

**SCIENCE AND ELEMENTARY
TECHNOLOGY (SET)**

**PRIMARY FOUR
(P4)**

TEACHER'S GUIDE

Adapted Edition

Kigali, 2022

EXPERIMENTAL VERSION

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FOREWORD

Dear teacher,

Rwanda Basic Education Board is honoured to present to you the Primary Four Science and Elementary Technology Teacher's Guide which serves as a guide to competence-based teaching and learning to ensure consistency and coherence in the learning of Science and Elementary Technology subject. The Rwandan educational philosophy is to ensure that learners achieve full potential at every level of education which will prepare them to be well integrated in society and exploit employment opportunities.

In line with efforts to improve the quality of education, the government of Rwanda emphasizes the importance of aligning teaching and learning materials with the syllabus to facilitate their learning process. Many factors influence what they learn, how well they learn and the competences they acquire. Those factors include the relevance of the specific content, the quality of teacher's pedagogical approaches, the assessment strategies and the instructional materials available. We paid special attention to the activities that facilitate the learning process in which learners can develop ideas and make new discoveries during concrete activities carried out individually or with peers. With the help of the teacher, learners will gain appropriate skills and be able to apply what they have learnt in real life situations. Hence, they will be able to develop certain values and attitudes allowing them to make a difference not only to their own life but also to the nation.

This is in contrast to traditional learning theories which view learning mainly as a process of acquiring knowledge from the more knowledgeable person who is mostly the teacher. In competence-based curriculum, learning is considered as a process of active building and developing of knowledge and understanding, skills and values and attitude by the learners where concepts are mainly introduced by an activity or situation that helps the learners to construct knowledge, develop skills and acquire positive attitudes and values.

In addition, such active learning engages learners in doing things and thinking about the things they are doing and they are encouraged to bring their own real experiences and knowledge into the learning processes. In view of this, your role is to:

- Plan your lessons and prepare appropriate teaching and learning materials.
- Organize group discussions for learners considering the importance of social constructivism suggesting that learning occurs more effectively when the learners work collaboratively with more knowledgeable and experienced people.

- Engage learners through active learning methods such as inquiry methods, group discussions, research, investigative activities and group and individual work activities.
- Provide supervised opportunities for learners to develop different competences by giving tasks which enhance critical thinking, problem solving, research, creativity and innovation, communication and cooperation.
- Support and facilitate the learning process by valuing learners' contributions in the class activities.
- Guide learners towards the harmonization of their findings.
- Encourage individual, peer and group evaluation of the work done in the classroom and use appropriate competence-based assessment approaches and methods.

To facilitate you in your teaching activities, the content of this teacher's guide is self-explanatory so that you can easily use it. It is divided in 3 parts:

The part 1: Explains the structure of this Teacher's guide and gives you the methodological guidance;

The part 2: Gives the sample lesson plans as reference for your lesson planning process;

The part 3: Provides the teaching guidance for each concept given in the Pupil's book.

Even though this teacher's guide contains the answers to all activities given in the student's book, you are requested to work through each question and activity before judging learner's findings.

I wish to sincerely appreciate all people who contributed towards the development, translation and adaptation of this teacher's guide, particularly REB staff who organized the whole process from its inception. Special gratitude goes to translators, illustrators and designers who diligently worked to successful completion of this teacher's guide. Any comment or contribution would be welcome for the improvement of this teacher's guide for the next edition.

Dr. MBARUSHIMANA Nelson

Director General, REB

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Finally, my word of gratitude goes to the Rwanda Basic Education Board staff particularly those from the Curriculum, Teaching and Learning Resources Department (CTRLRD) who were involved in the whole process of writing of this translated teacher's guide.

Joan MURUNGI

Head of Curriculum, Teaching and Learning Resources Department/ REB

PART I: GENERAL INTRODUCTION

1.0. About the Teacher's guide

This book is a Teacher's guide for Primary Three Science and Elementary Technology subject. It is designed to accompany Pupil's book and intends to help teachers in the implementation of competence based curriculum specifically Science and Elementary Technology syllabus.

As the name says, it is a guide that teachers can refer to when preparing their lessons. Teachers may prefer to adopt the guidance provided but they are also expected to be more creative and consider their specific classes' contexts and prepare accordingly.

1.1. The structure of the guide

This section presents the overall structure, the unit and sub-heading structure to help teachers to understand the different sections of this guide and what they will find in each section.

Overall structure

The whole guide has three main parts as follows:

Part I: General Introduction

This part provides general guidance on how to develop the generic competences, how to integrate cross cutting issues, how to cater for students with special educational needs, active methods and techniques of teaching Science and Elementary Technology and guidance on assessment.

Part II: Sample lesson plan

This part provides a sample lesson plan, developed and designed to help the teacher develop their own lesson plans.

Part III: Unit development

This is the core part of the guide. Each unit is developed following the structure below:

Each unit is made of the following sections:

- **Unit title:** from the syllabus
- **Key unit competence:** from the syllabus
- **Prerequisites (knowledge, skills, attitudes and values)**

This section indicates knowledge, skills and attitudes required for the success of the unit. The competence-based approach calls for connections between units/topics within a subject

and interconnections between different subjects. The teacher will find an indication of those prerequisites and guidance on how to establish connections.

- Cross-cutting issues to be addressed

This section suggests cross cutting issues that can be integrated depending on the unit content. It provides guidance on how to come up with the integration of the issue. Note that the issue indicated is a suggestion; teachers are free to take or add another cross-cutting issue taking into consideration the learning environment.

- List of lessons

This section presents in a table the list of suggested lessons, lesson objectives copied or adapted from the syllabus and duration for each lesson.

- Teaching approach for each lesson

In this section, each lesson is developed by describing how it will be conducted in classroom. Note that it is a proposal which leaves the room to the teacher of adapting the lesson to the context of the class and school environment. Each lesson development shows the lesson objectives, teaching and learning materials, teaching and learning activities, conclusion of the lesson and assessment of the lesson.

- Additional information for the teacher

This part gives the teacher additional content and advanced knowledge on the unit to be taught. Remember that the teacher must have more knowledge and understanding beyond the content or topic in the syllabus and Pupil's book.

- Answers to End of unit assessment

This part provides answers or guidance to questions of the end of unit assessment in the Pupil's book and suggests additional questions and related answers to assess the key unit competence.

- Additional activities (remedial, consolidation and extended activities)

The purpose of these activities is to accommodate each learner (slow, average and gifted) based on end of unit assessment results.

Structure of each lesson

Each lesson is made of the following sections:

Lesson title 1:

- Lesson objectives

- Teaching and learning resources

This section suggests the teaching aids or other resources needed in line with the activities to achieve the learning objectives. Teachers are encouraged to replace the suggested teaching aids by the available ones in their respective schools and based on learning environment.

- Teaching and Learning activities

This section provides a short description of the methodology and any important aspect to consider. It provides also answers to learning activities with cross reference to Pupil's book.

- Assessment and Conclusion

This provides guidance on how to conduct assessment and support learners to make a conclusion or summary of what they learned.

Note: The guide ends with references.

1.2. Methodological guidance

1.2.1. Developing competences

Since 2015, Rwanda shifted from a knowledge based to a competence based curriculum for pre-primary, primary and general secondary education. For TTCs, it is in 2019 that the competence based curriculum was embraced. This called for changing the way of learning by shifting from teacher centered to a learner centered approach. Teachers are not only responsible for knowledge transfer but also for fostering pupil's learning achievement, and creating safe and supportive learning environment. It implies also that a learner has to demonstrate what he/she is able to do using the knowledge, skills, values and attitudes acquired in a given situation.

The competence-based curriculum employs an approach of teaching and learning based on discrete skills rather than dwelling on only knowledge or the cognitive domain of learning. It focuses on what learners can do rather than what they know. Learners develop basic competences through specific subject unit competences with specific learning objectives broken down into knowledge, skills and attitudes. These competences are developed through learning activities disseminated in learner-centered rather than the traditional instructive approach. The learner is evaluated against set standards to achieve before moving on.

In addition to specific subject competences, learners also develop generic competences which are transferable throughout a range of learning areas and situations in life.

Below are examples of how generic competences can be developed in Science and Elementary Technology:

Generic competence	Examples of activities that develop generic competences
Critical thinking	<p>These activities require learners to think critically about subject content. These may include:</p> <p>Work in groups in different ways e.g. taking turns, listening, taking decisions,</p> <p>Observe and analyse. Example: mark out areas in the school and get different groups to record living things like insects, people, animals, birds</p> <p>Discuss and give scientific reasons of phenomenon commonly known like sun shining, raining, changing colours for plants, e.t.c.</p> <p>Observe, record, interpret data recorded during experiments</p> <p>Identify and use the applications of Science and Elementary Technology concepts to solve problems of life and society</p>
Research and Problem solving	<p>Research using internet or books from the library</p> <p>Design a project for making toys and materials</p>
Innovation and creativity	<p>Create an experiment procedure to prove a point</p> <p>Making practice in different units</p> <ul style="list-style-type: none"> - Conduct experiments with objectives, methodology, observations, results, conclusions - Identify local problems and ways to resolve them
Cooperation, Personal and Interpersonal management and life skills	<p>Work in Pairs</p> <p>Small group work</p> <p>Large group work</p>

Communication	Telling a story related to the lesson of SET needed to be studied Presenting ideas verbally or in writing Reading a text related to SET
Lifelong learning	Take initiative to update knowledge and skills with minimum external support Cope with the evolution of knowledge and technology advances for personal fulfilment Seek out acquaintances more knowledgeable in areas that need personal improvement and development Exploit all opportunities available to improve knowledge and skills in SET.

1.2.2. Addressing cross cutting issues

Among the changes in the competence based curriculum is the integration of cross cutting issues as an integral part of the teaching/learning process as they relate to and must be considered within all subjects to be appropriately addressed. The eight cross cutting issues identified in the national curriculum framework are: genocide studies, environment and sustainability, gender, Comprehensive Sexuality Education (CSE), Peace and Values Education, Financial Education, standardization Culture and Inclusive Education.

Some cross cutting issues may seem specific to particular learning areas or subjects but the teacher needs to address all of them whenever an opportunity arises. In addition, student should always be given an opportunity during the learning process to address these cross cutting issues both within and out of the classroom so as to progressively develop related attitudes and values.

Below are examples on how crosscutting issues can be addressed in Science and Elementary Technology:

Cross-cutting issues	Examples on how to integrate the cross-cutting issues
Inclusive education	Involve all learners in all activities without any bias. Eg: Allow a learner with physical disability (using wheelchair) to take notes or lead the team during a task or an experiment.

Gender	<p>Involve both girls and boys in all activities: No activity is reserved only to girls or boys.</p> <p>Teacher should ensure equal participation of both girls and boys during activities as well as during cleaning activities after practical tasks.</p>
Peace and Values Education	<p>During group activities, the teacher will encourage learners to help each other. During all teaching and learning activities, texts and examples used by the teacher should reflect promotion of peace and values among them at school and with others in society.</p>
Standardizationculture	<p>- Some lessons involve carrying out practical tasks. Instructions should be clear for learners to always check if they are using appropriate materials.</p> <p>- Through making quality work/objects which are attractive to the community.</p>
Environment and sustainability	<p>In order to avoid the environment pollution, before, during or after practical tasks, learners should avoid throwing wastes anywhere; special places or appropriate containers should be used.</p> <p>During field visits, learners should be reminded of not damaging or destroying environment components or of not throwing wastes in environment.</p>
Financial Education	<p>When making toys and objects for example, learners are encouraged to use well the resources by using the quantities that are just required.</p> <p>Using materials, tools and materials in proper way for safeguarding their durability</p> <p>Making different objects that can be sold.</p>

1.2.3. Attention to special educational needs specific to teaching and learning SET subject

In the classroom, pupils learn in different way depending to their learning pace,needs or any other special problem they might have. However, the teacher has the responsibility to know how to adopt his/her methodologies and approaches in order to meet the learning needs of each pupil in the classroom. Also teacher must understand that learners with special needs need to be

taught differently or need some accommodations to enhance the learning environment. This will be done depending on the unit and the nature of the lesson.

In order to create a well-rounded learning atmosphere, teacher needs to:

- Remember that pupils learn in different ways so they have to offer a variety of activities (e.g. role-play, music and singing, word games and quizzes, and outdoor activities).
- Maintain an organized classroom and limits distraction. This will help learners with special needs to stay on track during lesson and follow instructions easily.
- Vary the pace of teaching to meet the needs of each learner. Some learners process information and learn more slowly than others.
- Break down instructions into smaller, manageable tasks. Learners with special needs often have difficulty understanding wordy or several instructions at once. It is better to use simple, concrete sentences in order to facilitate them understand what you are asking.
- Use clear consistent language to explain the meaning (and demonstrate or show pictures) if you introduce new words or concepts.
- Make full use of facial expressions, gestures and body language.
- Pair a learner who has a disability with a friend. Let them do things together and learn from each other. Make sure the friend is not over protective and does not do everything for the learner. Both learners will benefit from this strategy.
- Use multi-sensory strategies. As all pupils learn in different ways, it is important to make every lesson as multi-sensory as possible. Pupils with learning disabilities might have difficulty in one area, while they might excel in another. For example, use both visual and auditory cues.

Below are general strategies related to each main category of disabilities and how to deal with every situation that may arise in the classroom. However, the list is not exhaustive because each learner is unique with different needs and that should be handled differently.

Strategy to help learners with developmental impairment

The teacher should:

- Use simple words and sentences when giving instructions.
- Use real objects that the learner can feel and handle, rather than just working abstractly with pen and paper.
- Break a task down into small steps or learning objectives. The learner should start with an activity that s/he can do already before moving on to some thing that is more difficult.
- Gradually give the learner less help.
- Let the learner work in the same group with those without disability.

Strategy to help learners with visual impairment

The teacher should:

- Help learners to use their other senses (hearing, touch, smell and taste) to play and carry out activities that will promote their learning and development.
- Use simple, clear and consistent language.
- Use tactile objects to help explain a concept.
- If the learner has some sight problem, ask him/her what they can see. Get information from parents/caregivers on how the learner manages their remaining sight at home.
- Make sure the learner has a group of friends who are helpful and who allow them to be as independent as possible.
- Plan activities so that learners work in pairs or groups whenever possible.

Strategy to help learners with hearing impairment

The teacher should:

- Set strategies to help learners with hearing disabilities or communication difficulties
- Always get the learners' attention before you begin to speak.
- Encourage the learners to look at your face.
- Use gestures, body language and facial expressions.
- Use pictures and objects as much as possible.
- Ask the parents/caregivers to show you the signs they use at home for communication. Use the same signs and encourage other learners to also use them.
- Keep background noise to a minimum.

Strategies to help children with physical disabilities or mobility difficulties

The teacher should:

- Adapt activities so that learners who use wheelchairs or other mobility aids, or other learners who have difficulty moving, can participate.
- Ask parents/caregivers to assist with adapting furniture e.g. The height of a table may need to be changed to make it easier for a learner to reach it or fit their legs or wheelchair under.
- Encourage peer support. Friends can help friends.
- Get advice from parents or a health professional about assistive devices.

1.2.4. Guidance on assessment

Each unit in the Teacher's guide provides additional activities to help learners achieve the key unit competence. Results from assessment inform the teacher which learner needs remedial, consolidation or extension activities. These activities are designed to cater for the needs of all categories of learners; slow, average and gifted respectively.

Assessment is an integral part of teaching and learning process. The main purpose of assessment is for improvement. Assessment for learning/ Continuous/ formative assessment intends to improve learners' learning and Teacher's teaching whereas assessment of learning/summative assessment intends to improve the entire school's performance and education system in general.

Continuous/ formative assessment

It is an ongoing process that arises out of interaction during teaching and learning process. It includes lesson evaluation and end of sub unit assessment. This formative assessment plays a big role in teaching and learning process. The teacher should encourage individual, peer and group evaluation of the work done in the classroom and uses appropriate competence-based assessment approaches and methods.

In Primary Three, formative assessment principle is applied through application activities that are planned in each lesson to ensure that lesson objectives are achieved before moving on. At the end of each unit, the end of unit assessment is formative when it is done to give information on the progress of learners and from there decide what adjustments need to be done. Assessment standards are taken into consideration when setting tasks.

Summative assessment

The assessment done at the end of the term, end of year, is considered as summative. The teacher, school and parents are informed on the achievement of educational objectives and think of improvement strategies. There is also end of level/ cycle assessment in form of national examinations.

1.2.5. Pupils' learning styles and strategies to conduct teaching and learning process

There are different teaching styles and techniques that should be catered for. The selection of teaching method should be done with the greatest care and some of the factors to be considered are: the uniqueness of subjects, the type of lessons, the particular learning objectives to be achieved, the allocated time to achieve the objective, available instructional materials, the physical/sitting arrangement of the classroom, individual learner's needs, abilities and learning styles.

There are mainly four different learning styles as explained below:

a) Active and reflective learners

Active learners tend to retain and understand information best by doing something active with it, discussing or applying it or explaining it to others. Reflective learners prefer to think about it quietly first.

b) Sensing and intuitive learners

Sensing learners tend to like learning facts while intuitive learners often prefer discovering possibilities and relationships. Sensors often like solving problems by well-established methods and dislike complications and surprises; intuitive learners like innovation and dislike repetition.

c) Visual and verbal learners

Visual learners remember best what they see (pictures, diagrams, flow charts, time lines, films, demonstrations, etc.); verbal learners get more out of words (written and spoken explanations).

d) Sequential and global learners

Sequential learners tend to gain understanding in linear steps, with each step following logically from the previous one. Global learners tend to learn in large jumps, absorbing material almost randomly without seeing connections, and then suddenly “getting it.”

1.2.6. Teaching methods and techniques that promote the active learning

The different learning styles mentioned above can be catered for, if the teacher uses active learning whereby learners are really engaged in the learning process.

What is Active learning?

Active learning is a pedagogical approach that engages students in doing things and thinking about the things they are doing. In active learning, learners are encouraged to bring their own experience and knowledge into the learning process.

The role of the teacher in active learning

- The teacher engages learners through active learning methods such as inquiry methods, group discussions, research, investigative activities and group and individual work activities.
- He/she encourages individual, peer and group evaluation of the work done in the classroom and uses appropriate competence-based assessment approaches and methods.
- He provides supervised opportunities for learners to develop different competences by giving tasks which enhance critical thinking, problem solving, research, creativity and innovation, communication and cooperation.
- Teacher supports and facilitates the learning process by valuing learners' contributions in the class activities.

The role of learners in active learning

Learners are key in the active learning process. They are not empty vessels to fill but people with ideas, capacity and skills to build on for effective learning.

A learner engaged in active learning:

- Communicates and shares relevant information with other learners through presentations, discussions, group work and other learner- centred activities (role play, case studies, project work, research and investigation).
- Actively participates and takes responsibility for their own learning.
- Develops knowledge and skills in active ways.
- Carries out research/investigation by consulting print/online documents and resourceful people, and presents their findings.
- Ensures the effective contribution of each group member in assigned tasks through clear explanation and arguments, critical thinking, responsibility and confidence in public speaking.
- Draws conclusions based on the findings from the learning activities.

Some active techniques that can be used in Science and Elementary Technology

The teaching methods strongly emphasised in the competence Based Curriculum (CBC) are active methods. Below are some active techniques that apply in sciences:

A. Practical work/ experiments:

Many of the activities suggested in the Science and Elementary Technology curriculum as well as in the Pupil's book are practical work or experiments.

Practical work is vital in learning Science and Elementary Technology; this method gives the learner the opportunity to implement a series of activities and leads to the development of both cognitive and hands-on skills. The experiments and questions given should target the development of the following skills in learners: observation, recording and report writing, manipulation, measuring, planning and designing. Most of experiments or practical activities suggested in the syllabus of SET are developed in step by step guidance in a booklet called "SET Practical activities user guide" to be used while facilitating such practical activities.

A practical lesson/Experiment is done in three main stages:

- **Preparation of practical lesson/ experiment:** Checking materials to ensure they are available and in a good state; try the task before the lesson; think of safety rules and give clear instructions.
- **Performance of practical lesson/ experiment:** Sitting or standing arrangement of learners; introduction of the experiment: aims and objectives; setting up the materials; performing the experiment; write and record the data.

- **Discussion:** Observations and interpreting data; make generalisations and assignment: writing out the experiment report and further practice and research.

In some cases, demonstration by the teacher is recommended when for example the experiment requires the use of sophisticated materials or very expensive materials or when safety is a major factor like dangerous experiments and it needs specific skills to be learnt first.

In case your school does not have enough science kit materials, experiments can be done in groups but make sure every learner participates.

B. Project work

Science and Elementary Technology teachers are encouraged to sample and prepare project works and engage their learners in, as many as possible. Learners in groups or individually, are engaged in a self-directed work for an extended period of time to investigate and respond to a complex question, problem, or challenge. Projects are based on real-world problems that capture learners' interest. This technique develops higher order thinking as the learners acquire and apply new knowledge in a problem-solving context.

C. Field trip

One of the main aims of teaching Science and Elementary Technology in Rwanda is to apply its knowledge for development. To achieve this aim we need to show to learners the relationship between classroom science lessons and applied sciences. This helps them see the link between science principles and technological applications.

To be successful, the field visit should be well prepared and well exploited after the visit:

Before the visit, the teacher and learners:

- agree on aims and objectives
- gather relevant information prior to the visit
- brainstorm on key questions and share responsibilities
- discuss materials needed and other logistical and administrative issues
- discuss and agree on accepted behaviours during the visit
- Visit the area before the trip if possible to get familiar with the place

After the visit

When learners come back from trip, the teacher should plan for follow-up. The follow-up should allow learners to share experiences and relate them to the prior science knowledge.

Alternate Teaching Approach

The 5Es

This "5Es" is a constructivist approach based on the idea that learners learn best when they participate in activities that give them opportunities to work things out for themselves. As the name suggests, there are five phases: engage, explore, explain, elaborate and evaluate.

1. Engage

In this phase:

- Teachers engage learners in activities that capture their interests and stimulate curiosity,
- Learners raise questions,
- Teachers verify learners' prior understandings of the topic,
- Learners compare ideas.

2. Explore

In this phase learners undertake hands-on activities where they:

- Experience the phenomenon or concept,
- Explore the questions they have raised, test their ideas and solve problems.

3. Explain

Only after learners have had opportunities to explore, they have opportunities to:

- Compare their ideas with scientific explanations,
- Use scientific terminology,
- Construct explanations that can be justified using information collected.

4. Elaborate

In this phase learners have opportunities to:

- Apply what they have learnt to new contexts,
- Develop a deeper understanding of the problem or phenomenon as they discuss and compare ideas.

5. Evaluate

In this phase learners and the teacher:

- Look for evidence of changes in learners' ideas, beliefs and skills,
- Evaluate what learners know and can do.

Example of the 5Es teaching and learning approach

Phase of teaching and learning approach	Examples of teaching and learning activities	Sample Questions
<p>1. Engage Create interest Reveal personal ideas and beliefs</p>	<p>Brainstorming, concept mapping, developing questions, demonstrations, asking open-ended questions.</p>	<p>What do you mean by . . . ? Tell me more about . . . ? I find that hard to understand: tell me . . . ? What makes you think . . . ? How do you know . . . ? How did you find out about that idea?</p>
<p>2. Explore Explore questions and test learner's ideas</p>	<p>Prioritise class questions, group tasks, investigations, test ideas, research.</p>	<p>How are you going to . . . ? How will you be able to tell . . . ? Is that the question you really want to ask . . . ? What will you do when . . . ? It might be a good idea to think about . . . ? How will you know it . . . ? What do you need to find out more about . . . ? Why are you doing it that way . . . ? How will you be sure it is a fair test . . . ? How did you arrive at that idea . . . ?</p>
<p>3. Explain Compare ideas Construct explanations and justify them in terms of observations and data</p>	<p>Reporting, group discussion, gathering information.</p>	<p>What do you think others might think about this . . . ? How is that idea different to . . . ? Some people say . . . Does that fit with your idea . . . ? How did you arrive at that idea . . . ? How will you be able to tell . . . ?</p>
<p>4. Elaborate Apply concepts and explanations in new contexts</p>	<p>Further practical work, videos, debates, research.</p>	<p>Same as the <i>explore</i> phase. How could you verify that . . . ? What will happen if . . . ?</p>

<p>5. Evaluate Gather evidence of changes in learners' ideas, beliefs and skills</p>	<p>Refining concept maps, responding to open-ended questions, reflection.</p>	<p>How have your ideas changed . . . ? How is that different to . . . ? It seems you are not sure about . . . Do you have any questions about . . . ? What have you found out? What else do we need to know . . . ? What else might you do to be really sure of that. . . ?</p>
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Main steps for a lesson in active learning approach

All the principles and characteristics of the active learning process highlighted above are reflected in steps of a lesson as displayed below. Generally, the lesson is divided into three main parts whereby each one is divided into smaller steps to make sure that learners are involved in the learning process. Below are those main parts and their small steps:

1) Introduction

Introduction is a part where the teacher makes connection between the current and previous lesson through appropriate technique. The teacher opens short discussions to encourage learners to think about the previous learning experience and connect it with the current instructional objective. The teacher reviews the prior knowledge, skills and attitudes which have a link with the new concepts to create good foundation and logical sequencing.

2) Development of the new lesson

The development of a lesson that introduces a new concept will go through the following small steps: discovery activities, presentation of learners' findings, exploitation, synthesis/summary and exercises/application activities, explained below:

❖ Discovery activity

Step 1

- The teacher discusses convincingly with learners to take responsibility of their learning
- He/she distributes the task/activity and gives instructions related to the task (working in groups, pairs, or individual to instigate collaborative learning, to discover what is to be learnt.)

Step 2

- The teacher allows the learners to work collaboratively on the task.
- During this period the teacher refrains to intervene directly on the task.
- He/she then monitors how the learners are progressing towards the task to be done and boost those who are still behind (but without communicating to them)

❖ Presentation of learners' findings

- In this section, the teacher invites representatives of groups to present the learners' productions/findings.

- After three/four or an acceptable number of presentations, the teacher decides to engage the class into discussion about the learners' findings. .
- **Discussion on the learners' findings.** The teacher asks the learners to evaluate the findings citing the ones that are correct, incomplete or false.
- Then the teacher judges the logic of the learners' findings, corrects those which are false, completes those which are incomplete, and confirms those which are correct.

❖ **Institutionalization (summary/conclusion/ and examples)**

The teacher summarises the learnt content and gives examples which illustrate the learnt content.

❖ **Exercises/Application activities**

- Exercises of applying processes and products/objects related to covered unit/sub-unit
- Exercises in real life contexts
- Teacher guides learners to make the connection of what they learnt to real life situations. At this level, the role of teacher is to monitor the fixation of process and product/object being learnt.

3) Assessment

In this step the teacher asks some questions to assess achievement of instructional objective. During assessment activity, learners work individually on the task/activity. The teacher avoids intervening directly. In fact, results from this assessment inform the teacher on next steps for the whole class and individuals. In some cases, the teacher can end with a homework assignment.

PART II. SAMPLE LESSON PLAN

School Name:

Teacher's Name:

Term	Date	Subject	Class	Unit No.	Lesson No.	Duration	Class Size
I	12/09/2022	Science and Elementary Technology (SET)	P4	1	1 of 12	80 minutes	36
Type of Special Educational Needs to be catered for in this lesson and number of learners in each category				<p>Hearing Impairment (3): Let the learners sit in front of the teacher so that they can hear the lesson clearly.</p> <p>Visual Impairment (1): Let the learner sit in a way that he/she can see the teacher pointing to illustrations and his/her facial expressions and gestures. Arrange for a Braille book if the learner is completely blind.</p>			
Unit Title	Agricultural Tools						
Key Unit Competence	To be able to use and maintain agricultural tools safely.						
Title of the Lesson	The common Agricultural tools						
Instructional Objective	Having many different tools, learners will be able to identify common agricultural tools correctly.						
Plan for this Class (location: In/Outside)	Outside the classroom						
Learning Materials (for all learners)	Pens and Pupil's book. Agricultural tools Braille pupil's books if there are blind pupils in the class. <i>NB: Teacher will remind the learners with hearing impairment to wear their hearing aids.</i>						
References	Rwanda National Curriculum, Primary 4 Science and Elementary Technology (SET) Pupil's book, Primary 4 SET Teacher's Guide, Primary 4 Internet and library materials English dictionary						

(Contd...)

Timing for Each Step	Description of Teaching and Learning Activity		Generic Competences and Cross-cutting Issues to be Addressed + A Short Explanation
	Teacher leads class to the farm, students observe and identify common agricultural tools		
	Teacher's Activities	Learner's Activities	
Introduction 10 minutes	<p>Ask questions which guide to discover career related to sources of food and its relevant materials</p> <p>Possible questions:</p> <ol style="list-style-type: none"> 1. <i>What is the career of most of Rwandese people?</i> 2. <i>Which materials are used in the agricultural career by Rwandese people?</i> <p>Announce the new lesson title, i.e., Common agricultural tools</p>	<p>Answers to the questions.</p> <p>Possible answers:</p> <ol style="list-style-type: none"> 1. <i>Most of Rwandese people are farmers.</i> 2. <i>Hoe, machete, slasher, axe, spade, wheelbarrow, spraying pump, milking can,</i> 	<p>(a) Competences</p> <p>Critical thinking: Learner will think about different careers and establish comparison regarding to the number of people in each career to find out the career in which most Rwandan people are involved in.</p>
Development of the Lesson 60 minutes	<p>Lead learners to the nearest farm.</p> <p>Split class into groups of six.</p> <p>Ask questions related to the ongoing farm activities.</p> <p>Possible questions:</p> <ol style="list-style-type: none"> 1. <i>What tools are farmers using it</i> 2. <i>Identify their specific tools</i> 	<p>Observe the ongoing farm activities.</p> <p>Answer the questions and present their findings</p> <p>Possible answers:</p> <ol style="list-style-type: none"> 1. <i>Farmers are preparing land.</i> 2. <i>Hoe, machete, rake, wheel barrow, spade, axe, slasher,</i> 	<p>Critical thinking In the environment, learners observe and compare the different ongoing activities.</p> <p>Communication: The working group of classmates provides an open environment to group members which facilitate communication.</p>

(Contd...)

	<p>3. Name the material that is being used by each working group.</p> <p>4. Ask them to discuss in their groups on how to use and maintain a hoe or a machete.</p>	<p>3. The first group is using machetes to cut grasses and bushes, and the second is using hoes to dig land.</p> <p>4. Discussion on how to use hoe/ machete and presentation of findings</p> <p>Possible use:</p>  <p>Hoe is used with two hands but machete is used with</p>  <p>one arm/ hand.</p> <p>5. Under supervision of teacher and farmer, prepare land using machete and hoe. Then maintain and store the tools.</p>	<p>b. Cross-cutting Issues:</p> <p>Peace and values:</p> <p>When using digging and clearing agricultural tools, attention is needed in order to prevent accidents to each other.</p>
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(Contd...)

<p>Conclusion and Lesson Assessment 10 minutes</p>	<p>Summary Ask the learners what they have learned in today's lesson and also what they have learned from each other.</p> <p>Assessment Ask questions to review common agricultural tools.</p> <p>Possible questions: 1. <i>Which Rwandan common agricultural tools are used ?</i></p>	<p>Learners summarise what they have learned in today's class. Some learners also present what they learnt from their fellow learners during the lesson.</p> <p>Answers to the questions.</p> <p>Possible answers: 1. a. <i>Digging: hoe</i> b. <i>Clearing: machete and slasher.</i></p>	
<p>Teacher's Self-evaluation</p>	<p>Were all the learners able to select, use safely and maintain correctly the clearing and digging tools?</p> <p>Were all the SEN learners able to select, use safely and maintain correctly the clearing and digging tools?</p> <p>Any changes needed in teaching approach?</p>		

PART III. UNITS DEVELOPMENT

UNIT 1: AGRICULTURAL TOOLS

1.1. Key unit competence

To use and maintain agricultural tools safely

1.2. Prerequisite

Learners will learn this unit better if you ask them which materials are used in the agricultural career by Rwandese people

1.3. Introductory activity and guidance

A) Introductory activity

People do different types of jobs for their living. Simple jobs can be done using hands. But some jobs are not easy to do with hands alone.

