also to attempt study questions after the pictures in learner's book. Give detailed information related to this topic by referring to main points in learner's book.

#### **Assessment opportunities**

##### **Observation**

Observe as learners do the activity. Are they able to identify the pictures?

##### **Conversation**

Talk to learners as they discuss the questions. Do they have points in their discussions?

##### **Product**

Are they able to answer all the questions asked in the activity?

### **Activity I.11**

*Refer to learner's book page 17*

In this activity, learners are expected to know the type of drugs. Improvise charts

with more pictures of drugs apart from the ones displayed in the learner's book. Introduce the topic by reviewing what learners learnt in the previous lesson. Give them time to look and identify drugs in learner's book and also in the improvised chart. Learners also to attempt study questions after the pictures in learner's book. Give detailed information related to this topic by referring to main points in learner's book.

#### **Assessment opportunities**

##### **Observation**

Observe as learners do the activity. Are they able to identify the pictures?

##### **Conversation**

Talk to learners as they discuss the questions. Do they have points in their discussions?

##### **Product**

Are they able to answer all the questions asked in the activity?

### **Activity I.12**

*Refer to learner's book page 18*

Introduce this lesson by reminding learners what they learnt in the previous lesson about drugs. Let them look at the pictures and give reasons for the various behaviors. Ask learners to mention other behaviors associated with drugs abuse that are not shown in the pictures. Give further clarification by using main points in learner's book.



## Assessment opportunities

### Observation

Observe as learners do the activity. Are they able to identify the pictures?

### Conversation

Talk to learners as they discuss the questions. Do they have points in their discussions?

### Product

Are they able to answer all the questions asked in the activity?

## Answers to check your progress I.4

Refer to learner's book page 20

1. When the prescribed drugs is under dosed, overdosed or used for the purpose that it was not prescribed for.
2. Inappropriate use of drugs
3. a) Alcohol, medicinal drugs, tobacco  
b) Heroin, cocaine, bhang
4. Award marks based on the area they are coming from. Also check if the drug is really being abused.
5. Refer to learners book page 19

## I.5 Importance of living a healthy lifestyle

### Activity I.13

Refer to learner's book page 2

In this activity, learners are expected to role-play. Divide learners in pair and watch them as they role-play the conversation. Each and every learner despite the gender and the ability to participate during the activity.

## Assessment opportunities

### Observation

Observe as learners do the activity. Are they able to role play?

### Conversation

Talk to learners as they do the activity.

### Product

Are they able to answer all the questions asked in the activity?

## Answers to check your progress I.5

Refer to learner's book page 22

1. A healthy lifestyle is one which helps to keep and improve people's health and well-being.
2. Healthy eating, physical activities, weight management, and stress management.
3. Jumping, skipping, playing football, playing volley ball

## Understanding and using our eyes and ears

Refer to learner's book page 23 to 47

Learn about	Key inquiry questions
<p>Learners should investigate the external position and structure of their eyes and ears and those of other animals and work in pairs and groups to investigate binocular vision and how the principles might apply to hearing.</p> <p>Learners should draw on secondary sources to understand the internal structure of ears and eyes and discuss and investigate their functions.</p> <p>Learners should differentiate between transparent, translucent and opaque objects and design tests to investigate and explain the differences and classify objects.</p> <p>Learners should design tests to find out how sound travels, and how it might be enhanced and reduced.</p> <p>Learners should draw on a wide range of secondary sources such as reference books and the internet to secure their understanding.</p>	<ul style="list-style-type: none"> <li>• How can you differentiate the different functions of the eye and ear?</li> <li>• Why are the sense organs eye and ear important to our life?</li> <li>• How do we differentiate between objects that are transparent, translucent and opaque?</li> <li>• Why some objects around us are transparent, translucent and opaque?</li> <li>• How can we identify nature of sound?</li> <li>• How is the nature of sound related to its uses?</li> <li>• Why is the nature of sound and its uses important to our daily life?</li> </ul>

Learning outcomes		
Knowledge and understanding	Skills	Attitudes
<ul style="list-style-type: none"> <li>Understand the internal structures of sense organs (eye and ear) and their uses</li> <li>Differentiate between transparent, translucent and opaque objects</li> <li>Understand the nature of sound and its uses</li> </ul>	<ul style="list-style-type: none"> <li>Design fair tests</li> <li>Record and present results of their findings</li> <li>Observe carefully</li> <li>Sort out objects based on consistent characteristics</li> <li>Relate findings of tests to application</li> <li>Draw conclusions</li> </ul>	<ul style="list-style-type: none"> <li>Appreciate the importance of the sense organs</li> </ul>
<p><b>Contribution to the competencies:</b></p> <p>Critical thinking: how internal structures of eye and ear function</p> <p>Co-operation: group work</p>		
<p><b>Links to other subjects:</b></p> <p>Social Studies: sound for entertainment such as during dance</p> <p>Arts: the making of music</p> <p>Life skills: Physical development</p>		

## Introduction to the unit

This unit helps learners to identify objects, symbols and gestures using any of the two senses, understand the concept of image formation, reflection and identify the sound produced by different objects and learn how echoes are produced. Learners will compare different sense organs by stating function of each of them. Learners should be encouraged to use scientific vocabulary with increasing accuracy, building on useful scientific terms that they already know.

## Competencies to be developed

Learners are asked to work in pairs and groups, so there are continuous opportunities for co-operation and teamwork. This unit provides good opportunities to create roles in groups so that for example there is a writer, questioner, presenter and group leader.

In their discussions and presentations in groups or as a whole class, there are many opportunities for good communication. It is important in P4 that the teacher continues to model communication clearly, describing where appropriate features of good communication such

as clarity, active listening, correct use of grammar and pace.

