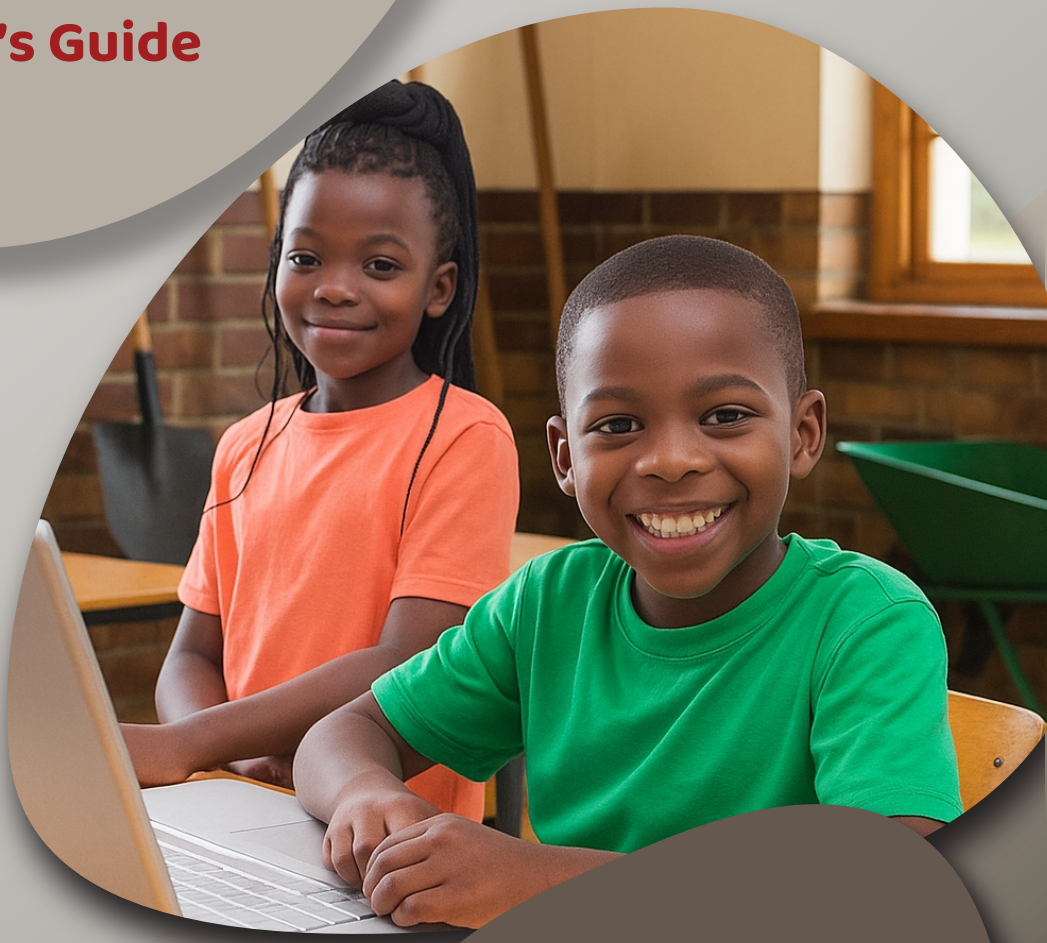
SET

Science and Elementary Technology

Teacher's Guide



PRIMARY THREE

P3

REB RWANDA BASIC EDUCATION BOARD

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Science and Elementary Technology
Teacher's Guide
Primary 3

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FOREWORD

The Rwanda Basic Education Board (REB) is honored to present the Science and Elementary Technology teacher's guide for primary three. This guide is designed to support the effective implementation of the Competence-Based Curriculum (CBC), ensuring consistent and learner-centered teaching practices that align with Rwanda's vision of empowering pupils to reach their full potential, actively participate in society, and pursue meaningful careers.

As Rwanda advances toward building a knowledge-based economy, education plays a pivotal role. Teachers are central to this transformation, guiding pupils to connect classroom knowledge with real-life experiences, thus fostering individual growth and national development.

This Teacher's Guide serves as a comprehensive resource for teaching Science and Elementary Technology at Primary three. The subject is an integral part of the CBC, aimed at equipping pupils with essential knowledge, skills, values, and attitudes necessary for becoming responsible and competent citizens. Through this subject, pupils are encouraged to develop problem-solving abilities and contribute positively to their communities.

This guide places special focus on engaging pupils in meaningful, activity-based learning experiences; whether individually or collaboratively; where they can explore, discover, and construct knowledge. Unlike traditional approaches where learning is often passive and teacher-centered, the CBC promotes active, learner-driven engagement. Teachers encourage pupils to participate in activities that allow them to apply what they learn, to develop key competences, and build values that empower them to positively impact their lives and society.

To support this active learning approach, teachers are encouraged to:

- Plan lessons effectively and prepare relevant materials;
- Facilitate group discussions and collaborative activities;
- Apply active teaching strategies such as inquiry, research, investigations, and both group and individual tasks;
- Create opportunities for pupils to develop competences like critical thinking, problem-solving, creativity, innovation, communication, and teamwork;
- Recognize and encourage pupils' contributions;
- Guide pupils in refining their ideas;
- Promote self, peer, and group assessments using appropriate CBC-based assessment methods.

This teacher's guide is divided into 4:

Part I: Highlights the structure of this book and gives you general methodological guidance;

Part II: Sample lesson plans as reference for lesson preparation;

Part III: Content map showing unit names, key unit competence and number of periods per each unit.

Part IV: Details the teaching guidance for each concept given in the pupil's book.

I sincerely thank everyone who contributed to the development and refinement of this teacher's guide. Special recognition goes to the REB team who coordinated the entire process, as well as to education development partners, teachers, and all individuals who supported the process from start to the end. Your continued suggestions and feedback are highly valued and will help improve future editions of this textbook.

Dr. MBARUSHIMANA Nelson

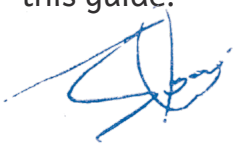
Director General

ACKNOWLEDGEMENT

I would like to extend my sincere appreciation to everyone who contributed to the refinement of the Science and Elementary Technology Teacher's guide for Primary three. This achievement would not have been possible without the active involvement of various education stakeholders.

Special thanks go to the Rwanda Basic Education Board (REB) staff and subject experts for their valuable work on this teacher's guide.

I am also deeply grateful to the education development partners whose support was instrumental throughout the process. In particular, I acknowledge university lecturers, teachers, partners and all stakeholders for their contributions in editing and developing this guide.



MURUNGI Joan

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PART I. INTRODUCTION

1. About the teacher's guide

This book is a teacher's guide for the Primary Three for Science and Elementary Technology subject for schools in Rwanda. It is to be used with the Primary Three Pupil's Book for the same subject, to help teachers to implement the competence-based curriculum for the Science and Elementary Technology subject syllabus.

As the name says, this is a guide that teachers can refer to when preparing their lessons. Teachers may use the guidance provided, but they should also be creative and consider their own class contexts when preparing their lessons.

This teacher's guide has three main parts:

1. Methodological guidance for the teacher

This section guides the teacher on:

- Developing *pupils' competences*,
- Integrating *cross-cutting issues*,
- Teaching pupils with *special educational needs*,
- Using *active methods and techniques* for teaching Science and Elementary Technology,
- Carrying out appropriate *assessment of learning*.

2. A sample lesson plan

The sample lesson plan is a guide for teachers in developing their own lesson plans.

3. Unit development

This is the main part of the guide, because it shows the teacher how to teach the content of each unit and lesson.

Each unit begins with the unit title, and the key unit competence that are taught in the unit. (For example, the key competence of Unit 2 is to "identify various ICT tools and their uses" and "operate a radio and a television effectively"). Then, the rest of the unit is presented:

- The knowledge, skills, attitudes and values that the pupils should successfully learn in the unit.
- A list of the lessons in the unit, the learning objectives of each lesson, and the number of class periods to be used for each lesson.
- A list of key vocabulary words for the unit.

- The recommended approach to teaching each lesson in the unit, including a list of teaching and learning materials for the lessons.
- Recommended questions and activities for the end of unit assessment. A list of additional activities that can be given to less able pupils (remedial activities), normally-learning pupils (consolidation activities), and advanced pupils (extended activities). These activities could be carried out during class time, or as after-school activities.

2. Methodological guidance for the teacher

2.1. Developing values and competences

In 2015, Rwanda moved from a knowledge based to a competence-based curriculum (CBC) for pre-primary, primary and general secondary education. The CBC requires shifting the teaching and learning approach from being *teacher-centred* to being *learner-centred*. Teachers are responsible for developing their pupils' learning achievements, and for creating a safe and supportive learning environment for all pupils.

The CBC approach of teaching and learning also focuses on the students gaining specific skills, instead of just learning information that they can repeat in an exam. This approach focuses on what pupils can *do,* not only what they *know*. The pupil should be able to demonstrate the ability to *use* the knowledge, skills, values and attitudes that he or she has learned in a given lesson, in new or different situations.

In this approach, pupils develop basic competences with three specific learning objectives: gaining *knowledge*, learning *skills* and adopting appropriate *attitudes*. The teacher uses a pupil-centred approach, not the traditional teacher-centred approach, to teach each unit and lesson. The pupil can then be assessed based on whether he or she meets the standards set for those competences.

In addition to subject competences, pupils also develop generic competences which are useful in many learning areas and situations.

In the Science and Elementary Technology curriculum, the generic competences include:

Generic competences	**Ways of developing generic competences**
Critical thinking	Learning activities must require pupils to; calculate; interpret, analyze, compare and contrast (numbers, simple texts, objects, manipulatives, storybooks, flash cards, charts etc.) to develop critical thinking.

Creativity and innovation	Learning activities should encourage pupils to be creative - such as building with construction blocks, painting, reading, or storytelling and writing while finding solutions to problems and sharing new ideas. Pupils learn to apply what they already know as basis for gaining new new knowledge and solving challenges both in the classroom and in everyday life.
Research and problem solving	Pupils are expected to find and use sources of information including books, the internet, and other knowledgeable people and to apply their knowledge to solve a given challenge or problems in the classroom and in real-life situations
Communication (literacy and Numeracy	All learning activities must require pupils to discuss in groups, write and present findings to the class to express their ideas to others.
Co-operation, interpersonal relations and life skills	All activities must require pupils to; work and share ideas in pairs or in groups to develop cooperation and interpersonal life skills.
Lifelong learning	Pupils should see the value of learning throughout their lives. They should make a practice of constantly gaining and updating knowledge and skills to be able to adapt to the fast-changing world.
Professional skills	The teacher is encouraged to use range of teaching skills e.g. asking as many pupils as possible to reinforce communication, probing, explaining, illustrating with examples, using blackboard, silence and non-verbal cues, using audio – visual aids, recognizing pupils' behavior to improve learning engagement in the classroom

2.2. Integrating cross-cutting issues in the curriculum

There are 10 cross cutting issues in the CBC

Competency-based learning also addresses specific cross-cutting issues into the teaching and learning process. Cross-cutting issues are aspects of life that are relevant to many curriculum subjects, and they should be made part of those subject lessons.

Some cross-cutting issues may seem specific to particular learning areas or subjects, but the teacher needs to address all of them whenever they come up. The pupils should also be encouraged to talk about these cross-cutting issues, in the classroom and outside the classroom, so that they can develop positive attitudes and values related to these issues. The teacher must introduce them at the most appropriate age and grade Level.
Below are examples of how cross cutting issues can be addressed:

Cross-cutting issue	Ways of addressing cross-cutting issues
1. Comprehensive sexuality education: The Comprehensive Sexuality Education program aims to provide children, adolescents, and youth with age-appropriate, culturally and gender-sensitive knowledge, skills, and values. It helps them make responsible decisions about sexual and social relationships. It also supports understanding and expressing feelings, values, and attitudes to promote behaviors that reduce risks and enhance well-being.	• The teacher can lead pupils to discuss the following situations: "Alcohol abuse"; "unwanted pregnancies"; "home violence" etc. to advise pupils on how they can fight against them. • Give pupils an opportunity to give examples of cases of abuse or violence they know • Give the students contacts where to report in case they are abused.
2. Genocide studies The study of the 1994 Genocide against the Tutsi helps children understand it as the worst crime committed against the Tutsi in the1994. It teaches why the genocide happened and emphasizes the importance of preventing such atrocities in the future. The story of recovery and national unity in Rwanda serves as a foundation for rebuilding the nation. Educating children on fighting genocide denial and its ideology is crucial. This knowledge equips pupils to help prevent future genocides.	• Teachers use simple methods to teach primary pupils about the 1994 genocide against the Tutsi, starting by asking what they know about the 1994 genocide against the Tutsi. • Upper primary pupils discuss 1994 genocide against the Tutsi in pairs or groups, share their ideas, and ask questions. • Teachers clearly explain what the 1994 genocide against the Tutsi is, why it happened in 1994, and why it must never happen again. • Lessons include Rwanda's recovery, national unity, and the importance of peace, with possible visits to 1994 genocide against the Tutsi memorial sites for older pupils.
3. Environment and sustainability: Integration of studies around the Environment, climate Change and Sustainability in the curriculum make pupils understand the need to protect the environment.	• Teachers should use real-life examples and pupils' experiences to explain environmental issues like soil erosion, effects of tree cutting and flooding, while encouraging responsible waste disposal and care during practical activities.
Cross-cutting issue	**Ways of addressing cross-cutting issues**

4. Financial Education: The integration of Financial Education into the curriculum is to teach young children the use of money; teach them to develop the culture of saving and how to use money responsibly.	• Teachers should guide pupils to discuss the importance of money, saving through methods like saving boxes or bank accounts, and spending wisely on essential needs. Pupils should also learn to use materials and tools carefully to make them last longer and avoid unnecessary replacements.
5. Gender: At school, gender roles should be understood as roles that complement each other in a family, in a community or the nation.	• Teachers should address gender issue through assigning leading roles in groups to both girls and boys; provide equal participation in the lesson to avoid any gender stereotype in the learning process. • Give pupils time to talk about different gender roles they know from their homes and how they complement each other. Let pupils discuss why these roles are beneficial for everyone.
6. Inclusive education: Inclusion is based on the right of all pupils to a quality and equitable education that meets their basic learning needs and understands the diversity of backgrounds and abilities as a learning opportunity.	• Teachers should identify pupils with special needs and use adapted teaching and learning resources when available while conducting a lesson. • Teachers must encourage inclusive participation and foster peer support for pupils with disabilities.
7. Peace and values education: Peace and Values Education (PVE) is the education that promotes social cohesion, and positive values, including the culture of peace personal responsibility, empathy, critical thinking to build a more peaceful society.	• Through a given lesson, a teacher should set a learning objective which address positive attitudes and values, e.g. encourage pupils to discuss positively, listen to each other's ideas, take turns and be able to come up with meaning full positive ideas. • The teacher leads pupils to discuss on the meaning peace and why it is important to have peace at home, at school and in the community. • Encourage pupils to respect each other and to create good peaceful and friendly relations

Cross-cutting issue	Ways of addressing cross-cutting issues
8. Standardization culture: Standardization Culture is about introducing a positive culture around the classroom that promotes respect of instructions, classroom rules; good health, cleanliness, self-development self-respect; dignity and the respect of other people and other people's culture.	• Lessons that involve making things should emphasize quality work and using the right materials properly. • Engaging pupils with practical activities and word problems helps them to understand their role and recognize how a culture of standardization contributes to health, the economy, industry, and overall well-being.
9. Standardization culture: Standardization Culture is about introducing a positive culture around the classroom that promotes respect of instructions, classroom rules; good health, cleanliness, self-development self-respect; dignity and the respect of other people and other people's culture.	• Lessons that involve making things should emphasize quality work and using the right materials properly. • Engaging pupils with practical activities and word problems helps them to understand their role and recognize how a culture of standardization contributes to health, the economy, industry, and overall well-being.
10. Impact of social media: Teaching the impact of social media fosters digital literacy, creativity, and collaboration while providing access to diverse learning resources. It promotes critical thinking and responsible online behavior. However, balanced use is essential to avoid distractions and mental health issues. This prepares pupils for effective digital engagement in their academic and social lives.	• To make digital safety learning fun and engaging, the activities should be interactive, visual, and story-based, while being culturally relevant and age-appropriate. • Digital safety can be taught through Child Online Protection clubs; edutainment and interactive multimedia textbooks; storytelling and games. Edutainment makes learning engaging and practical. Role-playing and puzzles help children practice safe internet habits and handle online risks. • To set clear, age-appropriate rules for internet use, start by having open conversations about which websites and apps they want to use and explain the importance of safety.