- (1) What can we do to make such jobs easier?
- (2) Name any three tools man use to make the work easier
- (3) Do you think tools are very important? If yes suggest any three reasons.
- (4) Can you predict what we are going to study

B) Guidance on the introductory activity

- Start by reading the scenario in the introductory activity to the learners.
- Ask them first question and allow them to think and suggest the answers
Continue to ask all questions and other possible probing questions to learners until they discover and predict what they are going to study

C) Answers for introductory activity

- (1) We use tools
- (2) Hoe, machete, spade, rake, knife,
- (3) They make had work easier and simple.
- (4) Agricultural tools

1.4. List of lessons

#	Lesson title	Learning objectives	Number of periods:12
1	The common Agriculture tools	-Identify the commonly used agricultural tools -Draw and name some common agricultural tools	2

2	Uses of agriculture tools	-Explain the use of agricultural tools -Group agricultural tools based on their uses - careful while using agricultural tools	2
3	Maintenance of agricultural tools	-Explain the maintenance of agricultural tools -Apply techniques of maintaining agricultural tools.	2
4	Storage of agriculture tools	-Display awareness about the proper and safe -use of agricultural tools -Apply techniques of storing agricultural tools	1
5	Dangers of the misuse of agricultural tools	-Explain the dangers of misuse of agricultural tools -- Discuss the possible ways to avoid dangers of misuse of agricultural tools	2
6	Precaution when using agricultural tools	-Explain precautions taken when using agricultural tools - Show concern about prevention against potential dangers of agricultural tools 'misuse	2
7	Assessment of unit one	Demonstrate the achievement of the key unit competence	1

1.4.1. Common agricultural tools

(a) Learning objectives

- Identify the commonly used agricultural tools
- Draw and name some common agricultural tools

(b) Teaching resources

-Recordings

-Text books

-Real agricultural tools

-Images of different agricultural tools.

-Video showing use of agricultural tools and other agricultural practices

(c) **Learning activities**

Step1..Lead the class to the nearest agricultural farm.

Step2. Split the learners into small groups and ask them to observe and compare the different ongoing farm activities.

Step3..Ask the learners to observe various tools available in the farm.

(d) **Lesson assessment and conclusion**

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

Answers for learning activity 1.1 on page 1 in students book

1. Agricultural tools
2. A farmer uses these tools for digging, transporting, spraying, cutting and transplanting.
3. (i) an axe (ii) spraying pump (iii) a hoe (iv) wheel barrow (v) milking can
(vi) File (vii) watering can (viii) machete (ix) rake (x) trowel
(xi) Spade (xii) pickaxe

1.4.2. **Uses of agriculture tools**

(a) **Learning objectives**

- Explain the use of agricultural tools
- Group agricultural tools based on their uses
- be careful while using agricultural tools

(b) **Teaching resources**

- Real tools
- Text books
- Images of different tools in use
- Videos showing different tools in use

(c) **Learning activities**

Step 1: Ask learners to bring different agricultural tools or

Step 2: Lead learners to nearby farm or school gardens to role play about the use of agricultural tools

Step 3: Group the tools according to their uses for learners to demonstrate and practice on how to use different agricultural tools.

(d) **Lesson assessment and conclusion**

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Answers to the activity 2 page 2 in students book

- (1) Rake , machete, watering can, wheel barrow , spraying pump, an axe

- (2) Clearing tools: machete, slasher,
- Digging tools: hoe, pickaxe
- Watering tools: watering can, watering wheel,
- Transporting tools: wheel barrow,
- Transplanting tools: trowel, spade,
- Sharpening tools: File,
- Spraying tools: Spraying pump
- Cleaning tools: Rake
- Cutting tools: an axe, sickle
- Milking tools: milking can

1.4.3 :Maintenance of agricultural tools

(a) Lesson objectives

- Explain the maintenance of agricultural tools
- Apply techniques of maintaining agricultural tools

(b) Teaching resources

- Real agricultural tools
- oil, water, file, paint, grease,
- videos showing how some agricultural tools are maintained

(c) Learning activities

Step1-Ask learners to bring or collect different agricultural tools to role play on maintenance

Step2-Guide learners on how to oil moving parts, washing some tools, sharpen cutting tools, replacing the worn out parts of some tools.

Step3-Allow them to discuss what can happen to a tool if not maintained properly

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Guideline on the activity1. 3 in students book on page 7

-Group the learners into small groups to discuss what can happen if tools are poorly maintained

Possible responses

- Tools cannot stay for long.
- Tools can be weak
- Tools can be damaged
- Money can be wasted to buy more tools
- Tools can rust and become weak

1.4.4. Storage of agriculture tools

(a) Lesson objectives

- Display awareness about the proper and safe -use of agricultural tools
- Apply techniques of storing agricultural tools

(b) Teaching resources

- Agricultural tools,
- Text book

(c) **Learning activities**

Step1-Take the learners to a tool store and allow them to properly arrange the tools in the room

Step1-make them aware that tools which are mostly used are kept near the door way.

Step3-Allow them discuss what can happen if tools are poorly stored.

Step4-Take learners to farms to observe the techniques in storage of tools

Step5-After the visit put them in small groups to discuss and present different techniques used in storage of agricultural tools

(d) **Lesson assessment and conclusion**

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Guideline on the activity1. 3 in students book on page 8.

Group the learners into small groups to discuss what can happen if tools are poorly stored

Possible responses

- Tools can be stolen.
- Tools can be lost.
- Money can be wasted to buy new tools.

1.4.5: Dangers of the misuse of agricultural tools

(a) **Lesson objectives**

- Explain the dangers of misuse of agricultural tools
- Discuss the possible ways to avoid dangers of misuse of agricultural tools.

(b) **Teaching resources**

- Text books
- images showing dangers of misuse of agricultural tools
- videos showing dangers of misuse of agricultural tools.

(c) **Learning activities**

Step1-provide images showing dangers of misuse of agricultural tools

Step2-allow learners to discuss and make presentation about dangers of misuse of agricultural tools.

(d) **Lesson assessment and conclusion**

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Possible answers for dangers of misuse of agricultural tools.

- sharp tools can cut us.
- tools can cause bruises to our body parts.
- tools can cause injuries.
- Worn-out tools can cause accidents

1.4.6. Precaution when using agricultural tools

(a)**Lesson objectives.**

- Explain precautions taken when using agricultural tools
- Show concern about prevention against potential dangers of agricultural tools 'misuse

(b) Teaching and learning resources

- textbooks
- images showing the precaution taken when using agricultural tools

(c) Learning activities

Step1- Take learners to a nearby farm to observe how farm tools are handled

Step2-Put learners in groups to discuss and present the precautions taken when handling agricultural tools.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Possible answers for activity 1.6 on page 8 student's book

Question 3:

- 1.Debris should be removed so that the fields become safer places to work.
2. Worn out tools in poor condition can lead to accidents. Therefore, these must not be used.
3. If we get cut with any tools, first aid should be applied properly.
4. Agrochemicals are poisonous. These should be used by wearing gloves and mask.
5. Agrochemicals must not be checked by inhaling.
6. Hand gloves, boots and a mask should be worn while sprinkling pesticides.
7. After working with pesticides, wash your hands with soap properly.

1.5.Additional information for the teacher.

The following are some additional learner-centered activities which the teacher can use to help develop learners' competences

Activity A-2

or to assess the competence level achieved by the learners. More examples of agricultural tools and equipment's are: cultivator, shovel, garden fork, mattock, seed drill, tractor, pruners,

Activity A-1

There is plate of tools. Ask the learners to identify the agricultural tools and label them.

The teacher can divide class into groups of ten learners each. Then, he/she will distribute each group a set of flashcards on agricultural tools. Let them observe and identify each tool. Now, he/she will ask them to write their names in their notebooks.



1.6. End unit assessment

(A) Guidance on End unit assessment.

- The end unit assessment is called “Revision activity “in the student book, Page 11 to 12
- Request learners to answer all questions of the unit “review exercises” during the time reserved to lesson of end unit assessment. If all questions cannot be completed in that time, request them to answer them during their self-study time or as homework.
- Mark their answers and keep records of every student’s achievements.

Provide the remedial, consolidation and extended activities.

B .Answers to the end unit assessment/ unit review activities.

I. Fill in the blanks with the correct options:

1. (a) 2. (a) 3. (b) 4. (b) 5. (c)

II. State whether the following statements are true or false:

1. True 2. True 3. True 4. False 5. True

III. Match the following:

1. (c) 2. (d) 3. (e) 4. (b) 5. (a)

IV. Answer the following questions briefly:

1. The tools we use in farming are called agricultural tools.
2. Some common agricultural tools are hoe, spade, rake, axe, wheelbarrow, watering can and trowel.

3. (a) Uses of hoe

- | | |
|----------------------|--|
| (i) Digging the soil | (ii) Removing weeds |
| (iii) Making drains | (iv) Harvesting crops like maize, Sugarcane, cassava and yam |

(b) Uses of rake

- (i) Collecting fallen leaves, hay and grass
- (ii) Levelling the soil
- (iii) Making seedbeds

(c) Uses of spraying pump

- (i) Spraying liquid fertilisers
- (ii) Spraying pesticides, herbicides and weedicides

D . Uses of trowel

- (iii) Transplanting of seedlings
- (iv) Digging holes for planting seeds
- (v) Application of fertilisers and manure to the soil.

E .Uses of machete

- (vi) Clearing of bushes
- (vii) Harvesting crops like maize and sugarcane

4. The following are some useful methods to maintain agricultural tools in good condition:
- (a) Tools must be cleaned properly after use.
 - (b) After cleaning, tools must be stored in a safe, dry and termite-free place.
 - (c) Digging and cutting tools should be kept sharp.
 - (d) Plastic sprayers must be kept away from fire. Pipes and nozzles must be cleaned regularly to prevent blockages.
 - (e) Damaged tools must be repaired properly. Their parts must be replaced, if they are not in working condition.
 - (f) Metallic tools such as watering cans and wheelbarrows must be painted regularly to avoid rusting.
 - (g) On transporting tools and their parts, oiling and greasing must be done regularly.
 - (h) Tools must be handled with care.
 - (i) Tools must be used for the purpose they are designed.
 - (j) Records of the movement of tools must be kept.
5. Misuse of agricultural tools could lead to injuries to people and their co-workers. Incorrect storage of tools could also lead to injuries. We may get cut with the sharp edges of the tools. Therefore, tools must be handled with care. If an agrochemical is inhaled as a mist, it may cause headache, nausea and diseases of lungs. So it is necessary to wear a mask during the spraying of pesticides. Ensure that there is nobody around while spraying.



V. Complete the crossword puzzle using the clues below:

- | Across | Down |
|------------------|----------------|
| 2. Spraying pump | 1. Milking can |
| 4. Trowel | 3. Machete |
| 5. Wheelbarrow | |

1.7. Additional activities

A. Remedial Activities

- (1) Outline any three examples of agricultural tools.
- (2) Draw any one cutting tool.
- (3) Discuss any two dangers of misuse of agricultural tools.

Answers to remedial activities

- (1) Hoe, spade, trowel, wheel barrow, milking can, machete, watering can, spraying pump.
- (2) Teachers guide.
- (3) -they cause injuries.
-they cause bruises.
-they hurt us.
-They cause accidents.

B. Consolidation activities

1. Explain what will happen if the tools are poorly maintained and stored?
2. Explain any four uses of agricultural tools

Answers to the consolidation activities

1. -Tools can be stolen.
-Wastage of money on buying agricultural tools.
-Tools can be damaged.
-Tools can rust.
2. -for transporting
-for transplanting
-for cutting
-for spraying
-for digging

A. Extended activities.

1. Tools make our job easier.....
2. Digging and cutting tools should be kept sharp regularly.....
3. Tools must be handled with care.....
4. Agricultural tools must be stored in a damp and dry room.....
5. One must wear a mask while spraying insecticides.....

Answers to the extended activities

1. True
2. True
3. True
4. True
5. True

Unit 2 : OBJECTS PRODUCTION

2.1. Key unit competence

To make play utility and learning objects

2.2. Prerequisite

Learners will learn better this unit if they remember the content of unit two of primary two related to making of various materials, teaching and learning aids. Learners know that making materials are very important.

2.3 . Introductory activity and guidance

A) Introductory activity

A father went to buy toys from the market for his children, when he reached there he found toys were very expensive. He came home and asked the children to suggest what can be done in order to have toys.

- (1) Why is it important to make our own toys?
- (2) Mention any four materials you can use to make toys
- (3) Can you predict what you are going to learn in this unit?

B .Guidance on the introductory activity:

Start by reading the scenario in the introductory activity to the learners.

Ask them the first question and allow them to think and suggest the answers

Continue to ask other possible probing questions to learners until they discover and predict what they are going to study

Answers to the introductory activity questions

1. – To make our own toys its cheap
-It makes us improve on our skills
-It motivate us
2. –Clay soil, wires, banana fibre, sisal, wood, sticks,
3. Object production

2.4 .List of lessons

#	Lesson title	Learning objectives	Number of periods:13
1	Making toy bicycles and dolls	-Identify the most common local materials used in making various objects - Select materials by type of objects to make.	2
2	Making toy animals and motorcycles	- Identify the most common local materials used in making various objects - Show awareness of the use of local materials to make some useful objects (toys, utility and learning	2
3	Making utility objects in sticks: basket	-Identify the most common local materials used in making utility objects	2
4	Making utility objects in banana fibre: dustbin, mat	-Use banana fibre to make dustbin	2
5	Making learning materials in paper: Triangle, rectangle and square	- Show curiosity and willing to make certain objects with local materials - Display dexterity for safety Purpose in making objects	2
6	Maintenance of utility and learning objects	-Explain the maintenance of toys, utility and learning objects produced	2
7	Assessment of unit 2	Demonstrate the achievement of the key unit competence	1

2.4.1 Making toy bicycles and dolls

(A) Learning objectives

- Identify the most common local materials used in making various objects
- Select materials by type of objects to make

(b) Teaching resources

- Clay, wires, Fibres, knife/ razor-blade, needle or lancelet, wood, sisal, sticks, Papers, Manila paper and scissor

(C)Learning activities

-Start the lesson by asking the learners to suggest what they have made from their previous classes like scarf, mat, bag, shapes and pot

Activity (1) making dolls from clay (Pages 15–16 of Pupil’s book)

Step1-Provide learners with clay to make dolls of their own choice

Step2- Move around to monitor, guide and answer some oral questions which they may posse

Step3. Guide them to make a doll using clay as per the procedure given on pages 15–16 of the Pupil’s book

Step4-after let the learners display their made dolls in their classes

Step5-Ask them to reward the best made dolls.

Activity (2) making bicycle from wires (Pages 14–15 of Pupil’s book)

Step1-Provide learners with aluminium wires to make bicycle of their own choice

Step2 - Move around to monitor, guide and answer some oral questions which they may posse

Step3 -Help the learners to make a toy bicycle as per the procedure given on pages 14–15 of the Pupil’s book

Step4-After let the learners display their made bicycles in their classes

-Ask them to reward the best made bicycles

-Guide the learners to read the text given in Activities 1–3 given on pages 14–18 of the Pupil’s book and make a toy bicycle.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

2.4.2: Making toy animals and motorcycles

(a) Learning objectives

- Identify the most common local materials used in making various objects
- Show awareness of the use of local materials to make some useful objects (toys, utility and learning)

(b) Teaching resources

-Clay, wires, Fibres, knife/ razor-blade, wood, sisal, sticks,

(c) Learning activities

Activity (1) making toy animal.

Step1-provide learners with clay to make toy animal of their own choice

Step2 - Move around to monitor, guide and answer some oral questions which learners may posse

Step3 -Guide them to make a toy animal using clay following the procedure on pages 19–20 of the Pupil’s book

Step4-After let the learners display their made toy animal in their classes

Step5-Ask them to reward the best made toy animals.

Activity (2) making motorcycle.

Step1-Provide learners with wires or banana fibres to make motorcycle of their own choice

Step2 -Move around to monitor, guide and answer some oral questions which learners may pose

Step3 -Guide them on how to make a toy motorcycle using wires following the procedure given on pages 21–22 of the Pupil’s book.

Step4-After let the learners display their made motorcycle in their classes

Step5-Ask them to reward the best made motorcycles

Step6 -Provide the project work to the learners to continue.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

2.4.3: Making utility objects in sticks: basket

(a) Learning objectives

-Identify the most common local materials used in making utility objects

(b) Teaching resources

Fibres, wood, sisal, sticks,

(c)Learning activities

Step1-Provide learners with sticks, sisal, or banana fibres to make a basket

Step2 -Move around to monitor, guide and answer some oral questions which learners may pose -Support the learners to make a basket from sticks as per the procedure given on pages 23–24 of the Pupil’s book

Step3-After let the learners display their made baskets in their classes.

Step4-Ask them to reward the best made baskets

Step5-Provide the project work to the learners to continue perfecting the steps of making basket

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

2.4.4: Making utility objects in banana fibre: dustbin, mat

(a) Learning objectives

-Use banana fibre to make dustbin and mat

(b) Teaching resources

Fibres, knife/ razor-blade, wood, sisal, sticks, Papers, scissor

(c)Learning activities

Activity (1) making dustbin

Step1 -provide learners with wires or banana fibres to make dustbin.

Step2 -Move around to monitor, guide and answer some oral questions which learners may pose

Step3 -After let the learners display their made dustbin in their classes

Step4-Ask them to reward the best made dustbin

Step5-Provide the project work to the learners to continue

Activity (2) making mats

Step1-provide learners with sisal or banana fibres to make mats of their own choice

Step2-Move around to monitor, guide and answer some oral questions which learners may pose

Step3-After let the learners display their made mat in their classes

Step4-Ask them to reward the best made mats in class

Step5-Provide the project work to the learners to continue perfecting the steps of making mats.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

2.4.5: Making learning materials in paper: Triangle, rectangle and square

(a) Learning objectives

- Show curiosity and willing to make certain objects with local materials
- Display dexterity for safety purpose in making objects.

(b) Teaching resources

- Razor-blade, Papers, Manila paper and scissor

(c) Learning activities

Step1-Ask all the learners to read Activity 9 given on pages 28–29 of the Pupil's book to understand the procedure of making a triangle from a paper.

Step2-Provide a rectangular sheet of paper and a pair of scissors to each learner and ask them to carry out the activity individually. The pair of scissors may be used one by one in rotation-

Step3 –Allow them to display their work for rewarding the best

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

2.4.6: Maintenance of utility and learning objects

(a) Learning objectives

- Explain the maintenance of toys, utility and learning objects produced

(b) Teaching resources

- Baskets, mats, learning materials like triangle, rectangle, square, dustbin, motorcycles

(c) Learning activities

Step1-Divide the class into small groups and lead a discussion on the maintenance of the

toys, utilities and the learning objects produced.

Step2-Let learners know that the objects produced should be kept/stored in a dry,cool and clean place.

Practical Activity (Page 31 of Pupil's book)

Step 1 . Ask the learners to collect the materials listed in this activity.

Step 2 . Ask the learners to prepare toys, utilities and learning objects individually.

Step 3. Support them to display their work to the class.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

2.5 Additional Information for the teacher

The following is an additional learner-centred activity for the teacher which can use to helpdevelop learners' competency or to assess the competency level achieved by the learners.

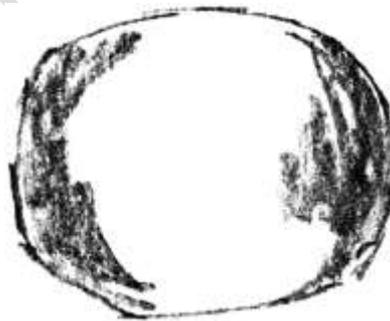
Activity A-1

Aim: Making a clay bird

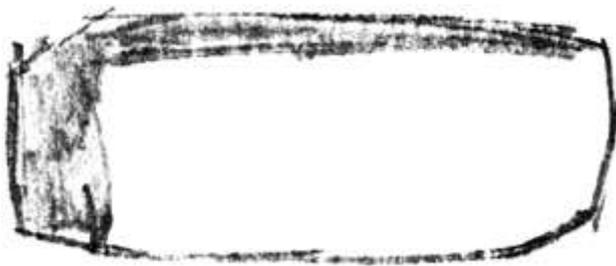
You will need: clay, water and a toothpick

Procedure

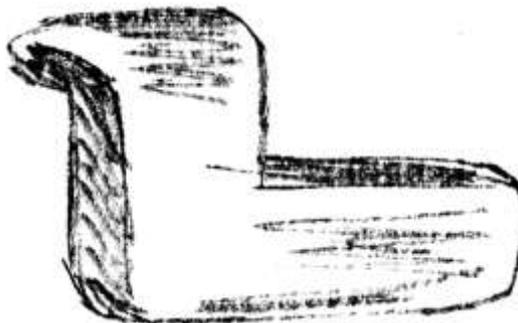
1. Start with a ball or an egg-shaped lump of clay, modelling it with the palms of thehands.



2. Model in a solid mass with no detail.



1. Shape the clay into a bird like this.



2. Now, make head, wings and tail.



In the same way, the learners can make models of various animals like a dog.

2.2 WEB LINKS FOR CONTENT ENRICHMENT

<http://www.wikihow.com/Make-Clay-Dolls>

<https://books.google.co.in/>

2.6. End unit Assessment/ unit review exercises

A. Guidance to end unit assessment/ unit review exercises

- The end unit assessment is called “unit review exercises” in the student book, at Page...**32 to 33**
- Request learners to answer all questions of the “unit review exercises” during the time reserved to lesson of end unit assessment. If all questions cannot be completed in that time,

request them to answer them during their self-study time or as homework.

- Mark their answers and keep records of every student's achievements.
- Provide the remedial, consolidation and extended activities when necessary.

2.6 Answers to end unit assessment page 32 to 34 pupils book

1. Natural clay
2. Doll, cat and motorcycle
3. Clay
4. Ropes, mats, bags and dustbin
5. (i) Triangle; (ii) Square; (iii) Rectangle

II. Complete the crossword puzzle using the clues below:

Across

2. Object
4. Square
5. Rectangle

Down

1. Fibre
3. Triangle

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2.7 . Additional activities

A. Remedial Activities

1. Name any two objects you can make from clay soil.
2. Outline any three common local material you can use to make play objects.
3. Draw and name a pot

Answers to remedial activities

1. Pot, doll animal, bicycle, motorcycle
2. Clay soil, sisal, stones, banana fibre
- 3.



B. Consolidation activities

1. Name any two utility objects
2. Mention two places where we can keep our play objects

Answers to consolidation activities

1. Baskets, dustbin, mat
2. In cupboard , on walls, shelves

C. Extended activities

3. Natural clay, water, and are used to make clay doll. (stones/cement)
4. Clay should be kneaded before modelling. (True/False)
5. What are needed to make a motorcycle from clay?
6. Making shapes from a sheet of paper is a culture. (True/False)
7. What care should be taken to keep learning tools safe?

Answers to extended activities

1. stones
2. True
3. Natural clay and knife
4. False

They should be kept at dry and clean place. They should be cleaned with dry softbrush

UNIT 3: COMPUTER MY FRIEND

3.1. Key unit competence

To use common ICT terms and differentiate Sugar and Gnome user interfaces

3.2. Prerequisite

Learners have learned basic ICT tools including the telephone and laptop. They know the main parts of the telephone and the computer and their roles. Before starting this new unit, ask them some probing questions to check if they remember what they learned in previous years related to ICT.

3.3 . Introductory activity and guidance

D) Introductory activity

Look at different pictures then answers the following questions



- i) List the name of each picture
- ii) States the roles of each picture
- iii) what do you think we are going to learn in this new unit?

E) Guidance on the introductory activity:

- Starting by showing the pictures to the learners.
- Ask them fist question and allow them to think and suggest the answers.
- Continue to ask all questions and other possible probing questions to learners until they discover and predict what they are going to study.

Answers to introductory activity

ii. a. The roles of laptop are:

- Storage of information
- Quick data processing
- Audio-visual aids in teaching
- Better presentation of information
- Access to the internet
- Quick communication between students, teachers and parents

b. The roles of monitor are:

- It allows people to interact with the computer, activate, and run programs.
- It helps to display the output.

c. The roles of mouse:

- Point
- Select
- Hover
- Scroll
- Drag-and –drop
- Open & close program

iii. ICT devices and its roles

3.4 . List of lessons

#	Lesson title	Learning objectives	Number of periods:21
1	Computer: definition, role, switch on/off	-Explain the common terms used in ICT. - Appreciate the importance of terms used in ICT.	1
2	Data and Information: Typing text from the keyboard	-List the common ICTterminologies. -Appreciate the importance of terms used in ICT.	2
3	Communication: definition, role, call/send messages	-Understand other perspectives and be aware of new vocabularies in ICT -Appreciate the importance of terms used in ICT.	2
4	Technology: type a text, call, send messages	- Practice to call and send SMS as the means of communication using mobile phones.	1

5	Internet, Website, WWW	- Differentiate and use ICT terms in daily life.	2
6	Activity (open, close) and Project	- Explore different activities.	1
7	Digital and Analogue	- Differentiate and use ICT terms in daily life.	1
8	Hardware (Keyboard, touchpad) and Software(activities)	- Explore different activities.	1
9	Sugar interface Search in home (Display quickly an activity), Favourite view, List view	- Identify the elements in Sugar user interface. - Manipulate with guidance different activities in Sugar interface. - Interact with Sugar user interface to open and close an activity. - Be excited by the design of the Sugar interface.	2
10	Gnome interface	- Switch from Sugar to Gnome interfaces. - Identify and explore elements in Gnome user interface. - Be aware of the two user interfaces and their strength.	2
11	Use of the Journal	- Locate name and erase a document in the Journal. - Appreciate the process of sending and receiving document.	2
12	Search and retrieve a saved document in the Journal	- Pay attention on how to manage documents in the journal. - Perform deletion and renaming a document. - Arrange documents and apply search techniques in the Journal.	2
13	Assessment of unit 3		2

Teaching approach for each lesson

3.4.1. Computer: definition, role, switch on/off

a) Learning objectives

- Explain the common terms used in ICT.
- Appreciate the importance of terms used in ICT.

b) Teaching resources

- x0 laptop, laptop computer, textbooks, Chalks

c) Learning activities

Guide the learners to define Computer, state its role and practice switching it ON and OFF on their own.

Activity 1: Observing and Listing Different ICT Tools

Step 1: Take learners to the school computer lab or bring the ICT tools in the classroom.

Step 2: Ask them to observe the equipment and describe all ICT tools found there briefly.

Step 3: Ask them to list those ICT tools not found in the computer lab.

Step 4: Take them back to the classroom and ask them to share the information they got on the ICT tools with classmates.

Step 5: Ask them to discuss the importance of each ICT tool.

Step 6: Ask them to write the role of the ICT tools in their notebooks.

Discuss the various roles of computer in our daily life as given on page 35 of the Pupil's book.

Activity 6: Switching ON a Computer

Guide learners to follow the steps of switching ON a desktop computer and an XO laptop given on pages 42–43 of the Pupil's book and perform the same.

Activity 7: Switching OFF a Computer

Guide learners to follow the steps of switching OFF a desktop and an XO laptop given on pages 43–44 of the Pupil’s book and practise the same.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample questions of lesson assessment:

1. States two roles of computer
2. Gives steps followed to switch ON computer.

3.4.2 . Data and Information: Typing text from the keyboard

a) Learning objectives

- List the common ICT terminologies.
- Appreciate the importance of terms used in ICT.

b) Teaching resources

- xo laptop, text book
- different types of data (number, letters and special characters)

c) Learning activities

Discuss with the learners the concept of data and information.

Tell them that typing text from a keyboard is a form of data.

Lead them to school computer lab to practise typing text using the keyboard.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

3.4.3 Communication: definition, role, call/send messages

a) Learning objectives

- Understand other perspectives and be aware of new vocabularies in ICT
- Appreciate the importance of terms used in ICT.

b) Teaching resources

Textbooks , Telephone , Radio, Television

c. Learning activities

Introduce the lesson by discussing that communication is the process of sending or receiving information.

Discuss that we can communicate by speaking, writing, through at and music and books.

Activity 2: Discussion on the Role of Tools of Communication

Step 1: Ask the learners to discuss with their parents or guardians the role of tools of communication (telephones, computers, radios, televisions) and how the communication

was done before the invention of these tools.

Step 2: Ask them to take note of the responses received in their notebooks.

Step 3: Ask them to share the information with their classmates.

Calling and Sending Messages Using a Mobile Phone

Guide the learners to carry out **Activities 3** and **4** given On pages 37–39 of the Pupil’s book.

Activity 3: Calling and Sending Messages Using Mobile Phones

Calling Using Mobile Phones

Step 1: Arrange a mobile phone for the activity.

Step 2: Ask the learners to write the receiver’s telephone number.

Step 3: Ask them to push the call key.

Sending Message Using Mobile Phones

Step 1: Ask the learners to open writing option on the mobile phone.

Step 2: Ask them to write a greetings message.

Step 3: Ask them to write a receiver’s telephone number.

Step 4: Finally, he/she should ask them to push the send key.

Activity 4: Typing and Sending Text Messages Using Mobile Phone

Step 1: Help the learners to type a text message from a mobile phone keypad.

Step 2: Ask the learners to send this message to one of their friend anda family member.

After this activity, the teacher discusses with the learners the roles communication plays in our day-to-day life as given on page 40 of the Pupil’s book.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample questions of lesson assessment:

1. Take phone then call the number of your parents or neighbors
2. Enumerate three roles of communication

3.4.4 Technology: type a text, call, send messages

a) Learning objectives

- Practise to call and sendSMS as the means of communication using mobile phones.

b) Teaching resources

Textbook, telephone, xo computer

c) Learning activities

Discuss with the learners, the concept of technology, its role and examples as given on page 40 of the Pupil's book.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample questions of lesson assessment:

1. What is technology
2. States two examples of technology

3.4.5 Internet, Website, WWW

a) Learning objectives

- Define internet and website
- Differentiate and use ICT terms in daily life

b) Teaching resources

- Textbook, computers, telephone, internet

c) Learning activities

Ask the learners to read and define Internet, Website and www.

Guide the learners to carry out **Activity 5** given on page 40 of the Pupil's book.

Activity 5: Typing Domain Name in the Address Bar of the Browse Activity

Step 1: Take the learners to the computer lab or ask them to use an XO laptop.

Step 2: Ask them to type the domain name of Rwanda Education Board(www.reb.rw) in the address bar in the browse activity.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

3.4.6 Activity (open, close) and Project

a) Learning objectives

- Switch from Sugar toGnome interfaces.
- Explore different activities

b) Teaching resources

Text book, XO laptop

c) Learning activities

Discuss with the learners the definition of Activity as given on page 40 of the Pupil's book.

Discuss with the learners the definition of Project as given on page 40 of the Pupil's book.

Discuss with the learners how to open an Activity.

Discuss with the learners how to close an Activity.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

3.4.7 Digital and Analogue

a) Learning objectives

- Differentiate and use ICT terms in daily life.

b) Teaching resources

Textbook, analogue radio, digital radio, analogue clock, digital clock

c) Learning activities

Discuss definition of digital and analogue data with the learners giving suitable examples.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample questions of lesson assessment:

1. By giving examples differentiate digital data to analogue data .

3.4.8 Hardware (Keyboard, touchpad) and Software(activities)

a) Learning objectives

- Explore different activities.
- Differentiate and use ICT terms in daily life

b) Teaching resources

Text book, mouse, printers, system unit, xo laptop, keyboard, monitor

c) Learning activities

Ask the learners to read and discuss the definition of computer hardware and software giving suitable examples.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample questions of lesson assessment:

1. Differentiate computer hardware to software and gives two examples for each.

3.4.9 Sugar interface Search in home (Display quickly an activity), Favourite view, List view

a) Learning objectives

- Identify the elements in Sugar user interface.
- Manipulate with guidance different activities in Sugar interface.
- Interact with Sugar user interface to open and close an activity.