Make learners to research on ways in which they can use the knowledge acquired from the unit in improving the living conditions of their communities. The greatness of a nation lays in the ability of its people to integrate skills and knowledge with national development and growth. Learners should know that knowledge and culture are mutually inclusive

## Cross-cutting issues

### 1. Peace and values of education

Throughout the unit, learners are actively involved in discussing issues as a group. Learners should be made aware of the need to accommodate everyone's idea and opinions. Through the discussions they will at times agree or disagree on issues at hand. They should be made to embrace the views of others and treat them as a learning process. Any form of intolerance should be highly condemned.

### 2. Life skills

A well-maintained atmosphere equals a fulfilling life. Learners should be sensitized on the need to conserve our environment. They should actively participate in activities such as peace day, tree planting day and also cleaning day. Learners should be made to understand the need to embrace one another regardless of their cultural background or nationality. Involve them in activities that foster coherence, respect, gender inclusivity and patriotism.

## Meaning of new words

- **Eye lid-** part of the eye that close to prevent the eye from drying.

- **Pupil-**part of the eye that allows light to enter into the eye
- **Lens-**part of the eye that allows to pass through
- **Retina-**part of the eye that are sensitive to the light
- **Cornea-**part of the eye that is transparent to allow light to pass through.
- **Optic nerve-** part of the eye that transports the impulse formed on the retina to the brain for interpretation.

## 2.1 Functions of the human eyes and the human ears

### Activity 2.1

*Refer to learner's book page 23*

In this activity, learners are expected to know the importance of eye. As a teacher, you are expected to make sure all the materials needed for this activity are available. To introduce this topic, you are required to review the topic of sense organs as learnt in lower classes. Divide learners into different groups by considering their ability. Each group to include both slow and first learners. Give them time to carry out the activity as you supervise. Learners to attempt study questions after the activity. Lead discussion with learners and emphasize on main points of learners book.

## **Assessment opportunities**

### **Observation**

Observe as learners do the activity. Are they able to do the activity as expected?

### **Conversation**

Talk to learners as they do the activity. Are they able to contribute during the discussion?

### **Product**

Are they able to answer all the questions asked in the activity?

## **Activity 2.2**

*Refer to learner's book page 24*

In this activity, learners are expected to know the importance of ears. As a teacher, you are expected to make sure all the materials needed for this activity are available. To introduce this topic, you are required to review the topic of sense organs as learnt in lower classes. Divide learners into different groups by considering their ability. Each group to include both slow and first learners. Give them time to carry out the activity as you supervise. Learners to attempt study questions after the activity. Lead discussion with learners and emphasize on main points of learners book.

## **Assessment opportunities**

### **Observation**

Observe as learners do the activity. Are they able to do the activity as expected?

### **Conversation**

Talk to learners as they do the activity. Are they able to contribute during the discussion?

### **Product**

Are they able to answer all the questions asked in the activity?

## **2.2 External structure of the human eye**

### **Activity 2.3**

*Refer to learner's book page 26*

Learners already know what the eye is and its importance. In this activity learners are expected to label parts of the external eye. As a teacher, you are expected to come up with improvised charts on external parts of the eye in case the real charts are not available. Learners to compare the parts they can see in learners book to that of improvised charts. Check if they compare them correctly. Learners also to name the parts of the eye they can see in their partner's eye.

## **Assessment opportunities**

### **Observation**

Observe as learners do the activity. Are they able to do the activity as expected?

### **Conversation**

Talk to learners as they do the activity.

Are they able to contribute during the discussion?

### **Product**

Check if learners are able to compare parts of the eye correctly.

## **2.3 Internal structure of human eye**

### **Activity 2.4**

*Refer to learner's book page 26*

Divide learners in various groups. The groups should be a mixture of slow learners and fast learners, also consider gender when grouping. Make sure that each group has a textbook. Give them time to identify the parts. Allow them to draw and label the parts on the textbooks using pencil; they should rub this as soon as they done. Using improvise chart and learning points of learners book, clarify further to the learners.

### **Assessment opportunities**

#### **Observation**

Observe as learners do the activity. Are they able to do the activity as expected?

#### **Conversation**

Talk to learners as they do the activity. Are they able to contribute during the discussion?

#### **Product**

Check if learners are able to label the parts of the eye correctly.

## **2.4 Comparison between human eye and that of other animals**

### **Activity 2.5**

*Refer to learner's book page 28*

Ensure that all the materials needed for this activity are available at the correct time. Learners to identify the animals in the picture and the location of the eye of learner's book. Alternatively, you can improvise charts of various animals and ask learners to identify the animals and eye location.

### **Assessment opportunities**

#### **Observation**

Observe as learners do the activity. Are they able to do the activity as expected?

#### **Conversation**

Talk to learners as they do the activity. Are they able to contribute during the discussion?

#### **Product**

Check if learners are able to compare the eye correctly.

### **Activity 2.6**

*Refer to learner's book page 29*

Introduce the lesson by reminding learners what they learnt in the previous topics in this unit. Divide learners into

groups and let them discuss the pictures of learner's book. Give them time to carry out the rest of the activity as you lead in discussion in each step. Clarify further by using learning points of learner's book.

### **Assessment opportunities**

#### **Observation**

Observe as learners do the activity. Are they able to do the activity as expected?

#### **Conversation**

Talk to learners as they do the activity. Are they able to contribute during the discussion?

#### **Product**

Are they able to answer the study questions correctly?

### **Answers to check your progress 2.1**

*Refer to learner's book page 30*

1. Seeing
2. Refer to learner's book page 27 for the drawing.
3. Eye brows
4. Refer to learner's book page 26
5. Refer to learner's book page 28

### **2.5 External structure of the human ear**

#### **Activity 2.7**

*Refer to learner's book page 31*

In this activity, learners are expected to know the external parts of the ear. As a teacher, you are expected to make sure all the materials needed for this activity are available. To introduce this topic, you are required to review the topic of sense organs as learnt in lower classes. Divide learners into different groups by considering their ability. Each group to include both slow and first learners. Give them time to carry out the activity as you supervise. Learners to attempt study questions after the activity. Lead discussion with learners and emphasize on main points of learners book.