11. Disaster risk reduction and management: It builds essential awareness and skills for preparedness, helping to reduce vulnerabilities and foster a culture of safety. It nurtures critical thinking, problem-solving and social responsibility, empowering children as agents of change. It aims to breaks cycles of vulnerability and supports sustainable development. This prepares future generations to adapt effectively to evolving risks like climate change.	• Engaging pupils in projects analyzing past local disasters and developing preparedness plans. • Using storytelling and role-playing based on community events to teach risks in a relatable way. • Forming disaster management clubs that promote peer learning and community outreach. • Collaborating with local experts and authorities to provide hands-on, culturally relevant education.

2.3. Attention to pupils' special educational needs in teaching and learning

Pupils in the classroom may have different ways of learning new information. Some pupils have special needs, such as impaired sight, impaired hearing, or other disabilities; these special needs mean that they will learn differently from other pupils. The teacher must be able to adapt the teaching methodologies and approaches that he or she uses, to be able to help each pupil to learn well in the classroom.

For example:

- Teachers need to use a variety of learning activities when appropriate, such as role-play, music and singing, games and quizzes, and outdoor activities if possible.
- The classroom should be well organized, in order to limit distractions. This will help pupils with special needs to stay on track and follow instructions during the lessons.
- The pace of teaching should not always be slow, or always be fast; this is because pupils learn at different speeds from each other, and they process information differently.
- Use clear, simple language to explain the meaning of new words or concepts, and use those new words more than once during the class time.
- Use multi-sensory strategies whenever possible. Since pupils learn in different ways, it is important to include listening, speaking, hands-on activities, and visual aids when teaching.

The teacher should work closely with the Special Educational Needs coordinator for the school, to help pupils with specific disabilities to learn well.

For pupils with *developmental difficulties (such as difficulties in cognitive or language development, or difficulties in behaviour)*, the teacher should:

- Use simple words and sentences when speaking to the class.
- Use objects that the pupil can see, feel and handle, instead of just talking or reading about them.
- Break tasks down into small steps or learning objectives. The leaner should start with an activity that he or she already knows, before moving on to something that is more difficult.
- Begin by giving the learner more help, and then gradually give him or her less help.
- Be sure that pupils with disabilities are included in groups of non-disabled pupils.

For pupils with *visual impairment,* the teacher should:

- Help the pupils to use their other senses (hearing, touching, smelling and tasting) to learn and play.
- Where possible, provide objects that the learner can touch and feel to help explain a concept.
- Speak to the pupil's parents or caregivers, to learn how the pupil manages his or her lack of sight when he or she is at home. This can help the teacher to understand how to work well with the pupil in the classroom.
- Plan group learning activities as much as possible so that the learner is not left alone.

For pupils with *hearing impairment,* the teacher should:

- Make sure that the pupil is paying attention before the teacher begins to speak.
- Use gestures, body language and facial expressions to help communicate.
- Use pictures and objects as much as possible.
- Seat the pupils with hearing difficulties at the front of the classroom if possible.
- Speak to the pupil's parents or caregivers, to learn how they communicate with the child at home. Then use those same ways of communicating with the learner in the classroom. Also, find out whether the pupil has had a hearing test.

For pupils with *physical disabilities* or *difficulty in moving around*, the teacher should:

- Adapt activities so that pupils who have difficulty in moving can participate.
- Ask parents/caregivers to assist with adapting furniture to make it easier for the pupil to use it.
- Get advice from parents or a health professional about assistive devices for the pupil.

2.4. Using the active learning approach

Children in the classroom have different ways of learning new content. The main learning styles are:

- *Active learning* or *reflective learning:* learning by doing something, or learning by thinking about it.

- *Sensing learning* or *intuitive learning*: learning specific facts, or learning how ideas and facts are related.
- *Visual learning* or *verbal learning*: learning from what they see, or learning by what they hear or say;
- *Sequential learning* or *global learning*: learning one step after the other, or learning to see the larger picture all at once.

Each of these learning styles is effective for the child who uses it naturally. However, in a classroom with many pupils, the best way to teach the whole class is by using the *active learning* approach. This approach is the most effective in getting the most pupils to use their own experience and knowledge to help them learn new content.

In the active learning approach, the pupil is central to learning. Pupils are not just taught ideas and information that they passively accept; instead, they actively build on their own ideas and skills to learn new content. The pupil who is engaged in active learning can communicate with other pupils about the topic, do his or her own investigation into the topic, and develop knowledge and skills in his or her own ways.

The role of the teacher in active learning includes:

- Using pair and group discussions, pupil research and individual activities to help the pupils learn;
- Giving pupils tasks that help them grow in their ability to think critically, solve problems, be innovative, and cooperate with each other in finding answers.
- Supporting pupils' learning by recognizing their contributions to class activities.
- The CBC approach encourages active learning methods and techniques. brainstorming by asking questions, demonstrations, role playing, discussion technique, scenario building, exploration and research, experiments, field visits, quiz technique. In science, all used active methods and techniques must be in 5 Es teaching-learning approach (Engage, Explore, Explain, Elaborate, Evaluate).

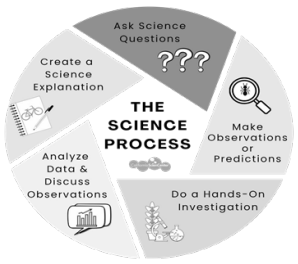
A lesson that is taught using an active learning approach should include steps like these:

- Introducing the new topic by connecting it with previous lessons;
- Developing the lesson to include discovery activities for the pupils, followed by a discussion of what they learned;
- Summarizing what was learned; and
- Exercises that link the lesson learned to the world outside the classroom.

2.5. Science process and engineering design process in teaching SET

a) The science process

Science learning focuses on inquiry and discovery. Pupils develop understanding by actively using their science knowledge and taking part in investigations. The Science Process helps learners think and act like scientists.



Introduce the Science Question:

Each lesson should begin with a clear science question. This question guides the lesson and keeps both the teacher and pupils

focused on the learning goal. By the end of the lesson,

pupils should be able to answer the question with increased understanding

Make Observations or Predictions:

Pupils bring prior knowledge from their experiences and previous learning. They can connect this knowledge to the science question by recording observations or making predictions in their exercise books.

Do a Hands-On Investigation:

Pupils explore the science question through hands-on investigations that build key science skills. These skills are called the Science Practices and include

- Asking questions
- Developing models
- Planning and carrying out investigations
- Collecting and analyzing data
- Using math to do science
- Creating explanations with evidence
- Obtaining, evaluating, and communicating information

During this time, the teacher supports inquiry by asking guiding questions and encouraging discussion. Pupils collect both quantitative and qualitative data. These firsthand observations provide evidence to answer the science question and may lead to new questions for further investigation.

Analyze Data and Discuss Observations:

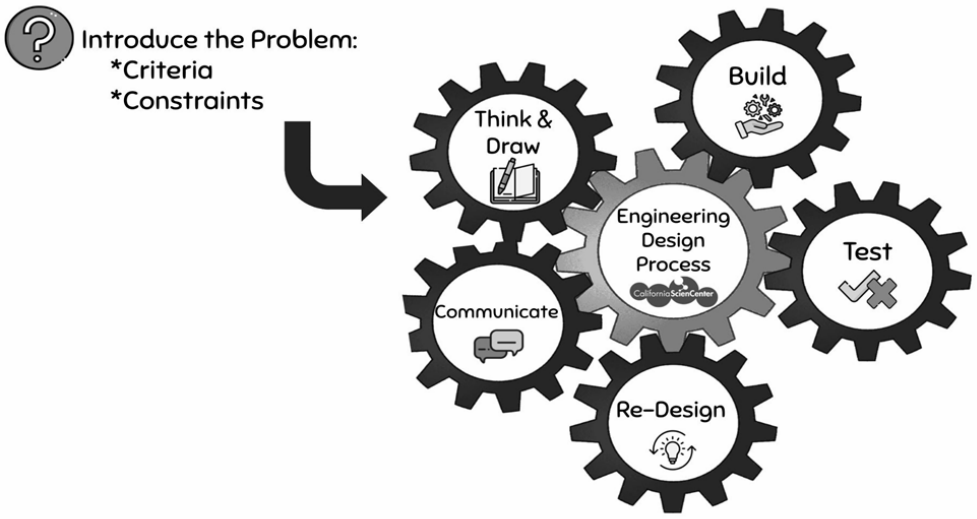
Pupils interpret their findings by examining data, comparing observations, and sharing results with peers. The teacher supports learning by introducing scientific vocabulary and addressing gaps in understanding.

The goal is to develop a shared understanding of the scientific concept.

Create a Science Explanation:

The science question is revisited, and pupils explain what they have learned. Their explanations should include evidence from the investigation, analysis of data, observations, and appropriate scientific language.

b) Engineering design process



Engineering is all about solving problems! The Engineering Design Process allows pupils of all ages to think and behave as engineers. Pupils who are solving a relevant problem will need time to think and draw, build, test, and communicate their solutions. In this process, they learn to collaborate with others and have opportunities to re-design and improve their solutions.

First, pupils must be **introduced to the problem** they are trying to solve. This is also the time that the **criteria** (what the design must include to be successful) and the **constraints** (what limitations are in place when solving the problem) are told to the pupils.

Pupils are then given time to **think and draw.** Both individually and in groups, pupils think through possible solutions to the problem and draw initial ideas for a solution. Once a possible solution is agreed upon, pupils will **build** their solution prototypes.

Pupils need to be given an opportunity **to test** their design to see if it meets the criteria and constraints that were introduced in the problem. After making observations and collecting data while testing, pupils are given a chance to **re-design** their solution to make it more successful. The Engineering Design Process continually flows from think and draw to redesign until the best solution is reached, or when time runs out.

Lastly, pupils **communicate** with their peers how and why they have designed their solution and reflect on the process.

2.6. Assessment

Assessment activities help the teacher to see how well the various pupils have learned lesson content, with the goal of improving teaching and learning in the classroom.

Two kinds of assessment are important in Rwandan education:

- *Continuous* or *formative assessment* aims to help improve the learning of the pupils and the teaching of the teacher. The pupils' learning is evaluated at the end of lessons and units; this is in order to see how the pupils are progressing, and also how well the teacher is teaching. If the assessment shows that some pupils are not learning well, the teacher must adjust his or her teaching approach to better support the pupils' learning. Formative assessment can identify slow, average and gifted pupils; different learning activities can then be given to match the speed of the pupils' learning.
- *Summative assessment* is usually done at the end of unit, end of a term or a school year. National examinations are summative. Summative assessment shows how well the entire class is learning, and the results can be used to improve school-level performance. The results of summative assessments show teachers, school leaders and parents how well the educational aims of the school and the education system are being met.

PART II. SAMPLE LESSON PLAN

School Name: xxxxxxxx Teacher's name: yyyyyyy

Term	Date	Subject	Grade	Unit	Lesson No	Lesson duration	Number of students
1	(dd/ mm/ yyyy)	SET	3	1	1/8	80 minutes (2 periods)	45

Number of students with special needs	Hearing impairment (2): Let the pupils sit in front of the teacher so that they can hear the lesson clearly. Visual impairment (1): Let the pupil sit in a way so that he/she can see the teacher pointing to illustrations and his/her facial expressions and gestures. Arrange for a Braille book if the pupil is completely blind.
Unit title	AGRICULTURAL TOOLS
Key unit competence	Pupils will be able to identify agricultural tools and safely use and care for them.
Lesson title	The common agriculture tools
Instructional objective	Having agricultural tools (real or images), pupils will be able to identify and name correctly the common agriculture tools.
Where the lesson takes place	Outside the classroom
Teaching and learning materials	Pupil's book, real or pictures of agricultural tools
References (Texts and books used)	REB (2022), Science and Elementary Technology, Pupil's book, Primary 3. REB (2022), SET Teacher's Guide, Primary 3 Internet and library materials English dictionary

Timing for each step	Teacher display real materials and pictures related to agriculture tools, pupils observe and answer the related questions with the guidance of teacher. With the help of teacher, pupils identify and name the common agriculture tools.		**Generic competences and Cross cutting issues to be addressed**
	The teacher's activities:	**The pupils' activities:**	

Introduction: 10min	Bring the real tools such as hoe, rake, machete, ...or display the images. Ask questions related to the brought real tools or the displayed images. Where these tools on images are used? Which tools do you use in caring garden or in farm at home? How do you call all these tools used in a garden or on a farm? Announce the new lesson title: **The common agriculture tools**	Answer the questions related to the brought real tools or displayed images. Possible answers: These tools are used in agriculture. Pupils give answers like hoe, rake, machete, ...	**Communication skills:** through listening and answering teacher's question. **Critical thinking:** through making analysis and providing answers related to the asked questions. **Gender education:** boys and girls are given equal opportunity without gender discrimination. **Inclusive education:** through providing activity to all pupils.
Lesson development: 60 minutes	Ask pupils to look at the picture under activity 1.1 in pupils 'book. Put pupils in groups and ask questions related to the observation: 1. What do you see in the picture? Have you seen these tools before? 2. Name each of the tools in the picture?	Observe all tools available on the pictures. Pupils share ideas and provide answers. Possible answer: 1. I see different agricultural tools like a hoe, rake, and watering can. Yes, I have seen some of these tools at home, in the garden, or at school. 2. Axe, spraying pump, hoe, wheelbarrow, milk can, file, watering can, panga (machete), rake, trowel, spade, pickaxe	**Peace and values education:** through telling pupils why is it important to be careful and to avoid causing accidents or injuries to others while using agriculture tools. **Communication:** The group of classmates creates an open environment that promotes effective communication among group members. **Gender education:** will be addressed through allowing all boys and girls to lead groups, contribute equally and asking both girls and boys to make presentation.

	Ask pupils to remain in their respective groups and give them task: You are asked to prepare a small garden at home. Name three tools you will use.	Pupils remain in their respective group, discuss and share ideas to provide answer from group discussion. Possible answer: Examples of tools: hoe, spade, watering can, ...	**Cooperation:**through helping each other and taking decision together.
Conclusion: **10 minutes**	**Summary:** Ask the pupils what they have learned in today's lesson and also what they have learned from each other. Ask questions to review common agricultural tools: Possible question: Which Rwandan common agricultural tools are used for making hygiene at home or at school (clearing bushes, cleaning and digging)	Pupils summarise what they have learned in today's class. Some pupils also present what they learnt from their fellow pupils during the lesson. **Answers to the questions.** **Possible answers:** hoe, spade, panga (machete), wheelbarrow, ...	**Critical thinking and creativity:** while providing answers. **Peace and values education:** through respecting other's ideas during group discussions and presentations.
Teacher self-evaluation	The lesson objective was achieved. Pupils were motivated and able to identify and name the common agriculture tools.		