- Be excited by the design of the Sugar interface.

b) Teaching resources

Xo laptop , Text book, chalks, blackboard, pens

c) Learning activities

Discuss how to start up sugar interface.

Help the learners understand different elements of sugar interface. The learners will perform **Activities 8** and **9** given on pages 44–46 of the Pupil’s book to understand the same.

Activity 8: Switching ON an XO Laptop

Step 1: Guide the learners to switch ON an XO laptop.

Step 2: Ask them to describe how icons are arranged on Home screen.

Starting up Sugar Interface

Ask the learners to carry out **Activity 9** given on pages 45–46 of the Pupil’s book.

Activity 9: Starting up Sugar Interface

Guide the learners to start up Sugar Interface both on a personal computer and on an XO laptop as given on pages 45–46 of the Pupil’s book.

Elements of Sugar Interface

Discuss and guide the learners understand the different elements of Sugar Interface as given on page 46–49 of the Pupil’s book.

XO Menu

Guide the learners to carry out **Activity 10** given on page 50 of the Pupil’s book.

Activity 10: Observing different XO Menu

Step 1: Ask the learners to switch ON their XO laptop.

Step 2: Ask them to hover over the XO icon in the middle of the ring of activities.

Step 3: Let them write in their notebooks the options which appear on the menu.

The XO menu appears when they point on the XO icon.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

3.4.10 Gnome interface

a) Learning objectives

- Switch from Sugar to Gnome interfaces.

- Identify and explore elements in Gnome user interface.
- Be aware of the two user interfaces and their strengths.

b) Teaching resources

Xo laptop, Textbook, blackboard, chalks, pens

c) Learning activities

Help the learners to understand how the XO laptop allows switching from Sugar interface to GNOME interface.

Activity 11: Switching to GNOME Interface from Sugar Interface

Step 1: Ask the learners to hover over the XO icon in the middle of ring of activities.

Step 2: Ask them to choose the option **My Settings**.

Step 3: Ask them to select **Switch Desktop** option under **My Settings**

and follow steps until they click on switch to GNOME.

Major Components of Gnome Desktop

Discuss with the learners, the major components of Gnome desktop as given on pages 52–58 of the Pupil’s book.

Creating a Folder in GNOME

Help the learners to perform **Activity 12** given on pages 54–55 of the Pupil’s book. It will help them understand how to create a folder in Gnome.

Activity 12: Creating and Renaming a Folder in GNOME

Step 1: Ask the learners to switch to Gnome from Sugar.

Step 2: Ask them to right click on blank area of desktop and the menu appears.

Step 3: Ask them to click on option Create Folder and the folder will be created on the desktop.

Step 4: Ask them to rename the new folder appeared on the desktop of their choice.

Switching to Sugar from GNOME

Help the learners understand that Switching back to Sugar from GNOME can be done by double click on icon “Switch to Sugar” of GNOME Desktop.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample questions of lesson assessment:

1. What are the major components of GNOME desktop?

3.4.11 Use of the Journal

a) Learning objectives

- Locate name and erase a document in the Journal.

- Appreciate the process of sending and receiving document.

b) Teaching resources

Xo laptop, Textbook, blackboard, pens, chalks

c) Learning activities

Discuss with the learners the different uses of Sugar Journal as given on pages 59–62 of the Pupil’s book.

Opening the Journal

Demonstrate how to open the journal.

Journal Features

Discuss the various Journal features with the learners.

Discuss with the learners the menu and a list of journal entries contained in the Journal View.

Journal Detail View

Discuss with the learners the components of the detail view as given on pages 62–63 of the Pupil’s book.

Using Removable Media

Discuss and guide the learners to understand the method to work with Journal using removable media. To understand this, ask the learner to perform **Activities 13, 14, 15** and **16** given on pages 64–68 of the Pupil’s book.

Activity 13: Using Removable Media

Step 1: Ask the learners to plug a flash disk into the XO laptop.

Step 2: Ask them to push on magnifying glass key to open Journal.

Step 3: Ask them to write on the notebook two icons found on the button of Journal.

Step 4: Ask them to open the Universal Serial Bus (USB) device by clicking on the icon representing flash disk on the bottom of the Journal.

Step 5: Ask them to click on Journal icon besides the USB device icon to see the activities saved in Journal.

Activity 14: Saving Entries from Journal to USB Device

Step 1: Ask the learners to plug USB device into XO laptop.

Step 2: Ask them to open Journal.

Step 3: Ask them to point on the entry they want to move and hold the touchpad key.

Step 4: Ask them to drag down to the USB device icon.

Activity 15: Saving Entries from USB Device to Journal

Step 1: Ask the learners to plug USB device into an XO laptop.

Step 2: Ask them to open Journal.

Step 3: Ask them to click on USB icon to view its content.

Step 4: Ask them to point on the entry they want to move and hold the touchpad key.

Step 5: Ask them to drag down to the Journal icon.

Activity 16: Sending Documents to Each Other

Step 1: Ask the learners to read and follow the steps given on pages 66–68 of the Pupil's book to carry out the activity.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample questions of lesson assessment:

1. Make a document and send to your classmate then send it to your journal using USB.

3.4.12 Search and retrieve a saved document in the Journal

a) Learning objectives

- Perform deletion and renaming a document.
- Arrange documents and apply search techniques in the Journal.
- Pay attention on how to manage documents in the journal.

b) Teaching resources

Xo laptop , Textbook, Blackboard, chalks

c) Learning activities

Guide the learners to search and retrieve a saved document in the journal using Journal features such as a Search box, by selecting items by type (anything) or filters by date (Anytime).

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample questions of lesson assessment:

1. Search a document called my homework saved on your computer

3.5 Additional content of student and teacher

3.5.1. Additional Information for the student (For the added content according to the

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3.5.2. Additional content for the teacher

The following additional content will be helpful for the teacher to introduce working of XO laptop and some shortcut keys used in Sugar Interface to the learners.

Opening an XO Laptop

To open the XO laptop, position the handle away. Lift both antennae up towards you. The laptop clicks open. Lift the screen up from the keyboard.

To open an XO laptop, follow these steps:

1. For hand held mode, lift the “bunny ears.”



2. Listen for the laptop clicking open.



To flip an XO laptop, follow these steps:

1. Bring the display up to a 90-degree angle and put the antennae down.



2. Rotate the display 180 degrees until it faces backwards.

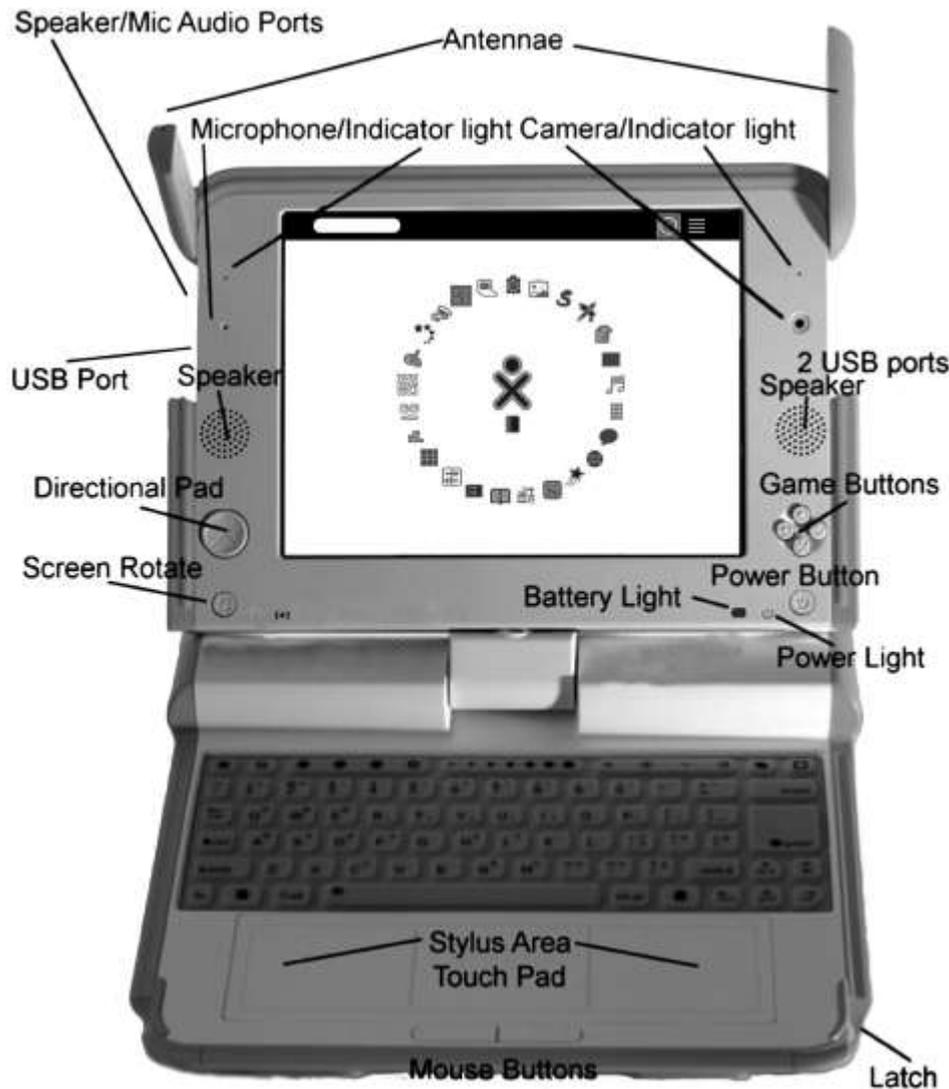


3. Lay the display down onto the keyboard.



Switching ON and OFF a Computer

Computer is an electronic device. It is important to learn proper handling of computers. There are proper steps to switch on and switch off of a computer system.



Components of an XO Laptop

To switch ON an XO Laptop, follow these steps:

Press the power button. The XO starts up after about two minutes.

It will ask your name first time.

Next time it will remember your name and go directly to the Home screen.

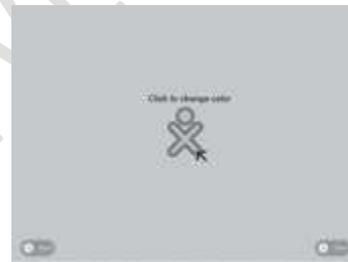
1. Enter your name.



2. Once you enter your name, click **Done**.



3. Choose your colours by clicking repeatedly.



4. Once you have chosen your colours, click **Done**.



Your screen looks like this when the laptop is ready to begin.



To switch OFF an XO Laptop, follow these steps:

1. Go to the **Home view**.
2. Take the pointer over the middle XO icon until you see a menu.
3. The **Reboot** and **Shutdown** options will appear.
4. Choose **Shutdown** option to ensure your laptop shuts down properly.



Some Shortcut Keys in Sugar Interface

Shortcuts	Description
Ctrl+c	Copy to clipboard
Ctrl+v	Paste from clipboard
Ctrl+x	Cut (and copy to clipboard)
Ctrl+a	Select all (current input/dialog/text box)
Ctrl+q	Quit activity
Ctrl+Esc	Quit activity
Alt+Enter	Toggle full-screen mode
Alt+Space	Toggle tray visibility (works in Browse but not in Record)
Ctrl+u	View source in Browse (opens copy of source in Write)
Fn+Space	View source (system wide, although not enabled in all applications yet)
Alt+1	Screen capture; saved to Journal as a PNG file named "Screenshot of N" where N is the activity or window name

3.6 . End unit assessment

a) Guidance on End unit assessment

- The end unit assessment is called "Unit Review Exercises" in the student book, at Page 69.

- Request learners to answer all questions of the “**Unit Review Exercises**” during the time reserved to lesson of end unit assessment. If all questions cannot be completed in that time, request them to answer them during their self-study time or as homework.
- Mark their answers and keep records of every student’s achievements.
- Provide the remedial, consolidation and extended activities when necessary.

b) Answers for End unit assessment

I. Fill in the blanks with the correct options:

- | | | | | | |
|----|-----|----|-----|----|-----|
| 1. | (a) | 2. | (b) | 3. | (c) |
| 4. | (d) | 5. | (a) | | |

II. State whether the following statements are true or false:

- | | | | | | |
|----|------|----|------|----|-------|
| 1. | True | 2. | True | 3. | False |
| 4. | True | 5. | True | | |

III. Match the following:

- | | | | | | |
|----|-----|----|-----|----|-----|
| 1. | (e) | 2. | (d) | 3. | (a) |
| 4. | (c) | 5. | (b) | | |

IV. Answer the following questions briefly:

- There are various roles of computers in our daily life.
 - It can be used for personal computing.
 - It can be used for educational references.
 - It can be used in the field of health and medicine.
 - It can be used for scientific research.
 - It can be used for communication and entertainment.
- Data:** Whatever you have typed from the keyboard is the **data**. It may be numbers, letters and symbols. Data is something on which operations are performed by a computer.

Information: The processed data is called **information**. In a computer, we can get information through output devices, for example: monitor and printer.

- The following are some features of a website:
 - It is a collection of web pages related to each other by certain topics.
 - A website is created by an organisation or an individual to give information about a topic or an organisation.
 - Each website has its own unique web address.

- (d) It can be reached through an Internet connection by typing domain name in the address bar.
 - (e) The opening page of a website is called homepage.
- 4.
- (a) *Scroll bar*: Using the scroll bar, you can move through the list.
 - (b) *Gedit Text Editor*: Gedit Text Editor can read, create, or modify any kind of simple text without any formatting.
 - (c) *GNOME Interface*: Gnome is a graphical user interface. It has many applications designed to help you in your daily work.
 - (d) *System menu*: The system menu provides options for configuring the system and desktop environment. These may be such as desktop theme and screen resolution.
 - (e) *Workspaces*: The Gnome desktop allows multiple workspaces to be active at any one time with different applications and windows visible on each workspace.

5. To switch ON a Computer

(a) *Desktop Computer*

1. Switch ON the main power supply.
2. Switch ON the uninterruptible power supply (UPS).
3. Switch ON the power button of the system unit.
4. Switch ON the monitor.

(b) *XO Laptop*

1. Push the Power button to turn on the laptop.

To switch OFF a Computer

(a) *Desktop Computer*

1. Click on the Start  button. A menu appears on the screen.
2. In the right pane of the Start menu, click on the Shutdown button.
3. Switch OFF the UPS.
4. Switch OFF the main power supply button.
5. Switch OFF the monitor.

(b) *XO Laptop*

1. Hover over the XO icon in the centre of the Home view.
2. A menu appears
3. Choose the Shutdown button.

6. The Journal Activity is an automated diary of everything you do within Sugar. Sugar Activities use the Journal as a place to save your work.

V. Complete the following crossword puzzle using the clues below:

Across

- 2. Interface
- 6. Information
- 7. Internet

Down

- 1. Technology
- 3. Software
- 4. Data
- 5. Computer

3.7 Additional activities

a. Remedial Activities:

Questions

- 1. The processed data is called information. (True/False)
- 2. Using which key you can move through the list?

ANSWERS

- 1. True
- 2. Scroll bar

b. Consolidation activities:

QUESTIONS

- 1. Is a large group of computers connected to each other. (Internet/Information)
- 2. It is a set of instructions for a computer to perform specific operations

ANSWERS

- 1. Internet
- 2. Computer software

c. Extended activities:

Questions

- 1. List at least two roles of a computer in our daily life.
- 2. A window is aarea of the screen. (rectangular/perpendicular)
- 3. What do you understand by communication?

Answers

- 1. (i) It can be used for personal computing.
(ii) It can be used in the field of health and medicine.
- 2. Rectangular
- 3. Communication is the process of transferring or exchanging information.

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UNIT 4: WRITING SKILLS

4.1. Key unit competence

To perform write activity

4.2. Prerequisites

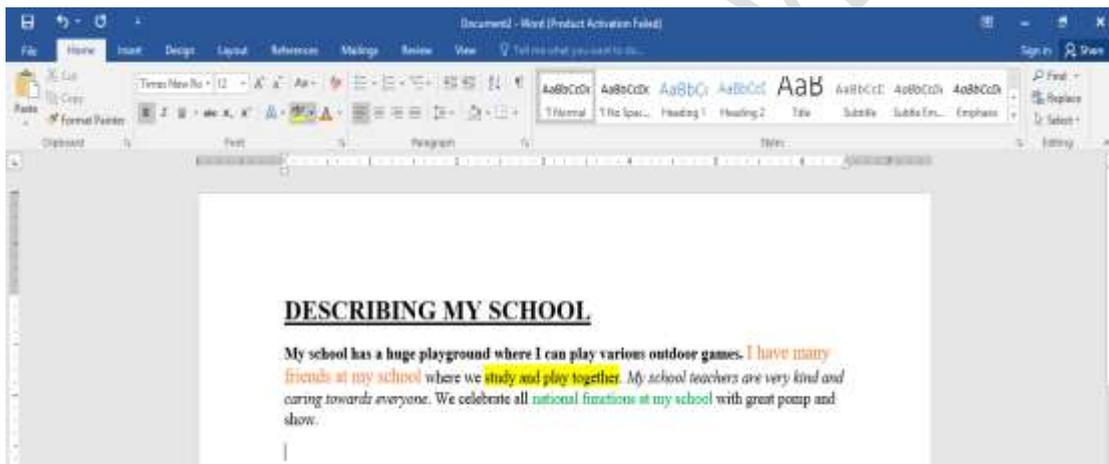
Learners have learned basic writing skills including opening Abi word and typing text. They know the main parts (interface) of Abi word and their roles. Before starting this new unit, ask them some probing questions to check if they remember what they learned in primary three on writing skills.

4.3. Introductory activity and guidance

a) Introductory activity

1. Open a new document and describe your school
2. Make the text looks smart
3. What have you discovered?

Answers to introductory activity



3. I have discovered that: To change the font of a text to **Bold**, italic, colour, underline and size.

b) Guidance on the introductory activity

- Prepare enough teaching and learning aid materials to help pupils to know how to type text and making formatting
- Give learners clear instructions to follow as they observe and explain how to open the Typing Turtle program.
- Continue to ask all questions and other possible probing questions to learners until they discover and predict what they are going to study.

4.4. List of lessons

#	Lesson title	Learning objectives	Number of periods: 9
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1	Text selection	Construct or copy paragraphs and texts. Apply the keyboard special keys according to their roles. Read voluntarily what they have written.	2
2	Text formatting	Describe the different ways of formatting and editing a text. Write a text and apply formatting methods and techniques. Care for the use of special keys	2
3	Save and open; - Share and Collaboration	Perform writing text and paragraphs with more speed. Identify the special keys and use them accordingly.	2
4	The Keyboard and Touchpad	Pay attention on typing errors. Notice the use of the special keys. Use correctly the special keys and touchpad.	2
5	Assessment of unit 4		1

Teaching approach for each lesson

4.4.1. Text selection

a) Learning objectives

- Construct or copy paragraphs and texts.
- Apply the keyboard special keys according to their roles.
- Read voluntarily what they have written.

b) Teaching resources

Text book, xo laptop, blackboard, notebooks, pens

c) Learning activities

The teacher will help the learners understand the method of selecting text using a keyboard and a mouse.

Selecting Text Using Keyboard

Activity 1: Opening Microsoft Word, Writing and Selecting Text Using Keyboard

Step 1: Lead the learners to the computer lab.

Step 2: Show the learners how to open the Microsoft Word.

Step 3: Ask them to follow the steps given on pages 73–74 of the Pupil’sbook to carry out the activity.

Activity 2: Selecting Sentence, Paragraph and Document Using Keyboard

Step 1: Lead the learners to the computer lab.

Step 2: Ask them to open new document.

Step 3: Ask them to write a home life story.

Step 4: Ask them to complete the activity by following the step-by-step procedure given on pages 75–76 of the Pupil’s book.

Selecting Text with Mouse

Discuss with the learners that we can use mouse to select characters, words, sentences, paragraphs or a whole document.

Activity 3: Selecting Word, Sentence, Paragraph and Document Using Mouse

Guide the learners to carry out the activity themselves by following the steps given on page 77 of the Pupil’s book.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample questions of lesson assessment:

1. which tool used to select a text?

Answer: tools used to select text are Mouse.

Give learners activities in the Pupil’s book on how to open and select a text.

4.4.2. Text formatting

a) Learning objectives

-Describe the different ways of formatting and editing a text.

-Write a text and apply formatting methods and techniques.

-Care for the use of special keys.

b) Teaching resource

Text book, xo laptop, blackboard, notebooks, pens

c) Learning activities

Discuss the method of formatting text using MS Word.

Help the learners to carryout **Activity 4** given on pages 77–79 of the Pupil’s book.

Activity 4: Formatting Text

Step 1: Arrange to take the learners into the computer lab.

Step 2: Ask them to open the Microsoft Word.

Step 3: Ask them to create a new document.

Step 4: Let them type a document.

Step 5: Show them the fonts menu.

Step 6: Ask them to select the first two sentences and highlight in bold type by pressing the **Ctrl + B** keys.

Step 7: Ask them to select the word “software”, italicise and underline by clicking on **I** and **U** or by pressing **Ctrl + I** for italic and **Ctrl + U** for underlining respectively.

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Step 8: Ask them to change the size of the whole text from 11 to 16, change the style from **Arial** to **Times New Roman** and put the first sentence in red colour.

Discuss with the learners how to rectify the errors in the text through the option of spell check.

Changing the Character Case of the Text

Step 1: Discuss with the learners that character case indicates the case of the text and it is used to change the text from lower case to uppercase or vice-versa.

Step 2: Ask the learners to change the character case of the text as given on page 79 of the Pupil's book.

Spelling and Grammar Checking

Activity 5: Checking Spelling and Grammar

Step 1: Arrange to take the learners into the computer lab.

Step 2: Ask them to open the Microsoft Word.

Step 3: Ask them to create a new document.

Step 4: Ask the learners to type the following text as it is:

On frrday, I went to the shoip to buyi tomatoies.

Step 5: Using the right button of mouse, let them click on the first word that has the red wavy line under it. Several choices will appear. Ask them to click on the correct one, that is, **Friday**.

Step 6: Ask the learners to click on the second word having the red wavy line under it, that is, **shop**, using the right of the mouse. Several choices will appear. Ask them to click on the correct word, that is, **shop**.

Step 7: Ask the learners to repeat the above process with the words **buyi tomatoies**.

Step 8: Finally, explain the learners that spelling errors are displayed with a red wavy line under the text. A red wavy line means that the word is misspelt or is not an English word.

Activity 7: Identifying Different Formatting Buttons

Step 1: Before the activity starts the teacher will ask the learners to tell the names of the various buttons.

Step 2: Ask the learners to write the names of the given buttons in their notebooks.

Step 3: After half an hour, ask the learners one by one to read their answers aloud.

Step 4: Rectify the answers which are wrong.

Activity 8: Typing and Formatting a Document

Step 1: Arrange to take the learners into the computer lab.

Step 2: Ask them to open the Microsoft Word.

Step 3: Ask them to create a new document.

Step 4: Ask them to type the following document.

Information and Communication Technology (ICT)

ICT stands for Information and Communication Technology. Computer is the basic need in every field. Life becomes easier with the introduction of different ICT tools.

Computers, mobile phones, calculators, radios, scanner and fax machines are the common ICT tools. These tools help us use information and share it digitally.

Step 5: Ask them to select the heading “Information and Communication Technology (ICT)”.

Step 6: Ask them to make it bold.

Step 7: Ask them to change its colour into red.

EXPERIMENTAL VERSION

Step 8: Ask them to underline it.

Step 9: Ask them to change its style into Arial.

Step 10: Ask them to select the first paragraph and change its case to uppercase.

Step 11: Ask them to select the second paragraph and make it italic.

Step 12: Finally, Ask them to save this document with the name 'ICT'.

Answers to activity

Activity 7 (*Page 83 of Pupil's book*)

- | | | |
|-----------------------|-------------------|--------------------|
| (i) Bold | (ii) Italic | (iii) Underlined |
| (iv) Font size | (v) Font list box | (vi) Colour box |
| (vii) Change case box | (viii) Save as | (ix) Open document |

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

4.4.3. Save and open; - Share and Collaboration

a) Learning objectives

- Identify the special keys and use them accordingly.
- Perform writing text and paragraphs with more speed.

b) Teaching resources

Text book, xo laptop, blackboard, notebooks, pens

c) Learning activities

Saving and Opening a Word Document

Guide the learners to save and open a word document as per procedure given on pages 81–82 of the Pupil's book.

Sharing and Collaboration

Guide the learners on the use of sharing and collaboration in Sugar Interface as given on pages 82–83 of the Pupil's book.

Activity 6: Sharing a Document

Ask the learners to carry out **Activity 6** following the procedure given on pages 82–83 of the Pupil's book.

Group Work

Ask the learners to go to their computer lab and search or connect to friends in the Neighborhood View as given on pages 82–83 of the Pupil’s book.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample questions of lesson assessment:

What are the steps used to save a word document?

Give learners activities in the Pupil’s book on how to share and collaborate on a document.

4.4.4. The Keyboard and Touchpad

a) Learning objectives

- Use correctly the special keys and touchpad.
- Pay attention on typing errors.
- Notice the use of the special keys.

b) Teaching resources

Xo laptop, Text book, blackboard, notebooks, pens

c) Learning activities

Discuss with the learners the role of keyboard and touchpad.

Guide the learners about the frame keys, volume control keys and brightness control keys available on the multimedia keyboard.

Guide the learners about the special keys on the keyboard and the special functions they perform.

Discuss the applications of the special keys in MS Word document as given on pages 86–88 of the Pupil’s book.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample questions of lesson assessment:

Define the word keyboard and touchpad.

Give learners activities in the Pupil’s book on special keys and their functions.

4.5. Additional content of student and teacher

4.5.1. Additional Information for the student (For the added content according to the Ministerial order)

4.5.2. Additional content for the teacher

Special Keys of Keyboard and Touchpad

The keyboard and the touchpad have some special keys. These are:

1. **Escape key:** It is labelled with an × symbol on a black circle. It is commonly used in combination with the control key to quit activities (**Ctrl + Esc**).
2. **Tab key:** It is labelled with arrows pointing right and left. The tab key is used in combination with the control, shift and alt keys to cycle through open Activities. For example, **Alt + Tab** cycles forward through running Activities.
3. **Control key:** It is used in combination with other keys to issue commands. For example, **Ctrl + C** is used to copy to the clipboard; **Ctrl + V** is used to paste from the clipboard.
4. **Shift key:** It is used in combination with other keys as a modifier, most commonly to shift between lowercase and uppercase in Latin-based alphabets.
5. **Fn key:** The function key is used in combination with other keys as a modifier. For example, **Fn + Erase** is delete; **Fn + Up arrow** is page up.
6. **Alt key:** It is used in combination with other keys to issue commands. For example, **Alt + Enter** toggles full-screen mode; **Alt + Space bar** toggles the tray visibility. This example works in the Browse Activity but not in the Record Activity.
7. **Space bar:** The space bar key types a space. In the future, when used in conjunction with the function key (**Fn**), it will eventually view the source code for the currently running Activity.
8. **Alt Gr key:** The alt graphics key is used in combination with other keys as a modifier, most commonly to select an alternative letter or generate an accented character. The details of this functionality vary from keyboard layout to keyboard layout: for example, on the US keyboard, **Alt gr + J** generates a € (euro sign); typing the character “a” followed by **Alt gr + 4** generating á.
9. **Arrow keys:** The arrow keys are used for navigation. Combined with the function key (**Fn**), they are used for page up, page down, home, and end.
10. **Language key:** The language key is found on keyboard layouts that combine Latin and non-Latin scripts. It toggles between scripts, so, for example, one can switch between typing in English and Kinyarwanda with a single keystroke. (On Latin-only keyboards, the language key has been replaced by a × and ÷ key.)
11. **Enter key:** The enter key—in addition to its standard use—is used in combination with modifier keys. For example, **Alt + Enter** toggles full-screen mode.
12. **Erase key:** The erase key deletes the character behind the cursor (backspace). **Fn + Erase** deletes the key in front of (or on) the cursor.

13. **Frame key:** The Frame key toggles the presence of the Frame on the screen. The Frame is the black border around the screen that holds the Activity taskbar, clipboard, wireless connections, battery level, and so on.
14. **Volume controls:** The volume keys lower and raise the audio level.
15. **Brightness controls:** The brightness keys lower and raise the brightness of the screen backlight. It may take 7–8 button presses to turn the backlight off completely.
16. **View keys:** The four view keys, from left to right, take you to the Neighbourhood view, the Group view, the Home view, and the Activity view.
17. **Search key:** The search key takes you directly to the Journal and places the text cursor in the search box.

4.6. End unit assessment

a) Guidance on End unit assessment

- The end unit assessment is called “Unit Review Exercises” in the student book, at Page 89.
- Request learners to answer all questions of the “Unit Review Exercises” during the time reserved to lesson of end unit assessment. If all questions cannot be completed in that time, request them to answer them during their self-study time or as homework.
- Mark their answers and keep records of every student’s achievements.
- Provide the remedial, consolidation and extended activities when necessary.

b) Answers for End unit assessment

I. Fill in the blanks with the correct options:

- | | | |
|--------|--------|--------|
| 1. (a) | 2. (b) | 3. (b) |
| 4. (a) | 5. (d) | |

II. State whether the following statements are true or false:

- | | | |
|----------|---------|----------|
| 1. True | 2. True | 3. False |
| 4. False | 5. True | |

III. Match the following shortcut keys with their functions:

- | | | |
|--------|--------|--------|
| 1. (e) | 2. (c) | 3. (a) |
| 4. (b) | 5. (d) | |

IV. Answer the following questions briefly:

1. Formatting the text means changing the style, colour, and size of the desired text. There are many tools in MS Word to do these.
2. To select a paragraph with mouse, triple click anywhere on the paragraph.
3. To select a whole document:
 - (a) Place the cursor anywhere on the document.
 - (b) Press **CTRL + A**.
4. A keyboard is an input device of a computer system. Data are entered into the computer with the help of the keyboard. It plays a very crucial role while working on a computer.

A touchpad is a pointing device on laptops and some keyboards. It is operated by using fingers. It allows the user to touch an area on the screen in order to enter data. Like a computer mouse, it also has two buttons. These two buttons allow the user to left-click or right-click.

5.
 - (a) It starts a new paragraph in a document.
 - (b) It cancels any command or exits the program.
 - (c) It moves the cursor to the end of the line.
 - (d) It moves the cursor to the beginning of the line.
 - (e) It erases the characters from right side of the cursor.
6. (a) To change the font colour of the text:
 1. Select the text whose font colour is to be changed using the keyboard or the mouse.
 2. Click on font colour box  on the Home tab of the Ribbon. It shows the colour of the text at present.
 3. Select your desired font colour from the drop down list.
- (b) To change the font style of the text:
 1. Select the text whose font style is to be changed using the keyboard or the mouse.
 2. Press Ctrl + Shift + F or click on font list box  on the Home tab of the Ribbon. The font size box shows the current font style.
 3. Select the required font style from the drop down list. Let us select font style. The selected text changes to the style of your selection.