### **Assessment opportunities**

#### **Observation**

Observe as learners do the activity. Are they able to do the activity as expected?

#### **Conversation**

Talk to learners as they do the activity. Are they able to contribute during the discussion?

#### **Product**

Are they able to answer all the questions asked in the activity?

### **2.6 Internal structure of the human ear**

#### **Activity 2.8**

*Refer to learner's book page 32*

Ensure that all the materials needed for this activity are available at the correct time. Learners to identify the animals in the picture and the location of the ears of learner's book. Alternatively, you can improvise charts of various animals and ask learners to identify the animals and ears location. Learners also to compare the size of the ear in each animal.

### **Assessment opportunities**

#### **Observation**

Observe as learners do the activity. Are they able to do the activity as expected?

#### **Conversation**

Talk to learners as they do the activity. Are they able to contribute during the discussion?

#### **Product**

Check if learners are able to compare the ears correctly.

## **2.7 Comparison between the human ear and that of other animals**

### **Activity 2.9**

*Refer to learner's book page 34*

Learners already know what the ear is and its importance. In this activity learners are expected to compare human ear to that of other animals. As a teacher, you are expected to come up with improvised charts showing ears of various animals. Give learners time to point out the differences and also similarities. Learners to compare the ears of human beings to that of the

other animal drawn in learner's book. Check if they compare them correctly.

### **Assessment opportunities**

#### **Observation**

Observe as learners do the activity. Are they able to do the activity as expected?

#### **Conversation**

Talk to learners as they do the activity. Are they able to contribute during the discussion?

#### **Product**

Check if learners are able to compare parts of the ear correctly.

## **Answers to check your progress 2.2**

*Refer to learner's book page 35*

1. A. Pinna, B. Inner ear, C. Middle ear, D. Ear canal
2. Trap dust
3. Refer to learner's book page 34 to 35
4. Semicircular canal
5. Refer to learner's book page 36

Animals raise their ears to capture sounds while human beings do not.

## **2.8 Transparent, translucent and opaque materials**

### **Activity 2.10**

*Refer to learner's book page 36*

Here the learners are going to learn something different from what they have been learning. Ensure that all the



materials are available at the correct time. To keep learners in a good track, introduce the lesson by defining transparent, translucent and opaque. Now give learners time to activity as you supervise. Ensure that each learner participates in doing the activity. Clarify further to the learners by using learning points of learner's book.

### **Assessment opportunities**

#### **Observation**

Observe as learners do the activity. Are they able to do the activity as expected?

#### **Conversation**

Talk to learners as they do the activity. Are they able to contribute during the discussion?

#### **Product**

Check if learners are able to differentiate between transparent, translucent and opaque.

### **Activity 2.11**

*Refer to learner's book page 38*

Learners already know about translucent material. Ensure all the materials required for this activity are available at the correct time. Give the learners time to carry out the activity as you supervise. Refer to learner's book to clarify further.

### **Assessment opportunities**

#### **Observation**

Observe as learners do the activity. Are they able to do the activity as expected?

#### **Conversation**

Talk to learners as they do the activity. Are they able to contribute during the discussion?

#### **Product**

Check if learners are able to do the activity.

## **Answers to check your progress 2.3**

*Refer to learner's book page 38*

1. Transparent materials let light pass through them in straight lines, so that you can see clearly through them. Translucent materials let some light through, but they scatter the light in all directions, so that you cannot see clearly through them. Opaque materials do not let any light pass through them.
2. Refer to learner's book page 37
3. All opaque material form shadow
4. North

## **2.9 Nature of sound and how sound travels**

### **Activity 2.12**

*Refer to learner's book page 39*

In this activity, learners are expected to draw the instruments and state their use. Ensure each learner has accessed to learners book. Remind them that to draw they need pencil, rubber and drawing book. Mistakes are part of learning; therefore learners should not fear making mistakes.

## **Assessment opportunities**

### **Observation**

Observe as learners do the activity. Are they able to do the activity as expected?

### **Conversation**

Talk to learners as they do the activity. Are they able to contribute during the discussion?

### **Product**

Check learners' drawings. Are they able to draw the instruments well?

## **Activity 2.13**

*Refer to learner's book page 40*

Ensure all the materials needed for this activity is available. Each learner to participate in doing the activity irrespective of gender and ability. Give learners time to carry out the activity as you supervise. Use learning points of learner's book to clarify further.

## **Assessment opportunities**

### **Observation**

Observe as learners do the activity. Are they able to do the activity as expected?

### **Conversation**

Talk to learners as they do the activity. Are they able to contribute during the discussion?

### **Product**

Check learners are able to make the telephone.

## **2.10 Pitch and volume of sound**

### **Activity 2.14**

*Refer to learner's book page 41*

Learners already know about sound, here they are required to differentiate between pitch and volume. Ensure that the guitar is provided to the learners at the correct time. In a situation where guitar is not available, improvise another alternative. Give learners time to do the activity as they follow the procedure. Lead in discussing pitches produce as they do the activity.

## **Assessment opportunities**

### **Observation**

Observe as learners do the activity. Are they able to do the activity as expected?

### **Conversation**

Talk to learners as they do the activity. Are they able to contribute during the discussion?

### **Product**

Check if learners are able to differentiate different pitches and volumes as they do the activity.

## **Activity 2.15**

*Refer to learner's book page 42*

Learners already know about sound, here they are required to differentiate between pitch and volume. Ensure that the guitar is provided to the learners at the correct time. In a situation where guitar is not available, improvise another

alternative. Give learners time to do the activity as they follow the procedure. Lead in discussing pitches produce as they do the activity.

### **Assessment opportunities**

#### **Observation**

Observe as learners do the activity. Are they able to do the activity as expected?

