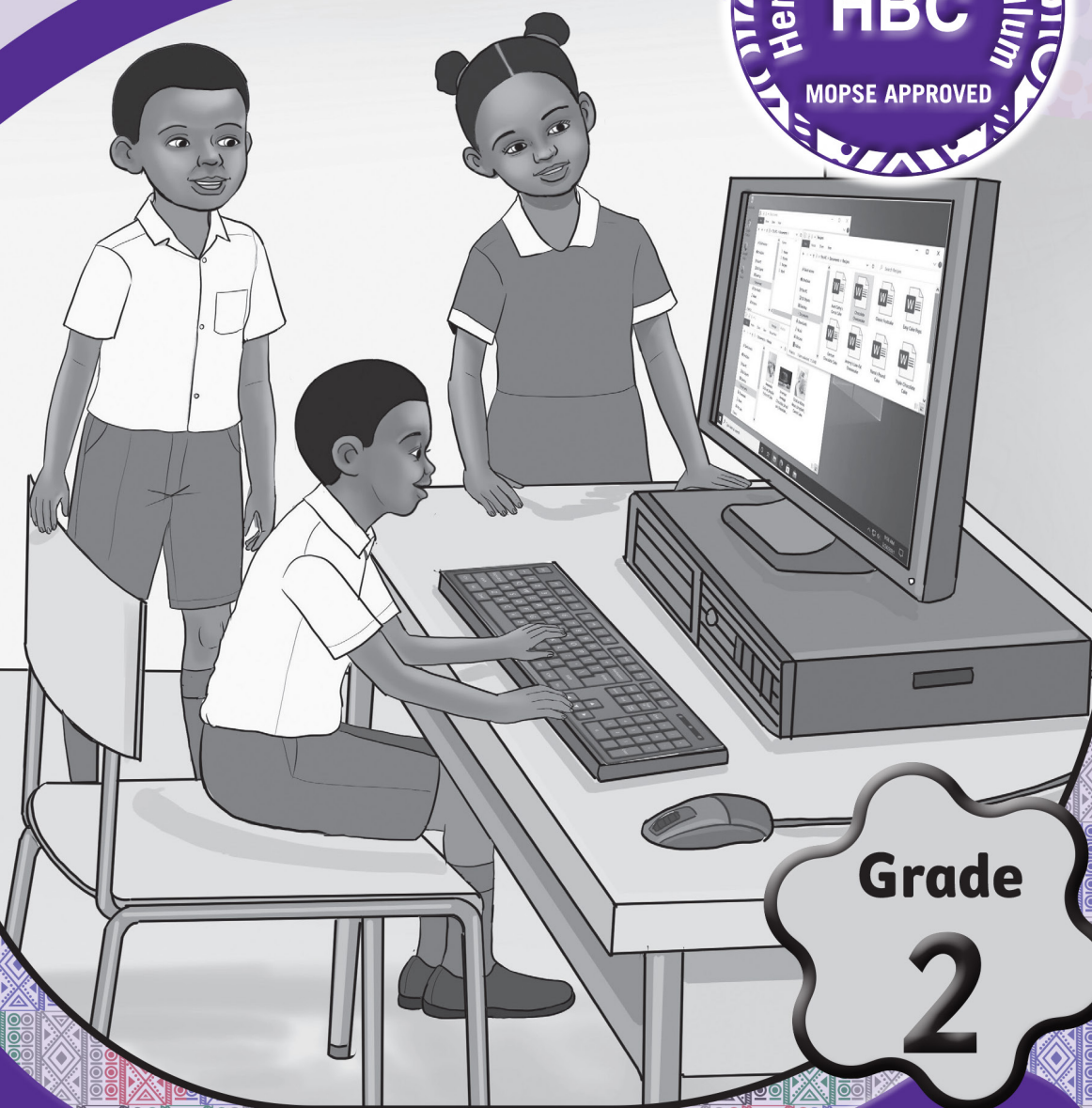


PlusOne

# Science and Technology



Grade  
2

*Boniface N. Nyamai*

**Teacher's Guide**

PlusOne

# Science and Technology

Teacher's Guide



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## **PlusOne Science and Technology | Grade 2 – Teacher’s Guide**

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# Introduction

This **PlusOne Science and Technology Grade 2 Teacher's Guide** provides basic and practical ways to teach key components required by the Science and Technology competency-based curriculum for primary schools. It closely follows the curriculum requirements and outcomes, tying to the topics and units.