 Times New Roman

(c) To save a word document:

1. Press Ctrl + S or click on the  button on the Home tab of the Ribbon. The Save As window will appear.

2. Select the location in the computer where you wish to save the document.

3. Write a file name in the **File name** box.

4. Click on the **Save** button.

V. Complete the crossword puzzle using the clues below:

Across/Down

3. Collaboration

1. Frame keys

4. SkyDrive

2. Touchpad

5. Keyboard

4.7. Additional activities

a. Remedial Activities:

Questions

1. What does ICT stand for?

2. Which keys are used to save a document?

ANSWERS

1. ICT stands for Information and Communication Technology.

2. CTRL + S

b. Consolidation activities:

QUESTIONS

1. Name two input devices that are used in computer.

2. Write one use of mouse.

ANSWERS

1. Keyboard and mouse.

2. We can use mouse to select characters and words.

c. Extended activities:

Questions

1. What do you understand by 'formatting a text'?

2. Touchpad is operated by using..... (fingers/mouse)

Answers

1. Formatting a text means changing the style, colour and size of the desired text.

2. fingers

UNIT 5: GRAPHICS AND MULTIMEDIA

5.1. Key unit competence

To use paint activity to draw and colour different shapes and to enhance project work.

5.2. Prerequisite

Pupils will learn this unit better if they know to draw and colours different shapes like house, National flag using their hands.

5.3. Introductory activity and guidance

a) Introductory activity

In our class Manzi and Odette tried to draw a picture of house using hands but they fail to do it well.

1. what do you think they can improve on their drawing?
2. can you predict what they are going to study?

b) Guidance on the introductory activity

-Start the unit by helping the learners to observe the drawings

- Make the discussion on the drawing of their peers.

-Continue to ask all questions and other possible probing questions to learners until they discover and predict what they are going to study.

Answers to introductory activity

1. They improve their drawings by using program used to draw (**paint program**)
2. We are going to study Paint program

5.4. List of lessons

#	Lesson title	Learning objectives	Number of periods:7
1	Paint application: Definition and role	-Paying attention to typing errors. -Notice the use of special keys	1
2	Starting the Paint Activity	-Draw by free hand class and home objects. - Apply different colours to improve drawn objects. -Control the movement of the touchpad (mouse).	1
3	Paint window(environment)	-Draw and produce images for different objects. -Care for the use of special keys	2
4	Drawing using free hands	-Insert a comment on an image to make it more meaningful. -Draw and produce images for different objects.	1
5	Drawing Geometric shapes	-Improve the presentation of the image. -Resize and locate the image in the paint window. -Master drawing geometric shape seen in the class.	1
6	Assessment of unit 5		1

Teaching approach for each lesson

5.4.1. Paint application: Definition and role

a) Learning objectives

- Define paint application
- Notice the use of special keys
- Paying attention to typing errors.

b) Teaching resources

Textbook, xo laptop, blackboard, chalks, pens

c) Learning activities

Begin the lesson by discussing the definition and the role of paint application.

Tell the learners that Paint is an activity in Sugar Interface.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample questions of lesson assessment:

1. Define paint program

2. States two roles of paint program

Give learners activities in the Pupil's book on definition and roles of paint activity.

5.4.2. Starting the Paint Activity

a) Learning objectives

- Draw by free hand class and home objects.
- Apply different colours to improve drawn objects.
- Control the movement of the touchpad (mouse).

b) Teaching resources

Textbook, x0 laptop, blackboard, chalks, pens

c) Learning activities

Activity 1: Starting the Paint Activity

Ask the learners to carry out the activity by following the procedures given on page 92 of the Pupil's book.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample questions of lesson assessment:

1. How to start paint activity?

Give learners activities in the Pupil's book on starting the paint activity

5.4.3. Paint window (environment)

a) Learning objectives

- Care for the use of special keys.
- Draw and produce images for different objects.

b) Teaching resources

Textbook, x0 laptop, blackboard, chalks, pens

C) Learning activities

Start this lesson by showing Primary and Secondary Toolbars on the screen to the learners.

Primary Toolbar

Discuss the functions of the tools such as brush tool, shape tool, etc., available on the primary toolbar as given on page 93 of the Pupil's book.

Ask the learners to do **Activity 2** given on page 93 of the Pupil's book.

Activity 2: Practising Editing and Cropping an Image

Step 1: Ask the learners to take an image of market place from the Internet.

Step 2: Ask the learners to reduce its size with the help of crop tool, delete some of unwanted parts from it and change the colour of image.

Secondary Toolbar

Discuss the functions of the tools such as Edit tools, Brush tools, shapes, text tool, image editing etc., available on the secondary toolbar as given on pages 93–97 of the Pupil’s book.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample questions of lesson assessment:

1. Enumerate four Toolbar you know

Give learners activities in the Pupil’s book on editing and cropping an image.

5.4.4. Drawing using free hands

a) Learning objectives

- Insert a comment on an image to make it more meaningful.
- Draw and produce images for different objects.

b) Teaching resources

Xo laptop, Textbook, blackboard, chalks, pens

c) Learning activities

Ask the learners to draw pictures with free hands using drawing tools (pencil, eraser and bucket).

Ask them to carry out **Activity 3** given on pages 98–101 of the Pupil’s book.

Activity 3: Drawing a House with Free Hands

Ask the learners to draw picture of a house using drawing tools such as pencil, eraser and bucket by following the step-by-step procedure given on pages 98–101 of the Pupil’s book.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample questions of lesson assessment:

1. What is the tools used to color your image?

Give learners activities in the Pupil’s book on drawing a house with free hands.

5.4.5. Drawing Geometric shapes

a) Learning objectives

- Improve the presentation of the image.
- Resize and locate the image in the paint window.
- Master drawing geometric shape seen in the class.

b) Teaching resources

Textbook, xo laptop, blackboard, chalks, pens

c) Learning activities

Guide the learners to open Paint and select different shapes of tool and fill with color.

Guide the learners to carry out **Activities 4 and 5** given on pages 102–105 of the Pupil's book.

Activity 4: Drawing a Cartoon Using Shapes Tool

Ask the learners to draw a cartoon using shapes tool by following the step-by-step procedure given on pages 102–105 of the Pupil's book.

Activity 5: Drawing Images Using Geometric Shapes

Step 1: Ask the learners to draw an image of a school bus with the help of geometric shapes only.

Step 2: Ask them to fill colour in it with the bucket tool.

Comments on a Picture and Save, Close and Open an Activity

Start the lesson by asking the learners to add comments on a picture.

Ask the learners to carry out **Activities 6, 7, 8 and 9** given on pages 105–109 of the Pupil's book.

Comments on a Picture

Activity 6: Commenting on a Picture

Step 1: Ask the learners to go to home view and press F5.

Step 2: Ask them to select the Activity on which they want to comment.

Step 3: Ask them to type their comment about their activity. It will be automatically saved.

Activity 7: Commenting on Images (*Page 106 of Pupil's book*)

Step 1: Ask the learners to draw an image of hut in the forest with the help of geometric tools and free hand.

Step 2: Ask them to fill suitable colour in the image.

Step 3: Finally, ask them to write meaningful comment for the image.

Activity 8: Saving and Closing an Activity

Ask the learners to save and close an activity by following the procedure given on pages 107–108 of the Pupil's book.

Opening a Saved Activity

Activity 9: Opening a Saved Activity

Guide the learners to carry out the activity by following the procedure given on pages 108–109 of the Pupil’s book.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample questions of lesson assessment:

1. What are the steps followed to give comment to an image.

Give learners activities in the Pupil’s book on drawing geometric shapes.

5.5. Additional content for the teacher

5.5.1. Additional Information for the student (For the added content according to the Ministerial order)

5.5.2. Additional content for the teacher

Paint Activity allows the users to create paintings or drawings. It is a versatile Activity with many uses such as:

- Creating drawings or paintings,
- Creating images for inserting into Write documents,
- Creating slides for a Portfolio Activity slide show,
- Creating images for using in other Activities including Turtle Blocks and many more,
- Editing and cropping images made by other Activities including Turtle Blocks and many more,
- Editing and cropping screenshots (take screenshots with Alt+1),
- Editing and cropping photos taken with the Record Activity.

Note: Paint does not support sharing. You can use Turtle Blocks for collaborative drawing.

- III.** Match the following: **1. (e)** **2. (d)** **3. (b)** **4. (a)**
5. (c)

IV. Answer the following questions briefly:

1. The Paint Activity is used to draw, colour and edit pictures.
2. The Primary toolbar is located at the top of the screen.

Each toolbar contains a logically grouped set of buttons and controls, as the name on its corresponding tab suggests. Each of these sets represent a distinct editing or control context, called Secondary Toolbar.

3. (a) **Brush tool:** Brush tool is used for painting and editing image colour. The brush tool works like traditional drawing tools for applying colour.
(b) **Eraser:** This tool is used to erase areas of your picture or clipart.
(c) **Bucket:** This tool is used to fill the entire picture or an enclosed shape with colour.
(d) **Picker:** This tool is used to pick colour from other objects.
4. (a) Undo: Ctrl + Z (b) Redo: Ctrl + Y
(c) To go for the Home view: F5 (d) To close a Paint Activity: Ctrl + Q

5.7. Additional activities

a. Remedial Activities:

Questions

1. is an activity in Sugar Interface? (Paint/DOS)
2. Which tool is used to type text in your activity and change the format of text?

Answers

1. Paint
2. Text tool

b. Consolidation activities:

Questions

1. Copy command creates a duplicate of selected clip. (True/False)
2. How does brush tool work?

Answers

1. True
2. The Brush tool works like traditional drawing tools for applying colour.

c. Extended activities:

Questions

1. Which tool is used to pick colour from other objects?
2. what are the three purpose for paint?

Answers

1. Colour picker
2. Decoration, Protection and Ease of cleaning

UNIT 6: PROGRAMS FOR CHILDREN

6.1. Key unit competence

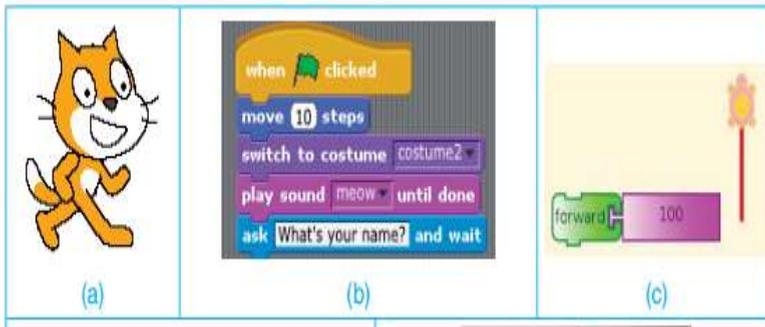
To design and construct geometric shapes in Turtle art activity and create animations using Scratch Activity

6.2. Prerequisites

Pupils will learn this unit better if they know basic programming languages such as Turtle Art and basic mathematical reasoning skills and problem solving skills.

6.3. Introductory activity and guidance

a) Introductory activity



1. Describe each images above
2. predict what you are going to learn

Answers to introductory activity

1. cartoon, Turtle commands
2. Programming for children

b) Guidance on the introductory activity

-Start the unit by helping the learners to observe the Screenshots.

- Make the discussion on the images.

-Continue to ask all questions and other possible probing questions to learners until they discover and predict what they are going to study.

6.4. List of lessons

#	Lesson title	Learning objectives	Number of periods:22
1	Turtle art and its main toolbar	-Identify different tools in the turtle art window.	2

		- Conceptualize the ICT contribution in the real life.	
2	Palettes tool bar of turtle	-Conceptualise the ICT contribution in the real life. -Describe different components of scratch window	2
3	Using turtle art instructions: Forward, back, left, right, arc, clean	- Construct and produce different geometric shapes using turtle art instructions. - Observe practice and organize the turtle art instructions correctly.	2
4	Drawing vertical, horizontal and oblique lines	- Associate different commands to develop animations. - Express the desire to draw more colourful drawings using turtle art commands.	2
5	Drawing square, rectangle and circle	-Practice and correctly manage the components of scratch window.	2
6	Save a document, close and open Turtle Art activity	-Outline the steps of saving and opening a project. -Explain how to save and open a file.	2
7	Components of Scratch window	-Practice and correctly manage the components of scratch window.	2
8	Object animations: Choosing new sprite from file and changing background	- Associate different commands to develop animations -Appreciate an animated object. -Pay attention on how to use command and make animations.	2
9	Object animations: Adding blocks to scripts and playing scripts	-Create and animate objects by arranging the instructions required in the proper sequence. -Pay attention on how to use command and make animations -Appreciate how to arrange commands and produce animations.	2

10	Save and open a project, close and open scratch activity	-Outline the steps of saving and opening a project. -Explain how to save and open a file.	2
11	Assessment of unit 6		2

Teaching approach for each lesson

6.4.1. Turtle art and its main toolbar

a) Learning objectives

- Identify different tools in the turtle art window.
- Conceptualize the ICT contribution in the real life.

b) Teaching resources

Xo laptop, Textbook, blackboard, chalks, pens

c) Learning activities

Discuss with the learners that Turtle Art program allows children to draw colorful and complex images.

Ask the learners to carry out **Activity 1** given on page 112 of the Pupil's book.

Activity 1: Starting up Turtle Art

The teacher should ask the learners to click on the Turtle icon in the Home View.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample question of lesson assessment:

1. Define Turtle Art

Give learners activities in the Pupil's book on starting up Turtle Art.

6.4.2. Palettes toolbar of turtle

a) Learning objectives

- Conceptualise the ICT contribution in the real life.
- Describe different components of scratch window

b) Teaching resources

Xo laptop, Textbook, blackboard, chalks, pens

c) Learning activities

Discuss with the learners, the elements of the Turtle Art window,i.e., the Main toolbar and the Palettes toolbar.

Ask the learners to read and discuss the tools of Main toolbar and Palettes toolbar.

Activity 2: Adding and Deleting Blocks

Step 1: Ask the learners to practise the method of adding a block by dragging it from

the palette to the main area.

Step 2: Ask them to practise the method of deleting a block by dragging it back onto the palette.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample question of lesson assessment:

1. Give 4 palettes toolbar

Give learners activities in the Pupil's book on adding and deleting Blocks.

6.4.3. Using turtle art instructions: Forward, back, left, right, arc, clean

a) Learning objectives

- Construct and produce different geometric shapes using turtle art instructions.
- Observe practice and organize the turtle art instructions correctly.

b) Teaching resources

Xo laptop, Textbook, blackboard, chalks, pens

c) Learning activities

Discuss with the learners the instructions they can use in Turtle Art as given on pages 118–119 of the Pupil's book.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample question of lesson assessment:

1. States two instructions you can use in Turtle Art.

Give learners activities in the Pupil's book on using Turtle Art instructions.

6.4.4. Drawing vertical, horizontal and oblique lines

a) Learning objectives

- Associate different commands to develop animations.
- Express the desire to draw more colorful drawings using turtle art commands.

b) Teaching resources

XO laptop, Textbook, blackboard, chalks, pens

c) Learning activities

Discuss with the learners how to use multiple blocks from the Turtle Palette, to draw horizontal lines, vertical lines and oblique lines. square, as given on pages 120 of the Pupil's book.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample question of lesson assessment:

1. What is the steps used to draw oblique line.

Give learners activities in the Pupil's book on drawing geometrical shapes using Turtle Art.

6.4.5. Drawing square, rectangle and circle

a) Learning objectives

-Practise and correctly manage the components of scratch window.

b) Teaching resources

Xo laptop, blackboard, chalks, pens ,Textbook,

c) Learning activities

Guide the learners to draw a square, a rectangle and a circle using Turtle Art as per the procedure given on pages 121–122 of the Pupil's book.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample question of lesson assessment:

1. What is the steps used to draw square.

Give learners activities in the Pupil's book on drawing geometrical shapes using Turtle Art.

6.4.6. Save a document, close and open Turtle Art activity

a) Learning objectives

-Explain how to save and open a file.
-Outline the steps of saving and opening a project.

b) Teaching resources

Xo laptop, Textbook, blackboard, chalks, pens

c) Learning activities

Ask the learners to save a document, close and open the Turtle Art Activity following the step-by-step procedure given on pages 122–123 of the Pupil's book.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample questions of lesson assessment:

1. What is the steps used to save a document.

Give learners activities in the Pupil's book on saving, closing and opening Turtle Art activity.

6.4.7. Components of Scratch window

a) Learning objectives

-Practise and correctly manage the components of scratch window.

b) Teaching resources

Textbook, x0 laptop, blackboard, chalks, pens

c) Learning activities

Discuss with the learners that Scratch is a fun programming language. It allows us to create games, stories and animation.

Ask the learners to carry out **Activity 3** following the procedures given on page 123 of the Pupil's book.

Activity 4: Getting Started Scratch Window

Ask the learners to go to the folder where they copied the Scratch

Ask them to double click the Scratch icon to get the Scratch Window.

Ask the learners to read the text given on pages 124–128 of the Pupil's book and then discuss the components of Scratch Window such as Command Palette, Toolbar, Script Pane, Stage Pane and Thumbnails Pane.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample question of lesson assessment:

1. What is the uses of scratch window?

Give learners activities in the Pupil's book on scratch window.

6.4.8. Object animations: Choosing new sprite from file and changing background

a) Learning objectives

- Associate different commands to develop animations.
- Pay attention on how to use command and make animations.
- Appreciate an animated object.

b) Teaching resources

Textbook, x0 laptop, blackboard, chalks, pens

c) Learning activities

Guide the learners to animate an object themselves by following the steps given on pages 128 of the Pupil's book.

Ask the learners to practice creating animations, using the steps of saving and opening a project in Scratch.

Ask the learners to practise choosing new sprite from file, changing the background, adding blocks to scripts, playing/executing scripts, saving a project,closing Scratch Activity and opening a project.

(a) Choosing New Sprite from File

Ask the learners to follow the steps given on page 128 of the Pupil's book to choose New Sprite from file.

(b) Changing the Background

Ask the learners to change the background of an object by following the step-by-step procedure given on page 128 of the Pupil's book.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample question of lesson assessment:

1. What is the steps used to choose new sprite from file?

Give learners activities in the Pupil's book on changing the background.

6.4.9. Object animations: Adding blocks to scripts and playing scripts

a) Learning objectives

- Create and animate objects by arranging the instructions required in the proper sequence.
- Pay attention on how to use command and make animations.
- Appreciate how to arrange command and produce animations.

b) Teaching resources

Textbook, xo laptop, blackboard, chalks, pens.

c) Learning activities

Ask the learners to carry out the activity by following the procedure given on pages 129–132 of the Pupil's book.

a. Playing/Executing Scripts

Ask the learners to play/execute Scripts as given on pages 132–133 of the Pupil's book.

b. Project

Guide the learners to save a project as per the steps given on pages 133–134 of the Pupil's book.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample question of lesson assessment:

1. What is the steps used to add block to the script?

Give learners activities in the Pupil's book on creating project by adding block to the script.

6.4.10. Save and open a project, close and open scratch activity

a) Learning objectives

- Outline the steps of saving and opening a project.
- Explain how to save and open a file.

b) Teaching resources

Textbook, x0 laptop, blackboard, chalks, pens.

c) Learning activities

Ask the learners to close Scratch Activity and open a project as per the procedure given on page 134 of the Pupil's book.

Activity 6: Creating and Animating a Sprite

Step 1: Ask the learners to create a sprite in the Scratch Window.

Step 2: Ask them to animate it by arranging the instructions required.

d) Lesson assessment and Conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Sample question of lesson assessment:

1. What is the steps used to save a project?

Give learners activities in the Pupil's book on creating and animating a sprite.

6.5. Additional content of student and teacher

6.5.1. Additional Information for the student

6.5.2. Additional content for the teacher

Some Popular Fun Programming Languages

There are five popular fun programming languages. These are:

Scratch

It is developed by the MIT Media Lab. It is a visual programming language for children age 6 and above. Scratch is available free of charge and runs on Mac, Windows, and Linux Operating System.



Alice

Alice is a free and open source 3D programming environment. With Alice, the learners drag and drop graphic tiles in order to animate an object and create a program. A variant of Alice, Storytelling Alice was developed by Caitlin Kelleher as a part of her doctoral work in Computer Science at Carnegie Mellon University.



Hackety Hack

Hackety Hack is an open source application that teaches the basics of programming in the popular Ruby language. Hackety Hack offers an interactive tutorial

that runs on Windows, Mac, and Linux operating systems.

Arduino

Arduino is an open-source electronics prototyping platform with both hardware and software components. Projects that use Arduino to introduce children to programming include a modification of Scratch to support simple programming on the Arduino hardware.

Lego Mind storms

One of the most popular toys in history, Lego may be best known for its brick-building. But Lego Mind storms also enables robotics-building. Like several of the tools on this list, Lego Mind storms has its roots at the MIT Media Lab.



6.6. End unit assessment

a) Guidance on End unit assessment

- **The end unit assessment is called “Unit Review Exercises” in the student book, at Page 136.**
- Request learners to answer all questions of the “Unit Review Exercises” during the time reserved to lesson of end unit assessment. If all questions cannot be completed in that time, request them to answer them during their self-study time or as homework.
- Mark their answers and keep records of every student’s achievements.
- Provide the remedial, consolidation and extended activities when necessary.

b) Answers for End unit assessment

I. Fill in the blanks with the correct options:

1. (a) 2. (b) 3. (a) 4. (d)
5. (b)

II. State whether the following statements are true or false:

1. True 2. True 3. True 4. False 5. False

III. Match the following:

1. (e) 2.(d) 3. (a) 4. (b)
5. (c)

IV. Answer the following questions briefly:

1. Scratch and Turtle Art are two popular programming languages for the kids.
2. Using Arc Command, you can draw a part of the circle. The angle is the part of

the circle the turtle draws.

3. Categories of Command Palette Motion, Looks, Sound, Pen, Control, Sensing operators and Variables.
4. (a) Using **Forward** command, you can move the turtle forward with the number of pixels entered.
(b) Using **Back** command, you can move the turtle backward with the number of pixels entered.
(c) Using **Left** command, you can change the turtle's direction to the left by a specified angle.
(d) Using **Right** command, you can change the turtle's direction to the right by a specified angle.

5. (a) To draw a horizontal line:

- Turn the turtle right 90 degrees.
- Then move the turtle forward 100 spaces.

(b) To draw a rectangle:

- Move the turtle forward 250 spaces.
- Then turn the turtle right 90 degrees.
- Move the turtle forward 500 spaces.
- Then turn the turtle right 90 degrees.
- Move the turtle forward 250 spaces.
- Then turn the turtle right 90 degrees.
- Move the turtle forward 500 spaces.
- Now the turtle comes to its original position and forms a rectangle.

6. To open a Scratch Activity:

Go to the folder where you copied the Scratch.

Double click the Scratch icon. You will see the Scratch Window.

V. Complete the following crossword puzzle using the clues below:

Across/Down

3. Turtle art

1. Scratch

4. Clean

2. Program

6.7. Additional activities

a. Remedial Activities:

Questions

1. Usingcommand, you can clean or clear the screen of all drawings. (clean/arc)

Answers

1.Clean

b. Consolidation activities:

Questions

1. Scratch is a fun programming language. (True/False)
2. Moves sprites and changes angles. (Motion/Clock)

Answers

1. True
2. Motion

c. Extended activities:

Questions

1. The... pane of scratch is called the Scripting Pane. (end/ middle)
2. Is a part of Programming language? (Turtle Art/Scratch)

Answers

1. Middle
2. Turtle Art

EXPERIMENTAL VERSION

UNIT 7: AIR, WIND AND SOUND

7.1. Key unit competence

To explain properties and importance of air and effects of wind as well as sound in surrounding environment.

7.2. Prerequisite

Learners will learn better this unit if they remember the content of unit four of primary two related to characteristic of air, importance of air, wind and its effects. Learners knows that clean air is a basic requirement of human respiration and well- being.

7.3. Introductory activity and guidance

A. Introductory activity

When we are at home, our parents always ask us to open our windows to allow in air. One day, my young sister started to cook in closed kitchen. She felt bad and needed to move out. When she reached outside she saw plants in the compound shaking and heard some different sounds.

- (1) Why is it necessary to keep our windows open during the day?
- (2) Suggest what happened to the young sister in a closed kitchen?
- (3) Mention any three sources of sound she might have heard outside.
- (4) Can you predict what we are going to learnt in this unit?

B. Guidance on the introductory activity

- D. Start by reading the scenario in the introductory activity to the learners.
- E. Ask them first question and allow them to think and suggest the answers
- F. Continue to ask all questions and other possible probing questions to learners until they discover and predict what they are going to study

C Answers for introductory activity questions

1. –in order to allow in enough air.
2. - breathing was becoming a problem
3. –cars , people, birds, airplanes, radios
4. air, wind and sound

7.4. List of lessons

#	Lesson title	Learning objectives	Number of periods: 16
1	Main Properties of air	-Identify properties of air - Appreciate the importanceof air and wind in our environment	1
2	Composition of air and use of air components	-Explain the composition ofair. -Design devises to get enough air in homes/classrooms	2

3	Dangers of components of air including Global warming	-Explain the dangers of components of air and how to prevent them - Design an experiment to identify the side effects of Carbon monoxide	2
4	Wind and its types	- Identify the types of wind - Compare the types of winds	1
5	Use of air and wind	- Explain the importance of air and wind in the environment	2
6	Dangers of wind	-Show concern for dangers brought by strong wind and how to overcome them. - Explain the dangers of wind and how to prevent them	1
7	Prevention of dangers of wind	-- Apply techniques of prevention of our environment from strong wind	2
8	Nature and production of Sound	- Explain the nature of sound. -Explain the sound propagation	1
9	Propagation, transmission, and reflection of sound	- Explain the sound propagation -Design and use a device showing that the sound travels through a medium	1
10	Sound, noise, and damaging effects of noise	-Distinguish sound from noise -Identify the damaging effects of noise on hearing system.	1
11	Protection of ears from noise	-Explain how to protect ears from noise - Be careful and avoid long exposure to harmful noise	1
12	Assessment of unit 7	Demonstrate the achievement of the key unit competence	1

7.4.1. Main Properties of air.

(a) Learning objectives

- Identify properties of air
- Appreciate the importance of air and wind in our environment

(b) Teaching resources

- Images showing composition of air, balloons, beam balance, electronic balance, syringe

(c) Learning activities

- Guide the learners to carry out Activities 2 (a) to 2 (c) given on pages 138–140 of the Pupil's book to discover the main properties of air.

Activity 2 (a): Exploring Properties of Air (Page 138 of Pupil's book)

Step 1: Arrange a few deflated balloons or ask the learners to bring some from their homes.

Step 2: Ask the learners to blow in the balloons with their mouth.

Step 3: Ask them to discuss and answer the following questions:

- What makes the balloon inflate? Explain why.

Step 4: Learners may reply that it is air that makes the balloon inflate.

Allow learners discuss and make presentation. In the same way, air causes football and bicycle tubes to inflate. What does this show?

The learners will reply that this shows that air occupies space.

Activity 2 (b): Exploring Properties of Air (Page 139 of Pupil's book)

Step 1: Provide materials to the learners such as a beam balance, two balloons of the same size and a string to carry out experiment

Step 2: The learners will blow the balloons.

Step 3: Ask them to tie their ends with string and place these on the two pans of the beam balance.

Step 4: Ask them to observe what happens.

Learners will observe the beam balance

Step 5: Ask them to burst one balloon and observe what happens.

Learners will observe that the pan that holds deflated balloon goes up and the other end goes down.

Step 6: Ask them what it shows.

Make the learners know that the inflated balloon goes down as it is heavy. It is heavy because it has air in it. This shows that air has weight.

Activity 2 (c): Exploring Properties of Air (Page 139 of Pupil's book)

Step 1: Ask the learners to bring a syringe.

Step 2: Guide them to pull the syringe and draw 10 mL of air.

Step 3: Ask the learners to cover its nozzle with their finger.

Step 4: Ask them to push the plunger down. Then ask them what they observe.

Step 5: Learners will reply that they are able to push plunger down to some extent.

Let the learners know that the air inside the syringe gets compressed to a certain extent. This shows that air can be compressed.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

After completion of Activities 2 (a), 2 (b) and 2 (c) given on pages 138–139 of the Pupil's book, the learners conclude that air has the following properties.

- (a) Air occupies space
- (b) Air has weight
- (c) Air can be compressed

7.4.2. : Composition of air and use of air components

(a) Learning objectives

- Explain the composition of air.
- Design devices to get enough air in homes/classrooms

(b) Teaching resources

Candle, beaker, glass jar, lighter, cockroach, potted plants, flasks, cotton wool, seeds

(c) Learning activities

Guide the learners to carry out Activity 3 given on page 140 of the Pupil's book.

Activity 1: Experiment on Composition of Air (Page 140 of Pupil's book)

Step 1: Allow learners to arrange a beaker, a candle and a glass jar.

Step 2: Ask the learners to fix the candle into beaker and pour water into it.

Step 3: Guide the learners to mark the initial level of water. let them light the candle and then cover the candle with a glass jar.

Step 4: Ask the learners to record their observations.

Step 5: Observe that the candle stops burning when it is covered with the jar and water rises up to fill the space.

Step 6: Guide the learners to understand that the candle extinguishes because the burning candle has used up the oxygen present inside the jar and the level of water rises to one-fifth of the glass jar because one-fifth of air is used up in the jar. This shows that oxygen is one-fifth of air.

Let the learners present their findings as: Nitrogen, Oxygen, Carbon dioxide, Argon and water vapor as composition of air.

Activity 2: Discussing the Use of Nitrogen (Page 141 of Pupil's book)

Step 1: Ask the learners to carry out the activity as per the procedure given on page 141 of the Pupil's book and present the findings to the class.

After the learners present their report, let learners know that if Nitrogen was not in air, everything would burn rapidly. Nitrogen prevents rapid burning.

(a) Oxygen (Pages 141– 143 of Pupil's book)

Activity 3(a): Exploring the Use of Oxygen (Page 141 of Pupil's book)

Step 1 Ask the learners to carry out the activity as per the steps given on page 141 of the Pupil's book.

Step 2. Let the learners know that the above activity shows that oxygen is used in respiration and is also necessary for burning/ combustion

Activity 3 (b): Exploring the Use of Oxygen (Page 142 of Pupil's book)

Ask the learners to carry out the activity as per the steps given on page 142 of the Pupil's book.

This activity shows that oxygen is necessary for respiration.

Activity 4 (c): Exploring the Use of Oxygen (Pages 142–143 of Pupil's book)

Ask the learners to carry out the activity as per the steps given on pages 142–143 of the Pupil's book

From these activities, the learners will conclude that Oxygen is used for:

- (a) Respiration
- (b) Plant germination
- (c) Combustion

(b) Argon (Page 144 of Pupil's book)

Activity 5: Exploring the Use of Argon (Page 144 of Pupil's book)

Ask the learners: "What does the picture show?"

Ask "Which gas is used in it?"

Let the learners know that Argon is used in light bulb.

(c) Carbon Dioxide (Page 144–146 of Pupil's book)

Activity 5(a): Exploring the Use of Carbon Dioxide (Page 144 of Pupil's book)

Ask learners the questions given in the activity.

Let learners know that plants use carbon dioxide to prepare food through a process known as photosynthesis.

Activity 5 (b): Exploring the Use of Carbon Dioxide (Page 145 of Pupil's book)

Step 1: Ask the learners to bring a brick or wide stone to the class.

Step 2: Lead the learners to the school playground.

Step 3: Ask them to cover some grass in the garden with a brick.

Step 4: Ask them to remove the brick after two days and observe the color of the covered grass.

Step 5: Ask them to observe the color of grass on every second day for a period of 10 days.

Step 6: Ask the learners to write their observation in their notebook and discuss their findings in the class.

Learners will observe that the grass covered with the stone cannot receive atmospheric carbon dioxide and light. So it is unable to prepare its food and becomes pale yellow. This shows that carbon dioxide is essential for green plants.

Activity 6 (c): Exploring the Use of Carbon Dioxide (Page 145 of Pupil's book)

Step 1: Ask the learners to observe the picture and answer the following questions:

- What does the picture show?
- Why does the drink fizz up?
- Which gas is used in its preparation

Step 2: Inform the learners that the drink fizzes up because carbon dioxide present in the soft drink bottle is quickly released upon opening the bottle.