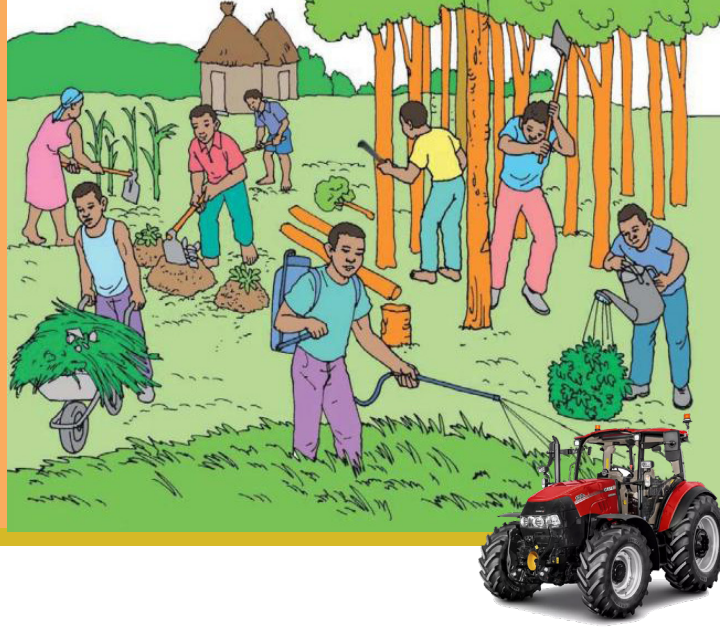
PART III. CONTENT MAP

SCIENCE AND ELEMENTARY TECHNOLOGY (SET) PRIMARY 3			2 periods / week
No	**Unit titles**	**Key unit competences**	**Number of periods/unit**
1	Agricultural tools	Pupils will be able to identify agricultural tools and safely use and care for them.	12
2	Writing skills with computer	Pupils will be able to write and format a text in a word processing program	10
3	Drinking water	Pupils will be able to prepare and store drinking water in the correct way	10
4	Animals	Pupils will be able to identify and tell the difference between vertebrate and invertebrate animals, and demonstrate care for animals in the environment.	8
5	Electricity	Pupils will be able to identify and use devices that use electricity in a safe way, and state how electricity helps us.	14
6	Magnets	Pupils will be able to identify magnets, use them safely and state the difference between magnetic and non-magnetic objects.	12
	TOTAL NUMBER OF PERIODS		66

PART IV. UNITS DEVELOPMENT

UNIT 1

AGRICULTURAL TOOLS



i. Key unit competence

Pupils will be able to identify agricultural tools and safely use and care for them.

ii. Key vocabulary words

agriculture	machete	axe	trowel	slasher	transporting
milk can	clearing	digging	harvesting	storing	protective
sharpen	repair	injury	pesticides	Spray	

iii. Prerequisites

Pupils will learn better this unit if they remember the content learnt in Primary 1 under the unit "Materials used at school and home" where they were introduced to simple farming practices such as digging, watering, and planting. These activities involved the use of basic tools like watering cans and hoes, giving pupils prior exposure to agricultural tasks, tool names, and their importance. This prior experience supports their understanding of tool identification, safe use, and maintenance. As a teacher, you will ask pupils some questions to check what they remember as a prerequisite. You may also give them the task of revising that prerequisite content in their evening time.

Introductory activity and guidance

A. Guidance on introductory activity

- Ask pupils to look at the picture under introductory activity in pupil's book.
- Ask pupils to read the questions related to the picture and allow them to give answers.
- Facilitate the pupils to make sure that they are on the right way.
- Encourage other pupils to contribute or ask questions.
- Ask them what the title of the new lesson might be.
- Ask the pupils questions until they discover and can predict what they are going to study.
- Write on the chalk board the title of the new lesson: Agriculture tools

B. Possible answers to the introductory activity

1. Yes, I have seen people working on the farm.
   (Encourage pupils to share where they saw this e.g., at home, in the village, or during a school trip.)
2. The people are using tools like hoes, spades, a wheelbarrow and watering cans.
3. They are digging the soil, planting crops, and watering the plants.

iv) Generic competences:

- Critical thinking: Developed through identifying, comparing, and classifying agricultural tools according to their functions, selecting suitable tools for farming activities, and explaining safe use and maintenance practices.
- Cooperation, interpersonal relations and life skills: Developed through collaborative farm visits, role plays, and group discussions on the safe use, maintenance, and storage of agricultural tools, promoting teamwork and communication skills.
- Research and problem solving: Developed through observing farming practices, investigating tool maintenance methods, identifying risks of misuse, and suggesting practical safety measures.

v) Basic values:

- Responsibility (Dignity and Integrity): Developed through using agricultural tools safely, cleaning and maintaining them properly, and storing them correctly after use.
- Hard work: Developed through active participation in practical farming activities, tool maintenance, and demonstrations, promoting diligence and a positive attitude toward work.
- Self-reliance: Developed through acquiring practical skills in selecting, using, maintaining, and caring for agricultural tools to perform simple farming activities independently.

vi) Cross-cutting issues to be addressed

a) Peace and values: When using digging and clearing agricultural tools, attention is needed in order to prevent accidents to each other. E.g: Pupils work in pairs to dig a small plot, taking turns and supporting each other rather than competing or fighting over tools

b) Gender equality: Encourage both boys and girls to participate equally in using and managing agricultural tools. E.g: Let girls use heavy tools like spades and boys use lighter tools like watering cans, showing that all pupils can learn and perform equally regardless of gender.

c) Inclusiveness and equity: Ensure that all pupils, including those with disabilities, can participate in practical work with tools e.g: by adapting tools or offering support.

d) Environment and sustainability: Teach pupils how to use tools in ways that do not damage the soil or natural resources. E.g: While learning about a hoe, pupils discuss how improper tilling can lead to soil erosion, and how to prevent it by using conservation techniques like contour farming.

vii) List of lessons

#	Lesson title	Learning objectives	Number of periods: 12
1	The common agriculture tools	• Identify the commonly used agricultural tools. • Name some common agricultural tools. • Draw and name different agricultural tools.	2
2	Uses of agriculture tools	• Explain the use of agricultural tools • Group agricultural tools based on their uses • Being careful while using agricultural tools.	2
3	Maintenance of agricultural tools	• Explain the maintenance of agricultural tools • Apply techniques of maintaining agricultural tools.	1
4	Storage of agriculture tools	• Apply techniques of storing agricultural tools. • Store tools in the correct place after use.	1
5	Dangers of the misuse of agricultural tools	• Explain the dangers of misuse of agricultural tools. • Show concern about preventing accidents caused by misuse of tools • State safety rules to follow when using farm tools.	1

6	Precautions while using agricultural tools	• Explain precautions taken when using agricultural tools • Show concern about prevention against potential dangers of agricultural tools 'misuse	1
	Practical activities on the content of the unit	• Practice the content of the unit	2
7	End of unit assessment	• Assess the acquired competences • Demonstrate the achievement of the key unit competence	2

Guidance on different lessons

1.1. Common agricultural tools

a) Learning objectives

Identify and name the commonly used agricultural tools.

b) Teaching and learning resources

Textbooks, real agricultural tools, images of different agricultural tools, video showing use of agricultural tools and other agricultural practices (where accessible).

Teachers are encouraged to improvise appropriate teaching and learning resources using locally available materials based on their school and community context to support the lesson.

c) Activity guidance and answers

Guidance on activity 1.1

This activity aims at making pupils identify common agricultural tools. You will processed as follow:

i) Ask pupils to look at the pictures in their pupil's book on activity 1.1. You can use real objects.
ii) The teacher should make sure that each pupil has the pupils' book to read
iii) Ask the pupils an oral question related to Activity 1.1

iv) Ask other pupils whether their answers match the answers given.
v) Allow some pupils to write their answers on the black board. The teacher should ensure that all pupils understand the answers that are given.

Note: Ensure to develop the values and generic competencies related to this lesson.

Answers to activity 1.1

1. They are used in agriculture.

   Yes, I have seen some of these tools at home, in the garden, or at school.
2. AAxe, hoe, watering can and panga (machete), wheelbarrow, milk can, file, watering can, panga (machete), rake, trowel, spade, pickaxe
3. Other tools: forked hoe, sickle, slasher, tractor, others

Guidance on application activity 1.1

This activity is identifying common agricultural tools:

i) Do this activity in groups of two or three pupils.
ii) Tell pupils to do the activity.
iii) As pupils are doing this activity, you move around and mark their work.
iv) When every group is done and you are done, invite some member(s) to present the answers.
v) Ask other pupils whether their answers match the ones discussed.
vi) Allow pupils to write the main points in their notebooks.

Possible answers to application activity 1.1

I would choose to use these three tools:

- Hoe: for digging the soil.
- Rake: for removing stones and leaves.
- Watering can: for watering the plants.

1.2. Uses of agricultural tools

a) Learning objectives

- Explain the use of agricultural tools.
- Group agricultural tools based on what they are used for.
- Be careful while using agricultural tools.

b) Teaching and learning resources

- Real tools, textbooks, images of different tools in use, videos showing different tools in use.
- Teachers are encouraged to improvise appropriate teaching and learning resources

using locally available materials based on their school and community context to support the lesson.

c) Activity guidance and answers

Guidance on activity 1.2

This activity helps pupils to explore uses of agriculture tools.

i) Introduce and explain the activity using pictures of agricultural tools, and ask guiding questions to help pupils remember what they have already learnt.
ii) Organize pupils into groups to identify and sort tools, based on what they are used for (for example, cutting/digging, watering, carrying).
iii) Tell groups to do activity 1.2 in the pupil's book. You may use real materials where accessible.
iv) Facilitate group work by moving around, asking questions to check their thinking, and encouraging discussion and reasoning.
v) Conclude with presentations from each group, clarify tool functions, and reflect on what was learned to reinforce key concepts.
vi) Allow pupils to write the main points in their notebooks.

Note: Ensure to develop the values and generic competencies related to this lesson.

Answers to activity 1.2

1. Machete to cut grasses or small trees.
2. Hoe to dig the soil.
3. Wheelbarrow: it helps to carry heavy things easily.
4. Watering can: used to water vegetables

Guidance on application activity 1.2

This activity aims at assessing the pupils' understanding of the uses of agriculture tools.

i) This activity will be done in pairs.
ii) Tell pupils to do application activity 1.2.
iii) As pupils are doing this activity, you should move around and provide short explanation through guiding questions.
iv) When everyone is done and you are done, invite some pupil(s) to share their answers to the whole class.
v) Ask other pupils whether their answers correspond to the ones discussed.
vi) Allow pupils to write the main points in their notebooks.

Answers to application activity 1.2

The uses of these tools are:

- Hoe: It is used to dig and loosen the soil to make it ready for planting.
- Rake: It is used to remove stones, leaves, and to level the soil.
- Watering can: It is used to water the plants after planting to help them grow.

1.3. Making and maintenance of agricultural tools

a) Learning objectives

- Explain the maintenance of agricultural tools
- Apply techniques of maintaining agricultural tools.
- Make a tool that can be used in a garden at school through the engineering design process.

b) Teaching and learning resources

- Real agricultural tools, oil, water, file, paint, grease, videos showing how some agricultural tools are maintained.
- Teacher's guide, Pupil's book, Scissors, Scotch or glue, Wire or string, Recyclable resources (i.e., plastic bottles, cardboard boxes, rubber, wood/sticks, cloth, cardboard, paper), Testing area, such as a garden or an area with dirt, leaves, and plants.

c) Activity guidance and answers

Part A: Guidance on activity 1.3

This activity helps pupils to explore how to maintain agriculture tools.

i) This activity will be done individually.
ii) Ask the pupils a question related to activity 1.
iii) Offer explanations when you are asking the pupils the question.
iv) Select pupils to answer, being sure that all the pupils are included.
v) Ask other pupils whether their answers match the ones discussed.
vi) Allow the pupils to write the main points in their notebooks.

Part B: Guidance on engineering activity 1.3

i) Share the problem as stated in pupil's book.
ii) Divide the class into small groups of 3-4 pupils to carry out this task.
iii) Explain to pupils that their agricultural tool will need to pass the following tests:

1. It must be safe for a nursery school pupil to use. Remind pupils of the size and age of a nursery school pupil.
2. It can be used to do its job. Refer to the tools' uses on page 5-8 of the pupil's book. For example:
   - A watering has a handle and spout to water plants.
   - A trowel must be able to break through dirt to dig holes.

- A rake must be able to collect leaves and grass.

iv) Groups will engineer one tool to solve the problem. Have groups look at the agricultural tools on pages 3 and 4 of the pupil's book. Which of the tools would be easy and safe for a nursery school pupil to use? Choose one. If pupils have difficulties deciding, tell groups that they can choose one of the following: a watering can, a trowel, or a rake.

v) Show pupils the learning resources that will be available for them to make the tool.

vi) Tell pupils to draw their individual designs in their exercise books before discussing with others. Remind them to think about the criteria (passing the tests) as they design their agricultural tool.

vii) Groups will decide on one design to build. Encourage pupils to combine design elements from their individual ideas. Accept all innovations.

viii) Give groups the learning resources to build their agricultural tools.

ix) Take pupils outside to test their agricultural tools. Gather the class around the testing area. Test one type of agricultural tool at a time. For example, have one pupil in every group that engineered a rake to come to the center of the testing area. Each person uses the rake to collect leaves at the same time to see if it can gather leaves or grass.

x) Make observations and ask pupils to think about their designs:

a) Did your agricultural tool do the function that the pupil's book described?

b) Is it safe for a nursery school pupil to use?

c) Did you see any designs of the same agricultural tool that looked different than yours?

xi) Encourage pupils to make observations of how the agricultural tools are uniquely built and how they perform on the tests. Instruct pupils to draw or write any notes they observe in their exercise books.

xii) Give groups time to re-design and re-build next class period if desired.

Then , proceed as follows:

xiii) Have pupils explain their design to another group that chose the same agricultural tool.

xiv) Prompt pupils to talk about the following:

a) What learning resources did you use to make your ____?

b) Did you design anything special so that it is safe for a nursery school pupil to use?

c) How did your tool perform on the test?

d) Did you need to change your design?

e) What changes did you make and why?

Answers to the activity 1.3, Part a

1. Yes, I have seen a farmer with agriculture tools like a hoe, machete, watering can.
2. Yes, the farmer has cleaned the tools.

For example: a hoe is cleaned with water and then dried; sometimes it is sharpened. A wheelbarrow is checked for air in the tire and kept in the shade.

Answers to Activity 1.3, Part b

- The agricultural tools do not need to be the same design or use the same learning resources. Accept all innovations.

- Possible answers in discussion:

  - Our ____ is easy for a nursery school pupil to use because ____.
  - It was able/not able to ____ when we tested it.
  - We changed ____ because ____.

Guidance on application activity 1.3

This activity aims at assessing the pupils' skills about the maintenance of agriculture tools.

i) This activity will be done in groups.
ii) Tell pupils to do application activity 1.3.
iii) Ask pupils to bring tools used in the school garden, to clean them like it is done in the activity.
iv) As pupils are doing this activity, you move around and support or guide them in their work.
v) When everyone is done and you are done, invite some member(s) or group(s) to share their answers to the whole class.
vi) Ask other groups whether their answers match the ones discussed.
vii) Allow pupils to write the main points in their notebooks.

Note: Ensure to develop the values and generic competencies related to this lesson.

Answers to the application activity 1.3

1.

Tool	What to use for cleaning
Hoe	Water, brush or rag, and a cloth to dry it.
Watering can	Clean water to rinse it inside and outside.
Machete	Water and cloth for cleaning it, a dry rag, and oil to prevent rust

2. To regularly maintain the tools

- Clean tools after every use to remove dirt and prevent rust.
- Dry tools properly before storing them to avoid moisture damage.
- Store tools in a safe, dry place (like a tool shed or covered area).
- Sharpen tools like hoes and pangas regularly to keep them sharp.

- Check for damage (like broken handles) and repair or replace what is broken when needed.
- Oil the metal parts of tools like pangas to prevent rusting.