#### **Conversation**

Talk to learners as they do the activity. Are they able to contribute during the discussion?

#### **Product**

Check if learners are able to differentiate different pitches as they do the activity.

### **Activity 2.16**

*Refer to learner's book page 44*

Learners already know about sound, here they are required to differentiate between pitch and volume. Ensure that the guitar is provided to the learners at the correct time. In a situation where guitar is not available, improvise another alternative. Give learners time to do the activity as they follow the procedure. Lead in discussing pitches produce as they do the activity.

### **Assessment opportunities**

#### **Observation**

Observe as learners do the activity. Are they able to do the activity as expected?

#### **Conversation**

Talk to learners as they do the activity. Are they able to contribute during the discussion?

#### **Product**

Check if learners are able to differentiate different volumes as they do the activity.

### **Answers to check your progress 2.4**

*Refer to learner's book page 46*

1. Refer to learner's book page 40
2. Sound
3. a) the quality of a sound governed by the rate of vibrations producing it; the degree of highness or lowness of a tone. b) The intensity of a **sound**;
4. Jane
5. Length of wire, thickness of wire and tension of wire

*Refer to learner's book page 48 to 83*

Learn about	Key inquiry questions
<p>Learners should draw on their experiences at home and draw on a wide range of sources to describe the importance and uses of water, minerals and manure in agriculture.</p> <p>Learners should construct and use simple weather instruments to understand wind energy and how this might provide electricity. They should monitor sunlight and rainfall over several days using symbolic representation, understand how the rotation of earth creates day and night, and how the weather during the night is different from the day, and the implications.</p> <p>Learners should draw on a wide range of secondary sources such as reference books and the internet to secure their understanding.</p>	<ul style="list-style-type: none"> <li>• Why are water, minerals and manure important in agriculture?</li> <li>• How do you use water, minerals and manure in agriculture?</li> <li>• How does the lack of water, minerals and manure affect agriculture?</li> <li>• How do we construct simple weather instruments using local materials?</li> <li>• Why should we use weather instruments to measure weather conditions?</li> <li>• How is wind formed?</li> <li>• Why is wind important in our daily lives?</li> <li>• How do we utilize wind energy in our daily life?</li> <li>• How is night and day formed?</li> <li>• Why do some parts of the earth experience day-time, while other parts experience night at the same time?</li> </ul>

<b>Learning outcomes</b>		
<b>Knowledge and understanding</b>	<b>Skills</b>	<b>Attitudes</b>
<ul style="list-style-type: none"> <li>• Describe the importance and uses of water in agriculture</li> <li>• Explain the importance of minerals and manure in agriculture</li> <li>• Know how to construct and use simple weather instruments</li> <li>• Understand the concept and causes of wind and uses of wind energy</li> <li>• Understand rotation of earth, day and night</li> </ul>	<ul style="list-style-type: none"> <li>• Investigate the uses of water, minerals and manure in agriculture</li> <li>• Demonstrate uses of water, minerals and manure in agriculture</li> <li>• Record and present their findings</li> <li>• Construct simple weather instruments</li> <li>• Use simple instruments to investigate weather conditions</li> <li>• Investigate the causes and uses of wind in their lives</li> <li>• Apply wind energy in daily life</li> </ul>	<ul style="list-style-type: none"> <li>• Appreciate the uses of water, minerals and manure in agriculture</li> <li>• Co-operation and open mindedness as they discuss uses of water, minerals and manure in agriculture</li> <li>• Curiosity to know about uses of water, minerals and manure in agriculture</li> <li>• Curiosity on how the Earth rotates to cause day and night</li> <li>• Value the effect of rotation of the earth causing day and night</li> </ul>
<p><b>Contribution to the competencies:</b></p> <p>Critical and Creative thinking: investigation on how water, minerals and manure are important to agriculture</p> <p>Communication and Co-operation: group work</p>		
<p><b>Links to other subjects:</b></p> <p>Geography: rain water, transfer of minerals through erosion</p> <p>Environment and sustainability: resources and climate change</p>		

## Introduction to the Unit

This unit is about weather. Learners have background information about the environment. Link the environment with agricultural activities as affected by weather. This will help learners understand the relationship between components of environment like water, minerals and manure and agricultural activities. Lead learners to understand how to construct and use simple weather instruments to measure weather conditions. Guide learners to understand how the rotation of the earth creates day and night and how weather during the day is different from the night, and the implications.

Learners should understand that this unit is a career area since it can lead to several career paths such as geology, meteorology and environmentalists among others.

## Competencies to be developed

This unit gives many opportunities for critical and creative thinking. This comes majorly through interpretation of pictures, giving reasons for interpretation and explanation. Also through being able to group and classify simple machines based on their uses.

Learners are asked to work in pairs, groups and as a class, so there are continuous opportunities for co-operation and teamwork. This provides good opportunity to create roles in groups so that for example, there is a writer, questioner, presenter and group leader.

In their discussions and presentations in groups or as a whole class, there are many opportunities for communication.

## Cross cutting issues

### Peace education

Throughout the unit, learners should be encouraged and made aware of the need to accommodate everyone's ideas and options. Through the discussions, they will at times agree or disagree on issues at hand. They should be made to embrace the views of others and treat them as learning process. This way, peace and values of education will be promoted.

### Environment and sustainability

Learners should be given the opportunity to consider how sustainable development is the kind of development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Learners should consider this within the context of the local environment, reflecting upon the benefits of protecting the environment near to where they live.

## 3.1 Uses of water, mineral and manure in Agriculture

### Activity 3.1

*Refer to learner's book page 48*

Prepare necessary teaching aids. These include photographs, pictures, video clips and wall charts showing different crops (healthy crops) growing on wet areas. Introduce the lesson by discussing with the different crops grown in their farms. Discuss how the crops appear during wet season and dry season. Learners to look at the pictures in learners book and discuss in their groups what they see. Clarify further by referring to the main points of learner's book.