This shows that carbon dioxide is used in industrial beverages.

Activity 5 (d): Exploring the Use of Carbon Dioxide (Page 146 of Pupil's book)

Step 1: Ask the learners to observe the picture and answer the following questions:

- What does the picture show?
- Which gas is used in the fire extinguisher?

Step 2: Let the learners know that carbon dioxide gas is used in fire extinguishers to put off fire

Let the learners know that carbon dioxide has the following uses:

- (a) Green plants use carbon dioxide to make their food.
- (b) Carbon dioxide is used for making industrial beverages.
- (c) Carbon dioxide is used in fire extinguishers to put the fire off.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

7.4.3: Dangers of components of air including Global warming

(a) Learning objectives

- Explain the dangers of components of air and how to prevent them
- Design an experiment to identify the side effects of Carbon monoxide

(b) Teaching resources

Charcoal stove, car, industries, glass jar, rats, burning candle, saucepan

(c) Learning activities

Support learners to discuss the dangers of air components such as carbon dioxide and water vapor as given on page 147 of the Pupil's book.

(a) Carbon Monoxide (Page 148 of Pupil's book)

Guide the learners to carry out Activity 8 given on page 148 of the Pupil's book to demonstrate danger of carbon monoxide gas.

Activity 1: Exploring the Dangers of Carbon Monoxide (Page 148 of Pupil's book)

Step 1: Help learners to get two rats put them in different jars

Step 2: Ask them to take another rat and keep it in the second jar.

Step 3: Ask them to place a burning candle in the second jar and cover both the jars with their lids.

Step 4: Ask them what difference they observe.

Learners will observe that the rat in the second jar gets unconscious. This is because the burning candle fills the jar with carbon monoxide. It shows that carbon monoxide is dangerous.

After completion of activity, the teacher should discuss with the learners that breathing carbon monoxide gas can cause headache, vomiting, nausea and loss of consciousness. Charcoal stoves are a source of carbon monoxide and thus one should never cook food inside a closed room.

Prevention from Global Warming (Page 149 of Pupil's book)

Discuss with the learners the steps to be taken to prevent global warming as given on page 149 of the Pupil's book

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

7.4.4: Wind and its types

(a) Learning objectives

- Identify the types of wind
- Compare the types of winds

(b) Teaching resources

- mosquito coil,
- images showing acts of wind
- wind mill
- clouds moving
- Winnower

(c) Learning activities

Ask the learners to carry out Activities 10 and 11 given on page 149 of the Pupil's book.

Activity 1: Discovering the Existence of Wind (Page 149 of Pupil's book)

Step 1: Let them arrange a candle and place the burning candle in the school veranda.

Step 2: Ask the learners what they observe.

Learners will answer that the candle flame is disturbed.

Step 3: Ask what makes the candle flame disturbed.

Learners will answer that moving air disturbs the flame.

The teacher should discuss with the learners that the moving air is called wind. It blows from a particular direction

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

7.4.5: Use of air and wind

(a) Learning objectives

- Explain the importance of air and wind in the environment

(b) Teaching resources

- winnower
- flying birds
- boats on water
- hanged clothes

(c) Learning activities

Guide learners to discuss on the activities on pages 150, 151, 152 pupils book and present to class members the importance or use of air and wind.

d) Lesson assessment and conclusion.

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

Possible responses from the discussion are

- it helps flying birds
- Drying of clothes
- for rain distribution
- for winnowing
- for breathing

7.4.6: Dangers of wind

(a) Learning objectives

- Show concern for dangers brought by strong wind and how to overcome them.
- Explain the dangers of wind and how to prevent them

(b) Teaching resources

- text books
- images showing destruction of wind

(c) Learning activities

Lead learners to discuss the dangers of wind on (Page 153 of Pupil's book) and carry out presentation to the class.

Ask the learners to add some more dangers to the list given on page 153 of the Pupil's book.

-Possible answers are

- Destruction of crops
- Strong winds can uproot the plants and electric poles.
- . It can damage our houses and other properties.

It can damage our crops.

On a stormy day, an airplane can lose its control and may crash.

Strong wind can make a boat sink

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

7.4.7: Prevention of dangers of wind

(a) Learning objectives

- Show concern for dangers brought by strong wind and how to overcome them.
- Explain the dangers of wind and how to prevent them

(b) Teaching resources

- images showing afforestation take place
- text books

(c) Learning activities

- Guide learners to discuss the activity on (Page 154 of Pupil's book)

Step 1: Ask the learners—What does the picture show?

Step 2: Ask them—Why does the boy plant trees around his house?

Let learners know that the boy plants trees around his house. He does so because trees block the wind speed and protect the house from damage.

Lead the discussion about the different ways to prevent dangers of wind

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

7.4.8: Nature and production of Sound

(a) Learning objectives

- Explain the nature of sound.
- Explain the sound propagation

(b) Teaching resources

- people
- birds
- radios
- airplanes
- drums
- whistle

(c) Learning activities

Guide the learners to carry out Activity given on pages 155–161 of the Pupil's book.

Differentiating Sources of Sound (Page 155 of Pupil's book)

Step 1: Ask the learners to go outside the class.

Step 2: Ask them to hear different sounds produced in their surroundings.

Step 3: Ask them to list the source of each sound they hear.

Step 4: Ask them to imitate these sounds.

Step 5: Thereafter, should guide them to ask their friends to tell what sound they are making.

After completion of the activity, let the learners know that sound is a form of energy and it comes from all around us such as from people talking, radios playing and airplanes flying.

(a) Sound Production (Page 155 of Pupil's book)

Discuss with the learners that sounds may be soft or loud, high or low, and pleasant or unpleasant. Still, all kinds of sounds are made in same way.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

7.4.9: Propagation, transmission, and reflection of sound

(a) Learning objectives

- Explain the sound propagation
- Design and use a device showing that the sound travels through a medium

(b) Teaching resources

- empty rooms
- bucking dog
- paper cups
- string

(c) Learning activities

Step1-Lead learners to discuss about sound propagation and transmission by guiding them to carry out Activities 24, 25(a), 25(b) and 25(c) given on pages 156, 157, 158, 159 of the Pupil's book

Step2-Allow the learners present their responses as:

Sound transmits through Solids, Air and Liquid

Echo is a reflected sound and echo happens when sound waves meets a cliff.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

7.4.10: Sound, noise, and damaging effects of noise

(a) Learning objectives

- Explain the sound propagation
- Design and use a device showing that the sound travels through a medium

(b) Teaching resources

- images showing damaging effects of noise
- text books

-grinding machines

(c) Learning activities

Should introduce this lesson by guiding the learners to carry out Activity 27 and 28 given on page 159 and 160 of the Pupil's book.

Step 1: Arrange a tuning fork, a hammer and a metal box.

Step 2: Ask one learner to strike the tuning fork with a hard object.

Step 3: Ask the learner to strike a hammer on a metal box and observe the sound it produces.

Step 4: Ask them whether they feel any difference.

Step 5: Ask them to discuss their observation in the class.

The teacher should discuss with the learners that the sounds which are pleasant to hear are pure or musical sounds. Musical sounds are produced by the regular vibrations. All musical instruments produce regular vibrations, for example, strings of guitar and violin.

The sounds which are unpleasant to hear are called noise. Irregular vibrations cause noise. Grinding machines and crackers produce noise.

(b) Damaging Effects of Noise (Pages 160–161 of Pupil's book)

Step 1. Lead the learners to nearby factory or a stone crusher

Step 2. Support them to recognize the type of sound produced

Step 3. Guide them to list the effects of such sounds to the environment.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

7.4.11: Protection of ears from noise

(a) Learning objectives

- Explain how to protect ears from noise
- Be careful and avoid long exposure to harmful noise

(b) Teaching resources

- ear muffs

(c) Learning activities

Step 1. Guide the learners to carry out Activity 29 given on page 161 of the Pupil's book. Put learners in small groups to discuss and present ways of protecting the ears from noise.

Activity: What are the ways of protecting the ears from noise?

Answers to the activity

- Stay away from noisy places.
- 2. Turn the volume down and get used to listening to quieter sounds.
- 3. Wear earmuffs.
- 4. Protect the ears of children those who are too young to protect their own.

5. Make people aware about the hazards of noise.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

7.5. Additional Information for the teacher

The teacher can demonstrate these activities in the class.

Activity A-1

Aim: To make a “Sound Gun”

You will need:

- A cardboard tube
- Matches
- A nail
- A dish
- Plastic wrap
- Some sand
- A birthday-cake candle

Procedure:

Take a cardboard tube and cover its both ends with plastic wrap. Ensure that the plastic is stretched tight. Using the nail make a small hole in the middle of the plastic at one end. Put some sand in the dish and stand the candle upright in the sand. Light the candle. Hold the “sound gun” so that the hole is about 2 centimetres away from the candle flame. Tap the plastic at the other end of the tube. What happens? to the flame? Try to explain your observations.



Activity A-2

Aim: To show reflection of sounds around

You will need:

- Two long cardboard tubes
- A ticking watch
- A wall

Procedure:

Hold a tube at an angle to the wall with the ticking watch at the other end. Ask a student to hold the other tube to his/her ear and aim it at the same spot on the wall as your tube is pointing. Can he/she hear anything?

What does this tell you about what is happening to the sound waves when they hit the wall?



7.6. End unit assessment/unit review exercises

A. Guidance to end unit assessment/unit review exercises

- The end unit assessment is called “unit review exercises the student book, Page...163–164 of Pupil's book
- Request learners to answer all questions of the “Revision activity” during the time reserved to lesson of end unit assessment. If all questions cannot be completed in that time, request them to answer them during their self-study time or as homework.
- Mark their answers and keep records of every student’s achievements.
- Provide the remedial, consolidation and extended activities when necessary.

ANSWERS TO THE END UNIT ASSESSMENT/ unit review exercises

I. Fill in the blanks with the correct options:

1. (a)
2. (a)
3. (b)
4. (b)
5. (a)

II. State whether the following statements are true or false:

1. True
2. False
3. True
4. False
5. True

III. Match the following:

1. (e)
2. (a)
3. (d)
4. (b)
5. (c)

IV. Answer the following questions briefly:

1. The main properties of air are: It occupies space, it has weight and it can be compressed.
2. Air is a mixture of various gases. It consists of the following gases:
Nitrogen 78%,
Oxygen 21%,
Rare gases like Argon 0.97%,
Carbon dioxide 0.03%.
Besides gases, dust particles, water vapor and smoke are also present.
3. (a) Uses of oxygen:
 - (i) It is essential for respiration.
 - (ii) It is also necessary for combustion or burning.(b) Uses of carbon dioxide:
 - (i) Carbon dioxide is useful for photosynthesis.
 - (ii) It is useful for making industrial beverages like soda water.
4. Different types of wind are light wind, breeze wind and storm wind.
5. The main uses of air and wind are:
Moving air helps the wheel of wind mill to generate electricity.
It helps the birds to fly in the sky.
It helps clouds to move for rain distribution.

Moving air helps to dry clothes.

6. When we shout near a hilly area, or in a big empty room a faint sound similar to the original sound is heard after some time. Sound hits the solid surface and reflects to the listener. This reflection of sound waves is called echo.

7. The following are the nature of sound wave:

Sound is a form of energy, just like electricity and light.

It is always produced by a source.

It needs a medium to travel. For example, sound travels in solid, liquid and gas.

Sound waves cannot be transmitted through vacuum.

Speed of sound varies in all three media.

8. To protect our ears from noise, we must:

Stay away from noisy places.

Wear earmuffs.

Turn the volume down and get used to listening to quieter sounds.

Keep ourselves away from noises caused due to fireworks.

Make people aware of the hazards of noise.



9. (a) Differences between breeze and storm

Breeze	Storm
Wind with soothing feeling on a warm day is called breeze. It blows at a certain speed.	When wind blows very fast, it is called storm. A storm can uproot trees and blow away temporary houses. It can also damage bird's nests, sheds, and crops. We must not go out of our homes during a storm.

(b) Differences between musical sound and noise

Musical Sound	Noise
The sounds which are pleasant to hear are pure or musical sounds. Musical sounds are produced by regular vibrations. All musical instruments produce regular vibrations, for example, strings of guitar and violin.	The sounds which are unpleasant to hear are called noise. Irregular vibrations produce noise. Grinding machine, hammer, motor vehicles and crackers produce irregular vibrations.

V. Complete the crossword puzzle using the clues below:

Across

2. Vibration
4. Echo
5. Wind

Down

1. Air
2. Vacuum
3. Oxygen

EXPERIMENTAL VERSION

7.7. Additional activities

A. Remedial Activities

1. Apart from oxygen, name other gases that make up air.
2. Write the percentage of the following gases.
 - (a) Oxygen
 - (b) Carbon dioxide
 - (c) Nitrogen
3. Write any two natural sources of sound.

Answers to the remedial activities

1. Rare gases, carbon dioxide, nitrogen
2. (a) 21%, 0.03%, 78%
3. Animals, water falls, thunder,

B. Consolidation activities

1. Explain any three importance of wind.
2. Outline the types of wind.
3. Discuss how you can prevent global warming.

Answers to the consolidation activities

1. –it dries our clothes
–sails boats on lake
–it distributes rain
2. –storm wind
–breeze wind
–light wind
3. Reduce fuel consumption
–Use solar or wind energy
–plant more trees

C. Extended activities

1. What is an echo?
2. Sound is....
3. Explain any two uses of oxygen
4. Outline the properties of air
5. What the two dangers of wind

Answers to the extended activities

1. Echo is a reflected sound
2. Sound is a form of energy.
3. –Oxygen supports burning
–Used for breathing
–supports germination
4. –Air has weight.
–Air occupies space

- Air can be compressed
- 5. -Destruction of crops
- Destruction of houses
- Airplanes fall down

EXPERIMENTAL VERSION

UNIT 8: SOIL

8.1 . Key unit competence: To choose good soil and prevent it from erosion

8.2 . Prerequisite

Learners will learn this unit better if they remember the content of unit five of primary three related to types of soil and erosion. Learners know that good soil supports plant life and soil health constitutes the foundation for the production of health food. We should therefore improve on soil fertility to support plant life.

8.3 . Introductory activity and guidance

A) Introductory activity

Soil health is the foundation of productive farming practices. One day Johan visited their garden to see how plants are doing. He found out that all crops were taken by running water and some available do not grow well.

- (1) What can Johan do to prevent their crops from being carried away??
- (2) How can they improve on their crops in order to grow well?
- (3) Can you predict what we are going to study from this unit?

B Guidance on the introductory activity

Start by reading the passage in the introductory activity to the learners.

Ask them first question and allow them to think and suggest the answers.

Continue to ask all questions and other possible probing questions to learners until they discover and predict what they are going to study

B. Answers for introductory activity questions

1. To carry out the preventive methods of soil erosion.
2. –adding manure/fertilizer.
-covering the soil with mulches.
- carrying out crop rotation
3. Soil.

8.4 List of lessons

#	Lesson title	Learning objectives	Number of periods:12
1	Definition and types of soil	-Define soil -Mention the types of soil	2
2	Composition of soil	-Identify the components of soil. -Describe the composition of soil.	2
3	Uses of soil	-Mention the uses of soil. -Demonstrate the uses of soil	1
4	Characteristics of fertile soil	-Explain the characteristics of fertile soil.	2

5	Soil erosion and its causes	-Define soil erosion and describe its causes.	1
6	Types of erosion	-Mention and write short notes on the types of soil erosion.	2
7	Prevention of erosion	-Identify methods and techniques of erosion prevention -Show concern to prevent soil erosion	1
8	Assessment of unit 9	Demonstrate the achievement of the key unit competence	1

8.4.1 . Definition and types of soil

(A) Learning objectives

- define soil
- Mention the types of soil

(b) Teaching resources

- Different samples of soil
- Clips showing causes and types of soil erosion including their prevention.
- Transparent jars, water.

(C) Learning activities

Step1- Support the learners to read the definition of soil given on page 166 of the Pupil's book

Step2-Guide learners to perform Activity 2 given on page 167 of the Pupil's book to observe different types of soil

Exploring the Types of Soil (Page 167 of Pupil's book)

Step 1: Support the learners to collect samples of soil from places like,lake side, farm and a construction site.

Step 2: Ask them to observe the color, size and the feel of different soil samples.

Step 3: Ask them to record their observations in Table 1 given on page 167 of the Pupil's book.

After completion of the activity, let the learners know that there are three main kinds of soil–Loam, Clay and Sand.

Support the learners to describe characteristics of the three types of soil as given on page 167 of the Pupil's book.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

8.4.2: Composition of soil

(a) Learning objectives

- Identify the components of soil.
- Describe the composition of soil.

(b) Teaching resources

- Dry garden soil, two jars, water, sticks

(c) Learning activities

Step1-Facilitate the learners to perform Activity 3 given on pages 167–168 of the Pupil's book.

Step2-Guide learners to carry out the activity by following the steps given on pages 167–168 of the Pupil's book.

Step3-After completion of the activity, support learners to know that soil has the following components:

1. Air
2. Moisture or water
Clay, sand, stones and humus

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

8.4.3: Uses of soil

(a) Learning objectives

- Mention the uses of soil.
- Demonstrate the uses of soil

(b) Teaching resources

- Samples of clay, sand and roam soil.
- Water, cylinder

(c) Learning activities

Step1-Guide the learners to carry out Activity 4 given on page 169 of the Pupil's book to investigate suitable use of each type of soil and make presentation to class.

After completion of the activity, support learners to know that each type of soil has a specific use.

Answers about the activity of which soil is suitable for making different shapes. Why?

- The clay soil is sticky when wet. So it is best for making shapes

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

8.4.4: Characteristics of fertile soil

(a) Learning objectives

-Explain the characteristics of fertile soil

(b) Teaching resources

-Three funnels, jars, water, clay soil, sand soil, roam soil, cotton wool

(c) Learning activities

Guide the learners to carry out activity 5 on page 170 of the pupil's book

Activity 5: Exploring the Characteristics of Different Types of Soil

(Page 170 of Pupil's book)

Step 1: guide the learners to carry out the activity as per the procedures given on page 170 of the Pupil's book.

Step 2: Learners will conclude that clay soil is suitable for cultivation as it has high water-holding capacity.

Step 3. Support learners to discuss the characteristics of fertile soil and make presentation to class.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

8.4.5: Soil erosion and its causes

(a) Learning objectives

-Define soil erosion and describe its causes.

(b) Teaching resources

-Images of different areas with soil erosion.

(d) Learning activities

Step1-Lead the learners to areas with soil erosion to observe

Step2-Support them to carry out discussion and make presentation to class about soil erosion and its causes.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

8.4.6: Types of erosion

(a) Learning objectives

-Mention and write short notes on the types of soil erosion

(b) Teaching resources

-images of different types of soil erosion

(c) Learning activities

Activity: Exploring the Types of Soil Erosion (Page 174 of Pupil's book)

Step 1: Help the learners to visit an area, where vegetation has been removed, after a heavy rainfall.

Step 2: ask them to observe the various types of soil erosion.

Step 3: Support them to make a list of types of soil erosion in their notebooks.

After completion of the activity, analyse with the learners the four types of soil erosion—Splash erosion, Sheet erosion, Rill erosion and Gully erosion.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

8.4.7: Prevention of erosion

(a) Learning objectives

- Identify methods and techniques of erosion prevention
- Show concern to prevent soil erosion

(b) Teaching resources

- Images of different soil erosion control

(c) Learning activities

Preventing Soil Erosion (Page 175 of Pupil's book)

Step 1: Guide the learners to observe the pictures given in the activity.

Step 2: ask the learners to suggest what they observe in each picture.

Support learner to discover discuss that Picture (A) shows Afforestation,

(B) shows Soil Cover, (C) shows Shelter Belts and (D) shows Terrace or Step Farming.

Guide them to discuss in detail these four methods of preventing soil erosion as given on pages 175–176 of the Pupil's book

Step3. Allow them to make presentation to class.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

8.5 Additional Information for the teacher

Demonstrate this activity in the class.

Activity A-1

Using compost to improve soil fertility.

Create small compost bags that the learners can observe using re-sealable plastic bags.

Put air holes in the bags. Ask the learners to fill the bags with moist soil and kitchen scraps. Close the bags up and observe for a few weeks, shaking them now and then. When the compost is ready, let the learners use it to grow plants of their own by adding seeds and watching them sprout.

WEB LINKS FOR CONTENT ENRICHMENT

<https://en.wikipedia.org/wiki/Soil>

ec.europa.eu

EXPERIMENTAL VERSION

8.6 . End unit assessment/ unit review exercises

A. Guidance to end unit assessment/unit review exercises

- The end unit assessment is called “unit review exercises “in the student book, at Page... (Pages 177–178 of Pupil’s book)
- Request learners to answer all questions of the “unit review exercises” during the time reserved to lesson of end unit assessment. If all questions cannot be completed in that time, request them to answer them during their self-study time or as homework.
- Mark their answers and keep records of every student’s achievements.

Provide the remedial, consolidation and extended activities when necessary

Answers to the end unit assessment/unit review exercises

I. Fill in the blanks with the correct options:

1. (b) 2. (b) 3. (b) 4. (c)

II. State whether the following statements are true or false:

1. True 2. False 3. False 4. True
5. False

III. Match the following:

1. (b) 2. (c) 3. (a)

IV. Answer the following questions briefly:

1. The top most layer of the earth’s surface is called soil.
2. Different types of soil are loam, clay and sand.
3. Soil contains air, water or moisture, clay, sand, stone, dead plants and animal remains.
4. (a) Loam contains good amount of humus. It is the best type of soil for plant growth.
(b) Clay is used for making bricks, toys, tiles, pottery and many other articles. Vegetables such as tomato and pepper grow well in this soil.
(c) Sandy soil when properly watered, is useful for some crops. Coconut, cash-peanut, dates and groundnut grow well in sandy soil. Sand is also used to make glass.
5. The three animals are rabbit, ant and earthworm.
6. Some characteristics of fertile soil are:
(a) It should have adequate amount of humus.
(b) It should have high water-holding capacity.

- (c) It should be well aerated.
7. Wind is an agent of soil erosion.

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8. Different types of soil erosion are:
 - (a) Splash erosion or raindrop erosion
 - (b) Sheet erosion
 - (c) Rill erosion
 - (d) Gully erosion
9. Three methods of preventing soil erosion are:
 - (a) Afforestation
 - (b) Soil cover
 - (c) Shelter belts

V. Complete the crossword puzzle using the clues below:

- | Across | Down |
|----------|---------|
| 2. Soil | 1. Loam |
| 4. Clay | 3. Sand |
| 5. Humus | |

8.7 Additional activities

A. Remedial Activities

1. What is afforestation?
2. Mention the types of soil
3. Outline any four components of soil
4. Explain two uses of soil.

Answers to remedial activities

1. Afforestation is the planting of trees where they have never been.
2. –clay, sand and loam soil.
3. –humus, moisture, living organisms, rock particles, air
4. –for growing of crops.
–for making shapes.
–home for some animals.

B . Consolidation activities

1. Mention the types of soil erosion
2. Explain how can we make soil fertile
3. Mention the causes of soil erosion

Answers to consolidation activities

1. splash erosion, sheet erosion, gully erosion, rill erosion
2. –adding manure, mulching the land, using crop rotation,
3. –Cutting down of trees
–poor methods of farming
–over stocking
–bush burning
–over grazing

C Extended activities

1. Mention the agents of soil erosion
2. Define soil erosion
3. What is deforestation

Answers to the extended activities

1. Wind, running water, animals
2. Is the taking away of top soil, or is the removal of top soil
3. Deforestation is the cutting down of trees on large scale.

Unit 9: ANIMALS

9.1 Key unit competence: To classify the animals according to their backbone, locomotion, feeding, reproduction, and respiration mode.

9.2 Prerequisite

Learners will learn better this unit if they remember the content of unit six of primary three related to characteristic of animals in terms of vertebrates and invertebrates. Learners know that animals are not the same.

9.3 Introductory activity and guidance

A) Introductory activity

John and Monica are pupils in primary four. One day they organised a trip to Akagera national park to observe different animals because they thought that animals are the same.

1. Why is it important to visit national park?
2. Mention some of the animals found in the national park
3. What can you say about the way animals reproduce in national park?
4. Can you predict what you are going to study

b) Guidance on the introductory activity

- Start the unit by reading the scenario in the introductory activity to the learners.
- Ask them first question and allow them to think and suggest the answers
- Continue to ask all questions and other possible probing questions to learners until they discover and predict what they are going to study

Answers for introductory activity questions

1. It is important because you can see different animals
2. Antelope, lions, zebra, rhinos, snakes, monkey, birds,
3. Some animals produce and others lay eggs.
4. This introduces us to unit of animals

9.4 List of lessons

#	Lesson title	Learning objectives	Number of periods: 14
1	Animal classification according to a backbone	-Name the major groups of animals -Describe the classification of animals according to backbone	2
2	Classes of vertebrates and class of mammal	-State the major classes of animals.	2
3	Birds	Describe the characteristics of birds	1
4	Fish	Draw and label the structure of fish	1
5	Reptile	-Explain the characteristics of reptiles	1
6	Amphibians	-Give examples of amphibians	1
7	Invertebrates	-Define the term invertebrates -Give examples of invertebrates	1
8	Animal classification according to respiration mode	-Give respiration mode of animals	1
9	Animal classification according to the locomotion mode	-Describe the different ways of animal locomotion	1
10	Animal classification according to the feeding mode	-Outline the feeding mode of animals	1
11	Animal classification according to their reproductive mode	-Show concern about protecting animals' lives in our environment as a way to maintain wild life	1
12	Assessment of unit 9	Demonstrate the achievement of the key unit competence	1

Teaching approach for each lesson

9.4.1: Animal classification according to a backbone.

(a) Learning objectives

- Name the major groups of animals
- Display awareness of social-economical role of animals in the society
- Describe the classification of animals according to backbone

(b) Teaching resources

- Visuals: Images showing different mammals, birds, reptiles, amphibians and fish
- text books

(c) Learning activities

- Guide learners to carry out Activity 1 given on pages 179–180 of the Pupil’s book.

Activity 1: Classifying Animals According to Backbone.

(Pages 179–180 of Pupil’s book)

Step 1: Help learners to observe the pictures of animals given on page 179 of the Pupil’s book.

Step 2: Support learners to group animals according to their backbone

Step3: Facilitate them to differentiate animals with backbone from those without backbone.

Step4. Encourage them to make presentation to class.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

9.4.2: Classes of vertebrates and class of mammals

(a) Learning objectives

- State the major classes of animals

(b) Teaching resources

- images of different vertebrates

(c) Learning activities

Help learners to do **Activity 2** given on page 180 of the Pupil’s book

Step 1: Guide learners to observe the pictures of animals given on page 180 of the Pupil's book and classify them according to their classes.

Step 2: Support learners to answer the following questions:

- (i) Are these animals vertebrates?
- (ii) What are their major characteristics?

Step 3: Guide learners to group these animals according to their major characteristics.

Support the learners to discuss the major characteristics of vertebrates as given on pages 180–181 of the Pupil's book. And make presentation for the five well-known classes of vertebrates:

Mammals, birds, reptiles, amphibians and fish.

(a) Mammals (Pages 181–183 of Pupil's book)

Ask the learners to do Activity 3 given on page 181 of the Pupil's book.

Activity 3: Carrying out Major Characteristics of Mammals (Page 181 of Pupil's book)

Step 1: Guide the learners to observe the pictures and answer the questions asked in the activity.

Cow (Pages 181–183 of Pupil's book)

Inform learners that cow is the best example of mammals.

Support learners to carry out Activities 4 and 5 given on pages 182–183 of the Pupil's book.

External Features of a Cow (Page 182 of Pupil's book)

Activity 4: Identifying External Body Parts of a Cow (Page 182 of Pupil's book)

Step 1: Help learners to identify the external body parts of a cow and label them in their notebook.

Internal Features of a Cow (Page 183 of Pupil's book)

Activity 5: Discussing the Functions of Internal Organs of a Cow
(Page 183 of Pupil's book)

Step 1: Guide learners to observe the internal organs of a cow, on a wall chart.

Step 2: Allow them to discuss the functions of each organ and present to the class.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

9.4.3: birds

(a) Learning objectives

-Describe the characteristics of birds

(b) Teaching resources

Hens,

Images of different birds

(c) Learning activities

(b) Birds (Pages 183–185 of Pupil's book)

Ask the learners to do Activity 6 given on page 183 of the Pupil's book

Activity 6: Discussing the Major Characteristics of Birds (Pages 183–184 of Pupil's book)

Step 1: Display the pictures of birds given on page 183 of the Pupil's book.

Step 2: for the learners to answer the following questions:

How do these animals make their young ones?

What is their body made up of?

What are these animals called?

-Support learners to take note of the characteristic features of birds as given on page 184 of the Pupil's book.

Hen (Pages 184–185 of Pupil's book)

Let the learners know that a hen is the best example of a bird.

External Features of a Hen (Page 184 of Pupil's book)

Activity 7: Identifying External Features of a Hen (Page 184 of Pupil's book)

Step 1: Ask the learners to identify the external body parts of a hen, label and discuss the function of the in their notebook.

Internal Features of a Hen (Page 185 of Pupil's book)

Step 1: Guide the learners to observe the internal organs of a hen on a wall chart.

Step 2: Ask them to discuss the functions of each organ.

Step 3: Ask them to make a report on it and present it to their class

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

9.4.4 Fish

(a) Learning objectives

-Draw and label the structure of the fish

(b) Teaching resources

-Text book

-image showing the fish structure

(c) Learning activities

Fish (Pages 185–187 of Pupil's book)

Ask the learners to carry out Activity 9 given on pages 185–186 of the Pupil's book.

Step 1: Get the real fish and show the learners or use the picture of a fish given on page 185 of the Pupil's book for learners to answer the following questions

Step 2: He should ask the following questions:

- (a) What does the picture show?
- (b) Where do fish live?
- (c) Write some characteristics of a fish.

Answers to the activity

- (a) The picture shows fish
- (b) The fish lives in water
- (c) It is cold blooded animals
It lays eggs

External Features of Tilapia (Pages 186–187 of Pupil's book)

Ask the learners to carry out Activity 10 given on page 186 of the Pupil's book.

Activity 10: Identifying External Features of Tilapia Fish (Page 186 of Pupil's book)

Step 1: Ask the learners to observe the picture and identify the external body parts of a Tilapia fish and label them in their notebook.

Step 2: Guide the learners to discuss the main external body parts of a Tilapia fish with their functions as given on page 187 of the Pupil's book.

Internal Features of Tilapia (Page 187 of Pupil's book)

Step 1: Guide the learners to observe the internal organs of a hen on a wall chart.

Step 2: Ask them to discuss the functions of each organ.

Step 3: Ask them to make a report on it and present it to their class

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

9.4.5: Reptile

(a) Learning objectives

Explain the characteristics of reptiles

(b) Teaching resources

-images of different reptiles

(c) Learning activities

(d) Reptiles (Pages 187–189 of Pupil’s book)

Guide learners to discuss the characteristics of reptiles, the internal and external features of snakes as given on pages 187–189 of the Pupil’s book.

Activity 11: Carrying out Major Characteristics of Reptiles (Page 187 of Pupil’s book)

-Support the learners to answer the following question

- (1) How do these animals move?
- (2) What is their body made up of?
- (3) What are these animals called?

After the learners present their views, inform the learners that animals are called reptiles and should discuss the characteristic features of reptiles as given on page 188 of the Pupil’s book.

Snake (Pages 188–189 of Pupil’s book)

Inform learners that a snake is the best example of a reptile.

External Features of a Snake (Page 188 of Pupil’s book)

Ask the learners to carry out Activity 12 given on page 188 of the Pupil’s book.

Activity 12: Identifying External Features of a Snake (Page 188 of Pupil’s book)

Step 1: Ask the learners to observe the picture and identify the external body parts of a snake and label them in their science notebook.