1.4. Storage of agricultural tools

a) Learning objectives

Apply techniques of storing agricultural tools.

b) Teaching and learning resources

Agricultural tools, textbooks.

c) Activity guidance and answers

Guidance on activity 1.4

This activity helps pupils to explore the storage of agriculture tools.

i) **Organize a visit to a nearby farmer** and brief the pupils before the visit. Instruct them to look at how agricultural tools are stored, like cleanliness, safety, and protection from weather.
ii) **Guide pupils during the visit** to pay attention to storage methods such as tool sheds, hanging racks, or tool stands, and to note any safety or maintenance practices used.
iii) **After the visit, instruct pupils to write a simple report** describing the storage techniques they observed and why those methods are effective.
iv) **Allow pupils to present their reports** to the class in groups or individually, and lead a discussion on how similar tool storage methods can be applied in the school garden.

Note: Ensure to develop the values and generic competencies related to this lesson.

Answers to activity 1.4

A sample short report

We visited a farmer near our school. I saw that the farmer stores tools in a small house called a tool shed. He cleans and dries the hoe and panga after using them. He hangs them on the wall, so they don't get damaged. The watering cans are turned upside down to dry. I learned that keeping tools safe helps them last longer and prevents injuries.

Guidance on application activity 1.4

This activity aims at assessing the pupils' skills about the storage of agriculture tools.

i) This activity will be done in groups.

ii) Tell the pupils to do application activity 1.4.
iii) As the pupils are doing this activity, you should move around to guide and support them.
iv) When everyone is done and you are done, invite some member(s) or group(s) to share their answers to the whole class.
v) Ask other pupils or groups whether their answers match the ones discussed in the whole class.
vi) Allow pupils to write the main points in their notebooks.

Answers to application activity 1.4

1. Farmers keep their tools in a tool store, shed, or safe storage room to protect them from damage and theft.
2. Tools can rust when left in the rain. Wooden parts can rot or break. Tools can become dull or damaged. Someone may get injured by stepping on or touching tools that have not been stored.
3. Cleaned tools should be stored in a dry, clean, and safe place such as a tool shed or storage room. They should be hung on racks, placed on shelves, or arranged neatly off the ground to prevent damage.

1.5. Dangers of the misuse of agricultural tools

a) Learning objectives

Explain the dangers of misuse of agricultural tools.

b) Teaching and learning resources

Textbooks, images showing dangers of misuse of agricultural tools, videos showing dangers of misuse of agricultural tools.

c) Activity guidance and answers

Guidance on activity 1.5

This activity aims at making pupils explore the dangers of the misuse of agriculture tools.

i) Ask the pupils a question related to Activity 1.5.
ii) Offer explanations when you are asking the pupils questions.
iii) Encourage pupils to reflect on the question asked, by asking a related question.
iv) Ask each pupil to answer the questions in activity 1.5 and link them to real life.
v) Allow pupils to write the summary in the notebook.

Note: Ensure to develop the values and generic competencies related to this lesson.

Possible answers to activity 1.5

1. Yes, I saw a man get hurt by a hoe.

2. He was not careful. He used the hoe too fast and hit his foot.

Guidance on the application activity 1.5

This activity assesses the pupil's knowledge about the dangers of misusing agriculture tools.

i) This activity will be done in group of two or three pupils.
ii) Tell pupils to do application activity 1.5 in five minutes.
iii) As pupils are doing this activity, you should move around and guide them.
iv) When each group is done and you are done, invite some member (s) to share their answers with the whole class.
v) Ask other pupils whether their answers are the same as the ones discussed.
vi) Allow pupils to write the main points in their notebooks.

Answers to application activity 1.5

If you play with or misuse tools like a panga, hoe, or slasher in the garden, these things can happen:

- You can injure yourself or others (e.g., get cuts or bruises).
- You can break the tool or damage school property.
- You may cause someone to fall or trip over tools left lying around.
- It can lead to serious accidents that require medical help.
- It slows down garden work and sets a bad example for others.

1.6. Precautions when using agricultural tools

a) Learning objectives

- Explain the precautions that must be taken when using agricultural tools.
- Show concern about preventing the potential dangers of misusing agricultural tools.

b) Teaching and learning resources

- Textbooks, images showing precautions being taken when using agricultural tools.

c) Activity guidance and answers

Guidance on activity 1.6

This helps pupils to explore the dangers of misusing agriculture tools.

i) Organize a visit to a nearby farmer, and instruct pupils to carefully observe how farm workers handle different agricultural tools during their daily activities.
ii) During the visit, guide the pupils to focus on how workers carry, use, and store tools, and whether they wear protective clothing.

iii) After the visit, lead a class discussion to list the precautions that the pupils observed (e.g., using tools properly, not playing with sharp tools, wearing gloves or boots).
iv) Have pupils make a list of safety precautions in their notebooks or as a group report, and discuss how these can be applied in the school garden or at home.

Note: Ensure to develop the values and generic competencies related to this lesson.

Answers to activity 1.6

Some precautions to be taken while using tools:

1. Use the correct tool for the work.
2. Do not play with sharp or heavy tools.
3. Carry sharp tools carefully, with their blades facing down.
4. Wear proper shoes or gloves when necessary.
5. Clean and check the tools before and after you use them.
6. Keep tools in safe places after work; never leave them lying around.
7. Work at a safe distance from other people, to avoid accidents.

Guidance on application activity 1.6

This activity assesses the pupils' knowledge about taking precautions when they use agricultural tools.

i) This activity will be done in groups.
ii) Tell pupils to do application activity 1.6.
iii) As pupils are doing this activity, you should move around and guide them by asking questions or providing clarification.
iv) When everyone is done and you are done, invite some member(s) or group(s) to share their findings to the whole class.
v) Ask other pupils or groups whether their answers match the ones discussed.
vi) Allow pupils to write the main points in their notebooks.

Answers to application activity 1.6

We wear strong shoes or boots when using tools like a hoe or slasher in the garden:

- To protect your feet from getting cut or injured if a sharp tool falls on them.
- To avoid slipping on wet or muddy ground.
- To protect your feet from thorns, sharp stones, or insects in the garden.

1.7. End of unit assessment 1

I. Guidance on end of unit assessment.

i) This assessment will be done individually.
ii) Distribute or write the assessment and read the instructions clearly. Make sure that the pupils understand what is expected before they begin.
iii) Allow enough time for pupils to answer all the questions, moving around to supervise and offer clarification if needed without giving answers.
iv) Encourage neat and honest work, reminding pupils to answer all the questions.
v) Collect and mark the assessments, then provide feedback to the pupils.

II.Answers to the end of unit assessment 1

A. Knowledge

1. b
2. c
3. a
4. b
5. (i-a), (ii-b), (iii-b), (iv-c)
6. a-True; b-True; c-True; d-False; e-True

B. Skills

7. b
8. b
9. 1-e; 2-a; 3-b; 4-f; 5-c; 6-d

C. Attitudes and values

10. b
11. c
12. b

1.8. Additional activities

A. Remedial activities

1. Give any three examples of agricultural tools.
2. Draw a cutting tool.
3. Discuss any two dangers of misuse of agricultural tools.

Answers to remedial activities

1. Hoe, spade, trowel, wheelbarrow, milking can, machete, watering can, spraying pump.

2. Any cutting tool in the pupil's book including axe and sickle.
3. They cause injuries, they cause bruises, they hurt us, they cause accidents.

B. Consolidation activities

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

Answers to the consolidation activities

1. Tools can be stolen, tools can be damaged, tools can rust, and money can be wasted on buying new tools.
2. Transporting, transplanting, cutting, spraying, digging

C. Extended activities.

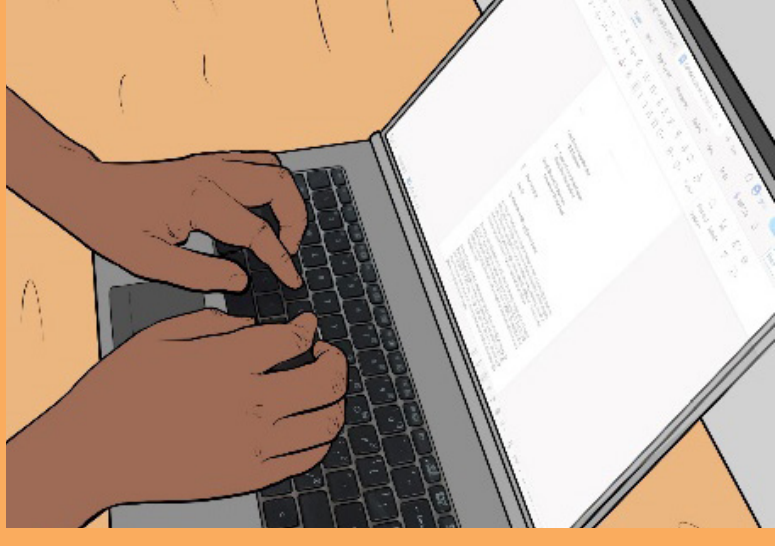
1. Your classmate is using a file to dig the soil. What would you tell them and why?
2. Explain the dangers of not storing agricultural tools properly.
3. Imagine you are a farmer. How would you organize your tool storage to keep your tools safe and ready to use?

Answers to the extended activities

1. I would tell them that a file is for sharpening tools, not digging. They should use a hoe or spade for digging.
2. If tools are not stored properly, they can rust, cause injuries, break easily, or become a danger to others.
3. I would store tools in a dry, well-lit room, hang them on hooks, clean and oil them after use, and check for damage before storing.

UNIT 2

WRITING ON A COMPUTER



i. Key unit competence

Pupils will be able to:

- Write small letters and capital letters in a Word Processing program using the keyboard.
- Explain AI in simple terms and its application in real life.

ii. Key vocabulary words

Keyboard	Abiword	Capital letters
Touchpad	Typing	Small letters
Word Processor	Finger placement	
AI		

iii. Prerequisites

The pupils should know a computer and its different parts including the keyboard which is used for writing.

Introductory activity and guidance

A. Guidance on the introductory activity

i) Invite pupils to read the scenario in small groups.

ii) Invite one learner to read loudly for the whole class.

iii) Invite pupils to provide answers to asked questions from the scenario.

B. Possible answers to the introductory activity

1. Gatesi used the teacher's computer.
2. Title was "P3 Superstars Newsletter".
3. The pupils identify the letters that they will use to type their names.

For example if the name is Uwimana the keys to use are UWIMANA

iv) Generic competences:

- Critical thinking: Developed through identifying keyboard keys and word processing tools, distinguishing between uppercase and lowercase letters, and selecting suitable formatting tools to create well-presented documents.
- Research and problem solving: Developed through exploring the keyboard, touchpad, and word processor using practical activities, identifying tool functions, and solving simple typing and document-saving challenges.
- Communication (Literacy and Numeracy): Developed through typing words, sentences, and simple documents accurately using correct letter cases and formatting tools to communicate ideas through digital text.

v) Basic values:

- Responsibility (Dignity and Integrity): Developed through using computers carefully, saving work regularly, and handling ICT equipment properly.
- Hard work: Developed through practicing keyboard skills, improving typing accuracy, and completing practical tasks with commitment and perseverance.
- Self-reliance: Developed through gaining confidence and skills to independently create, edit, save, and retrieve simple documents using a word processor.

vi) Cross-cutting issues to be addressed

a) Environment and sustainability: Provide short sentences that are about protecting the environment and make pupils write those sentences

b) Inclusive Education: Encourage participation from all Pupils and create a supportive classroom where every learner feels valued and confident to share their ideas through writing, regardless of ability or background.

vii) List of lessons

No	Lesson title	Learning Objectives	N° of periods 10
1	The keyboard and touchpad	• To identify the main parts of the keyboard and touchpad and demonstrate their functions • Use well the keyboard and the touchpad	2
2	Opening and saving a document	To open a word processing application, create a new document, and save it using an appropriate file name	2

3	Writing capital letter and small letters	To correctly type capital and small letters using the keyboard or the Uppercase and Lowercase tools	2
	Practical activities on the content of the unit	Practice the content of the unit	2
4	What is AI	Explain AI, what it can do, and give examples of tools that use it.	1
5	End of unit Assessment	• Assess the acquired competences • Demonstrate the achievement of the key unit competence	1

Guidance on different lessons

2.1. The keyboard and touchpad

Guidance on the lesson

a) Learning objective

- To identify the main parts of the keyboard and touchpad and demonstrate their functions
- Use well the keyboard and the touchpad.

b) Teaching and learning resources

- Laptop, touchpad, demonstration videos or animations, printed worksheets with keyboard diagrams, pupil's book.
- Teachers are encouraged to improvise appropriate teaching and learning resources using locally available materials based on their school and community context to support the lesson.

c) Activities' guidance and answers

Guidance on introductory activity

- Start by asking pupils what they know about the keyboard and if they have used it. Provide real life example such as opening a colorful document or typing a simple story. It is very important to tell pupils what they will learn and why it is useful.
- Perform the task using a projector and allow them to follow the teacher's steps on their own computers.
- Encourage pupils to type a few sentences.
- Note: Ensure to develop the values and generic competencies related to this lesson.

Answers on activity 2.1

1. The role of a keyboard is that it is used for typing letters, numbers, and commands.
2. The three types of computer keys are: Alphabet Keys (A–Z), Number Keys (0–9) and Function Keys (F1–F12)
3. The role of the touchpad is that it is used to move the mouse pointer by touching it using the finger
4. The touchpad has the right button and the left button.

d) Guidance and answers to application activity

Guidance on application activity 2.1

a) Ensure that students have access to computers

b) Remind pupils to apply learned keyboard skills in practices

c) Move around the class to provide support

d) Encourage active participation of all pupils in class

Answers to application activity 2.1

1. The Home rows are: A, S, D, F, G, H, J, K, L, and ; (semi colon)
2. It is necessary because it helps in typing without looking at the keyboard and makes typing faster and easier.
3. The 4 navigation keys are: left arrow, up arrow, down arrow, and the right arrow
4. The types of keys are: Letter keys, numeric keys and special keys

2.2. Opening and saving a document

a) Learning objectives

To open a word processing application, create a new document, and save it using an appropriate file name.

b) Teaching and learning resources

Computers with word processing software such as Microsoft Word and AbiWord, step-by-step printed guides (with screenshots), projector or interactive whiteboard (for demonstration), pupils' books.

c) Activity guidance and answers

Guidance on activity 2.2

i. Begin with a brief discussion by asking pupils the importance of saving document and what would happen if they wrote a story and forget to save it.

ii. Show how to open a word processing application such as Microsoft Word or AbiWord and demonstrate how to type a few words in a document.

iii. Show how to use Save and **Save As** options.

iv. Explain file names and choosing folders or locations to save.

v. Provide independent practice where each learner is assigned a simple task of typing a given text. You can write the text on chalkboard or use a projector.

vi. Ask pupils to demonstrate or explain the steps they have written and to discuss common errors and correcting them.

vii. Ask pupils to save their work on the computer.

Note: Ensure to develop the values and generic competencies related to this lesson.

Answers on activity 2.2

1. Pupils open Word or Abiword. The steps on how to do it are in the pupils' book section 2.2.
2. The text is written by clicking on the blank document and typing the given text using the keyboard.
3. To save the document click on the **Save Tool** or click on **Save as,** then write the document name and click on Save.

d) Guidance and answers on application activity 2.2

Guidance on application activity 2.2

Ensure that students have access to computers.

- Remind pupils to apply learned keyboard skills in practices. You can write the text on chalkboard or use projector to display work.
- Give pupils enough time to complete the task and move around the class to provide support
- Encourage active participation of all pupils in class.

Answers on application activity 2.2

1. To open a new word document, click on Start then click on Word.
2. The icon is used for saving a document
3. Abiword is found in the Gnome interface
4. The pupils write the school name and headteacher's name using a computer. They must use the correct fingers.