## **Assessment opportunities**

### **Observation**

Observe as learners do the activity. Are they able to do the activity as expected?

### **Conversation**

Talk to learners as they do the activity. Are they able to contribute during the discussion?

### **Product**

Check if learners are able to identify the pictures.

## **Activity 3.2**

*Refer to learner's book page 49*

This activity involves both field work and inside class activity. Ensure that you get permission from the right authority and also do a pre-visit to the area of study before actual day of study. All the materials required for the visit should be available at the right time. In the field encourage learners to ask as many questions as they can so that they can acquire all the information they need. Back in class, let learners read the passage in learners book and attempt the study questions that follow. Remind them that they can use the information that they acquire in the field to answer the study questions. Refer to learning points of learner's book to explain further.

## **Assessment opportunities**

### **Observation**

Observe as learners do the activity. Are they able to ask relevant questions?

## **Conversation**

Talk to learners as they do the activity. Are they able to contribute during the discussion?

### **Product**

Check if learners are able to answer study questions correctly?

## **Activity 3.3**

*Refer to learner's book page 51*

Introduce this lesson by reminding learners what they learnt in the previous lesson. Give them time to study the pictures of learner's book and answer the study questions. Clarify further by referring to learner's book.

## **Assessment opportunities**

### **Observation**

Observe as learners do the activity. Are they able to do the activity as expected?

### **Conversation**

Talk to learners as they do the activity. Are they able to contribute during the discussion?

### **Product**

Are learners able to identify the pictures?

## **Answers to check your progress 3.1**

*Refer to learner's book page 52*

1. Texture, structure, putting
2. Animals, yield
3. Calcium, yield
4. Refer to learners book page 53

### **Activity 3.4** Refer to learner's book page 53

This is a class activity. You will choose learners who will role-play Mr. Alai, Pupil, Judy, Bonny, Mary and Kim. Try to choose learners who can read well. You will role-play a teacher. After the activity, let learners attempt study questions. Refer to learner's book to clarify further.

#### **Assessment opportunities**

##### **Observation**

Observe as learners do the activity. Are they able to read and understand the conversation?

##### **Conversation**

Talk to learners as they do the activity. Are they able to contribute during the discussion?

##### **Product**

Check if learners understood the conversation by asking questions that are related to the conversation but not included in the study questions.

### **3.2 Effects of lack water, minerals and manure in Agriculture** **Activity 3.5, 3.6 and 3.7**

Refer to learner's book pages 57, 58 and 59

All these activities focus on effects of lack of water, minerals and manure in agriculture. Give learners time to study pictures in learner's book and answer the study questions. Divide learners in various groups and let them read the story in learner's book as you lead in

the discussion. Learners also to attempt study questions after the story as you correct them.

#### **Assessment opportunities**

##### **Observation**

Observe as learners do the activity. Are they able to read and understand the story?

##### **Conversation**

Talk to learners as they do the activity. Are they able to contribute during the discussion?

##### **Product**

Check if learners understood the story by asking questions that are related to the story but not included in the study questions.

### **Answers to check your progress 3.2**

Refer to learner's book page 60

1. Weak soil, infertility,
2. Drought
3. Cutting down of trees, soil erosion
4. It interferes with the health of the crops
5. Low produce, low income

### **3.3 Simple weather instruments**

**Activity 3.8, 3.9, 3.10, 3.11 and 3.12**  
Refer to learner's book page 61, 62, 63, 64 and 65

These are practical activities. You are expected to provide all the materials required for this activity at the



appropriate time. Encourage all learners to participate in the activity irrespective of gender. Give learners time to the activity as you supervise. Encourage them to ask questions for clarification. Remind them that they can practice doing these activities at their free time by improvising materials. Refer to learner's book to clarify further.

### **Assessment opportunities**

#### **Observation**

Observe as learners do the activity. Are they able to follow the given procedure?

#### **Conversation**

Talk to learners as they do the activity. Are they able to ask relevant question during discussions.

#### **Product**

Check if learners are able to construct the equipment as expected.

### **Answers to check your progress 3.3**

*Refer to learner's book page 66*

1. Cello tape, plastic bottle, a transparent container, small collecting bottle, Manila paper.
2. Refer to learners book page 63
3. To hold the polythene
4. C
5. Rubber band
6. Refer to learners book page 65

### **3.4 Using weather instruments to measure weather**

#### **Activity 3.13, 3.14, 3.15a and 3.15b**

*Refer to learner's book pages 67, 68, 69, 7 and 71*

All these activities require learners to use weather instruments to measure weather conditions. They should do these activities and present their final work to you.

### **Assessment opportunities**

#### **Observation**

Observe as learners do the activity. Are they able to follow the given procedure?

#### **Conversation**

Talk to learners as they do the activity. Are they able to ask relevant question during discussions.

#### **Product**

Check if learners are able to construct the equipment as expected and use them appropriately.

### **Answers to check your progress 3.4**

*Refer to learner's book page 72*

1. Millimeter
2. To reduce the rate of evaporation
3. Wind vane- direction of wind  
Rain gauge- amount of rainfall  
Thermometer-temperature  
Windsock- strength of wind
4. To show direction

5. The wind is going to
6. To be visible from a distance
7. Airport
8. °C
9. Temperature.
10. It is visible

### 3.5 Wind and wind

#### energy

#### Activity 3.17

*Refer to learner's book page 73*

Observe as learners study the pictures. Let learners do study questions after which you will in discussing the questions. Use learners book to clarify further.

#### Assessment opportunities

##### Observation

Observe as learners do the activity. Are they able to identify the pictures?

##### Conversation

Talk to learners as they do the activity. Are they able to ask relevant question during discussions.

##### Product

Check if learners are able to answer the study questions correctly.