Internal Features of a Snake (Pages 188–189 of Pupil’s book)

Ask the learners to carry out Activity 13 given on page 188 of the Pupil’s book.

Step 1: Ask the learners to observe the internal organs of a snake given on page 188 of the Pupil’s book.

Step 2: Ask them to discuss the functions of each body part.

Step 3: Ask them make a report on it and present it to their class

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on

the performed activities or content learnt to assess the learning and summarize the content

9.4.6; Amphibians

(a) Learning objectives

Give examples of amphibians

(b) Teaching resources

Frogs

-images showing the amphibians

(c) Learning activities

(e) Amphibians (Pages 189–191 of Pupil’s book)

Guide learners to discuss the characteristics of Amphibians and the internal and external features of frogs as given on pages 189–191 of the Pupil’s book.

Step 1: Display the images to the learners of frog, toad and salamander given on page 189 of the Pupil’s book.

Step 2: Ask the following questions:

- (1) Where do these animals live?
- (2) What is their body made up of?
- (3) What are these animals called?

Answers to the questions

- (1) These animals live on land and in water
- (2) Their bodies are moist
- (3) They are called amphibians

Help learners to discuss the characteristic features of amphibians as given on page 189 of the Pupil’s book.

Let the learners know that a frog is the best example of an amphibian.

External Features of Frog (Page 190 of Pupil’s book)

Support learners to carry out Activity 15 given on page 190 of the Pupil’s book.

Activity 15: Identifying the External Body Parts of a Frog (Page 190 of Pupil’s book)

Step 1: Ask the learners to observe the picture and identify the external body parts of a frog and label them in their science notebook.

Step 2: guide learners to discuss the main external parts of a frog and their functions as given on page 190 of the Pupil’s book make presentation to the class

Internal Features of Frog (Pages 190-191 of Pupil’s book)

Guide learners to discuss the main internal body parts of a frog—heart, stomach and intestines—and their functions as given on pages 190–191 of the Pupil’s book and make presentations to the class

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer,

and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

9.4.7: Invertebrates.

(a) Learning objectives

- Define the term invertebrates
- Give examples of invertebrates

(b) Teaching resources

Real insects, worms,
Images of invertebrate's animals

(C) Learning activities

A. Invertebrates (Pages 191–193 of Pupil's book)

Activity 16: Classifying the Invertebrates According to their Major Characteristics
(Page 191 of Pupil's book)

Step 1: guide the learners to carry out the activity as per the procedure given on page 191 of the Pupil's book.

Step 2: Let learners know that about 97% of the animals are invertebrates.

Support learners to discuss the characteristics of invertebrates as given on page 191 of the Pupil's book.

Inform learners that organisms like Amoeba and earthworms and insects like grasshoppers, houseflies and butterflies are invertebrates.

Insects (Pages 192–193 of Pupil's book)

Ask the learners to carry out Activity 17 given on page 192 of the Pupil's book.

Activity 17: Carrying out the Characteristics of Insects (Page 192 of Pupil's book)

Step 1: Display the pictures of locust, butterfly and housefly given on page 192 of the Pupil's book.

Step 2: Ask them the following questions:

- (1) How many legs do these animals have?
- (2) How do they feed?
- (3) What are these animals called?

Answers to the questions

- (1) Insects have six legs
- (2) Some feed on grass
- (3) They are called insects.

Let learners know the examples of insects like a locust, housefly, butterfly, Bees and many more

Add more explanation on characteristics of insects as given on pages 192–193 of the Pupil's book.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

9.4.8: Animal classification according to respiration mode.

(a) Learning objectives

-Give respiration mode of animals

(b) Teaching resources

Images of different animals like fish, cow, man, insects, snake

(c) Learning activities

Step 1- Support learners to discuss different ways of breathing organs.

Step 2 - Guide learners to classify animals into various categories on the basis of their breathing organs.

(a) Animals Breathing through Lungs (Page 193 of Pupil's book)

Step 1 Display the pictures of bird, cat and human given on page 193 of the Pupil's book to discuss and make presentation

Step 2: Ask them following questions:

How do these animals breathe?

Can you name some other animals that breathe through lungs?

Support learners to know animals that breathe through lungs

(b) Animals Breathing through Gills (Page 193 of Pupil's book)

Inform learners that aquatic animals such as fish and tadpoles breathe through gills.

(c) Animals Breathing through Skin (Page 193 of Pupil's book)

Inform learners that some animals like earthworms and frogs breathe through their moist skin.

(d) Animals Breathing through Spiracles (Page 194 of Pupil's book)

Activity 19: Locating the Spiracles in Insects (Page 194 of Pupil's book)

Step 1: Ask the learners to take two insects (e.g., cockroach and locust) and two glasses of water.

Step 2: Ask them to dip one insect in water by its abdomen and the other one by its head.

Step 3: Ask them to keep these insects in water for about 5 minutes.

Step 4: Let them remove the insects from water after 5 minutes.

Step 5: Let them answer the following questions

(1) Which of these two insects died? Explain why?

Support learners to know that an insect breathes through spiracles. Learners will observe that the insect dipped in water by abdomen died. This shows that the spiracle of the insects are located near the abdomen.

Allow them suggest examples of animals that breathe through spiracles

Such as caterpillar, grasshopper, housefly and butterfly.

(e) Animals breathing through both Lungs and Skin
(Page 195 of Pupil's book)

Step 1: Display the pictures of a frog, a toad and a turtle given on page 195 of the Pupil's book. to observe and carry out discussions to make presentations

Step 2: Ask them the following questions:

How do these animals breathe?

Can you name some other animals that can breathe through lungs and skin?

Inform learners that animals breathe through both lungs and skin. When on land, an adult frog breathes through lungs. But it breathes through its moist skin, when it is under water

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

9.4.9: Animal classification according to the locomotion mode.

(a) Learning objectives

-Describe the different ways of animal locomotion

(b) Teaching resources

- Images of different animals in the environment

(c) Learning activities

Step 1: Lead learners to visit the school compound to observe different animals on how they locomote or make a trip to the national park

Step 2: Ask them to observe the movement of different animals like birds, lizards, rabbits, elephants and crocodiles.

Step 3: Ask them to make a report on it and present it to the class.

Inform the learners that the movement of animals is called locomotion and on the basis of locomotion, animals are classified into various groups.

Guide learners to classify animals according to their locomotion mode such as flying, crawling, jumping or hopping, walking and swimming as given on page 195 of the Pupil's book.

Support learners to carry out Activities 22 and 23 as per the procedure given on pages 197–198 of the Pupil's book.

Activity 22: Practising Animal's Walking (Page 197 of Pupil's book)

Step 1: Take learners outside classroom to role play about animal movement

Step 2: Ask them to put one foot forward keeping the other on ground.

Step 3: Ask them to move the second foot forward keeping the first one on ground.

Step 4: Discuss with the learners that this is how most animals move.

Step 5: Ask them to name other animals which move like this.

Discuss with the learners that animals like goat, dog and human can walk and run. They walk by putting one foot in front of the other on the ground.

Activity 23: Role Playing Locomotion Mode of Animals (Page 198 of Pupil's book)

help the learners to do this activity as per the instructions given on page 198 of the Pupil's book.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

9.4.10: Animal classification according to the feeding mode.

(a) Learning objectives

-Outline the feeding mode of animals

(b) Teaching resources

Cows, insects, cat, man, pig,

(c) Learning activities

Ask the learners to carry out Activity 24 given on pages 198–199 of the Pupil's book.

Activity 24: Grouping Animals According to the Feeding Mode
(Pages 198–199 of Pupil's book)

Step 1: Guide the learners to read and carry out the activity themselves.

Step 2: Support learners to classify animals according to their feeding mode such as Herbivores, Insectivores, Carnivores, Omnivores and Granivores as given on pages 199–200 of the Pupil's book.

9.4.11: Animal classification according to their reproductive mode.

(a) Learning objectives

-Outline the reproductive mode of different animals

-Show concern about protecting animals' lives in our environment as a way to maintain wild life

(b) Teaching resources

Image showing different reproductive mode of animals

(c) Teaching activities

Activity 25: Grouping Animals According to their Reproductive Mode
(Pages 200–201 of Pupil's book)

Step 1: Ask the learners to observe the pictures given on page 200 of the Pupil's book and answer the following questions:

- (1) Which animals lay eggs?
- (2) Which animals give birth to their young ones?
- (3) How do these animals reproduce?

Answers to the questions

- (1) Birds
- (2) Man, zebra, elephant, antelope, goat, sheep, cows, dogs, pigs and

Step2. Help learners to know that some animals like tigers, humans and dogs reproduce by giving birth to their youngones. Some other animals like hens, frogs and snakes reproduce by laying eggs

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

9.5.Additional Information for the teacher.

Make copies of this worksheet and provide the learners one copy each. Ask them to identify these animals and classify them into vertebrates and invertebrates.

EXPERIMENTAL VERSION

ANIMALS WORKSHEET



Cat



Ostrich



Snake



Turtle



Crab



Lizard



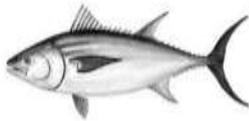
Star fish



Housefly



Mosquito



Tuna fish



Frog



Hen



Cow



Crocodile



Earthworm



Human

Vertebrates	Invertebrates

WEB LINKS FOR CONTENT ENRICHMENT

<http://www.mcwdn.org/Animals/Classification.html>

http://www.sheppardsoftware.com/content/animals/kidscorner/classification/kc_class_again.htm

<http://kids.sandiegozoo.org/animals/mammals>

9.6. End unit assessment/ unit review exercises

A. Guidance to end unit assessment/unit review exercises

- The end unit assessment is called unit review exercises “in the student book, Pages 202–203 of Pupil's book)
- Request learners to answer all questions of the “unit review exercises” during the time reserved to lesson of end unit assessment. If all questions cannot be completed in that time, request them to answer them during their self-study time or as homework.
- Mark their answers and keep records of every student’s achievements.

Provide the remedial, consolidation and extended activities when necessary

Solution to end unit assessment /unit review exercises

I. Fill in the blanks with the correct options:

- | | | |
|--------|--------|--------|
| 1. (a) | 2. (b) | 3. (b) |
| 4. (c) | 5. (b) | 6. (b) |

II. State whether the following statements are true or false:

- | | | |
|----------|----------|----------|
| 1. True | 2. True | 3. False |
| 4. False | 5. False | |

III. Match the following:

- | | | |
|--------|--------|--------|
| 1. (b) | 2. (a) | 3. (d) |
| 4. (e) | 5. (c) | |

IV. Answer the following questions briefly:

1. The animals having backbone are called vertebrates.
2. Five major classes of vertebrates are—mammals, birds, reptiles, amphibians and fish.
3. Lizard and snake
4. Gills
5. Earthworms and frogs

6. Tadpoles and fish
7. Grasshopper and housefly
8. Frog and salamander
9. Animals lacking backbone are called invertebrates.
10. Some properties of invertebrates are:
 - (a) They don't have backbones
 - (b) They cannot make their own food.
11. Insects have six legs, and they breathe through their spiracles.
12. Rodents

V. Complete the crossword puzzle using the clues below:

Across		Down	
3.	Herbivores	1.	Vertebrates
5.	Carnivores	2.	Granivores
		4.	Mammal

9.7. Additional activities

A. Remedial Activities:

Define

- a) Carnivores
- b) Insectivore
- c) Herbivores
- d) Granivores
- e) Omnivores

Answers to the remedial activities

- a) Carnivores are animals which feed meat only
- b) Insectivore are animals which feeds on insects only
- c) Herbivores are animals which feed on grass only
- d) Granivores are animals which feed on grains
- e) Omnivores are animals which feeds on plants and meat

B. Consolidation activities.

- (1) Mention the locomotive mode of animals in the environment.
- (2) Outline the animals which reproduce by giving birth.

Answers to the consolidation activities

- (1) Flying, walking, crawling, running, swimming.
- (2) man, cow, sheep, goat, antelope, hippo, dog, pigs

c. Extended activities

Complete the table below.

Flying animals	Walking animals	Running animals

Answers to the extended activities

Flying animals	Walking animals	Running animals
Weavers	man	Lion
pigeon	elephant	dog
Sun birds	sheep	rat

Unit 10: ANIMALS MANAGEMENT

10.1.Key unit competence

To explain and practice the rabbit keeping

10.2.Prerequisite

Learners will learn better this unit if they remember the content of previous unit of animals.

10.3.Introductory activity and guidance

A) Introductory activity (unit level)

Primary four wanted to rear animals at their school. One day they organised a trip to a certain farm to observe how different animals are managed.

- (1) Why is it important to visit many different farms?
- (2) Mention some of the animals found in the farms you visited?
- (3) Is it important to manage animals at school or at home?
- (4) Can you predict what you are going to study?

b) Guidance on the introductory activity

- Start the unit by reading the scenario in the introductory activity to the learners.
- Ask them first question and allow them to think and suggest the answers
- Continue to ask all questions and other possible probing questions to learners until they discover and predict what they are going to study

Answers to the introductory activity

- (1) To see and get courage on how animals are managed
- (2) Rabbits, goats, cows, sheep
- (3) To have meat, to sell and have money, to have skin
- (4) Animal management

10.4.List of lessons

#	Lesson title	Learning objectives	Number of periods 12
---	--------------	---------------------	----------------------

1	Conditions of good rabbit hutch	-Explain the condition good rabbits hutch	2
2	Characteristics of good rabbits	-Outline the characteristics of good rabbits to rear	2
3	Criteria for choosing rabbits to rear	Choose good rabbits to rear	1
4	Proper feeding of rabbits	-Practice the proper feeding of rabbits	2
5	Rabbit health	Maintain good health for the rabbits	1
6	Common diseases in rabbit	Outline the common diseases of rabbits	1
7	Importance of rabbit farming	-Describe the importance of rabbits	1
8	Assessment of unit 10	Demonstrate the achievement of the key unit competence	2

10.4.1: Conditions of good rabbit hutch

(a) Learning objectives

-Explain the condition good rabbit's hutch

(b) Teaching resources

-Images of different hutch

(c) Learning activities

Activity 1: Exploring the Conditions of a Good Rabbit Hutch (Page 205 of Pupil's book)

STEP 1: Arrange a field visit of the learners to a nearby rabbit farm and guide them to observe and note the different conditions necessary for a good rabbit hutch.

Step 2: Ask them to make a report on it and discuss in the class.

Step 3: Guide a group discussion among the learners.

After discussion, give an activity to make a model of a rabbit hutch.

Activity 2: Building a Model Rabbit Hutch (Page 206 of Pupil's book)

Step 1: Ask the learners to bring paper cartons, sticks and dry grass to build a model rabbit hutch.

Step 2: Ask the learners to place things that they think will be good for the rabbits.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the

content

10.4.2. Characteristics of good rabbits

(a) Learning objectives

- Outline the characteristics of good rabbits to rear
- Design a small scale rabbit keeping project

(b) Teaching resources

Images showing different types of rabbits

(c) Learning activities

Ask the learners to carry out Activity 3 given on page 206 of the Pupil's book.

Activity 3: Exploring the Characteristics of Good Rabbits (Page 206 of Pupil's book)

Step 1: Arrange a trip for the learners to visit a local rabbit farm.

Step 2: Ask the learners to observe the different characteristics of a good male and female rabbit.

Activity 4: Distinguishing a Male Rabbit from a Female Rabbit
(Page 207 of Pupil's book)

Step 1: Arrange a trip for the learners to a local rabbit farm.

Step 2: Ask the learners to observe the rabbits of opposite sexes.

Step 3: Ask the learners to compare their characteristics and make a report on it.

Thereafter, the teacher should discuss the ways in which a male rabbit is different from a female rabbit as given on page 207 of the Pupil's book

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

10.4.3. Criteria for choosing rabbits to rear

(a) Learning objectives

- Choose good rabbits to rear
- Distinguish male from female rabbit

(b) Teaching resource

Images showing different rabbits to rear

(c) Learning activities

Activity 5: Discussing the Criteria for Choosing a Rabbit to Rear (Page 207 of Pupil's book)

Step 1: Facilitate learners to visit a local rabbit farm.

Step 2: Ask the learners to discuss with the farm owner about criteria for choosing a rabbit to rear.

Step 3: Ask them to make a report on it and present it to the class.

Thereafter, help learners to know the different criteria to choose a rabbit to rear such as breeds, color and coat, age, health and environment

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

10.4.4: Proper feeding of rabbits

(a) Learning objectives

- Practice the proper feeding of rabbits
- Show interest in practising cuniculture

(b) Teaching resources

- Image showing different feeding methods

(c) Learning activities

Activity 6: Proper Feeding of Rabbits (Page 208 of Pupil's book)

Step 1: Take the class to a nearby rabbit farm.

Step 2: Ask the learners to observe the feeding and watering troughs.

Step 3: If they observe any trough which needs cleaning, they will ask the farm owner to clean the trough.

- Discuss with learners that rabbits feed on greenleafy vegetables, carrots, beetroots, turnips and pellets. Pellets are manufactured animal feed. Rabbits should also have a supply of water at all times which should be changed twice a day.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

10.4.5: Rabbit health

(a) Learning objectives

- Maintain good health for the rabbits
- Develop curiosity towards knowing more about rabbits' lives and that of other domestic animals

(b) Teaching resources

-Local rabbits

(c) Learning activities

Activity 7: Exploring the Measures that the Farm Worker Adopts to Keep the Rabbit Healthy (Page 209 of Pupil's book)

Step 1: Arrange to take the class to a local rabbit farm.

Step 2: Ask the learners to observe various measures that the farm workers adopt to keep the rabbits healthy.

Step 3: Ask the learners to make a report on it and present it to the class.
After the activity, the teacher should discuss with the learners the important sanitary measures that should be adopted to prevent health problems in rabbits as given on page 209 of the Pupil's book.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

10.4.6: Common diseases in rabbits

(a) Learning objectives

- Outline the common diseases of rabbits
- Identify the most common diseases of rabbits and their prevention

(b) Teaching resources

-pictures of different rabbits.

(c) Learning activities

Activity 8: Discussing the Common Rabbit Diseases (Page 209 of Pupil's book)

Step 1: Arrange to take the class to a local rabbit farm.

Step 2: Ask the learners to discuss with the farm owner about common rabbit diseases, their symptoms and prevention.

Step 3: Ask the learners to make a report on it and present it to the class.

Thereafter, let learners know that the common diseases of rabbits such as Coccidiosis, Ear Scabies, Tapeworms and Pneumonia along with their prevention and treatment techniques as given on pages 209–210 of the Pupil's book.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

10.4.7: Importance of rabbit farming

(a) Learning objectives

- Describe the importance of rabbits
- Point out the importance of practising rabbit farming

(b) Teaching resources

Charts showing different use of rabbits

(c) Learning activities

Activity 9: Discussing the Importance of Rabbit Farming

(Page 211 of Pupil's book)

Step 1: Ask the learners to discuss the importance of rabbit farming.

Step 2: Ask them to make a report on it and present it to their science teacher.

Thereafter, discuss with the learners the different purposes for which the rabbit is sold in the market as given on page 211 of the Pupil's book

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

10.5 Additional Information for the teacher

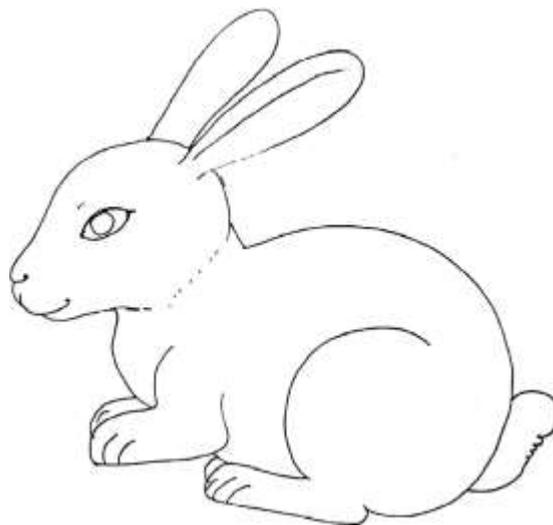
Make copies of this worksheet and provide the learners one copy each. Ask them to colour it and label its body parts.

ANIMALS MANAGEMENT WORKSHEET

Name:

Date:

1. Colour the rabbit and label its body parts.



This section provides additional content for the teacher to have a deeper understanding of the topic.

10.1 WEB LINKS FOR CONTENT ENRICHMENT

<http://www.wikihow.com/Build-a-Rabbit-Hutch>

<http://athomepets.weebly.com/the-rabbit-and-its-uses.html>

<http://www.instructables.com/id/Building-a-small-rabbit-hutch/>

10.6. End unit assessment/unit review exercises

A. Guidance to end unit assessment/unit review exercises

- The end unit assessment is called “unit review exercises “in the student book, (Pages **213 to 214 of Pupil’s book**)
- Request learners to answer all questions of the “unit review exercises” during the time reserved to lesson of end unit assessment. If all questions cannot be completed in that time, request them to answer them during their self-study time or as homework.
- Mark their answers and keep records of every student’s achievements.

Provide the remedial, consolidation and extended activities when necessary

Answers to the end unit assessment/unit review exercises

Answers to the end unit assessment/unit review activities

I. Fill in the blanks with the correct options:

1. (b)

2. (b)

3. (b)

II. State whether the following statements are true or false:

1. False
2. True
3. False
4. True
5. False

III. Match the following:

1. (d)
2. (c)
3. (b)
4. (a)

IV. Answer the following questions briefly:

1. Two conditions of a good rabbit hutch are:

(a) Hutches should be airy, dry and clean.

(b) Rabbits should have enough material to play with, such as small toys, pipes and ramps.

2. (a) The size of a female rabbit is larger than that of a male rabbit of the same age in the same breed.

(b) The round face in females is comparative to the block-like face in males.

(c) Old females have dewlaps but males haven't.

(d) Males are more defensive than females.

(e) Males produce more urine than females during the mating period.

3. We can select a rabbit to rear by checking its age and breed.

4. A rabbit feeds on green leafy vegetables, carrots, beetroots, turnip and pellets. Pellets are manufactured animal feed. They provide complete nutrition to the rabbit.

5. To keep a rabbit healthy:

(a) Clean the hutches or cages once in a week.

(b) Clean the feeding and watering troughs daily to avoid contamination.

6. Four common diseases of rabbits are Coccidiosis, Ear scabies, Tapeworm and Pneumonia.

7. Symptoms of ear scabies

(a) Brown scab inside the ear canal.

(b) Swelling and painful ear.

Prevention of ear scabies

(a) Isolate the affected rabbit.

(b) Keep the hutch clean.

8. Rabbit farming is important for two reasons:

(a) The meat of rabbits is sold for food.

(b) The fur of rabbits is made into wool and then woven into cloth.

9. We can use the skin of rabbit for making bags and gloves.

V. Complete the crossword puzzle using the clues below:

Across

3. Buck
4. Exotic

Down

1. Hutch
2. Doe

10.7. Additional activities

A. Remedial Activities

- (1) Name the diseases of rabbits
- (2) Explain the importance of rabbits
- (3) What name is given to female and male rabbits

Answers to the remedial activities

1. Coccidiosis, ear scabies, Tapeworm, Pneumonia
2. -The meat of rabbits is sold for food.
-The fur of rabbits is made into wool and then woven into cloth.
-We can use the skin of rabbit for making bags and gloves.

3. Male is buck and female is doe

B. Consolidation activities

- (1) Suggest any two criteria for choosing rabbits to rear.
- (2) Mention any two conditions of a good hutch

Answers to consolidation activities

1. -Those that grows very fast
-those provide a lot of meat

2. It must be clean
It must have open

C Extended activities

1. Pet rabbits live in(burrows/hutches)
2. A female rabbit is commonly known as a (doe/buck)
3. What does a rabbit feed on?
4. Name one common disease of rabbits.
5. Male rabbits are more defensive than females. (True/False)

Answers to the extended activities

1. Hutches
2. Doe
3. A rabbit feeds on green leafy vegetables, carrots, beetroots, turnips and pellets.
4. Coccidiosis

5. True

Unit 11: PLANTS

11.1.Key unit competence: To demonstrate stages of germination and establish the relationship between parts of plants and their function

11.2.Prerequisite

Learners will learn better this unit if they remember unit 6 of primary two about main parts of the plants and importance of plants to people.

11.3.Introductory activity and guidance

A) Introductory activity

Plants are living things. Animals cannot do without plants. One day Joe visited the forest to get some fruits to eat. He found out that most of plants were cut down.

- (1) Why is it important to take care of our plants?
- (2) Mention some of the plants we eat.
- (3) Do these plants have seeds?
- (4) How do these plants grow?
- (5) Can you predict what you are going to study?

B Guidance on the introductory activity

- Start the unit by reading the scenario in the introductory activity to the learners.
- Ask them first question and allow them to think and suggest the answers
- Continue to ask all questions and other possible probing questions to learners until they discover and predict what they are going to study

Answers to the introductory activity

- (1) We get food from plants
 - we get medicine from plants
 - we fire wood from plants
- (2) Mango plant, orange plant, maize plant, bean plant, tomato plant
- (3) Yes some plants have seeds.
- (4) Some grow from seeds, some from parts of same plants
- (5) plants

11.4.List of lessons

#	Lesson title	Learning objectives	Number of periods:12
1	Definition and conditions of germination	-Define germination. -Describe condition of germination	2
2	Types of germination	-Define the term germination	2

		-Outline the conditions of germinations	
3	Stages of germination	-Describe the stages of germination	2
4	Types of plants	-State the types of plants -Give examples of plants in our environment	2
5	Parts of the plant	-Locate the parts of the plant	2
6	Functions of parts of the plant	-State the function of each part of the plants to a plant	1
7	Assessment of unit 11	Demonstrate the achievement of the key unit competence	1

11.4.1: Definition and conditions of germination

(c) Learning objectives

- Define germination.
- Describe condition of germination

(b) Teaching resources

- Different plants
- Seeds, water, soil, containers, Containers, cotton, wool, cowpea seeds and a refrigerator
- Plastic jar, soil and water
- Seeds of maize and beans and transparent plastic pots.

(c) Learning activities

- Provide or ask learners to bring different types of seeds from their homes.
- Ask them to name the types of seeds they have brought from their homes.

Guide the learners to carry out Activity 1 given on page 215 of the Pupil's book.

Activity 1: Germination of Seeds (Page 215 of Pupil's book)

Step 1: Ask the learners to take some dry seeds and sow them in the school garden.

Step 2: Ask them to sprinkle water to keep the soil moist.

Step 3: Ask them to observe these daily for 3–4 days.

Inform learners that when seeds get enough air, water and light, they grow into new plants or seedlings.

Step 4: Let learners know that every seed needs certain favorable conditions to germinate.

Guide the learners to carry out Activity 2 given on pages 215–216 of the Pupil's book to demonstrate the conditions necessary for seed germination

**Activity 2: Experiment on Conditions Necessary for Germination
(Pages 215–216 of Pupil's book)**

Step 1: Ask the learners to collect four containers, cotton wool, some viable and non-viable cowpea seeds.

Step 2: Let them mark the four containers A, B, C and D as follows:

A with a dry cotton wool.

B, C and D with a moist cotton wool each.

Step 3: Ask them to place 3–4 viable (healthy) cowpea seeds at the top of the cotton wool in containers A, B and D and non-viable (unhealthy) seeds in container C.

Step 4: Let them place containers A, B and C in sufficient light and air.

Step 5: Ask them to place container D in the cupboard.

Step 6: Let them observe these containers daily for 3–4 days.

Step 7: Ask them to discuss their findings in the class.

After carrying out the activity, the learners conclude that oxygen, moisture and suitable temperature are the necessary conditions for viable seeds to germinate.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

11.4.2: Types of germination

(a) Learning objectives

- Define the term germination
- Outline the conditions of germinations

(b) Teaching resources

- Containers, cotton, wool, cow pea seeds and a refrigerator
 - Plastic jar, soil and water
- Seeds of maize and beans and transparent plastic pots

(c) Learning activities

- Ask the learners to carry out Activity 3 given on page 217 of the Pupil's book.

Activity 3: Identifying the Types of Germinations (Page 217 of Pupil's book)

Step 1: Ask the learners to observe the two pictures given on page 217 of the Pupil's book.

Step 2: Support the learners to explain what these diagrams represent and what Differences they observe in both diagrams

Inform learners that both pictures represent germination of seeds but of different types.

Let the learners know the two types of germination (epigeal and hypogeal) with examples

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

11.4.3: Stages of germination

(a) Learning objectives.

-Describe the stages of germination

(b) Teaching resources

-Different plants

-Seeds, water, soil, containers, cotton, wool, cowpea seeds and a refrigerator

Plastic jar, soil and water

Seeds of maize and beans and transparent plastic pots

(c) Learning activities

-Let the learners discuss the different stages of germination through Activity 4 given on pages 217–218 of the Pupil's book.

Activity 4: Identifying Main Stages of Germination (Pages 217–218 of Pupil's book)

Step 1: Ask the learners to take a small plastic jar and fill it with soil.

Step 2: Ask them to take a viable bean or a maize seed and place it in the soil of the jar.

Step 3: Let them keep the jar in a bright airy place.

Step 4: Ask them to sprinkle water every day and observe.

Note: Make sure that soil is always damp. The seed needs water to grow.

Step 5: Ask them to record their observations in their notebooks.

Thereafter, guide learners to record the four stages in the process of germination as given on page 218 of the Pupil's book.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

11.4.4: Types of plants

(a) Learning objectives.

-State the types of plants

-Give examples of plants in our environment.

(b) Teaching resources

-Different plant

(c) Learning activities

Ask the learners to carry out Activity 5 given on page 218 of the Pupil's book.

Activity 5: Sorting Plants into Trees, Herbs and Shrubs (Page 218 of Pupil's book)

Step 1: Lead learners on a nature walk.

Step 2: Ask them to observe various plants.

Step 3: Support them to collect information on different plants.

Step 4: Ask them to sort these plants into trees, herbs and shrubs.

After completion of the activity, allow learners discuss the characteristics of trees, shrubs and herbs along with their examples

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

11.4.5: Parts of the plant

(a) Learning objectives

-Locate the parts of the plant

(b) Teaching resources

-Different plants

-images of different plants

(c) Learning activities

Guide the learners to carry out Activity 6 on page 219 of the Pupil's book.

Activity 6: Identifying Different Parts of Flowering Plant.

Function for Each Part (Page 219 of Pupil's book)

Step 1: Organize a field visit to the areas surrounding the school.

Step 2: Ask the learners to uproot a small flowering plant and observe its various parts. (do not spoil many plants)

Step 3: Ask them to name these parts and discuss their functions in the class.

Inform the learners that a plant has many parts such as roots, stems, leaves, flowers and fruits.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

11.4.6: Functions of parts of the plant

(a) Learning objectives.

-State the function of each part of the plants to a plant

(b) Teaching resources

-Different plants

(c)-Learning activities

Step 1: Support learners to form small groups to discuss about the functions of different parts of the plant (page 220,221 and 222 of the pupil's book)

Step 2. Ask them to write findings and make presentation to class.