2.3. Writing capital and small letters

a) Learning objectives

To correctly type capital and small letters using the keyboard or the uppercase and lowercase tools

b) Teaching and learning resources

Computers with Word processing software, Projector to do demonstrations, a visual layout of the keyboard showing the location of different keys, Flashcard of letters for reference, Alphabet Chart on projector Screen or school Walls.

c) Activity guidance and answers

Guidance on activity 2.3.

i. Introduce the concept of uppercase and lowercase letters in typing.
ii. Ask pupils if they know the difference between capital and small letters.
iii. Show examples on the projector screen (e.g., A/a, B/b).
iv. Briefly explain when to use capital letters (e.g., names, beginning of sentences).
v. Open a word processing program and show how to type capital and small letters on the computer by using the correct fingers.
vi. Show how to type capital letters using the Shift key and the Caps Lock key.
vii. Use a projector or drawings on the school wall for whole-class visibility.
viii. Allow pupils to practice typing letters on their computers.
ix. Type a sentence in both formats for demonstration that pupils will imitate.
x. Provide task to pupils such as writing a short paragraph using both uppercase and lowercase letters correctly.
xi. Prepare a short typing test or exercise to assess pupils' ability to use both cases.

Note: Ensure to develop the values and generic competencies related to this lesson.

Answers on activity 2.3

1. Write the given text in Word or Abiword.
2. To save use the save tool or click on Save (or Save as) menu
3. Capital letters are written by pressing the Caps Lock key or pressing the Shift key. Writing small letters and changing them into capital letters by using the change case tool

d) Guidance and answers on application activity 2.3

Guidance on application activity 2.3

- Remind pupils to apply learned keyboard skills in practices. You can write the text on chalkboard or use projector to display work.
- Give pupils enough time to complete the task and move around the class to provide support.

- Encourage active participation of all pupils in class and provide enough assistance to slow pupils.

Answers on application activity 2.4

1. Open Word or Abiword and type the given text.
2. Selecting the text by using the shortcut key CTLR + A or by pressing the left button then moving the cursor on the text. After press on the **Change case** tool Aa and press on **lowercase.** As a result all the text becomes in small letters.

The entire paragraph will now appear in small letters:

it is very dangerous to live in a weak house. it can be damaged easily during heavy rain or strong wind. some houses are weak because they are old or built with poor materials, such as thin wood or low-quality bricks.

3. To change the text to capital letters select the entire text again (Ctrl + A).

- Go to the **Change Case** icon (Aa) on the Home tab.
- Choose **"UPPERCASE"**.
- The paragraph will now appear as:

  IT IS VERY DANGEROUS TO LIVE IN A WEAK HOUSE. IT CAN BE DAMAGED EASILY DURING HEAVY RAIN OR STRONG WIND. SOME HOUSES ARE WEAK BECAUSE THEY ARE OLD OR BUILT WITH POOR MATERIALS, SUCH AS THIN WOOD OR LOW-QUALITY BRICKS.

2.4. AI tools in writing

Guidance on the lesson

a) Learning objective

Explain AI, what it can do, and give examples of tools that use it.

b) Teaching and learning resources

Computer with Internet connectivity, smart phone or tablet with an application to edit images using AI, pupil's book, two images of cartoons to illustrate the cartoon before and after being edited using AI, educational video to display to learners to show how AI can be used to edit image, teacher's computer and projector for displaying the video and images.

c) Activities' guidance and answers

Guidance on application activity

- Show the cartoon images which are in the student book. Start with the cartoon of a child then show the other on which beard has been added. If there are other images or videos illustrating how images can be edited show them.
- Show a small telephone and ask if it can be used to edit images like that and let

learners explain why it can not.

- Guide learners through the questions of the activity 2.4 so that they discover more on AI.
- Guide learners so that the class comes to the conclusion on what AI can do as it is summarized in the lesson in the section "I have discovered that:"

Note: Ensure to develop the values and generic competencies related to this lesson.

Answers on activity 2.4

1) The image B has beard and it is in a smart phone

2) The image B was made using a smart phone with an application which used AI.

3) AI has helped to add beard to that face.

4) AI is Artificial Intelligence

5) Other tools that can use AI are robots, self driving cars and drones.

d) Guidance and answers to the application activity 2.4

The application activity 2.4 is to be done individually in the classroom and it is a close ended question.

- Write the questions, call one learner to read them and let learners answer them.
- Move around to correct the answers given by learners. Occasionally ask one you correct why he/she chose that answer.
- Let learners correct the questions collectively. Make sure they explain why they answered by True or False or why they chose one answer instead of another.
- End the lesson by encouraging learners to use AI responsibly.

Answers to application activity

1) Yes 2) Yes 3) Yes 4) Robot and car

2.5.End of unit assessment 2

a) Guidance and answers on end of unit assessment

I. Guidance on end of unit assessment

i. Each pupil will complete this assessment individually.

ii. Distribute printed copies or write the assessment on the chalkboard or display it using a projector.

iii. Move around the classroom to supervise and provide clarification when necessary.

iv. Encourage pupils to do their work with care and integrity

v. Remind pupils to attempt all questions.

vi. Collect the completed assessments, mark them and share feedback during the next lesson.

II. Answers on the end unit assessment

Knowledge and understanding

1. a) Right arrow key moves the cursor in right direction: **True**

   b) A word can be selected by using the mouse or touchpad: **True**

   c) The left little finger is used to write letter l: **False**

Skills

2. Pupils write the names of their classmates. They make sure the first letters are written in capital letters. They also use the correct fingers.

Attitudes and values

3. The positive answer expected is that pupils would say that they use the correct fingers when writing and that the reason is that it makes writing quick and makes them not look at the keyboard all the time they are writing.
4. It is good to save the work because if it is not saved it get lost when there is a power cut or when you want it the next time.

2.6. Additional activities

A. Remedial activities

1. Type your name in lowercase letters. Now use the Shift key to type it in capital letters.

2. What does the Backspace key do? Use it on your computer

3. Select a word and change its font size to 16.

4. Using capital letters, write the sentence: I love ICT

Answers to remedial activities

Questions 1,3, 4 are practical and the result is verified by looking at the pupils Word documents.

Question 2 The backspace deletes the characters that are before the cursor

B. Consolidation activities

1. a)Type the sentence: Technology helps us learn better.

   b) Change the word “better” into capital letters.

2. Write what you know about the parts of a computer and their uses.

3. Choose the correct answer:

To keep a document in a computer after typing click at:

a) Open b) New c) Save as

Answers to the consolidation activities

Questions 1 is practical and are about writing text. Pupils will do it in a Word processing program and by using the correct fingers.

2. The parts of computer and their uses:

Keyboard: is used for writing in the computer

Screen: is used to read, text or watch cartons on a computer

Computer case: Keeps the internal parts of a computer

Adaptor (or power cable): is used to connect the computer to the source of electricity.

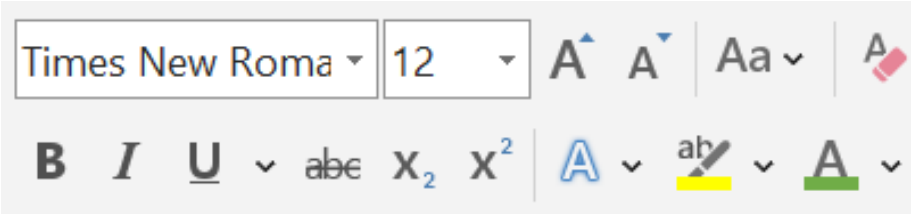
3. The correct answer is: Save as

C. Extended activities

1. Write a short story (5–6 sentences) about your favorite animal.
   - Use three different font styles in the story.
   - Highlight the animal's name using bold and a unique font color.
2. Create a title for your story and make it:
   - Font size 22
   - Font style Agency FB
   - Underlined and colored
3. Type the following list and format it using bullets and different font colors:
   - Apples
   - Bananas
   - Mangoes
   - Pineapples
4. Type the alphabet in uppercase and lowercase, using a different font for each row.

Answers to the extended activities

These questions are practical in which font size, font color and font style will be applied. The tools to use are in this image:



UNIT 3

DRINKING WATER

i. Key unit competence

Pupils will be able to prepare, store, and drink clean water in a safe and healthy way.

ii. Key vocabulary words

drinking	boiling	bubbles	filter
filtration	disinfectant	funnel	

iii. Prerequisites

Pupils will learn how to prepare drinking water better if they already have a basic understanding of the sources of water and the importance of water in life. In Primary one, pupils learnt about sources of water and its importance in unit 3. Ask questions on the natural sources of water and its uses.

Introductory activity guidance and answers

A. Guidance on introductory activity

Part A

i) Ask pupils to look at the picture under introductory activity in their pupil's book.
ii) Ask the pupils to read the question related to the picture and allow them to give answers.
iii) Ask the pupils what the new lesson could be called.
iv) Write on the chalk board the title of the new lesson.

Part B

i) Share the problem as stated in pupil's book. You should avail before the lesson the materials to be used like scissors, scotch or glue, wires or string, learning resources to create with (i.e., cloth, paper, plastic, foil, leaves, etc.), learning resources to test designs (a basin or large container of water).
ii) Divide the class into small groups of 3-4 pupils to carry out this task.

iii) Explain to pupils that their solution will need to pass the following tests:

1. When wind blows over the container, the water stays dirt and dust free.
2. The solution should be able to attach and detach from the container easily.

iv) Show pupils the learning resources that will be available to them to make their solution.

v) Tell pupils to draw their individual design in their exercise books before discussing with others. Encourage them to think about the criteria (passing the tests) as they design their solution.

vi) Allow pupils to share their individual ideas with their group afterwards.

vii) As a group, they will decide which design to build together. It is okay to combine ideas as well. The groups' solutions do not need to be the same. Accept all innovations.

viii) Give groups the learning resources to build their designs.

ix) As groups finish building, gather them around the basin or container of water to begin testing. To test the design solutions, follow these steps:

- The teacher will attach the solution to the container of water.
- Pinch a small amount of dirt on your hand and blow it over the container.
- Detach the solution and check the cleanliness of the water.

x) As each group is testing their design, facilitate these conversations:

a) Explain to pupils how easy it was for you to attach and detach the solution. For example, how long did it take? Did it stay intact?

b) Did the water stay clean?

xi) Encourage pupils to make observations of how the groups' solutions are uniquely built and how they perform on the tests. Instruct pupils to draw or write any notes they observe in their exercise books.

xii) Give groups time to re-design and re-build next class period if desired.

Then, proceed as follows:

xiii) Have pupils explain their design to another group.

xiv) Prompt pupils to talk about the following:

a) What special design makes your solution easy to attach and detach?

b) What part of your solution kept the dust and dirt out of the water?

c) What happened when you tested your solution?

d) What changes did you make after testing?

B. Possible answers to the introductory activity

Part A

1. Children are drinking water.
2. In the first picture A, the child is not doing a good thing. He is drinking dirty water.

3. Advice to the child: do not drink dirty water.

Answers to introductory activity, Part B

- The solutions do not need to be the same design or use the same learning resources. Accept all innovations.
- Possible answers on prompts:

- We made sure our design was easy to attach and detach by ____.
- The part that kept dust and dirt out of the water was ____.
- When we tested our solution, it ____.
- We changed ____ because ____.

iv) Generic Competences:

- Critical thinking: Developed through comparing methods of preparing safe drinking water (boiling, filtering, and using SUR'EAU), analyzing their advantages and disadvantages, and selecting appropriate methods for different situations.
- Research and problem solving: Developed through investigating water preparation practices, identifying sources of contamination, and applying practical methods to make water safe for drinking and storage.
- Communication (Literacy and Numeracy): Developed through group discussions, presenting findings on water treatment methods, explaining procedures using scientific vocabulary, and recording observations from practical activities.

v) Basic values:

- Responsibility (Dignity and Integrity): Developed through preparing, storing, and using safe drinking water hygienically to protect personal and community health.
- Hard work: Developed through active participation in practical activities such as boiling, filtering, disinfecting, and safely storing drinking water.
- Self-reliance: Developed through acquiring practical skills to independently prepare, treat, and store safe drinking water using locally available methods and materials.

vi) Cross-cutting issues to be addressed

a) Gender: When boys and girls work together in the following activities: to boil water and to disinfect water using chemicals e.g. Sur'eau.

b) Environment sustainability: For example when pupils avoid dirt in their place of work as they boil or disinfect drinking water.

c) Peace and values: Tell pupils to work together peacefully and cooperate.

d) Financial education: When pupils keep responsibly the materials they use to boil or disinfect water for drinking.

e) Standardization culture: For example, when pupils check whether Sur'eau they use to disinfect water is not expired

vii) List of lessons

	Lessons	Objectives	Number of periods: 10
1	Preparing drinking water by boiling	Prepare drinking water by boiling Boil water to make it safe for drinking	2
2	Preparing drinking water by filtering	Prepare drinking water by filtering Store boiled water in clean, covered containers	2
3	Preparing safe drinking water by using disinfectant "Sur'Eau"	Prepare drinking water by disinfecting tap water using SUR'EAU Use water treatment (like Sur'Eau) to kill germs.	2
	Practical activities on the content of the unit	Practice the content of the unit	2
4.	End unit assessment	• Assess the acquired competences • Demonstrate the achievement of the key unit competence	2

Guidance on different lessons

3.1. Preparing drinking water by boiling

a) Learning objectives

Prepare drinking water by boiling and keep it properly.

b) Teaching and learning resources

- Pupils' book, teacher's guide, water, a saucepan, filter or sieve, charcoal, filter funnel, cup or glass, stove, small jerry can, water.
- Teachers are encouraged to improvise appropriate teaching and learning resources using locally available materials based on their school and community context to support the lesson.

c) Activity guidance and answers

Guidance on the activity 3.1

i) Start the lesson by welcoming pupils to the new lesson.
ii) Involve all pupils in activities without any bias, and consider gender balance in forming the groups or in asking questions.
iii) Put your pupils in groups of 3-4 (or even 5, depending on the size of your class).
iv) Give a pupil's book to each group.
v) Ask the pupils to look at pictures 1, 2,3,4,5 and 6 of activity 3.1 in the pupil's book and answer the questions.
vi) Move around the groups and give comments if their answers are not right.
vii) Allow each group to share answers with others and allow discussion.

Note: Ensure to develop the values and generic competencies related to this lesson.

Answers to activity 3.1

1. In picture 1 there are a saucepan/casserole, filter, filter funnel, small jerry can, water and a child.
2. 1. Cleaning a casserole 2. Putting a casserole containing water on the stove 3.Heating water 4. Filtering water 5. Storing prepared water 6. Drinking prepared water.
3. The pictures show the preparation of drinking water by boiling it.
4. Pupils will say how they are going to prepare their water for drinking.

Guidance on the application activity 3.1

i) Ask the pupils to explain the steps followed when preparing drinking water by boiling it.
ii) Ask the pupils if they have prepared drinking water at home with their parents.

Answers to the application activity 3.1

1. The filter is used to remove solid particles from the water.
2. A. Heating water b. Filtering water c. Storing prepared water
3. Pupils will describe how they prepare drinking water at home

3.2. Preparing drinking water by filtering

a) Learning objectives

Prepare drinking water by filtering it and keep it properly.

b) Teaching and learning resources

Pupil's book, teacher's guide, water, cup or glass, bottle, rocks, coarse sand, charcoal and a clean cloth.

c) Activity guidance and answers

Guidance on activity 3.2

1. Start the lesson by welcoming pupils to the new lesson.
2. Involve all pupils in activities without any bias, and consider gender balance in forming the groups or in asking questions.
3. Put your pupils in groups of 3-4 (or even 5, depending on the size of your class).
4. Give a pupil's book to each group.
5. Ask the pupils to look at the picture in the pupil's book and answer the questions.
6. Move around the groups, and give comments if their answers are not correct.
7. Allow each group to share their answers with the others.

Answers to activity 3.2

1. The materials used are water, a cup or glass, a bottle, rocks, coarse sand, charcoal and a clean cloth.
2. The container has 4 layers.
3. The picture shows how to filter water.
4. Pupils prepare water referring to the picture in pupil's book.

Tell pupils that they are going to learn to prepare drinking water by filtration.

Write the title on the chalk board: "**Preparing drinking water by filtering**"

Guidance on the application activity 3.2

This activity is done individually.

i) Ask pupils to read carefully the question and give answers.
ii) Ask pupils if they have prepared drinking water at home in collaboration with their parents.