#### Answer to Check your progress 3.5

*Refer to learner's book page 77*

1. It does not emit gas that pollutes the environment.
2. Wind, kite, strong, winnow

#### Activity 3.18

*Refer to learner's book page 78*

This is a practical activity, therefore all the materials needed for the activity to be provided at the appropriate time. You are expected to familiarize the learner with the materials provided for the activity. Since the materials required for the practical are dangerous, caution learners to handle them with care. Guide learner's step being step in doing the activity. (Lead in discussion). Alternatively, you can do the activity following the procedure as learners watch. (These maybe applicable if the materials are limited)

#### Assessment opportunities

##### Observation

Observe as learners do the activity. Are they able to follow the procedure?

##### Conversation

Talk to learners as they do the activity. Are they able to ask relevant question during discussions.

##### Product

Check if learners are able to construct a simple propeller.

#### Answers to check your progress 3.6

*Refer to learner's book page 79*

1. It does not emit gas that pollutes the environment.
2. Canoe
3. Windy

4. Chaffs
5. Cross, tick, tick, cross, tick
6. Windmill

### 3.5 Rotation of the earth

#### Activity 3.19

*Refer to learner's book page 80*

This activity requires the learner to study the pictures and answer the study questions that follows. Refer to the learning points of learner's book to clarify further.

#### Assessment opportunities

##### Observation

Observe as learners do the activity.  
Are they able to follow the procedure?

##### Conversation

Talk to learners as they do the activity.  
Are they able to ask relevant question during discussions.

##### Product

Are their points in discussion logical?

#### Activity 3.20

*Refer to learner's book page 81*

This is a practical activity, therefore all the materials needed for the activity to be provided at the appropriate time. You are expected to familiarize the learner with the materials provided for the

activity. Learners to do the practical by following the procedure of learner's book. Learners also to answer question of learner's book. Lead in further discussion by referring to learner's book.

#### Assessment opportunities

##### Observation

Observe as learners do the activity. Are they able to follow the procedure?

##### Conversation

Talk to learners as they do the activity. Are they able to ask relevant question during discussions.

##### Product

Are they able to do achieve the aim of the activity?

#### Answers to check your progress 3.7

*Refer to learner's book page 84*

1. Axis, 24
2. No, yes, no
3. Refer to learners book page 83

*Refer to learner's book page 84 to 105*

Learn about	Key inquiry questions
<p>This unit provides an opportunity to learners to talk about their experiences at home and about the previous lesson. Therefore, they should be encouraged to work in groups and produce group work and individual written work.</p> <p>Learners should describe the simple common tools found in school and the home, identify the positions of the fulcrum (pivot), effort and load and investigate how tools are simple machines by using claw hammer to remove a nail, push a load using a wheel barrow and carrying sand using a shovel.</p> <p>Learners should design fair tests in groups to investigate the behaviour of materials under different temperatures such as heating, cooling and freezing. They should use reference books, and internet to consolidate their understanding.</p>	<ul style="list-style-type: none"> <li>• How do we classify simple common tools?</li> <li>• Why should we use simple common tools in our daily life?</li> <li>• How do you differentiate first class, second class and third class simple common tools?</li> <li>• How do different temperatures affect materials?</li> <li>• Why do materials behave differently under different temperatures?</li> </ul>

<b>Learning outcomes</b>		
<b>Knowledge and understanding</b>	<b>Skills</b>	<b>Attitudes</b>
<ul style="list-style-type: none"> <li>• Describe simple common tools and their classifications as machines e.g. first, second and third classes</li> <li>• Describe and explain the behaviour of materials under different temperatures</li> </ul>	<ul style="list-style-type: none"> <li>• Classify simple common tools</li> <li>• Observe, record and present their findings</li> <li>• Investigate the behaviour of materials under different temperatures using fair tests</li> <li>• Draw conclusions from their evidence and consider how their tests might be improved</li> </ul>	<ul style="list-style-type: none"> <li>• Appreciate the use simple common tools in their lives</li> </ul>
<p><b>Contribution to the competencies:</b></p> <p>Critical and Creative thinking: how simple common tools are classified and their uses</p> <p>Co-operation and Communication: team work during investigation of behaviour of materials under different temperatures</p>		
<p><b>Links to other subjects:</b></p> <p>Geography: rising temperature of the earth (global warming)</p>		

## **Introduction to the unit**

The content in this unit is about types of simple tools, their classification and behavior of different materials under different temperatures. It may help to remind learners what they learnt in primary 4 on pulleys and inclined planes and various states of matter. Let them understand that these are merely simple

tools majority of which are examples of simple machines. It may also help to differentiate between these simple machines from complex or heavy machinery used in agriculture and in industry in general.

## **Competencies to be developed**

### **1. Co-operation**

During group discussions and pair works let learners engage one another by giving a chance for all to participate. Also, you can allow rotational presentations within the group members. Further, encourage learners to be tolerant to other learner's views and to understand that people should not necessarily be right always.

### **2. Communication**

Communication in English will be improved when learners freely participate in the discussions and presentations. Encourage all learners irrespective of their abilities to participate in the discussions, during presentations by asking questions and during question and answer sessions to either introduce or wrap up the lessons.

All learners should also be encouraged to write summary notes at the end of the lesson as this will help improve their writing skills.

### **3. Critical and creative thinking**

This competence will be developed by learners as they answer the probing questions such as those on page 1 at the beginning of this unit and as they discuss the results of the various practical activities. Guide learners to discover for themselves the various uses of tools and their categories.

This competence will also come about as learners think about their findings in

the activities and as they give out their suggestions on why this is the case. Further, encourage learners to come up with innovative ways and make simple tools for use at home. For example, they can use bearing and pieces of wood to make a homemade wheelbarrow, among others.