This book offers valuable guidelines on how to use the PlusOne Science and Technology Grade 2 Learner's Book which has the following topics:

- 1 Health and safety
- 2 Materials and structures
- 3 Energy and fuels
- 4 Electricity and electronics
- 5 Forces and magnets
- 6 Design and technology
- 7 Water
- 8 Weather and climate
- 9 Soil, plants and animals
- 10 Landforms and Maps
- 11 Sustainable resource management

In this Teacher's Guide for Grade 2, you can expect to find teaching skills that focus on high levels of engagement for learners through active learning styles. Many of these pedagogical approaches require the teacher to act as a facilitator who skillfully guides the learning process by employing targeted questions at appropriate times to encourage learners to think deeply on the more difficult or complex concepts and content.

## Methodology and time allocation

Some of the inclusive learner-centred and multisensory methods and approaches that can be used to learn Science and Technology at junior level are suggested below. The principles of individualisation, concreteness, unification and stimulation should enhance implementation of these methods.

- a Demonstrations
- b Experimentation
- c Science and technical exhibitions
- d Simulations
- e Resource persons
- f Case-study
- g Project work/research

- h** Games (quiz, drama, storytelling)
- i** Gallery walk
- j** Debates

Five 30 minute periods per week, of 2 double lessons and 1 single lesson, should be allocated for adequate coverage of concepts. If possible, there should be internal arrangements for more time for activities outside the classroom such as excursions and other educational visits. This will make learners have enough time for practical lessons.

## Subject-specific aims

The syllabus aims to enable learners to:

- apply to self, work and society.
- select and use a wide range of materials and components in the environment.
- develop the creative, technical and practical expertise to participate in a scientific and technological world.
- demonstrate innate talent that lead to originality and innovativeness.
- enhance scientific and technological designs, through the use of Information and Communication Technology.
- manipulate materials and equipment to enhance creativity.
- develop critical evaluation skills in technical, aesthetic, economic, environmental, social and cultural contexts.
- explore opportunities that promote a sense of self-reliance, enterprising and community development.

## Pedagogical approaches

These include the approaches, methods, strategies, appropriate relevant teaching, and learning resources for ensuring that every learner benefits from the teaching and learning process. The teacher should:

- create learning-centred classrooms using creative approaches.
- position inclusion and equity at the centre of quality teaching and learning.
- use differentiation and scaffolding as teaching and learning strategies.
- use Information and Communications Technology (ICT) as a pedagogical tool.
- identify subject specific instructional expectations to make the subject relevant.
- integrate all assessment strategies.
- use questioning techniques that promote deep learning.

This Teacher's Guide provides teaching methodology for each lesson and concept to ensure that the correct pedagogical approach is used. However, this may need to change based on the skills levels of your class in any year, so use your own experience and discretion to adapt these methodologies accordingly.

## Teaching tips

### **a** Scheme of work

Never go into a class unprepared even if you have taught a lesson many times before. Have your ideas, plans and materials ready. You should make sure you are confident with your material. Classes are easier to manage, and behaviour is better when a lesson is tightly organised.

You might want to develop a regular pattern such as:

- A brief period of revision. What did we do last time?
- The introduction of new material given in the form of a class lesson.
- Activities, undertaken in pairs, groups or singly.
- Whole class discussion of what everyone has done.

When learners are used to being occupied for the whole time, they tend to be more co-operative and to value the lesson more.

Here are some points to remember when developing a scheme of work:

- Know your syllabus.
- Make a preliminary plan based on the time you think you will need to cover each unit.
- Be prepared to change that plan as you learn how much time each theme really takes. Consider school events which take up time such as sport, important national events, examinations and any other special occasions.
- Leave some spare time in your planning. Very few timetables work out perfectly.