Answer on the application activity

See pupil's book under subheading 3.2.

3.3. Preparing safe drinking water using disinfectant "Sur'eau"

a) Learning objectives

Prepare drinking water by disinfecting tap water using SUR'EAU.

b) Teaching and learning resources

- A small jerry can, tap water, sur'eau, a strainer and a funnel.
- Teachers are encouraged to improvise appropriate teaching and learning resources using locally available materials based on their school and community context to

support the lesson.

c) Activity guidance and answers

Guidance on activity 3.3

i) Put your pupils in groups of 3-4 (or even 5, depending on the size of your class).
ii) Give a pupil's book to each group.
iii) Ask the pupils to look at the pictures and answer the questions.
iv) Allow groups of pupils to share their answers.
v) Give the name of the new lesson and write its name on the chalkboard.

Note: Ensure to develop the values and generic competencies related to this lesson.

Answers to activity 3.3

1. In the picture there are small jerry can, tap water, Sur'Eau, strainer and a funnel.
2. The child is preparing drinking water using Sur'Eau.
3. Pupils prepare drinking water by using"Sur'Eau"

Guidance on application activity 3.3

i) This activity is done individually.
ii) Ask the pupils to read the question carefully and give their answers.
iii) Tell the pupils to explain to their parents how to prepare drinking water using Sur'eau
iv) Let the pupils do the activity in five minutes.
v) Ask the pupils to share their answers one by one.

Answer on the application activity 3.3

1. For the answer, see the steps of using " Sur'Eau"under subheading 3.3 in pupil's book.
2. Pupils prepare drinking water in their homes with parents.

3.4. End of unit assessment 3

I. Guidance to end of unit assessment

i) This assessment will be done individually.
ii) Distribute or write the assessment and read the instructions clearly. Make sure that the pupils understand what is expected before they begin.
iii) Allow enough time for pupils to answer all the questions, moving around to supervise and offer clarification if needed without giving answers.
iv) Encourage neat and honest work, reminding pupils to answer all the questions.
v) Collect and mark the assessments, then provide feedback to the pupils.

II. Answers to end unit assessment 3

A. Knowledge and understanding

1. b
2. c
3. c
4. a
5. a) boiling; b) sieve; 3) Sur'Eau

B. Skills

6. b
7. b
8. i-c; ii-a; iii-b.

C. Attitudes and values

9. c
10. b
11. b

3.5. Additional activities

A. Remedial activities

1. Name one chemical used to treat water.
2. List 2 physical methods used to prepare drinking water.

Answers:

1. Sur'eau
2. Boiling and filtering

B. Consolidation activities

1. List the materials used when preparing drinking water by filtration.
2. What is the role of a clean cloth during filtration?

Answers:

1. Rocks, coarse sand, charcoal, fine sand and clean cloth
2. To prevent solid materials from going into the water.

C. Extended activities

1. Describe two ways that you can treat water for drinking at home.

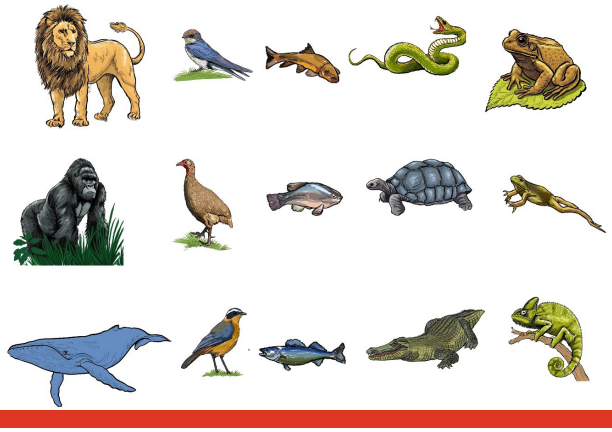
Answer:

a) Boil water, filter it and keep it well in a clean container.

b) Treat water with Sur'eau , filter it and keep in a clean container.

UNIT 4

ANIMALS



i. Key unit competence:

Pupils will be able to identify and and tell the difference between vertebrate and invertebrate animals, and demonstrate care for animals in the environment.

ii .Key vocabulary words

vertebrate	backbone	invertebrate	worm	snail
butterfly	insect	worm		

iii. Prerequisites

Pupils already have knowledge about domestic and wild animals. learned in Primary one Unit 4. Ask the pupils to describe the difference between domestic and wild animals, and tell them about backbones.

Introductory activity and guidance

A. Guidance on introductory activity

Part A

- When possible ,start with a video of animals using a laptop and projector.
- Ask the pupils to look at the picture under introductory activity in their pupil's book.
- Ask the pupils to read the question related to the picture, and allow them to give answers.
- Ask the pupils a question related to the introductory activity
- Ask them what the new lesson could be named.
- Write on the chalk board the title of the new lesson: **Animals**

Guidance on introductory activity, Part B

i) Tell pupils that they will do an investigation to answer this science question: What are vertebrates and what are invertebrates?

ii) Instruct pupils to touch the center of their backs. Have them start from the base of their neck and move their fingers down to their lower back. Ask pupils:

a) What do you feel?

b) Do you know what that is called?

If pupils do not know the name, tell them that they are touching their **backbone.** Animals with backbones are called **vertebrates**. Humans are vertebrates!

iii) Have pupils draw a picture of themselves, including the backbone. Label the backbone.

iv) Pass out a piece of string to each partner. Direct their attention to the pictures on page 33 in the pupil's book. Together, partners place the string on the picture to discuss where the backbone of each of the animals is located.

v) Next, have them turn to page 34 and look at the animals. What kind of animals are they looking at? Can they use the string to discuss where the backbone in these animals are located? Inform pupils that these animals do not have backbones. They are called invertebrates. In fact, all insects and bugs are invertebrates. Some insects have hard outer coverings called exoskeletons; those are not backbones.

Then, proceed as follows:

vi) As a class, practice differentiating which animals have backbones and which do not with the pictures on page 35 in the pupil's book.

vii) Play a movement game called "Backbone, No Backbone" to practice.

a) Teacher calls out an animal name.

b) If it is a vertebrate, learners STAND tall.

c) If it is an invertebrate, learners CURL down.

viii) Optional: Have pupils pull an animal name from the prepared bag. They must draw the animal in their exercise book and label it vertebrate or invertebrate. If it is a vertebrate, the drawing should include a backbone.

ix) Restate the science question that was introduced at the beginning of the lesson: What are vertebrates and what are invertebrates? Have pupils answer the science question in their own words. Encourage them to use information from the lesson.

B. Possible answers to the introductory activity

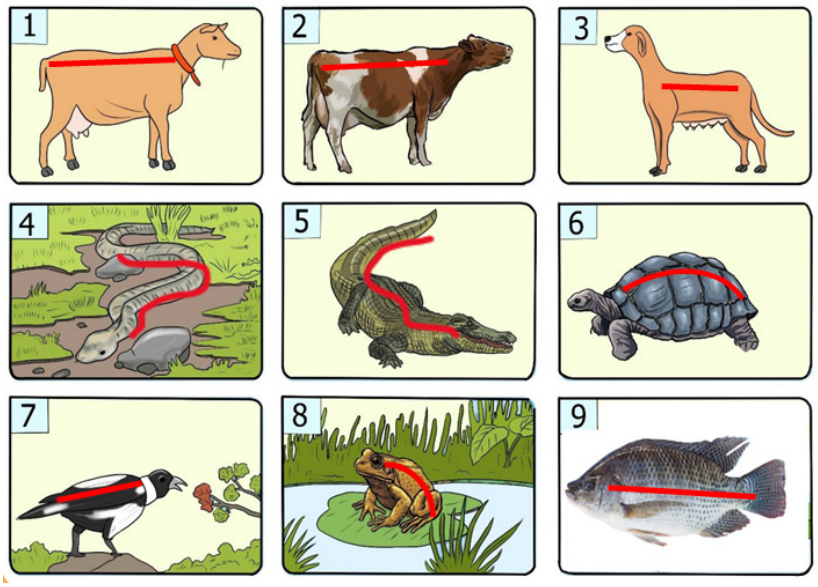
Part A

1. There are animals in the pictures.
2. Animals with backbones: cat, dog, cow and fish.

- Animals without backbones: bee, spider, worm, ladybug, octopus and butterfly.

Answers to introductory activity, Part B

- Possible answers to discussion:
  - I feel something hard.
  - I feel bones.
  - I feel my skeleton.
- Placement of string on vertebrates during the hands-on investigation:



- Answers will vary depending on the animals the teacher calls out.

iv) Generic Competences:

- Critical thinking: Developed through observing, comparing, and classifying animals based on the presence or absence of a backbone, and identifying similarities and differences between vertebrates and invertebrates.
- esearch and problem solving: Developed through investigating animals in the surroundings using field visits and picture observations, classifying them correctly, and suggesting ways to care for and protect animals.
- Communication (Literacy and Numeracy): Developed through group discussions, classifying animals, presenting findings, and using appropriate scientific vocabulary to describe vertebrates and invertebrates.

v) Basic values:

- Respect for others and human rights: Developed through showing respect for living things, treating animals humanely, and recognizing the importance of protecting wildlife and domestic animals.
- Responsibility (Dignity and Integrity): Developed through caring for animals, protecting their habitats, and avoiding activities that may harm them.
- National and cultural identity: Developed through appreciating the diversity of animals in Rwanda and understanding the importance of conserving natural resources and biodiversity.

vi) Cross-cutting issues to be addressed

a) Environmental sustainability: This will be achieved after pupils have well understood the different types of animals and how they can be protected.

b) Standardization culture: How different societies view and value animals. Indigenous practices in animal management and conservation. For example: Techer can explain cultural significance of animals.

vii) List of lessons

No	Lessons	Leaning objectives	Number of periods: 8
1	Vertebrates	Show interest in learning about animals around us. Care for and protect animals in the environment Identify animals with backbone (vertebrates)	2
2	Invertebrates	Identify animals without a backbone (invertebrates) Name animals without a backbone (invertebrates	2
	Practical activities on the content of the unit	• Practice the content of the unit	2
3	End of unit assessment	• Assess the acquired competences • Demonstrate the achievement of the key unit competence	2

Guidance on different lessons

4.1.Vertebrate animals

a) Learning objectives

Identify animals with backbone (vertebrates)

b) Teaching and learning resources

- Pupil's books, P3 teacher's guide, pictures of animals with a backbone.
- Teachers are encouraged to improvise appropriate teaching and learning resources using locally available materials based on their school and community context to support the lesson.

C) Activity guidance and answers

Guidance on activity 4.1

i) Ask the pupils to observe carefully the pictures of animals and answer the questions.
ii) This activity is done by brainstorming (questioning).
iii) Involve all the pupils without any bias, and consider gender balance in forming the groups.
iv) Be aware of those that need special help in their studies, and give them activities according to their abilities.
v) Give boys and girls equal chances in carrying out the activities that help pupils understand the lesson better.
vi) Help those with a difficulty/problem in observing, identifying and listing.
vii) Allow pupils to share their answers with the others.

Note: Ensure to develop the values and generic competencies related to this lesson.

Answers to activity 4.1

1. A Goat 2. A cow 3. A dog 4. A snake 5. A crocodile 6. A tortoise 7. A bird (crow) 8. A Toad 9. A fish
2. All these animals have a backbone.
3. These animals with backbones are called **vertebrates**.

Guidance on application activity 4.1

This activity is done individually

i) Ask the pupils to read carefully and answer the questions
ii) Move around the class and give marks to the pupils.
iii) Be aware of those that need special help in their studies, and give them activities according to their abilities.
iv) Make sure that each pupil has a pupil's book.
v) Ask them to share their answers, with one pupil at a time standing up to speak.

Answers to the application activity 4.1

1. Sample vertebrate animals: Lion, elephant, mouse/rat, humans, chameleon, chicken.
2. Animals with a backbone: Hen, pig and man.

4.2 Invertebrate animals

a) Learning objectives

Identify animals without a backbone (invertebrates)

b) Teaching and learning resources

- Pupil's books, teacher's guide, pictures of animals without a backbone (invertebrates), animation,computer, projector,...
- Teachers are encouraged to improvise appropriate teaching and learning resources using locally available materials based on their school and community context to support the lesson.

c) Activity guidance and answers

Guidance on activity 4.2

i) Ask questions about animals with a backbone (vertebrates)
ii) Ask the pupils to carefully look at the pictures of animals and answer the questions. A video can be used or powerpoint slides. This activity is done in groups or pairs.
iii) Involve all pupils without any bias, consider gender balance in forming the groups.
iv) Be around those that need special help in their studies, and give them activities according to their abilities.
v) Give boys and girls equal chances in carrying out different activities that help pupils understand the lesson better.
vi) Help those with a difficulty/problem in observing, identifying and listing.

Note: Ensure to develop the values and generic competencies related to this lesson.

Answers to activity 4.2

1. All of these animals are without a backbone.
2. Animals without a backbone are called invertebrates.

Guidance on the application activity 4.2

- Ask the pupils to look at the pictures under activity in their pupil's book.
- Allow the pupils to read the questions.
- Move around so that you can guide each group to answer the question correctly.
- Ask the pupils to share the group's answers with the others.
- Harmonise the answers and conclude the lesson.

Answer to application activity 4.2

The invertebrate animals are bee, spider, butterfly

4.3. End of unit assessment 4

I. Guidance to end of unit assessment

i) This assessment will be done individually.
ii) Distribute or write the assessment and read the instructions clearly. Make sure that the pupils understand what is expected before they begin.
iii) Allow enough time for pupils to answer all the questions, moving around to supervise and offer clarification if needed without giving answers.
iv) Encourage neat and honest work, reminding pupils to answer all the questions.
v) Collect and mark the assessments, then provide feedback to the pupils.

II. Answers to the end unit assessment

A. Knowledge and understanding

1. a
2. b
3. c
4. b
5. 1-a; 2-b; 3-a; 4-b; 5-a; 6-b; 7-a; 8-a

B. Skills

6. b
7. c

C. Attitudes and values

8. b
9. c
10. b

4.4 Additional activities

A. Remedial activities

1. From the list of animals below, underline the ones that have a backbone.
   lion, bees, dog, hen, flea, rabbit, snake, mosquito, wasp, beetle, cockroach

Answer: Lion, Bees, Dog, Hen, Flea, Rabbit, Snake, Mosquito, Wasp, Beetle, Cockroach

B. Consolidation activities

1. Describe the difference between vertebrates and invertebrates and give two examples of each kind of animal.

   Vertebrates: Animals which have a backbone **Example:** birds and fish

   Invertebrates: Animals without a backbone. **Example**: Insects, worms and snails

C. Extended activities

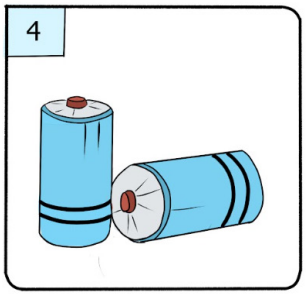
1. Group the animals in the list below into vertebrates and invertebrates.
   (Cow, Lion, Bees, Dog, Hen, Flea, Rabbit, Snake, Mosquito, Wasp, Beetle, Cockroach)

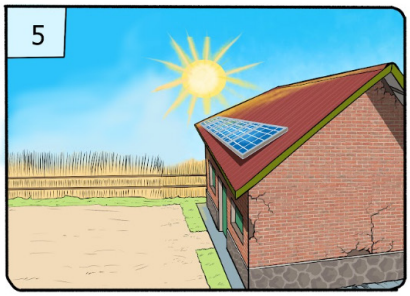
Answer:

Vertebrate s	Invertebrates
Cow	Flea
Lion	Mosquito
Dog	Bees
Hen	Wasp
Rabbit	Beetle
Snake	Cockroach

UNIT 5

ELECTRICITY





i. Key unit competence

Pupils will be able to identify and use devices that use electricity in a safe way, and state how electricity helps us.

ii. Key vocabulary words

electricity	generator	hydro power	solar
microwave	welding	burning	shocks
dangerous	sockets		

iii. Prerequisites

Pupils will learn better this unit if the teacher really has enough knowledge about the meaning of electricity, uses of electricity, devices that use electricity, dangers of electricity and the ways of preventing the dangers of electricity.