Encourage learners to do research on the various tools used by different communities in South Sudan. They should use the skills they have acquired to come up with such tools

## **Cross-cutting issues to be addressed**

### **1. Environmental awareness and sustainability**

Most of the simple machines and tools are made from trees; learners should be cautioned not to practice deforestation. Also the oils and other chemicals that come from machines when not disposed of well, cause pollution. By causing pollution our environment gets spoilt. This may bring problems. Caution the learners against disposing of these wastes anyhow. Also, make learners aware of the fact that destruction of the environment may cause greenhouse effect, which may lead to global warming.

### **2. Peace and values education**

Make learners aware that simple machines should not be used to hurt others. People should live in peace and harmony in order to develop. Inform them that they should be willing all the time to accommodate views of others. Make them aware that it is not possible

to always agree on everything so it is important to give and take in areas where disagreements may arise.

### **3. Life Skills**

When we make and use our local simple tools our work becomes easy and cheap. Encourage learners to develop a habit of making their own simple tools where possible. Also, let the learners understand that, well maintained tools last for long hence reduce costs of replacement. Also, let learners know that when they grow up, they can earn a living from making and fabricating simple tools.

You can further encourage learners to develop a culture of working together irrespective of gender and to involve all learners in various activities irrespective of their physical status.

## **4.1 Common simple tools and their classification**

### **Activities 4.1 and 4.2**

*Refer to learner's book pages 85 and 86*

You may introduce the lesson through a brainstorming session on what simple tools are and their uses. You can then take learners through activities 4.1. and 4.2. By now, learners have a rough idea of what simple tools are from the brainstorming session. Build on this and put learners in pairs. Let the learners carry out the activities in turns.

Guide them to discuss in groups how easy work becomes when someone uses a simple tools compared to using bare hands. Let them to discover the importance of a simple tool is based on

their discussions which is enables people to do work easily and with little effort'.

With your guidance let learners identify the simple tools they used in the activities above.

### **Assessment opportunities**

#### **Observation**

Observe as learners do the activity. Are they able to follow the procedure?

#### **Conversation**

Talk to learners as they do the activity. Are they able to ask relevant question during discussions.

#### **Product**

Are they able to do achieve the aim of the activity?

### **Activities 4.3 and 4.4**

*Refer to learner's book pages 87 and 89*

You may introduce this lesson by reminding learners what they learnt in the previous lesson. Ask them to name some simple tools that they know and their uses.

Guide learners to carry out this activity in groups. Give them sample of simple tools above to observe. Let them try using them. They should then discuss whether they used the tools in the same way. You may also take learners for a tour to a nearby workshop to see the various tools in use.

Build on their findings and introduce the six types of simple machines/ tools i.e. levers, wheel & axle, pulleys inclined planes, wedges and screws. Wrap up this lesson

by inviting one learner to summarise the lesson on behalf of the rest. Finally highlight key points as learners take summary notes

## **Assessment opportunities**

### **Observation**

Observe as learners do the activity. Are they able to identify the tools?

### **Conversation**

Talk to learners as they do the activity. Are they able to ask relevant question during discussions.

### **Product**

Check if learners are able to fill the table correctly.

### **Activity 4.5**

*Refer to learner's book page 92*

Prepare the lesson by organizing the objects you may need for the practical activities for example, crowbar, sea saw, shovel or spade, bottle opener etc.

Let learners play on a see saw as directed in this activity. Let them say why one person goes down and another up.

Guide them to assemble the crow bar and the stones as shown. Let them try using the crowbar to lift the big stone. At this point, you can bring out the concept of fulcrum, load and effort. Guide them to understand what each means and how they interrelate.

You can bring out the concept of levers then help them define what a lever is. You may as well give them research work

on finding out the meaning of the term lever. Wind up this content area by letting learners collect a variety of simple tools, use them and identify positions of load, effort and fulcrum. Let them group the various tools based on their findings.

## **Assessment opportunities**

### **Observation**

Observe as learners do the activity. Are they able to identify parts of the lever?

### **Conversation**

Talk to learners as they do the activity. Are they able to ask relevant question during discussions.

### **Product**

Check if learners are able to identify the parts of the lever.

### **Activity 4.6 and 4.7**

*Refer to learner's book pages 93 and 96*

This activity is a practical activity. As a teacher you should ensure that all materials required for this activity is available on time. Just before learners start doing the experiment, remind them that they are about to deal with dangerous tools, therefore, they should be cautious while dealing with the materials.

Guide learners to carry out this activity in pairs. Give them a hammer, a bottle opener and a shovel or spade. Let them try using them. They should then discuss the questions after the activities.

Give them time to draw a diagram indicating the positions of effort, fulcrum



and the load. Build on their diagrams and introduce the concept of the classes of lever i.e. first class, second class and third class levers based on the position of load, effort and fulcrum.

Narrow down to each class and demonstrate using the various tools. Let learners try using the tools as well.

You should then guide learners into discovering which class of lever the tools belong to. Let learners find out other examples of tools in that class.

Wrap up this lesson by bringing various simple tools to class and learners practicing using them and grouping them.

### **Assessment opportunities**

#### **Observation**

Observe as learners do the activity. Are they able to use the tools appropriately?

#### **Conversation**

Talk to learners as they do the activity. Are they able to ask relevant questions during discussions.

#### **Product**

Check if learners are able to use each tool for its purpose.

### **Answers to Check your progress 4.1**

*Refer to learner's book page 96*

1. Simple objects which we use to make work easier. They reduce force required to do the work, change direction of force and increase efficiency.

2. Spade, hoe, wheelbarrow, hammer, saw, crowbar, etc
3. To create an inclined plane of sorts. This helps to reduce amount of energy required to climb uphill.
4. Windlass helps to draw water from the well without using too much effort or energy.
5. A lever is a rigid bar which balances on a fixed point called a pivot (Fulcrum), the force applied to the lever is called the effort and applied is called the load.
6. X – Effort  
Y – Load  
Z – Fulcrum
7. (a) When the fulcrum is in between the load and the effort.  
(b) When the load is in between the fulcrum and the effort.  
(c) When the effort is in between the fulcrum and the load.
8. Inclined plane

## **4.2 Behavior of materials under different temperature**

### **Activity 4.8**

*Refer to learner's book page 98*

This lesson will involve individual research work and group activities. You will therefore organize the class as need arises during the lesson. **REMEMBER:** When grouping learners, you should consider the different abilities of learners and the special needs for various individuals. Each learner to study the

pictures of learners book and answer the study questions that follows. Clarify further to the learners by referring to main points of learners book.