Step3: Guide them to take the summary about the function of parts of the plant on pages from 220-222 of the pupils book.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

11.5.Additional Information for the teacher

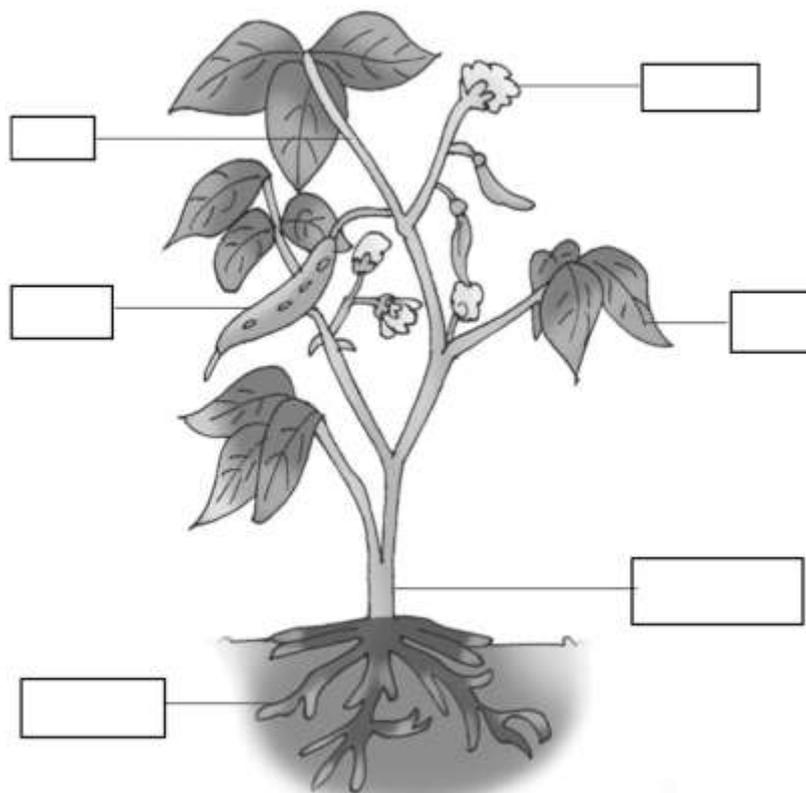
Make copies of this worksheet and provide the learners one copy each to test their knowledge , skills and understanding.

PLANT WORKSHEET

Name:

Date:

1. Observe this picture. Identify all its parts and label them.



WEB LINKS FOR CONTENT ENRICHMENT

<http://plantsinmotion.bio.indiana.edu/plantmotion/>

<http://study.com/academy/lesson/what-is-seed-germination>

<http://theseedsite.co.uk/germinating.html>

11.6. End unit assessment

A. Guidance on End unit assessment/ unit review exercises

- The end unit assessment is called “unit review exercises” in the student book, Page 224 to 225
- Request learners to answer all questions of the “unit review exercises” during the time reserved to lesson of end unit assessment. If all questions cannot be completed in that time, request them to answer them during their self-study time or as homework.
- Mark their answers and keep records of every student’s achievements.

Provide the remedial, consolidation and extended activities when necessary

Answers to the end unit assessment/unit review exercises

1. Fill in the blanks with the correct options:

1. (a) 2. (c) 3. (c) 4. (d)
5. (c)

2. Match the following:

1. 2. 3.

3. State whether the following statements are true or false:

1. True 2. False 3. False 4. True
5. True

i. Answer the following questions briefly:

1. When seeds get enough air, water and sunlight, they grow into seedlings. The growing of seeds into seedlings is called germination.
2. Two types of germination are: epigeal germination and hypogeal germination.
3. The hard, strong, and thick stems of a tree is called trunk.
4. Hibiscus and rose
5. Functions of roots:
 - a. Roots fix the plant into the soil.
 - b. They absorb water and minerals from the soil. Water and minerals are important for plants to grow healthy.
6. Cauliflower and broccoli
7. Functions of flowers:
 - a. Flowers turn into fruits.
 - b. They give off a sweet smell. So they are used to decorate houses and gardens.

Functions of fruits:

- c. Fruits protect the seeds.
- d. Fruits are a part of our diet.

ii. Complete the crossword puzzle using the clues below:

- | Across | Down |
|---------|----------|
| 2. Stem | 1. Shrub |
| 3. Tree | 2. Seed |
| 4. Herb | |

11.7. Additional activities

A. Remedial Activities

1. Name two types of germination.
2. Name a seed in which epigeal germination occurs.
3. Tall plants are trees. (True/False)
4. Give one example of a shrub.
5. Which part of the plant grows below the ground?

Answers to the remedial activities

1. Epigeal germination and hypogeal germination
2. Bean seed
3. True
4. Hibiscus
Root

B Consolidation activities

- (1) Mention any three examples of seeds
- (2) Outline the conditions for the seed to germinate.
- (3) Three examples of plants whose roots are eaten.

Answers to the consolidation activities

- (1) Orange seed, soybean seed, simsim seeds, mango seed, tomato seed
- (2) –Moisture, oxygen, warmth
- (3) Cassava plant, sweet potato plant, yam

C Extended activities:

- (1) Mention the types of plant
- (2) Name the parts of plant.
- (3) Explain the uses of plants to people.

Answers to the extended activities

- (1) Trees, shrubs, Herb
- (2) Leaves, stems, roots, flower, fruits
- (3) –Used for food.
–Used for medicine.
–Used as homes for the animals
–Used as materials for construction.

Unit 12: HUMAN SENSORY ORGANS

12.1.Key unit competence

To explain the structure, function and maintenance of the human sensory organs

12.2.Prerequisite

Learners will learn better this unit if they remember unit 8 of primary one about main body parts, uses of human body parts, unit 8 of primary two about sensory organs and their functions, ways of keeping sensory organs clean and unit 7 of primary three about the parts of the body.

12.3.Introductory activity and guidance

A. Introductory activity

The human body has different body parts which support one another to make a complete person. In a certain village, there was a man who had wounds on the skin, could not see well, as well as hearing. One day he visited a doctor to consult what was going on with him. A doctor told him that this is brought by not observing personal hygiene and not eating balanced diet.

- (1) What advise can you give to the person?
- (2) Which sensory organs are affected in the activity?
- (3) Can you name the sensory organ of the body we have to keep clean
- (4) Can you predict what we are going to study?

B .Guidance on the introductory activity

- Start the unit by reading the scenario in the introductory activity to the learners.
- Ask them first question and allow them to think and suggest the answers
- Continue to ask all questions and other possible probing questions to learners until they discover and predict what they are going to study

Answers to the introductory activity

- (1) Always to observe personal hygiene and eating balanced diet.
- (2) Eye, ear, skin
- (3) Eyes, nose, ear, tongue and skin.
- (4) Human sensory organs.

12.4.List of lessons.

#	Lesson title	Learning objectives	Number of periods:27
1	Functional mechanism of all sensory organs	- Explain the functional mechanism of the sensoryorgans -Discuss the functional mechanism of sensory organs	2
2	Structure, function, and	-Draw and label the structure of skin -Practice the maintenance of the skin	2

	maintenance of the skin	-Describe the structure of the skin	
3	Skin diseases, accidents, and accidents first aid	- Recognize some skindiseases. -Show concern to prevent skin diseases	2
4	Structure, function, and maintenance of the tongue	- Explain how to deal withs tongue accident -Draw the structure of tongue	2
5	Hygiene and care of the tongue	- State the different functions of tongue -Adopt the culture of promoting hygiene and care of the tongue	2
6	Tongue disorders and accidents	- Develop a habit of consultinga physician both for preventionand treatment of possible tongue diseases -Name the tongue disorders and accidents	2
7	Structure, function, and maintenance of the nose	- List the different parts of nose. -Discuss the structure, functions and maintenance of the nose.	2
8	Diseases of the nose and their causes	- Apply accurately various techniques of maintaining hygiene ofnose. -Name the diseases of the nose and their causes.	1
9	Prevention of nose diseases	- Develop an awareness of prevention against possible noseaccidents -Mention the preventive measures of nose diseases	1
10	Structure, function, and maintenance of the ear	- Draw and label the different parts of ears -Respect the functional mechanism of the ear.	2
11	Hygiene of the ear	- Apply accurately various techniques of maintaining hygiene ofears. -Show concern to the hygiene of the ear.	1
12	Diseases of the ear and their causes	- Identify the diseases of earsand their possible causes -Describe the diseases of the ear and their causes	1

13	Structure, function and maintenance of the eye	- Apply techniques of prevention from the most common eye defects. - Draw and label the structure of the eye.	2
14	Eye defects and their corrections	- Develop the habit of consulting a physician both for prevention and treatment of possible eye defects - Design the correction of the eye defects	2
15	Prevention of eye defects	- Apply techniques of prevention from the most common eye defects	2
16	Assessment of unit 12	Demonstrate the achievement of the key unit competence	1

12.4.1: Functional mechanism of all sensory organs

(a) Learning objectives

Explain the functional mechanism of the sensory organs

(b) Teaching resource.

Charts showing sensory organs

Clips showing human sensory organs and their functions.

Video showing parts of sensory organs.

Video showing the hygiene of each sensory organ

(c) Learning activities

Introduce the lesson by guiding the learners to carry out Activity 1 given on page 226 of the Pupil's book.

Activity 1: Research on Functional Mechanism of Sensory Organs
(Page 226 of Pupil's book)

Step 1: Support learners to research on the functional mechanism of all sensory organs from library or search engines like Google or Yahoo.

Step 2: Ask them to make a report on it and present it to the class.

Discuss with the learners the working of the sensory organs as given on pages 226 to 227 of the Pupil's book and make summary about functional mechanism of sensory organs

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

12.4.2: Structure, function, and maintenance of the skin.

(a) Learning objectives

- Draw and label the structure of skin
- Practice the maintenance of the skin

(b) Teaching resources

- Images showing the structure of the skin

(c) Learning activities

Support learners to know that the skin is the outer most covering of our body. It is the sensory organ for touch and feel.

Parts of Skin (Pages 227–228 of Pupil's book)

Guide the learners to carry out Activity 2 given on page 227 of the Pupil's book.

Activity 2: Identifying the Parts/Layers of Human Skin (Page 227 of Pupil's book)

Step 1: Ask the learners to use a hand lens to observe different types of skin:
on the head
in the palm of the hand
on the arm.

Step 2: Ask them to compare their findings with those of the other.

Step 3: Ask them to use the Internet to find out the numbers of layers in the skin and the functions of each layer.

After the activity, let the learners know that three layers of the skin: epidermis, dermis and hypodermis.

Functions of Skin (Page 228 of Pupil's book)

Ask the learners to carry out Activity 3 given on page 228 of the Pupil's book

Activity 3: Exploring the Function of Skin (Page 228 of Pupil's book)

Step 1: Ask the learners to run around their playground twice.

Step 2: Ask them to observe their skin and tell what is formed on their skin.

After the activity, inform the learners that the substance they see is sweat.

Properties of Skin (Page 228 of Pupil's book)

Put learners in groups to discuss about the properties of skin and make presentation to class.

Hygiene of Skin (Page 229 of Pupil's book)

Activity about the maintenance of the skin

Step 1: Guide them to form small groups

Step2: Support them to discuss about the maintenance of the skin

Step 3: Allow them to make presentation to the class.

Lead the discussion on ways to keep our skin clean.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

12.4.3: Skin diseases, accidents, and accidents first aid.

(a) Learning objectives

-Recognize some skindiseases

(b) Teaching resources

-images of different skin diseases

(c) Learning activities

Ask the learners to carry out Activity 4 given on pages 230–231 of the Pupil’s book.

Activity 4: Exploring the Common Skin Diseases (Pages 229–230 of Pupil’s book)

Step 1: Ask the learners to observe the pictures given in the activity.

Step 2: Ask them what these pictures show.

Step 3: Ask the learners to search information on some common skindiseases in library books or from the search engines like Google and Yahoo.

Step 4: Ask them to make a report and discuss on it.

Thereafter, ask the learners to read the content on common skin diseases given on pages 229–230 of the Pupil’s book and discuss the symptoms of each disease.

Skin Accidents and First Aid (Pages 231–232 of Pupil’s book)

Ask the learners to carry out Activities 5 and 6 given on pages 231–232 of the Pupil’s book.

Answers to the activity 4 question one on page 230 of the pupils book

- a) Ring worm
- b) Eczema
- c) Scabies

Leprosy

Activity 5: Exploring the Skin Accidents (Page 231 of Pupil’s book)

Step 1: Ask the learners to observe the pictures given on page 231 of the Pupil's book.

Step 2: Ask them to tell what these pictures show.

Step 3: Ask them to tell the causes and signs of each skin accident.

Let learners know the common skin injuries such as wounds, bruises, burns, scalds and that the first aid interventions is required for each type of skin injury.

Answers to the activity 5 question one on page 231 of the pupils book

- a) Wounds
- b) Bruises
- c) Burns

Activity 6: Role Playing a Skin Accident (Page 232 of Pupil's book)

Step 1: Ask the learners pretend that one of their friends has a skin accident with severe wounds on his/her skin. What would you do?

Step 2: make a pair of two learners each. One learner will act as a victim. The other learner will provide him/her necessary first aid

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

12.4.4: Structure, function, and maintenance of the tongue.

(a) Learning objectives

- Explain how to deal with tongue accident
- Draw the structure of tongue

(b) Teaching resources

- Common salts, sugar, mirror, water, tongue scraper
- images showing different tongue.

(c) Learning activities

Introduce the lesson by guiding the learners to carry out Activity 7 given on page 232 of the Pupil's book

Activity 7: Identifying the Parts of the Tongue (Page 232 of Pupil's book)

Step 1: Ask the learners to look in a mirror and observe their tongue.

Step 2: Ask them to discuss their findings in the class.

Parts of Tongue (Page 233 of Pupil's book)

Activity 8: Tasting Food Samples (Page 233 of Pupil's book)

Step 1: Arrange for different food samples that are sweet, salty and sour.

Step 2: Guide the learners to use a toothpick and place each of the samples on different parts of the tongue at once.

Step 3: Ask them to observe and find out which part of the tongue can detect which taste.

-Inform learners about the taste buds present in different areas of the tongue. These buds help us to taste salt, sugar and lemon.

Functions of Tongue (Page 233 of Pupil's book)

Activity 9: Exploring the Functions of a Tongue (Page 233 of Pupil's book)

Ask the learners to carry out the activity as per the steps given on page 233 of the Pupil's book.

Discuss with the learners the different functions of tongue and allow them present to the class

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

12.4.5: Hygiene and care of the tongue

(a) Learning objectives

-Describe the maintenance of the tongue

- State the different functions of tongue

(b) Teaching resources

-Water, tongue scraper,

(c) Learning activities

Activity 10: Discussing the Hygiene of Tongue (Page 234 of Pupil's book)

Step1. Ask the learners to carry out the activity as per the steps given on page 234 of the Pupil's book.

Step2 After the activity, discuss with the learners the importance of keeping our tongue clean.

Proper Method of Cleaning Tongue (Page 234 of Pupil's book)

Let learners know that the proper method of cleaning tongue as given on page 234 of the Pupil's book

Activity11: Taking care of the tongue.

Step1: Ask learners to form small groups.

Step2: Guide them to discuss about the care of the tongue.

Step3: Allow them to make presentation to the class.

(d) **Lesson assessment and conclusion**

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content.

12.4.6: Tongue disorders and accidents

(a) **Learning objectives**

- Develop a habit of consulting a physician both for prevention and treatment of possible tongue diseases

(b) **Teaching resources**

Mirror, images showing different disorders of the tongue

(c) **Learning activities**

Activity 11: Identifying Common Tongue Disorders (Page 234 of Pupil's book)

Ask the learners to carry out the activity as per the steps given on page 234 of the Pupil's book.

After the activity, inform learners that sore, swelling of tongue, black hairy tongue, loss of sense of taste, the disorders of the tongue etc., their causes and prevention techniques.

Tongue Accident (Page 235–236 of Pupil's book)

Activity 12: Identifying Tongue Accidents (Page 235 of Pupil's book)

Ask the learners to carry out the activity as per the steps given on page 235 of the Pupil's book.

After the activity, inform the learners some tongue accidents such as tongue bite, burn of tongue, their causes and signs

(d) **Lesson assessment and conclusion**

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

12.4.7: Structure, function, and maintenance of the nose

(a) **Learning objectives**

- List the different parts of nose.
- Draw the structure of the nose
- Describe the maintenance of the nose.

(b) **Teaching resources**

- Image showing the structure of the nose
- Cotton wool, perfume

(c) Learning activities

Introduce the lesson by guiding the learners to carry out Activity 13 given on page 236 of the Pupil's book.

Activity 13: Exploring the Uses of Nose (Page 236 of Pupil's book)

Step 1: Ask the learners to spray perfume into a cotton wool and leave it in one corner of the room.

Step 2: Ask them to wait for a few minutes and then call their friends in. Do the friends smell something?

Step 3: Ask them to name the organ which helped to smell the perfume.

After the activity, the learners should know that the nose is the sensory organ for smell. It picks up air when we breathe in.

Activity 14: Identifying the Parts of a Human Nose (Page 237 of Pupil's book)

Step 1: Ask the learners to draw the diagram given in the Pupil's book in their science notebook.

Step 2: Ask them to identify all its parts and label them.

After the activity, learners should tell the different parts of nose such as nostrils and nasal cavity and their functions.

Functions of Nose (Page 237 of Pupil's book)

The teacher should introduce the functions of nose through Activity 15 given on page 237 of the Pupil's book.

Activity 15: Discovering the Function of Nose (Page 237 of Pupil's book)

Step 1: Ask the learners to hold their nose tight.

Step 2: Ask them what they feel and why.

After the activity, tell the learners that they will feel uneasy.

This is because the nose helps us to breathe. Also it helps us to smell.

Hygiene of Nose (Page 238 of Pupil's book)

Introduce the topic through Activity 16 given on page 238 of the Pupil's book.

Activity 16: Discussing the Hygiene of Nose (Page 238 of Pupil's book)

Step 1: Guide the learners to discuss the following questions in groups:

(i) How often do you clean your nose?

(ii) Why is it essential to keep the nose clean?

Step 2: Ask them to make a report on it and present to the class.

After the activity, learners should know the importance and the ways of proper nose care.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

12.4.8: Diseases of the nose and their causes

(a) Learning objectives

- Mention the diseases of the nose
- Apply accurately various techniques of maintaining hygiene of nose

(b) Teaching resources

- charts showing different nose diseases

(c) Learning activities

Use Activity 17 given on pages 238–239 of the Pupil's book to introduce the lesson diseases of the nose.

Activity 17: Identifying Common Nose Diseases (Pages 238–239 of Pupil's book)

Step 1: Ask the learners to discuss and answer the given questions.

After the activity, the teacher should discuss with the learners the common nose diseases such as common cold and sinusitis and their causes.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

12.4.9: Prevention of nose diseases

(a) Learning objectives

- State different ways of preventing nose diseases.
- Develop an awareness of prevention against possible nose accidents

(b) Teaching resources

- charts showing different nose disease.

(a) Learning activities

Discuss with the learners the measures that should be taken to prevent nose diseases as given on page 239 of the Pupil's book.

Accidents of Nose (Page 240 of Pupil's book)

Discuss with the learners the common nose injuries, their causes and the first aid methods in case of broken nose as well nosebleed as give onpage 240 of the Pupil's book

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

12.4.10: Structure, function, and maintenance of the ear

(a) Learning objectives

- Draw and label the different parts of ears.
- Describe the maintenance of the ear.

(b) Teaching resources

- Charts showing the structure of the ear.

(c) Learning activities

Step1. Ask the learners to perform Activity 18 given on page 240 of the Pupil's book.

Activity 18: Exploring the Importance of Ears (Page 240 of Pupil's book)

Step2 Guide the learners to carry out this activity as per the procedure given on page 240 of the Pupil's book.

Step3. After the activity, learners should know that ears are our sensory organs of hearing.

Parts of Ear (Pages 241–242 of Pupil's book)

Ask the learners to perform Activity 19 given on page 241 of the Pupil's book.

Activity 19: Identifying the Parts of a Human Ear (Page 241 of Pupil's book)

Ask the learners to perform this activity themselves.

Let learners know that the three major parts of ear are; the outer ear, the middle ear and the inner ear.

- Ask the learners to draw the structure of the human ear

Functions of Ears (Page 243 of Pupil's book)

Guide learners to discuss the specific functions of the ears as:

- for body balance
- for listening OR hearing

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

12.4.11: Hygiene of the ear

(a) Learning objectives

- Apply accurately various techniques of maintaining hygiene of ears

(b) Teaching resources

Soft ear pads, clean water,

(c) Learning activities

Ask the learners to perform Activity 20 given on page 243 of the Pupil's book.

Activity 20: Discussing the Hygiene of Ears (Page 243 of Pupil's book)

Step 1. Ask the learners to perform this activity on their own.

Step 2. Ask them to make a report on it and present to the class.

Activity 21: Discuss the steps taken when cleaning the ear.

Answers to the activity 21

- a) Clean the ear with extra care
- b) Do not clean your ear with sharp pointed objects
- c) Going to the hospital for cleaning the wax in case they accumulate.
- d) Wear hearing protection when sound is too much.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

12.4.12: Diseases of the ear and their causes

(a) Learning objectives

- Identify the diseases of ears and their possible causes

(b) Teaching resources

- Charts showing ear disease infection

(c) Learning activities

- Ask the learners to perform Activity 21 given on page 243 of the Pupil's book.

Activity 21: Identifying Diseases of Ears (Page 243 of Pupil's book)

Hearing Loss and Deafness (Pages 244–246 of Pupil's book)

Inform the learners that the common ear diseases such as hearing loss and deafness, their types, their causes and their cures as given on pages 244–246 of the Pupil's book.

Conductive Hearing Loss (Page 244 of Pupil's book)

Activity 22: Identifying Causes of Conductive Hearing Loss (Page 244 of Pupil's book)

Step 1: Ask the learners to observe the picture given on page 244 of the Pupil's book.

Step 2: Ask them to tell what the child is doing.

Step 3: Ask them to tell whether it is safe to enter foreign materials into the ears.

Step 4: Ask them to explain the reason of their answers.

After the activity, explain to learners that it is unsafe to enter foreign materials such as matchstick into the ears. It may lead to conductive hearing loss.

Sensory Hearing Loss (Page 245 of Pupil's book)

Activity 23: Identifying Causes of Sensory Hearing Loss (Page 245 of Pupil's book)

Step 1: Guide learners to observe the two pictures given on page 245 of the Pupil's book.

Step 2: Ask them to tell what difference they observe between the two pictures.

Step 3: Ask them to tell what happens when a child hears loud noises every day.

After the activity, explain to learners that in the first picture, the child is hearing loud noise coming from vehicles and speakers. If he hears such loud noise for a long time he may suffer from sensory hearing loss.

Discuss what sensory hearing loss is and its other causes.

Deafness (Pages 245–246 of Pupils book)

Discuss with the learners the deafness, its types, causes and prevention as given on pages 245–246 of the Pupil's book

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

12.4.13: Structure, function and maintenance of the eye

(a) Learning objectives

Apply techniques of prevention from the most common eye defects

(b) Teaching resources

-images showing the human eye

-face to face looking

(c) Learning activities

Guide the learners to perform Activity 24 given on page 247 of the Pupil's book.

Activity 24: Observing the Structure of Eyes (Page 247 of Pupil's book)

Step 1: Ask each learner to choose a partner and face each other.

Step 2: Ask them to look into the eyes of their partners closely.

Step 3: Ask them to describe structure and make presentation to class referring to the given description below

The eyes are organs of sight. We have a pair of eyes.

The eyes are located in the bony cavities of the skull.

They are protected by the eyelids and eye lashes.

Parts of an Eye (Pages 247–249 of Pupil's book)

Support the learners to carry out Activity 25 given on page 247 of the Pupil's book.

Activity 25: Identifying Different Parts of a Human Eye (Page 247 of Pupil's book)

Step 1: Ask the learners to draw the picture of an eye in their exercise book.

Step 2: Ask the learners to identify and label all its parts

Answers to the activity 25 on page 247 of the pupils book

1. Sclera
2. Posterior chamber
3. Cornea
4. Pupils
5. Iris
6. Ciliary body
7. Choroid
8. Retina
9. Optic nerve
10. White of the eye.

Layers of an Eye (Pages 247–249 of Pupil's book)

Discuss with the learners the three concentric layers of eyes as given on pages 247–249 of the Pupil's book.

Chambers of an Eye (Pages 248–249 of Pupil's book)

Discuss with the learners the three chambers of eyes—Anterior chamber, Posterior chamber and Vitreous chamber as given on pages 248–249 of the Pupil's book.

Functions of Eyes (Page 249 of Pupil's book)

Support the learners to carry out Activity 26 given on page 249 of the Pupil's book.

Activity 26: Exploring the Functions of Eyes (Page 249 of Pupil's book)

Step 1: Ask the learners to blindfold one of their friends.

Step 2: Ask them to put different objects in front of him/her.

Step 3: Ask whether their friend is able to see the things. Why?

Let learners know that, the blindfolded pupil cannot see the things because it is the eyes that help us to see

Activity 27: Practicing the maintenance of the eye.

Step 1: Group learners into small groups.

Step 2: Guide them to discuss on the maintenance of the human eye.

Step 3: Support them to make representation to class.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

12.4.14: Eye defects and their corrections

(a) Learning objectives

-Develop the habit of consulting a physician both for prevention and treatment of possible eye defects

-Mention the eye defects

(b) Teaching resources

XO Laptop, printed materials showing eye defects.

(c) Learning activities

The teacher should begin this topic by asking the learners to carry out Activity 27 given on page 249 of the Pupil's book.

Activity 27: Identifying the Types of Eye Defects (Page 249 of Pupil's book)

Step 1: Guide the learners to search information on eye defects from various sources (parents, peers, nearest health facilities, printed materials and electronic sources) and their prevention.

Step 2: Ask them to share the information with the class.

Step 3: Ask the learners to observe the given pictures.

Ask the learners the following questions:

(i) Which disease is the girl suffering from?

(ii) Which disease is the lady suffering from?

-Discuss with the learners the different types of eye defects, their causes and methods to correct these defects as given on pages 250–252 of the Pupil's book.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

12.4.15: Prevention of eye defects.

(a) Learning objectives

- Apply techniques of prevention from the most common eye defects.

(b) Teaching resources

- Charts showing the prevention of eye defects.
- Textbooks.

(c) Learning activities

- Begin this topic by asking the learners to carry out Activity 28 given on page 252 of the Pupil's book.

Activity 28: Collecting Information on Prevention and Treatment of Eye Defects
(Page 252 of Pupil's book)

Step 1: Take the learners to the school library and collect information on prevention and treatment of possible eye defects.

Step 2: Ask them to make a report on it and present to the class.

Discuss with the learners the methods of preventing eye defects.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

12.5. Additional Information for the teacher.

Content about maintenance of the skin

Protect yourself from the strong sunlight

Use sunscreen

Seek shade

Wear protective clothing

Don't smoke

Treat your skin gently

Shave carefully

Eat healthy diet

Manage stress

Content about care of the tongue

- Try tongue scrap
- Rinse the mouth with clean water
- Drink green tea
- Monitor the colour of the tongue
- Drink plenty of water

Content for activity 27 on maintenance of the human eye

Eat a healthy balanced diet

- Maintain a healthy weight
- Get regular exercises
- Wear sun glasses
- Wear protective eye wear
- Avoid smoking
- Know your family medical history

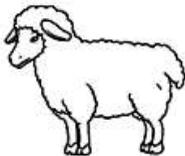
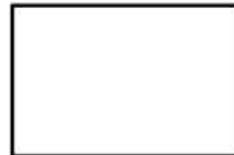
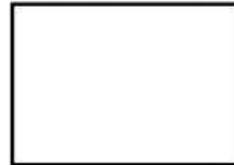
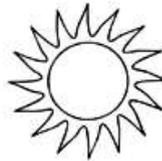
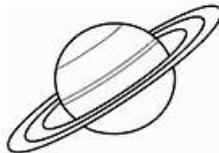
Make copies of this worksheet and provide the learners one copy each.

HUMAN SENSORY ORGANS WORKSHEET

Name:

Date:

Observe the pictures in each row. Draw a sense organ in the box that shows each sense you would use.



WEB LINKS FOR CONTENT ENRICHMENT

<http://www.britannica.com/science/human-skin>

<http://www.webmd.com/skin-problems-and-treatments/picture-of-the-skin>

<http://www.webmd.com/oral-health/guide/tongue>

12.6. End unit assessment.

A. Guidance on End unit assessment/unit review exercises

- The end unit assessment is called “unit review exercises” in the student book, Page 254, 255 to 256
- Request learners to answer all questions of the “unit review exercises” during the time reserved to lesson of end unit assessment. If all questions cannot be completed in that time, request them to answer them during their self-study time or as homework.
- Mark their answers and keep records of every student’s achievements.
Provide the remedial, consolidation and extended activities.

B. Answers to the end unit assessment/unit review exercises

I. Fill in the blanks with the correct options:

- | | | | |
|--------|--------|--------|--------|
| 1. (b) | 2. (c) | 3. (b) | 4. (d) |
| 5. (a) | 6. (d) | | |

II. Match the organs with their functions:

- | | | | |
|--------|--------|--------|--------|
| 1. (d) | 2. (c) | 3. (b) | 4. (e) |
| 5. (a) | | | |

III. State whether the following statements are true or false:

- | | | | |
|----------|----------|---------|----------|
| 1. True | 2. False | 3. True | 4. False |
| 5. False | | | |

IV. Answer the following questions briefly:

1. Sensory organs are connected to the brain through nerves. They work as follows.
 1. Each sensory organ receives stimuli such as touch, heat, cold and pressure from the environment.
 2. The sensory organ transmits this information to the brain through sensory nerves.
 3. The brain interprets this information and gives feedback to the sensory organs through motor nerves.
2. The main functions of skin include:
 1. It allows us to have a sense of touch.

2. It protects our body from harmful germs.
 3. It regulates our body temperature.
 4. It helps to release waste products as sweat.
3. Some properties of skin include:
1. Different people have different skin colours. Some people have light skins. Others have dark skins.
 2. Skin may be oily and dry.
4. Ringworm, eczema and scabies.
5. A bruise is a black or blue mark on the skin. It is caused by blood trapped under the skin. It happens when an injury crushes small blood vessels but does not break the skin. Bruises are often painful and swollen.
6. The main functions of a tongue are:
1. It enables us to detect various tastes.
 2. It helps us to speak.
 3. It helps us in chewing food and rolls it into food pipe.
 4. It helps us to clean food particles stuck between gums and teeth.
7. To keep your tongue clean:
1. Wash your mouth before and after taking food.
 2. Clean your tongue with a soft tongue cleaner.
 3. Clean your tongue twice daily—in the morning and at night.
8. The tongue is affected by a number of problems. These include:
1. Sore: In case of sore, there are white or red patches seen on the tongue. Sores are often painful. A person with a sore on the tongue finds eating spicy foods difficult. Sores may be caused by viruses. Diseases like chickenpox and measles develop sore on the tongue.
If you have sore:
 - (a) Avoid hot and spicy foods.
 - (b) Take soft foods and cold beverages until the sore heals.
 2. Loss of sense of taste: Sometimes people lose the ability to taste sour, salty, bitter, or sweet flavours partially or completely. Poor oral hygiene and dental problems are the causes of this. Loss of taste can create serious health issues like heart disease, diabetes, and other illnesses.
If you have a taste disorder, consult a doctor.
 3. Swelling of tongue: Sometimes the tongue may suddenly swell up in size. It is a symptom of disease like tongue cancer. If you have such a problem, immediately consult a doctor.
 4. Black hairy tongue: In this case, the tongue appears to be hairy. It is caused by a course of antibiotics. It can also be developed by consuming too much of coffee and cigarettes.

If you have black hairy tongue:

- (a) Scrap your tongue with a special tongue scrapper regularly.
- (b) Avoid smoking.

9. The following are various functions of a nose:

- It helps us to smell.
- It helps us to breathe.
- The tiny hairs and the mucus in the nose do not allow the dirt and dust to enter inside the body.

10. A clean tongue cannot be attacked by diseases. So it is important to keep our tongue clean.

To keep your tongue clean:

- Wash your mouth before and after taking food.
- Clean your tongue with a soft tongue cleaner. You can also use a brush to clean your tongue
- Clean your tongue twice daily—in the morning and at night.

11. Common cold: It is a viral infectious disease. A person with common cold feels a runny nose.

Causes of common cold: The causes of common cold include:

- Transmission of cold viruses through air-borne droplets
- Cold weather condition such as rain or winter
- Poor immune functions, Insufficient sleep and malnutrition

Sinusitis: It is an infection of the sinuses near the nose. This infection usually occurs after a cold. When a person suffers from sinusitis, his/her nose is blocked. He/ She does not breathe well. He/ She has headache and facial discomfort.