As a teacher, you will ask pupils some questions to check whether they have some prerequisite knowledge about electricity. You may also give them a task aiming to arouse the knowledge they may have about the lessons comprising the unit.

Introductory activity and guidance

A. Guidance on introductory activity

- Ask the pupils to look at all the pictures and answer the questions by giving the names of what they see.
- Pupils may not know the right answer, but they are encouraged to suggest possible answers.
- Answers are provided by pupils gradually through learning and discovery activities provided in the lesson.
- Let them brainstorm for five minutes, to decide what is taking place in the pictures of the introductory activity.

- Ask them the questions that are under the picture, and try to orient their answers to the right ones.
- Give time for some brainstorming and then share the main sub-units.
- Guide the pupils to understand why it is important to learn this unit about electricity.

Possible answers to the introductory activity

1. a) Light bulb, b) TV screen, fan, hair dryer, lamp, iron, radio
2. Hair dressing, ironing clothes, cutting hair, shaving, others.

iv) Generic Competences:

- Critical thinking: Developed through identifying electrical devices, comparing their uses, recognizing electrical hazards, and selecting appropriate safety measures.
- Research and problem solving: Developed through investigating electricity use at home and school, identifying unsafe practices, and suggesting ways to prevent electrical accidents.
- Communication (Literacy and Numeracy): Developed through discussing electricity uses and dangers, presenting safety rules, and using appropriate science and ICT vocabulary related to electricity.

v) Basic values:

- Responsibility (Dignity and Integrity): Developed through using electrical appliances safely, reporting damaged equipment, and following safety rules at home and school.
- Self-reliance: Developed through gaining confidence in operating simple electrical devices safely and applying basic electrical safety measures independently.
- Hard work: Developed through active participation in practical activities, discussions, and demonstrations to build knowledge and safe working habits.

vi) Cross-cutting issues to be addressed

a) Environment sustainability: Understands the importance of conserving and protecting electrical equipment

b) Financial education: The use of electricity in different activities like cooking, hair dressing salon.

c) Standardization culture: When using energy generating and electrical appliances of a standard quality, that can't cause accidents.

d) Gender: Girls and boys work together in various activities related to electricity

vii) List of lessons

	Lessons	Objectives	The number of periods: 14
	Meaning of electricity	• Define electricity • Outline the sources of electricity • Tell the meaning of electricity	2
	Uses of electricity	• Outline the uses of electricity • Be thankful for the help electricity gives us.	2
	Devices that use electricity	• List home and school equipment that use electricity	2
	Dangers of electricity	• List the dangers caused by electricity • Use electrical items safely.	2
	Preventing dangers of electricity	• Identify the ways of preventing the dangers of electricity. • Follow safety rules to prevent electrical dangers.	2
	Practical activities on the content of the unit	• Practice the content of the unit	2
	End of unit assessment	• Assess the acquired competences • Demonstrate the achievement of the key unit competence	2

Guidance on different lessons

5.1. The meaning of electricity and its uses

5.1.1 Meaning of electricity

a) Learning objectives

- Define electricity
- Describe the sources of electricity
- Identify sources of electricity in a closed circuit

b) Teaching and Learning resources

- Real materials like dry cell batteries, insulated electric cables, bulbs or simple lamps, pictures or charts showing sources of electricity like a battery, a generator, a hydro dam. Common electrical appliances like light bulbs, fan, TV screens. Flashcards with words and images (e.g., "electricity," "battery," "light")
- Pencil (for demonstration)
- 1 set of learning resources for each group of pupils including insulated electric cables already connected to a bulb, dry cell battery, block of wood, piece of rubber.

c) Activity guidance and answers

Guidance on activity 5.1.1

Part A

- Put the pupils in small groups depending on the class size. Respect gender balance in the groups.
- Tell the pupils to observe the pictures and answer the questions. It is better if you can use real objects.
- As pupils are doing this activity, you should move around and guide them.
- When every group is done and you are done, invite some members or group(s) to discuss their answers with the whole class.
- Ask other pupils or groups whether their answers match the ones discussed.
- Together with the pupils, harmonize the points and make a summary on the board.
- Allow the pupils to write the main points in their notebooks.

Note: Ensure to develop the values and generic competencies related to this lesson.

Guidance on Activity 5.1.1, Part B

i) Tell pupils that they will do an investigation to answer this science question: What is electricity and where does it come from?

ii) Divide the class into small groups of 3-4 pupils for this lesson.

iii) Show pupils a bulb. Ask:

a) How does this bulb work?

b) How can we turn it on? How can we light it up?

Have pupils write or draw their answers in their exercise book. Call on a few pupils to share their thoughts. Be sure to call on someone who mentions electricity.

iv) Tell pupils that they are going to work in small groups to figure out which objects will provide electricity for the bulb to light up. They will do this by connecting the wires to different objects, one at a time. Use a pencil to demonstrate how to touch each wire to both ends of the pencil. Ask pupils:

a) Did the bulb light up?

b) What does that tell us about the pencil?

v) Confirm that the pencil does not provide the flow of energy that the bulb requires to light up. If the bulb lights up, it means that the object provides a flow of energy called electricity.

Then , proceed as follows:

vi) Have pupils copy the chart from the pupil's book in part of hands-on investigation and use it to record their results.

vii) Pass out the connected wires and bulb, battery, rubber, and wood block to the groups. Give them time to connect the wires to each object one at a time to find out which one is a source of electricity.

viii) Once every group has finished investigating, have a class discussion.

a) Which object is a source of electricity? How do you know?

b) Which objects are not sources of electricity? How do you know?

c) What are other things that need electricity to work?

d) Do you know of any other sources of electricity?

ix) Communicate that the battery is a source of electricity. The energy flows from the battery through the wires and into the bulb to turn it on. Other sources of electricity can come from water (hydro), the wind, and the Sun (solar).

x) Restate the science question that was introduced at the beginning of the lesson: What is electricity and where does it come from? Have pupils answer the science question in their own words. Encourage them to use information from the lesson.

Answers to activity 5.1.1

Part A

1. Electric cables on an electric pole, a generator, a battery, dry cell batteries and solar panels.
2. They are used to produce electricity.
3. Electricity is a form of energy that flows in wires.

Answers to Activity, Part B

- Possible answers to discussion:

a. How does this bulb work?

Turn it on with a light switch.

It uses electricity.

It is in a torch or lamp.

b. How can we turn it on? How can we light it up?

Click on a power button.

Charge it with energy.

Connect it to wires.

Plug it in.

- **Possible answers to demonstration:**
- The bulb did not light up.
- The pencil does not have the energy or electricity to light up the bulb.
- **Possible discussion answers:**
- The battery is a source of electricity because the bulb lit up.
- The rubber and wood block are not sources of electricity because nothing happened.
- Other objects that need electricity to work are computers, an iron, a radio, and television.
- Another source of electricity can come from wind, the Sun and water.

Guidance on application activity 5.1.1

- This activity will be done individually.
- Tell pupils to answer the questions in the pupil's book.
- Ask the pupils a question related to electricity.
- As the pupils are doing this activity, you should move around and help them as needed.
- Allow pupils to write the main points in their notebooks.

Answers to the application activity 5.1.1

1. Electricity flows in wires.
2. Some sources of electricity are hydro power, solar energy, generators, batteries and wind power.

5.1.2. Uses of electricity

a) Learning objectives

List the uses of electricity

b) Teaching and learning resources

- Electrical equipment: Computer/laptop, a telephone, an iron, a fridge, a torch, an air conditioner, a television, a radio, an electric oven, a heater
- Teachers are encouraged to improvise appropriate teaching and learning resources using locally available materials based on their school and community context to

support the lesson.

c) Activity guidance and answers

Guidance on activity 5.1.2

- Put pupils in small groups depending on the class size. Respect gender balance in the groups.
- Tell pupils to observe the pictures and answer the questions. It is better if you can use real objects.
- As pupils are doing this activity, you should move around and guide them.
- When everyone is done and you are done, invite some pupils from different groups to share their answers to the questions.
- Ask other pupils or groups whether their answers match the ones discussed.
- Together with pupils, harmonize the points and make a summary on the board.
- Allow pupils to write the main points in their notebooks.

Note: Ensure to develop the values and generic competencies related to this lesson.

Answers to activity 5.1.2

1. Electric stove, iron, washing machine, cell phone being charged, shaving machine, electric mill, welding machine and radio.
2. Electricity is used for cooking food, washing and ironing clothes, charging cell phones, cutting hair, grinding grains, welding metals and running a radio.
3. Possible answers: Running a TV screen, giving light, cutting wood, cooling and keeping food and drinks in a fridge.

Guidance on application activity 5.1.2

- This activity will be done individually.
- Tell the pupils to answer the questions.
- Ask the pupils other questions about electricity.
- As the pupils are doing this activity, you should move around and help them.
- Ask other pupils whether their answers match the ones mentioned.
- Allow pupils to write the main points in their notebooks.

Answers to the application activity 5.1.2

1. Possible answers: Radio, iron, laptop, refrigerator, phone, TV
2. Possible answers: Cooking, washing clothes, ironing clothes, lamps, watching TV
3. Possible answers: Printing documents, running computers, running security lights

5.2. Devices that use electricity

a) Learning objectives

- List home and school equipment that use electricity
- Know how to maintain electrical equipment

b) Teaching and learning resources

- Computer/laptop, telephone, iron, fridge, torch, air conditioner, television, radio, watches/clocks, electric clippers, electric ovens, a household heater
- Teachers are encouraged to improvise appropriate teaching and learning resources using locally available materials based on their school and community context to support the lesson.

c) Activity guidance and answers

Guidance on activity 5.2

- Put pupils in small groups depending on the class size. Respect gender balance in the groups.
- Tell pupils to observe the pictures and answer the questions. It is better if you can use real objects.
- As pupils are doing this activity, you should move around and guide them.
- When everyone is done and you are done, invite some members or group(s) to share their answers with the whole class.
- Ask other pupils or groups whether their answers match the ones discussed.
- Together with pupils, harmonize the points and make a summary on the board.
- Allow pupils to write the main points in their notebooks.

Note: Ensure to develop the values and generic competencies related to this lesson.

Answers to activity 5.2

1. 1) Hair dressing and drying machines 2) ;.having machine 3) kettle 4) water heater, 5) microwave 6) TV screen 7) computer 8) electric stabilizer
2. Smartphones, washing machines, electric ovens and stoves

Guidance on application activity 5.2

- This activity will be done individually.
- Tell pupils to do the activity.
- As pupils are doing this activity, you should move around and guide them.
- Ask other pupils whether their answers correspond to the ones mentioned
- Allow pupils to write the main points in their notebooks.

Answers to application activity 5.2

1. Possible answers: Radio, laptop, iron, washing machine, microwave, fridge, kettle, stove, TV.
2. Possible answers: Radio, TV screen, fridge.
3. Printer, laptop, TV screen, lights.
4. A flat iron needs to be hot to iron clothes, so it is connected to electricity.
5. The radio will stop operating.

5.3. Dangers of electricity

a) Learning objectives

Understand the dangers caused by electricity.

b) Teaching and learning materials

Charts/posters showing unsafe uses of electricity like touching sockets, common electrical hazards caused by wet hands near switches, overloaded sockets, exposed wires. Flashcards with electrical symbols or scenarios to be used for class games or discussions. Pictures or illustrations of electrical items like plugs, wires, appliances, power lines, computer, laptop, projector.

c) Activity guidance and answers

Guidance on activity 5.3

- Put pupils in small groups depending to the class size. Respect gender balance in the groups.
- Tell the pupils to observe the pictures and answer the questions. It is better if you can use real objects.
- As the pupils are doing this activity, you should move around and guide them.
- When everyone is done and you are done, invite some member(s) or group(s) to discuss their findings with the whole class.
- Ask other pupils or groups whether their answers match the ones discussed.
- Together with the pupils, harmonize the points and make a summary on the board.
- Allow pupils to write the main points in their notebooks.

Note: Ensure to develop the values and generic competencies related to this lesson.

Answers to activity 5.3

1. They show some dangers caused by electricity.
2. Burning houses, shocks, burning appliances.

3. It can cause death.

Guidance on application activity 5.3

- This activity will be done individually.
- Tell the pupils to answer the questions.
- As pupils are doing this activity, you should move around and guide them.
- Allow the pupils to write the main points in their notebooks.

Answers to the application activity 5.3.

1. Possible answers: Cooking, shaving, cutting hair, ironing clothes, listening to the radio, lights.
2. Burning houses and materials in it, shocks, damage to devices that use electricity, death.

5.4. Preventing dangers of electricity

a) Learning objectives

Identify ways to prevent the dangers of electricity.

b) Teaching and learning resources

Visual aids like posters and charts showing safe use of electricity, symbols for danger or warning signs. Flashcards with images of electrical appliances and safety rules.

Real-life objects (Demonstration Materials) like safe, disconnected electrical appliances. Model of a socket or plug for demonstration (not connected to power). Insulated wires vs. exposed wires (for visual contrast)

Activity guidance and answers

Guidance on activity 5.4

- Put pupils in small groups depending to the class size. Respect gender balance in the groups.
- Tell pupils to observe the pictures and answer the questions. It is better if you can use real objects.
- As pupils are doing this activity, you should move around and guide them.
- When everyone is done and you are done, invite some members or group(s) to share their answers with the whole class.
- Ask other pupils or groups whether their answers match the ones discussed.

- Together with pupils, harmonize the points and make a summary on the board.
- Allow pupils to write the main points in their notebooks.

Note: Ensure to develop the values and generic competencies related to this lesson.

Answers to activity 5.4

1. They show ways of preventing the dangers which can be caused by electricity.
2. Climbing an electric pole, plugging in too many things to the same socket, putting metallic materials in a socket, connecting the electric stove to a socket.
3. Using insulated tools and wires, drying hands before touching a plug.

Guidance on application activity 5.4

- This activity will be done individually.
- Tell the pupils to answer the questions.
- Ask the pupils an additional question related to electricity.
- As pupils are doing this activity, you should move around and guide them.
- Allow pupils to write the main points in their notebooks.

Answers to application activity 5.4

1. Advantages are: It helps in cooking food, ironing clothes, keeping food and drinks cool, giving light.
2. Dangers are: It can burn houses and materials, it can cause shocks, it can cause death.
3. Avoid water near electrical devices, do not play near electrical devices or wires, do not put objects into sockets.

5.5. End of unit assessment 5

I. Guidance on end of unit assessment

i) This assessment will be done individually.
ii) Distribute or write the assessment and read the instructions clearly. Make sure that the pupils understand what is expected before they begin.
iii) Allow enough time for pupils to answer all the questions, moving around to supervise and offer clarification if needed without giving answers.
iv) Encourage neat and honest work, reminding pupils to answer all the questions.
v) Collect and mark the assessments, then provide feedback to the pupils.

II. Answers to the end unit assessment

A. Knowledge and understanding

1. b

2. b
3. a
4. b
5. a) Television; b) danger ; c) wet
6. 1-b; 2-a; 3-a; 4-b; 5-b; 6-a

B. Skills

7. b
8. b

C. Attitudes and values

9. b
10. a
11. The answer is under activity 5.4 in pupil's book.

5.6. Additional activities

A. Remedial activities

1. Name one thing that uses electricity to cut hair.
2. Can we watch TV without electricity?
1. List four kinds of electric equipment used at home.

Answers to remedial activities

1. A shaving machine.
2. No, we need electricity to watch TV.
3. Computer/laptop Telephone, iron box, fridge, torch, radio.