## **Assessment opportunities**

### **Observation**

Observe as learners do the activity.

Are they able to do the activity?

### **Conversation**

Talk to learners as they do the activity.

Are they able to ask relevant question during discussions.

### **Product**

Are learners able to answer the study questions correctly?

## **Activity 4.9**

*Refer to learner's book page 98*

Collect or instruct learners to bring the various items to be used during the practical session i.e. balloons, stick, Eureka can, measuring cylinder, stone, bottle of water, among others listed in this practical activity.

You may begin the lesson by asking learners probing questions such as: Have you ever heard of the word

'Matter'? What does it mean?

Put learners in groups of four or any other number depending on the class size. Let learners do the activity as you supervise and also explaining to term the steps that they are not understanding. Let them make their observations and

record them in their notebooks. Guide the learners to discover the meaning of the word matter by discussing the results of above experiments and through research in the library or the internet. Emphasize the fact that matter is anything that occupies space and has volume. Prove the fact that this is the case by citing the results of the experiments in this activity.

## **Assessment opportunities**

### **Observation**

Observe as learners do the activity. Are they able to do the activity?

### **Conversation**

Talk to learners as they do the activity.

Are they able to ask relevant question during discussions.

### **Product**

Check on the table filled by learners.

## **Activity 4.10**

*Refer to learner's book page 100*

Put learners in pairs then let them carry out the activities listed in this practical activity. You can also use groups of varied numbers depending on the size of the class. Let them pour, compress and feel the various items as they make observations.

Let them record their findings in their notebooks. They can do it in a table format as shown in their books on page. Guide the learners to discover the differences between the various states of matter. They should try to group them

based on the characteristics that they have observed.

Let them do research on the characteristics of the various states of matter. They should then compare their findings to the characteristics that they earlier wrote down.

Guide them to make conclusions about the three states of matter i.e. solids, liquids and gases.

Emphasize the fact that the particles in the three states of matter are organized differently hence the observed characteristics. Show learners the pictures in Fig. 4.24 page of their books to help them differentiate between the three states. Wind up the lesson by highlighting the characteristics of the three states of matter as they write summary notes. Refer to pupil's book page 96.

### **Assessment opportunities**

#### **Observation**

Observe as learners do the activity. Are they able to do the activity?

#### **Conversation**

Talk to learners as they do the activity. Are they able to ask relevant question during discussions.

#### **Product**

Check on the table filled by learners.

### **Activity 4.11**

*Refer to learner's book page 102*

This lesson will involve an experiment

to investigate the physical changes in water and coming up with melting and boiling point of water. You will therefore organize the class to enable demonstration on the same. Collect or instruct learners to bring the various items to be used during the practical session which include: water, freezer, bucket of ice, clock, source of heat, tin with lid, transparent beaker, thermometer, test tubes, among others.

This can be a class demonstration or alternatively, if you have enough equipment, put learners in groups of manageable sizes to carry out the activity. Let them carry out the activities listed in this experiment.

They should heat some water and allow it to cool then observe the underside of the container on top with cold water in it or lid. Help learners to draw a conclusion about this.

In the same manner, allow learners to heat some ice then observe and record what happens. Guide them to interpret the observations.

Next, guide learners in finding out the melting point of ice and boiling point of water. Heat ice and water respectively with thermometer immersed in it. Let them record the temperature at which the ice melts and the water boils. Let learners to answer the study questions in this activity.

Summarize the lesson by guiding learners to discover the meaning of melting, evaporation, condensation and freezing. Stress the fact that melting point of ice is the same as freezing point

of water. Help them come up with a chart like the one shown in Fig.4.26 page 99 of their book.

Emphasize the fact that pure water boils at  $100^{\circ}\text{C}$  and pure ice melts at  $0^{\circ}\text{C}$  under standard conditions. Wrap up the topic by highlighting the main points as learners write summary notes

## Assessment opportunities

### Observation

Observe as learners do the activity. Are they able to do the activity?

### Conversation

Talk to learners as they do the activity. Are they able to ask relevant question during discussions.

### Product

Are they able to answer study questions correctly?

### Activity 4.12

*Refer to learner's book page 104*

This lesson will involve both individual research activity and a classroom demonstration on what happens when naphthalene is heated. You will therefore organize the class to enable demonstration and individual research. Collect the various items necessary for this practical activity that is, naphthalene solid, iodine, transparent tin with lid, bottle top and a source of heat. Put learners in various groups depending on class size then demonstrate what happens when naphthalene and iodine solids are heated and cooled. Let learners observe and record what happens.

You can then clarify the fact that some solids change directly to gaseous state when heated while when cooled, they also change directly to solid state. Iodine is an example. At this point, you can explain the difference between sublimation and deposition

Remind learners about activity 4.10 where they heated water and ice. Let them say what they observed. You can also carry out this activity here again. Ask them the processes involved. From the activity above, learners should list evaporation and melting and condensation and freezing as some of the processes involved.

Combine the content above and what has been learnt in this activity and summarise the various changes of state that occur in substances. Refer to Fig.4.30 in learner's book. Wrap up the topic by highlighting the main points as learners write summary notes.

## Answer to check your progress 4.2

*Refer to learner's book page 106*

1. Refer to learner's book page 103
2. Refer to learner's book page 105
3. Award marks if learners are able to state the characteristics and relating to use.
4. B
5. Ice, steam
6. The **melting point** and boiling point can be used to identify unknown substance and as an indication of its purity.