Causes of sinusitis: The causes of sinusitis include:

- Micro-organisms such as virus, bacterium or fungus
- Abnormalities in the structure of the nose
- It can be caused by allergy and irritation of sinuses.

12. The following are two specific functions of the ears:

1. They help in hearing sound.
2. They help in balancing our body.

13. The common ear diseases are: hearing loss and deafness.

Hearing loss: Hearing loss is the reduced ability to hear sound. It occurs when sound waves do not reach the brain. Basically, there are two types of hearing loss:

- (i) *Conductive hearing loss:* It is due to the problem with ear canal, eardrums and middle ears. It is temporary and can be corrected.

It can be caused by the following factors:

- ◆ Intrusion of foreign materials in the ear
- ◆ Infection in the ear canal
- ◆ Tumour in the ear
- ◆ Much ear wax in the ear canal.

This disease is temporary. It can be cured by removing ear wax and other foreign materials from the ears.

- (ii) Sensory hearing loss: It is due to the problem in the inner ear. A person with such disease cannot understand what he/she is hearing. This disease is nerve-related.

It can be caused by the following factors:

- ◆ Old age
- ◆ Injury to the ear canal
- ◆ Exposure to loud noise
- ◆ Ear infection

This disease can be cured by:

- ◆ Treatment of ear infection
- ◆ Avoiding travel in the vehicles which produce loud sound
- ◆ Treatment of infection in the ear canal

Deafness: Deafness is the complete inability to hear sound. It is caused by damage to the inner ear or to the nerves that send sound to the brain. Basically, there are three types of deafness. These are:

- (i) Partial deafness: It is the condition in which a person is unable to hear properly.

It can be caused by the following factors:

- ◆ Intrusion of foreign materials in the ear
- ◆ Much ear wax in the ear canal
- ◆ Holes in the ear drum

This disease is temporary. It can be cured by removing ear wax and other foreign materials from the ears.

- (ii) Permanent deafness: It is the condition in which a person is completely unable to hear. If a woman contracts German measles during pregnancy, her child may have a permanent hearing disability. In some cases, deafness is inherited from the parents to their child. This type of deafness is permanent and cannot be cured.

- (iii) Sensory deafness: It is due to the problem in the nervous system. A person with such a disease cannot understand what he/she is hearing.

It can be caused by the following factors:

- ◆ Disease of the blood vessel

- ◆ Loud noises or sounds
- ◆ Tumour in the ear canal
- ◆ Use of certain medicines (drugs) that are harmful to hearing.

This disease can be cured by:

- ◆ Treating the diseases of the blood vessels.
- ◆ Avoiding working around loud noises every day.
- ◆ Removing tumour from the ear canal by surgery.

14. Short-sightedness is also called myopia. In myopia, a person sees near objects clearly but cannot see objects well that are far.

This defect can be corrected using a concave (diverging) lens.

Long-sightedness is also called hypermetropia. In hypermetropia, a person can see distant objects clearly, but near objects with blurred vision.

This defect can be corrected using a convex (converging) lens.

15. To prevent eye defects:

- Eat a healthy diet that includes fruit and green leafy vegetables.
- Avoid smoking.
- When you are outdoors, wear sunglasses that block sun’s harmful UV rays.
- Keep at least a distance of 25 cm when you are reading and watching TV.
- Have a regular check up of your eyes by an eye doctor.

V. Complete the crossword puzzle using the clues below:

Across

5. Sensory organs

Down

1. Tongue

2. Nose

3. Eyes

4. Ears

5. Skin

12.7. Additional activities

A. Remedial Activities:

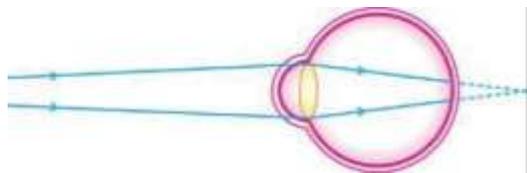
1. Name the sensory organ for taste.
2. What are sense organs?
3. In short-sightedness, a person sees near objects clearly. (True/False)
4. Name two diseases of nose.
5. Ears are the outermost covering of our body. (True/False)
6. Is the complete inability to hear sound. (Deafness/Blindness)

Answers to remedial activities

1. Tongue
2. Organs which help us to see, hear, smell, taste and feel are called sensory organs.
3. True
4. Common cold and sinusitis
5. False
6. Deafness

B .Consolidation activities:

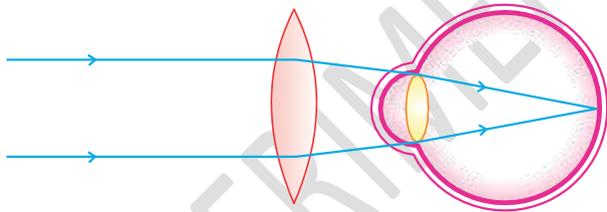
1. Name the eye defects below



2. Draw its correction.

Answers to consolidation the activity

1. Long sightedness
- 2.



c. Extended activities

1. What is astigmatism?
2. Describe six ways of maintaining our eye.

Answers to the extended activities

1. Person cannot simultaneously focus on both horizontal and vertical objects or this is when the cornea is not smooth enough to have regular refraction.
 2.
 - Eat a healthy balanced diet
 - Maintain a healthy weight
 - Get regular exercises
 - Wear sun glasses
 - Wear protective eye wear
 - Avoid smoking
- Know your family medical history

Unit 13: HUMAN SKELETON.

13.1.Key unit competence

To describe the human skeleton and explain its functions and maintenance.

13.2.Prerequisite

Learners will learn better this unit if they remember unit seven of primary three about bones of the human body, muscles of the body, comparing joints , muscles and bones.

13.3. Introductory activity and guidance

A) Introductory activity

Duck Sony has bent arms and legs. He visited a doctor and told him that it is caused by not eating balanced diet, accidents and bone diseases.

- (1) What advise can you give him?
- (2) Can you suggest the type of food we can eat to strengthen our bones.
- (3) Suggest some of these bone diseases.
- (4) How can you control such accidents?
- (5) Can you predict what we are going to learn?

B) Guidance on the introductory activity

- Start the unit by reading the scenario in the introductory activity to the learners.
- Ask them first question and allow them to think and suggest the answers
- Continue to ask all questions and other possible probing questions to learners until they discover and predict what they are going to study

Answers to the introductory activity

- (1) To eat balanced diet.
- (2) Food that contain vitamin D, calcium.
- (3) Rickets, bone cancer,
- (4) -Never play dangerous games.
 - Never fight with your friends.
 - Take a well-balanced diet to keep your bones healthy. Especially, eat food rich in calcium.
 - Exercise regularly
- (5) Human skeleton

13.4.List of lessons

#	Lesson title	Learning objectives	Number of periods:13
1	Main parts and major bones of the skeleton	- Identify the main parts and major bones of the human skeleton	2
2	Functions of the skeleton	- Explain the functions of the skeleton	1
3	Accidents of bones	- State the main types of bone fractures	1
4	Bone diseases and deformation of the vertebral column	- Name and explain most common bone diseases and deformation of the vertebral column.	2
5	Hygiene of the skeleton	- Explain the hygiene of the human skeleton	2
6	Prevention of accidents	- Show concern about preventive measures against skeleton accidents - Practice first aid in case of bone accident.	1
7	Prevention of bone diseases and deformation of the vertebral column	- Be very careful while providing first aid in case of bone accident.	2
8	Assessment of unit 13	Demonstrate the achievement of the key unit competence	2

13.4.1: Main parts and major bones of the skeleton

(a) Learning objectives

- Identify the main parts and major bones of the human skeleton.

(b) Teaching resources

- Charts showing complete skeleton.
- Text books

(c) Learning activities

Start this lesson by asking the learners to carry out Activity 1 given on page 257 of the Pupil's book.

Activity 1: Identifying Main Parts of a Human Skeleton (Page 257 of Pupil's book)

Ask the learners to carry out the activity on their own.

Support learners to know that skeleton gives shape and support to our body. A skeleton comprises skull, arms and legs. Each of the major parts consists of some small bones.

Answers to the activity 13.1 on page 257 of the pupil's book.

1. Skull
2. Humerus
3. Ulna
4. Radius
5. Femur
6. Fibula
7. Tibia
8. Pelvis
9. Spine
10. Ribs

(a) Major Bones of Skull (Pages 258–259 of Pupil's book)

Ask the learners to carry out Activity 2 given on page 258 of the Pupil's book.

Activity 2: Exploring Bones in the Forehead (Page 258 of Pupil's book)

Step 1: Ask the learners to press the top of their forehead.

Step 2: Ask the learners to tell whether they feel hard or soft.

Step 3: Ask the learners to tell what they think makes their forehead harder.

After completion of the activity, learners should name a major bone of the skull—Cranium and Facial bones.

(b) Major Bones of Trunk (Pages 259–260 of Pupil's book)

Ask the learners to carry out Activity 3 given on page 259 of the Pupil's book.

Short description of the methodology and any important aspect to consider

Activity 3: Identifying Major Bones of Trunk (Page 259 of Pupil's book)

Step 1: Encourage the learners to look at the given picture.

Step 2: Support the learners to identify the major bones of trunk from the given options and write in their notebook.

After completion of the activity, learners should know that bones of trunk are Backbone, Ribs and Pelvis.

(c) Major Bones of Legs and Arms (Pages 261–262 of Pupil's book)

Guide the learners to carry out Activities 4 and 5 given on pages 261–262 of the Pupil's book to understand the major bones of legs and arms.

Answers to the activity 13.3 on page 259 of the pupils book

1. Ribs

2. Spine

Pelvis

Activity 4: Identifying Major Bones of Legs (Page 261 of Pupil's book)

Step 1: Help the learners to look at the given picture.

Step 2: Ask the learners to identify how many long bones are there in the leg.

Step 3: Ask the learners to write their names in their science note book.

After completion of the activity, learners should know that each leg has three major bones—Femur, Tibia and Fibula.

Activity 5: Identifying Major Bones of Arms (Pages 261–262 of Pupil's book)

Step 1: Ask the learners to look at the given picture.

Step 2: Ask the learners to identify how many long bones are there in an arm.

Step 3: Ask the learners to write their names in their science note book.

After completion of the activity, learners should know that the major bones of an arm are: humerus, ulna and radius.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

13.4.2. Functions of the skeleton

(a) Learning objectives

- Explain the functions of the skeleton

(b) Teaching resources

-text book

(c) Learning activities

Guide the learners to carry out Activity 6 given on page 262 of the Pupil's book.

Activity 6: Discussing the Functions of Skeletal System (Page 262 of Pupil's book)

-Guide the learners to discuss what would happen if we did not have skeleton

- Support learners to make report and present to the class.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

13.4.3. Accidents of bones

(a) Learning objectives

State the main types of bone fractures.

(b) Teaching resources

- Charts showing different fractures
- Splint, sling, piece of cloth, cardboard

(c) Learning activities

-Support them to understand what “bone accidents is” and let them know that fracture is one type of accident to the bone

Guide the learners to carry out Activity 7 given on page 263 of the Pupil’s book.

Activity 7: Discussing the Types of Accidents of Bones (Page 263 of Pupil’s book)

Step 1: Ask the learners to look at the picture and tell what the person is suffering from.

Let learners know that fractures can occur to the bones of legs, arms, head and backbones.

Discuss with the learners the signs and symptoms of fractures.

(a) Types of Fractures (Page 263 of Pupil’s book)

Discuss with the learners the two types of fracture—open fracture and closed fracture.

(b) First Aid for Fracture (Page 264 of Pupil’s book)

Guide them to discuss the first aid and steps to be taken in case of a fracture.

(c) Prevention of Accidents of Bones (Page 264 of Pupil’s book)

Discuss with the learners the precautions we should take to prevent bone accidents.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

13.4.4. Bone diseases and deformation of the vertebral column.

(a) Learning objectives

Name and explain most common bone diseases and deformation of the vertebral column

(b) Teaching resources

-Textbooks from the library, wall charts, search engine like Google or yahoo

(c) Learning activities

The teacher should start this topic by asking the learners to carry out Activity 8 given on page 265 of the Pupil's book.

Activity 8: Identifying the Bone Diseases (*Page 265 of Pupil's book*)

Step 1: Ask the learners to search information on different bone diseases from different sources such as library, wall charts and search engines like Google or Yahoo.

Step 2: Ask the learners to share the information in the classroom.

After completion of the activity, let the learners discuss more about the common bone diseases such as rickets and bone cancer, their causes, symptoms, prevention and treatment.

(a) Rickets (*Page 265 of Pupil's book*)

Discuss with the learners the causes, symptoms and prevention of rickets.

(b) Bone Cancer (*Pages 265–266 of Pupil's book*)

Discuss with the learners the causes, symptoms and treatment of bone cancer and make presentation to class.

(c) Deformities of Vertebral Column or Spine (*Pages 266–268 of Pupil's book*)

Support the learners to carry out Activity 9 given on page 266 of the Pupil's book.

Activity 9: Identifying the Deformities of Spine (*Page 266 of Pupil's book*)

Step 1: Let the learners look at the pictures given on page 266 of the Pupil's book and tell what the people are suffering from.

Let learners know that the people in the picture have deformities of spine, showing the diagram of deformities in vertebral column.

-Support them to know that there are three main types of deformities

—Scoliosis, Lordosis and Kyphosis.

Guide learners to read the causes, symptoms and treatment of three main types of deformities.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

13.4.5. Hygiene of the skeleton.

(a) Learning objectives

Explain the hygiene of the human skeleton.

(b) Teaching resources

-Textbooks, ropes for jumping

(c) Learning activities

Activity 10: Discussing the Maintenance of Skeleton (Page 268 of Pupil's book)

Step 1: Lead a discussion among the learners to find out good practices of maintaining the skeleton and avoiding accidents.

Step 2: Ask the learners to make a report on it and present to the classteacher.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

13.4.6. Prevention of accidents.

(a) Learning objectives

- Show concern about preventive measures against skeletal accidents.
- Practice first aid in case of bone accident.

(b) Teaching resources

- Wall charts showing prevention of bone accident.

(c) Learning activities.

Activity: discussing the prevention of bone accidents

Step1: Guide learners to make small groups

Step2: Support learners to discuss about the prevention of bone accidents

Step3: Let them make report and make presentation to class.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

13.4.7. Prevention of bone diseases and deformation of the vertebral column.

(a) Learning objectives

- Be very careful while providing first aid in case of bone accident.

(b) Teaching resources

Charts showing prevention of deformation of vertebral column

(c) Learning activities

Ask the learners to carry out Activity 11 given on page 269 of the Pupil's book.

Activity 11: Preventing Deformities of Vertebral Columns (Page 269 of Pupil's book)

Ask the learners to observe the picture given in the activity and answer the questions asked in the activity.

After completion of the activity, support learners to answer the questions and discuss the ways in which we can prevent bone diseases and deformation of vertebral columns

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

13.5. Additional Information for the teacher

Reasons why we can give first aid.

1. To save life
2. To reduce pain
3. Create confidence
4. To prevent more injuries from worsening
5. Increase safety
6. Improve on the standard of living
7. To show love to the patient

How to prevent bone accident

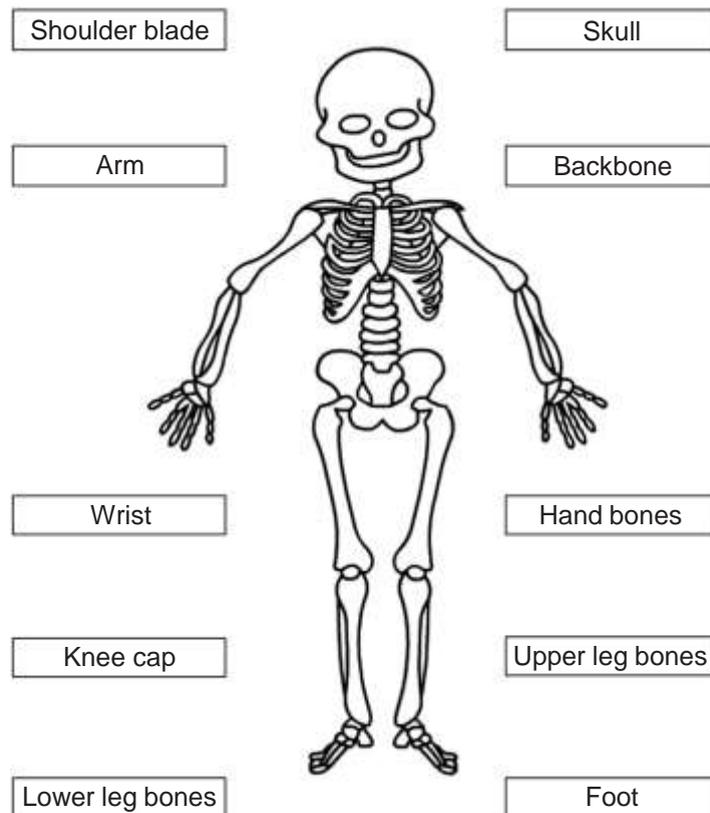
1. Eat healthy food.
2. Do regular exercises
3. Taking medication
4. Take care of your health

Make copies of the following worksheet and provide one copy to each learner. Ask them to draw a line from each label to the right part.

HUMAN SKELETON—WORKSHEET

Name:

Date:



WEB LINKS FOR CONTENT ENRICHMENT

<http://www.ivyroses.com/HumanBody/>

<http://www.innerbody.com/image/skelfov.html>

<http://www.innerbody.com/image/skel06.html>

13.6. End unit assessment/ unit review exercises

A. Guidance on End unit assessment/unit review exercises

- The end unit assessment is called “unit review exercises” in the student book, Page 271, 272 to 273
- Request learners to answer all questions of the “unit review exercises” during the time reserved to lesson of end unit assessment. If all questions cannot be completed in that time, request them to answer them during their self-study time or as homework.
- Mark their answers and keep records of every student’s achievements.

Provide the remedial, consolidation and extended activities when necessary

SOLUTIONS TO END UNIT ASSESSMENT/unit review activities

I. Fill in the blanks with the correct options:

- | | | |
|--------|--------|--------|
| 1. (a) | 2. (b) | 3. (c) |
| 4. (b) | 5. (a) | 6. (c) |

II. State whether the following statements are true or false:

- | | | | |
|---------|----------|----------|---------|
| 1. True | 2. False | 3. False | 4. True |
| 5. True | | | |

III. Match the bones with their functions:

- | | | | |
|--------|--------|--------|--------|
| 1. (d) | 2. (c) | 3. (a) | 4. (b) |
|--------|--------|--------|--------|

IV. Answer the following questions briefly:

1. Our body is supported by a framework of bones. This framework is called skeleton.
2. Skull
3. Major bones of the skull are cranium and facial bones.
4. Major bones of the trunk are: the backbone, ribs, and pelvis.
5. Major bones of the leg are femur, tibia and fibula.
6. Femur
7. Major bones of the arm are humerus, ulna and radius.
8. Humerus
9. The skeletal system has the following functions:
 - It gives shape and support to the body.
 - Together with muscles it helps us to move.
 - It protects all the delicate organs like brain and heart.
 - It helps in the formation of red blood cells
10. A break or crack in the bone is called fracture.
11. Open fracture and closed fracture
12. Rickets and bone cancer; scoliosis, kyphosis and lordosis.

V. Complete the crossword puzzle using the clues below:

Across

2. Skull
3. Fracture

Down

1. Trunk
2. Skeleton

13.7. Additional activities

A. Remedial Activities

1. Which part of the skull protects and supports the brain?
2. Fracture is the break or crack in the bone. (True/False)
3. is a bone disease caused due to lack of Vitamin D. (Rickets/Scoliosis)
4. Name the major bones of trunk.
5. Scoliosis, lordosis and kyphosis are bone accidents. (True/False)
6. State the function of skeleton.

Answers to remedial activities

1. Cranium
2. True
3. Rickets
4. The backbone, ribs, and pelvis
5. False
6. Skeleton gives shape and support to our body

B. Consolidation activities

1. What is skeleton?
2. Mention the types of skeleton
3. What do the following bones protect?
 - a) Skull
 - b) Ribs
 - c) Orbits
 - d) Spine
 - e) Pelvis

Answers to consolidation activities

1. Is a frame work of bones
2. Endo skeleton, Exo skeleton, Hydrostatic skeleton.
3.
 - a) Brain
 - b) Heart and lungs
 - c) Eyes
 - d) Spinal cord
 - e) Reproductive organs

c. Extended activities:

1. Mention any 3 signs and symptoms of rickets
2. Define the term fracture
3. Mention the types of fracture
4. Outline the major bones of skull

Answers to the extended activity

1. –Pain in the bones.
Bending of legs and backbone.
Swelling of the wrist.
2. Is a broken bone
3. Open fracture
Closed fracture
4. Cranium, facial bones

EXPERIMENTAL VERSION

UNIT 14: MUSCLES

14.1. Key unit competence

To identify and explain the functions and maintenance of muscles.

14.2. Prerequisite

Learners will learn better this unit if they remember unit seven of primary three about muscles of the human body and comparing muscles.

14.3 .Introductory activity and guidance

A) Introductory activity

A girl in primary four had weak muscles. She visited a doctor to consult what was wrong with her. The doctor told her that she was lacking balanced diet and physical exercises to the body.

- What advise can you give to her?
- Can you suggest any three importance of the physical exercises to the muscle
- What type of food would you advise her to eat?
- Can you predict what we are going to learn?

B) Guidance on the introductory activity

-Start the unit by reading the scenario in the introductory activity to the learners.

-Ask them first question and allow them to think and suggest the answers

-Continue to ask all questions and other possible probing questions to learners until they discover and predict what they are going to study

Answers to the introductory activity

- The advice is to perform body exercises and to feed on balanced diet
- It strengthens the muscles
-it makes the body fit
-Diseases cannot attack you easily
-Makes the muscles of the heart strong.
- Fruits and food that contains calcium
- Muscles of the human body

14.4. List of lessons

#	Lesson title	Learning objectives	Number of periods:8
1	Main groups of muscles	-Differentiate the two main groups of muscles.	2

2	Major voluntary and functions of muscles of the human body	- List the major groups of voluntary and involuntary muscles of the human body. - Show the concern to the importance of physical exercise as a way to care for muscles	2
3	Accidents of muscles and first aid	- Identify the major functions of voluntary muscles. - Develop habit of consulting a physician both for prevention and treatment of possible muscles' malfunctioning	2
4	Hygiene of the muscles, prevention of muscle accident	- Identify the accidents of muscles - Show the concern to the importance of physical exercise as a way to care for muscles	1
5	Assessment of unit 14	Demonstrate the achievement of the key unit competence	1

14.4.1: Main groups of muscles

(a) Learning objectives

-Differentiate the two main groups of muscles

(b) Teaching resources

-Charts showing different types of muscles

(c) Learning activities

Start this lesson with Activity 1 given on page 274 of the Pupil's book.

Activity 1: Muscles of Arms (Page 274 of Pupil's book)

Step 1: Ask the learners to make a fist bending their arm at the elbows and tighten the fist.

Step 2: Ask the learners what they see.

Through this activity the learners will be able to learn about muscles and their importance.

After this activity, guide the learners to group muscles through

Activity 2 given on pages 274–275 of the Pupil's book.

Activity 2: Grouping Muscles (Pages 274–275 of Pupil's book)

Step 1: Ask the learners to look at the pictures of different muscles in Activity 2 given

on page 274 of the Pupil's book.

Step 2: Pose the following questions:

- (a) Which of these muscles work at their will?
- (b) Which of these muscles do not work at their will?

After the activity, let learners know that the muscles of arms and legs work at our will. These are known as voluntary muscles. But the muscles of heart and lungs do not work at our will. These are known as involuntary muscles.

-Support learners to mention the examples of each

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

14.4.2: Major voluntary and functions of muscles of the human body.

(a) Learning objectives

- List the major groups of voluntary and involuntary muscles of the human body.
- Show the concern to the importance of physical exercise as a way to care for muscles

(b) Teaching resources

Charts showing major voluntary muscles

(c) Learning activities

Guide the learners to carry out Activity 3 given on page 275 of the Pupil's book.

Activity 3: Identifying the Major Voluntary Muscles of the Human Body

(Page 275 of Pupil's book)

Step 1: Ask the learners to touch their body.

Step 2: Ask them to contract their muscles.

Step 3: Ask them to move their organs such as head, trunk, legs and arms to discover the main muscles.

Through this activity, the learners will discover the major voluntary muscles of human body, such as major muscles of head, trunk, arms and legs.

(a) Major Muscles of the Head (Pages 275–276 of Pupil's book)

Let the learners know that the major muscles of head are:

- Eye muscles, Facial muscles, Chewing muscles and Neck muscles.

(b) Major Muscles of the Trunk (Page 277 of Pupil's book)

Help learners to discuss the major muscles of trunk and make presentation to class.

(c) Major Muscles of the Legs (Page 277 of Pupil's book)

Help learners to discuss the major muscles of legs and make presentation to class

(d) Major Muscles of the Arms (Page 278 of Pupil's book)

Help learners to discuss the major muscles of arm and make presentation to class

Help the learners to do Activity 4 given on page 278 of the Pupil's book.

Activity 4: Discussing the Functions of Voluntary Muscles (Page 278 of Pupil's book)

Step 1: Lead a discussion among the learners on the functions of voluntary muscles.

Step 2: Ask the learners to make a report on it and present it to the class.

Discuss with the learners the major functions of voluntary muscles.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

EXPERIMENTAL VERSION

14.4.3: Accidents of muscles and first aid

(a) Learning objectives

- Identify the major functions of voluntary muscles.
- Develop habit of consulting a physician both for prevention and treatment of possible muscles' malfunctioning

(b) Teaching resources

- Charts showing different accidents of muscles

(c) Learning activities

Let learners do Activity 5 given on page 279 of the Pupil's book.

Activity 5: Discussing the Cramps (*Page 279 of Pupil's book*)

Ask the learners to observe the picture given in the activity and try to answer the following questions.

- (a) What is the footballer suffering from?
- (b) What is a muscle cramp?
- (c) What are the causes of muscle cramps?

Answers to the questions

- (a) Footballer is suffering from muscle cramp.
- (b) Muscle cramps are sudden contractions of muscles
- (c) It is caused by dehydration and muscle fatigue

First Aid for Muscles (Cramp) (*Page 280 of Pupil's book*)

Start this lesson through a role play activity.

Activity 6: Role Play a Muscle Accident (*Page 280 of Pupil's book*)

Step 1: Present a situation that if one of the learner's friends has muscle cramp what he/she will do.

Step 2: Ask the learners to form a group of two pupils each.

Step 3: Ask one learner of the group to act as a victim and the other learner will provide him/her necessary first aid.

After completion of the activity, discuss with the learners the steps to be taken if one suffers from muscle cramp.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

14.4.4: Hygiene of the muscles, prevention of muscle accident

(a) Learning objectives

- Identify the accidents of muscles
- Show the concern to the importance of physical exercise as a way to care for muscles

(b) Teaching resources

Using search engine like Google
Charts showing prevention of muscle accidents

(c) Learning activities

Start this lesson with Activity 7 given on page 280 of the Pupil's book.

Activity 7: Discussing the Good Practices of Maintaining Muscles (Page 280 of Pupil's book)

Step 1: Lead a discussion among the learners to discover good practices of maintaining muscles and avoiding their accidents.

Step 2: Ask the learners to make a report on it and present it to the class.

After completion of the activity, discuss with the learners the care that should be taken for healthy muscles and allow them to make presentations to class

Maintaining Tone of a Muscle (Page 281 of Pupil's book)

Support learners to define "Muscle Tone" as given in the Pupil's book and guide the learners to understand that its purpose is to keep the muscles ready for action.

Discuss the things that can be done to maintain muscle tone such as eating nutritious food, drinking plenty of water and doing strength training exercises to reduce fat.

Prevention of Accidents (Page 281 of Pupil's book)

Discuss the tips that should be followed to prevent accidents during physical exercises such as warming up, cooling down.

(d) Lesson assessment and conclusion

During the activities, keep on observing and understanding what learners do and answer, and note their progress. At the end of the lesson, ask again some questions on the performed activities or content learnt to assess the learning and summarize the content

14.5. Additional Information for the teacher

This section provides additional content for the teacher to have a deeper understanding of the topic.

14.6. End unit assessment

A. Guidance to end unit assessment/ unit review exercises

- The end unit assessment is called “unit review exercises “in the student book, Page... Page 282, 283 to 284 of Pupil's book)
- Request learners to answer all questions of the “unit review exercises” during the time reserved to lesson of end unit assessment. If all questions cannot be completed in that time, request them to answer them during their self-study time or as homework.
- Mark their answers and keep records of every student’s achievements.
- Provide the remedial, consolidation and extended activities when necessary

SOLUTIONS to end unit assessment /unit review exercises

I. Fill in the blanks with the correct options:

1. (a) 2. (a) 3. (b) 4. (a)
5. (a)

II. State whether the following statements are true or false:

1. True 2. False 3. True 4. True
5. False

III. Match the muscles to their functions:

1. (e) 2. (c) 3. (b) 4. (a)
5. (d)

IV. Answer the following questions briefly:

1. Muscles are soft tissues found in our body. They cover our bones and help to move them. Bones and muscles work together to move our body.
2. Two main types of muscles in our body are: voluntary muscles and involuntary muscles.
3. Eye muscles and facial muscles.
4. Major functions of voluntary muscles are:
 - (i) Producing skeletal movement: Contraction and relaxation of muscles allow the bones to move.
 - (ii) Maintaining posture and body position: Good posture depends on the

strength of muscles. A person with strong muscles can maintain upright posture.

5. A–Biceps; B–Triceps
6. Muscle cramp is caused due to poor physical condition, dehydration and muscle fatigue.
7. If you have a muscle cramp:
 - (a) Stretch the cramped muscle to increase flexibility.
 - (b) Gently massage the cramped muscle.
 - (c) Drink plenty of water.
 - (d) Take a hot water bath.
8. For healthy muscles, the following care should be taken:
 - (a) Take good food and pure air.
 - (b) Avoid dangerous games.
 - (c) Sit, walk and stand in a correct posture.
 - (d) Do physical exercise regularly.

V. Complete the crossword puzzle using the clues below:

Across		Down	
3. Involuntary	1.	Joint	
4. Cramps	2.	Muscle	

14.7 Additional activities

Remedial activities

1. Muscles that work at our will are called muscles. (voluntary/involuntary)
2. Muscles of arms and legs are involuntary muscles. (True/False)
3. List any two major involuntary muscles.
4. What are muscles?
5. Are the sudden contraction of muscles? (Bruise/Cramps)
6. Together with bones what else helps in the movement of our body?

Answers to remedial activities

1. voluntary
2. False
3. Muscles of stomach and heart.
4. Muscles are soft tissues found in our body.
5. Cramps
6. Muscles

Consolidation activities.

- (1) Define the word muscle.
- (2) Outline the types of muscles
- (3) Give any two examples of involuntary muscles
- (4) What is a cramp?
- (5) What is a muscle tone?

Answers to the consolidation activities.

- (1) A muscle is a soft tissue found in the body.
- (2) Involuntary and voluntary muscles
- (3) Heart muscles, intestinal muscles
- (4) Painful involuntary contraction of a muscle or muscles.
- (5) Muscle tone is an unconscious low level contraction of muscles at rest

Extended activities:

- (1) Give any three importance of muscles
- (2) Explain the difference between voluntary and involuntary muscles.
- (3) Outline any two muscles of the trunk
- (4) Give two examples of the muscles of the arm

Answers to the extended activities

- (1) They help in the movement of human body.
They support our body.
They help maintain posture
- (2) Involuntary muscles cannot be controlled while voluntary muscles can be controlled.
- (3) –abdominal muscles, pectoral muscles.
- (4) Biceps and triceps.

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