B. Consolidation activities

1. Describe one how can avoid dangers of electricity.
2. Why is it dangerous to play with electric wires?
3. How does electricity reach our homes?
4. What are some things that electricity helps us do at home?
5. How does electricity help students?

Answers to the consolidation activities

1. Do not play with cables/wires
- Do not plug in electrical equipment with wet hands.
- Do not put sticks or metallic objects in the socket

- Do not touch an electric oven with bare hands.

2. Because they can carry high voltage that can harm or kill someone.
3. Electricity reaches our homes through wires from power stations and electric poles.
4. Electricity helps us light our homes, cook food, and power TVs and fans.
5. It helps students by powering lights to read and charge laptops or tablets.

C. Extended activities

1. Why is electricity called a form of energy?
2. Why do some materials need electricity and others do not?
3. How can parents help keep children safe from electrical danger at home?
4. How can you help a person who has been shocked by electricity?
5. What are the objects that prevent people from electric shock?

Answers to the extended activities

1. It is called a form of energy because it can do work like moving machines, lighting bulbs, and heating things.
2. Some materials are machines or devices that need energy to work, while others like chairs or spoons do not need energy.
3. They can cover sockets, keep wires out of reach, and teach children not to play with electrical items.
4. Pupils give different ideas. Discuss and come up with the best answer.

UNIT 6

MAGNETS

i. Key unit competence

Pupils will be able to identify magnets, use them safely and state the difference between magnetic and non-magnetic objects.

ii. Key vocabulary words

magnet	attract	iron
needle	razor blade	repel
north pole	south pole	

iii. Prerequisites

Pupils will learn this unit better if they have some basic knowledge about what magnets are, the uses of magnets, magnetic and non-magnetic objects, characteristics of magnets. The teacher will give pupils the time to discuss in groups the above-mentioned concepts. These foundational discussions support deeper understanding of unit's lessons. As a teacher, you should ask pupils some questions to check what they remember as prerequisite. You may also give them the task of revising the content of the prerequisite in their evening time.

Introductory activity and guidance

A. Guidance on introductory activity

- Ask the pupils to observe the pictures and answer the questions.
- Pupils may not be able to find the right answers, but they are encouraged to suggest possible answers.
- Answers are provided by pupils gradually through learning activities provided during the lesson.
- Let the pupils brainstorm for five minutes to discover what is taking place in the picture of the introductory activity.

- Ask them the questions under the pictures and try to orient their answers to the right ones.
- Give time for some brainstorming and then share the main sub-units.
- Guide the pupils to discover that it is important to learn about magnets and their characteristics.

B. Possible answers to the introductory activity

1. The nails are being attracted by the magnets.
2. They are attached by the magnets because they are metallic
3. Yes. Like metallic coins, spoons

iv. Generic Competences:

- Critical thinking: Developed through investigating and comparing materials, classifying them as magnetic or non-magnetic, and explaining why some objects are attracted to magnets.
- Research and problem solving: Developed through conducting simple magnet experiments, observing magnetic forces, identifying uses of magnets, and solving classification tasks through investigation.
- Communication (Literacy and Numeracy): Developed through discussing experimental observations, describing magnet properties and uses using scientific vocabulary, and presenting findings.

v. Basic values:

- Responsibility (Dignity and Integrity): Developed through handling magnets carefully, protecting electronic devices from magnetic damage, and following safety instructions during practical activities.
- Self-reliance: Developed through independently investigating magnetic and non-magnetic materials, classifying objects correctly, and applying knowledge in daily life situations.
- Hard work: Developed through active participation in practical investigations, careful observation of results, and completion of classification and experimentation tasks with commitment.

vi. Cross-cutting issues to be addressed

a) Gender: Girls and boys work together in various activities related to magnetic forces.

b) Financial education: Pupils keep well magnetic and non-magnetic items used in all activities related to learning and understanding magnetism.

c) Environment sustainability: Pupils leave their working place clean and safe as they found it.

vii. List of lessons

	Lessons	Objectives	Number of periods: 12
1	The meaning of a magnet	• Explain what a magnet is.	2
2	Magnetic and non-magnetic objects	• List magnetic and non-magnetic objects • Distinguish between magnetic and non-magnetic objects	2
3	Characteristics of magnet	• Explain the characteristics of magnet	2
4	Uses of magnets	• Outline the uses of a magnet • Describe what a magnet can do. • See and feel how magnetic force works.	2
	Practical activities on the content of the unit	• Practice the content of the unit	2
	End of unit assessment	• Assess the acquired competences • Demonstrate the achievement of the key unit competence	2

Guidance on different lessons

6.1. The meaning of a magnet

a) Learning objectives

Be able to explain what a magnet is.

b) Teaching and learning resources

- Real magnets like bar magnets, horseshoes, button magnets, a variety of small objects like paper clips, coins, plastic buttons, rubber bands, screws.
- Visual aids like posters or charts showing different types of magnets and magnetic objects, videos, animation, computer, projector,simulations.

c) Activity guidance and answers

Guidance on activity 6.1

- Put pupils in small groups depending on the class size. Respect gender balance in the groups.
- Tell pupils to observe the pictures and answer the questions. It is better if you can use real objects.
- As pupils are doing this activity, you should move around and guide them.
- When everyone is done and you are done, invite some member(s) or group(s) to share their answers with the whole class.
- Ask the other pupils or groups whether their answers match the ones discussed.
- Together with the pupils, harmonize the points and make a summary on the board.
- Allow the pupils to write the main points in their notebooks.

Note: Ensure to develop the values and generic competencies related to this lesson.

Answers to activity 6.1

1. Pieces of magnets, nails, a bottle cap, pen

a) The nail and the safety pin move toward the magnet and stick to it. This shows that they are magnetic objects.

b) The pen cover and pieces of wood do not move toward the magnet. They are non-magnetic objects.

Guidance on application activity 6.1

This activity will be done individually.

- Tell pupils to do the activity.
- As pupils are doing this activity, you move around and guide them, or mark their work.
- When everyone is done and you are done, invite some members to share their answers with the whole class.
- Ask other pupils whether their answers match the ones discussed.
- Allow pupils to write the main points in their notebooks.

Answers to application activity 6.1

Attracted by the magnet	Not attracted by the magnet
Fork, ring, scissors	Paper, cloth, rubber.

6.2. Magnetic and non-magnetic objects

a) Learning objectives

- List magnetic and non-magnetic objects.
- Distinguish between magnetic and non-magnetic objects.

b) Teaching and learning materials

- Magnetic objects like bar magnets, horseshoe magnets, or fridge magnets, screwdriver, razor blades and safety pins.
- Real magnetic objects like nails, paper clips, screws, safety pins, metal spoons, keys.
- Non-magnetic objects like a plastic spoon, wooden stick, rubber band, coin, cloth piece, pencil, eraser.
- Flashcards or picture cards showing the images or names of different objects like metal, wood, plastic for classification, videos, animation, simulations..
- Teachers are encouraged to improvise appropriate teaching and learning resources using locally available materials based on their school and community context to support the lesson.

Note: Ensure to develop the values and generic competencies related to this lesson.

c) Activity guidance and answers

Guidance on activity 6.2.

- Put pupils in small groups depending to the class size. Respect gender balance in the groups.
- Tell the pupils to observe the pictures and answer the questions. It is better if you can use real objects.
- As pupils are doing this activity, you should move around and guide them.
- When every group is done and you are done, invite some members or group(s) to share their answers with the whole class.
- Ask other pupils or groups whether their answers match the ones discussed.
- Together with pupils, harmonize the points and make a summary on the board.
- Allow pupils to write the main points in their notebooks.

Answers to activity 6.2

1. Books, bar magnet, key and glass
2. The key is attracted by the magnet. The pen is not attracted by the magnet.

3. Those things that are attracted by the magnet are called magnetic objects and those that are not attracted by the magnet are called non-magnetic objects.

Guidance on application activity 6.2

- This activity will be done individually.
- Tell pupils to do the activity.
- As pupils are doing this activity, you should move around and guide them.
- When everyone is done and you are done, invite some pupils (s) to share their answers with the whole class.
- Ask other pupils whether their answers match the ones mentioned.
- Allow pupils to write the main points in their notebooks.

Answers to application activity 6.2

a) The magnet will attract coins, small nails, paper clip, needles, safety pins and razor blades will be attracted by the magnet.

b) All of them are magnetic objects.

6.3. Characteristics of a magnet

a) Learning objectives

Explain the characteristics of magnet

b) Teaching and learning resources

- Different kinds of magnets like bar magnets, horseshoe magnets, disc magnets, ring magnets.
- Magnetic and non-magnetic items like small nails, papers, thin and flat glass
- Teachers are encouraged to improvise appropriate teaching and learning resources using locally available materials based on their school and community context to support the lesson.

c) Activity guidance and answers

Guidance on activity 6.3

- Put pupils in small groups depending to the class size. Respect gender balance in the groups.
- Tell the pupils to observe the pictures and answer the questions. It is better if you can use real objects.
- As the pupils are doing this activity, you should move around and guide them.
- When everyone is done and you are done, invite some members or group(s) to share

their answers with the whole class.

- Ask other pupils or groups whether their answers match the ones mentioned.
- Together with the pupils, harmonize the points and make a summary on the board.
- Allow pupils to write the main points in their notebooks.

Note: Ensure to develop the values and generic competencies related to this lesson.

Answers to activity 6.3

1. 1 and 2 They are putting the ends of the magnets together, and in 2 and 3 they are putting a magnet and small nails together through a piece of paper.
2. Letters S and N
3. They are two colours, white and red
4. When you try to connect the magnets by two parts of different colours, they attract each other.
5. When you connect the magnets by two parts of the same colour, they repel each other.

Guidance on application activity 6.3

This activity will be done individually.

- Tell pupils to do the activity.
- As pupils are doing this activity, you shouldmove around and guide them.
- When everyone is done and you are done, invite some pupil(s) to share their answers with the whole class.
- Ask other pupils whether their answers match the ones mentioned.
- Allow pupils to write the main points in their notebooks.

Answers to application activity 6.3

1. A magnet has two poles: the North Pole and the South Pole.
2. They repel each other.

6.4. Uses of magnets

a) Learning objectives

- Outline the uses of a magnet
- Use magnets to solve a problem through the engineering design process

b) Teaching and learning resources

- Real magnets like bar magnets, horseshoe magnets, ring magnets; also magnetic and non-magnetic objects like paper clips, nails, screws, coins (if they are magnetic), pins, spoon, rubber band, pencil, cloth, wooden blocks.

- Pictures or charts showing real-life uses of magnets, such as fridge magnets, magnetic door catches, magnetic toys, compasses, and others.
- String or wire, Scotch, Recyclable learning resources for building (i.e., cardboard, plastic bottles, rags, paper, etc.), learning resources to test designs (Paper fans or thick pieces of cardboard and a metal door or window).

c) Activity guidance and answers

Guidance on activity 6.4

Part A

- Put pupils in small groups depending to the class size. Respect gender balance in the groups.
- Tell pupils to observe the pictures and answer the questions. It is better if you can use real objects.
- As pupils are doing this activity, you should move around and guide them.
- When everyone is done and you are done, invite some member(s) or group(s) to share their answers with the whole class.
- Ask other pupils or groups whether their answers match the ones discovered.
- Together with the pupils, harmonize the points and make a summary on the board.
- Allow the pupils to write the main points in their notebooks.

Note: Ensure to develop the values and generic competencies related to this lesson.

Guidance on Activity 6.4, Part B

i) Share the problem as stated in pupil's book.
ii) Divide the class into small groups of 3-4 pupils to carry out this task.
iii) Explain to pupils that their solution will need to pass the following tests:

1. The solution must include the use of magnets.
2. When wind blows, the door or window stays open.
3. The solution cannot damage the door or window.

iv) Show pupils the learning resources that will be available to them for their solution. If needed, give time for pupils to explore how the magnets interact with the door and windows in the classroom.
v) Tell pupils to draw their individual design in their exercise books before discussing with others. Encourage them to think about the criteria (passing the tests) as they design their solution.
vi) Allow pupils to share their individual ideas with their group afterwards.
vii) As a group, they will decide which design to build together. Encourage pupils to combine ideas within their group. The groups' solutions do not need to be the same. Accept all innovations.

viii) Give groups the learning resources to build their designs.

ix) When groups finish building, test their solutions one at a time with everyone. To test the solutions, follow these steps:

- Invite pupils to come forward with their solution and attach it to the door or window.
- Have them demonstrate how it keeps the door or window open.
- Fan the door or window vigorously with a paper fan or a thick piece of cardboard to simulate wind.

x) As each group is testing their designs, have them explain:

a. How they are attaching their solution to the door or window

b. How they intentionally used the magnets to keep the door or window open (listen for pupils' understanding of magnets)

xi) Encourage pupils to make observations of how the groups' innovations are uniquely built and how they perform on the test. Allow other groups to ask questions or give suggestions if they have thoughts about the solutions.

xii) Give groups time to re-design and re-build next class period if desired.

Then, proceed as follows:

xiii) Have pupils explain their design to another group.

xiv) Prompt pupils to talk about the following:

a) What learning resources did you use in addition to the magnets? Why?

b) How well did your solution solve the problem?

c) What changes did you make after testing?

Answers to activity 6.4, Part A

1. 1) Loudspeaker, 2) computer, 3) television 4) fridge.
2. Yes. In the loudspeaker and the fridge

Answers to activity, Part B

- The solutions do not need to be the same design or use the same learning resources. Accept all innovations.

- Possible answers:
- Other learning resources we used were ____ to ____.
- Our solution solved/did not solve the problem because ____.
- We changed ____ because ____

Guidance on application activity 6.4

- This activity will be done individually.

- Tell pupils to answer the question.
- As pupils are doing this activity, you should move around and guide them.
- Ask the other pupils whether their answers match the ones given..
- Allow pupils to write the main points in their notebooks.

Answers to application activity 6.4

Compass, magnetic doors, electric motors and generators, headphones

6.5. End of unit assessment 6

I. Guidance on end of unit assessment

i) This assessment will be done individually.
ii) Distribute or write the assessment and read the instructions clearly. Make sure that the pupils understand what is expected before they begin.
iii) Allow enough time for pupils to answer all the questions while moving around to supervise and offer clarification if needed without giving answers.
iv) Encourage neat and honest work, reminding pupils to answer all the questions.
v) Collect and mark the assessments, then provide feedback to the pupils.

II. Answers to the end unit assessment

A. Knowledge and understanding

1. b
2. a
3. b
4. c
5. a) attract; b) magnetic; c) non magnetic

B. Skills

6. 1-b; 2-b; 3-a; 4-b; 5-b; 6-b; 7-a
7. b
8. a
9. c

C. Attitudes and values

10. a
11. c

6.6. Additional activities

A. Remedial activities

1. What do we call things that magnets attract?
2. List two things that a magnet can attract.
3. Can a magnet attract plastic?
4. Mention two materials that magnets do not attract.
5. What do we call things that magnets cannot attract?

Answers to remedial activities

1. Magnetic materials.
2. Nail, razorblade.
3. No, a magnet cannot attract plastic.
4. Magnets do not attract wood plastic, others.
5. Non-magnetic materials

B. Consolidation activities

1. How do we call the end of a magnet?
2. What happens when you bring a magnet close to a metal spoon?
3. Where can we use magnets at home?

Answers to the consolidation activities

1. The end of a magnet is called poles
2. The spoon is attracted to the magnet.
3. We can use magnets to close fridge doors.

C. Extended activities

1. Why do you think magnets do not attract all metals?
2. How can you test if an object is magnetic?
3. What would happen if you put a magnet under a piece of paper and place some iron nails on top?
4. Why are magnets useful in sorting materials?
5. Think of a game or activity that can be played using magnets.

Answers to the extended activities

1. Because only some metals like iron and steel are magnetic.
2. You can bring a magnet close to it and see if it is attracted.
3. The iron nails will still be attracted through the paper.
4. They help separate magnetic from non-magnetic materials.
5. A fishing game using magnets and paper clips as fish.

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