Remember all the time that facts are only part of education. Keep in your mind the skills you wish to develop, particularly those of easy communication, co-operation and the development of mutual tolerance and respect. Make sure you have all the materials ready at hand for each lesson. If classes are sharing resources, make sure the ones you want are available when you want them. Before you start on any topic, check on your aims and work out how you can find out if you have achieved them. This is called evaluation.

When preparing materials and activities, consider the different abilities of your learners. Try to organise additional activities for the quicker learners to give you time to help those who are finding the lesson difficult.

### **b** Learning-centred pedagogy

A learning-centred classroom creates the opportunity for learners to engage in meaningful hands-on activities that relate what they are learning to the real world. It is a place for learners to discuss ideas, become actively engaged in looking for answers, working in groups to solve problems. They also research analyse and evaluate information. The aim of the learning-centred classroom is to enable learners to take ownership of their learning.

## Inclusion

Inclusion is ensuring access and learning for all learners especially those disadvantaged. Each lesson in this PlusOne Science and Technology Grade 2 Teacher's Guide contains advice on how to teach that concept to large classes, and to learners with special needs.

## Differentiation and scaffolding

Differentiation is a process by which differences (learning styles, interest and readiness to learn) between learners are accommodated so that all learners in a group have the best possible chance of learning. Differentiation could be by content, tasks, questions, outcome, groupings and support.

### **c** Marking work

When you have a large class the marking of learners' work can become a burden. If it is postponed the burden can become unbearable. Learners need to have their work marked and returned promptly with constructive criticism and as much encouragement as you can give them.

- Some marking of work can be done by learners themselves, swapping papers so that there is a check.
- You can mark work in class while you are going round supervising and encouraging the learners as they work. This has the advantage of offering instant praise and correction.
- Do not let your marking pile up from one day or one week to another.
- It is important to create an atmosphere of trust in which learners feel confident enough to ask you questions without feeling embarrassed.
- Learners should never be allowed to make fun of a learner who asks a question to which other learners already know the answer. Make it clear that such a response is not acceptable.

## Use of Information and Communication Technologies

Teachers are encouraged to use ICT as a teaching and learning tool to enhance deep and independent learning. If your school has internet access, these functions can be done online. Alternatively, download the clips or games to use offline in the classroom. The internet can provide as much additional material as you will ever need.

Once your learners have the chance to use a computer, they too will have access to a world of information. This can be done through effective use of the following ICT tools:

- Laptop or desktop computers
- Smartphones
- Tablets
- CD players
- Projectors
- Calculators
- Radios

- Cameras
- Television sets
- Computer and related software, such as Microsoft Office packages (Word, PowerPoint, and Excel).

ICTs are a useful communication technology that can, by and large, be used to enhance the quality of teaching and learning in schools.

## Diagnostic assessment

### **a** Assessment as learning

Assessment as learning relates to engaging learners to reflect on the expectations of their learning. Information that learners provide the teacher forms the basis for refining teaching-learning strategies.

Learners are assisted to play their roles and to take responsibility of their own learning to improve performance. Learners are assisted to set their own goals and monitor their progress.

### **b** Assessment for learning

It is an approach used to monitor learner's progress and achievement. This occurs throughout the learning process. The teacher employs assessment for learning to seek and interpret evidence which serves as timely feedback to refine their teaching strategies and improve learners' performance.

Learners become actively involved in the learning process and gain confidence in what they are expected to learn.

### **c** Assessment of learning

This is summative assessment. It describes the level learners have attained in the learning, what they know and can do over a period of time. The emphasis is to evaluate the learner's cumulative progress and achievement.

## Reinforcement and revision

Sometimes you will need to revise parts of the topic with the whole class. You will certainly need to start the next lesson by asking learners what they remember of the last one. Children need reinforcement. A few revision notes on the board to cover earlier work will be a very valuable start to every lesson.

## The Learner's Book

Within each topic and unit of the Learner's Book, there are different types of text, illustrations and activities. These are designed to be used in a variety of ways to make lessons interesting, to increase learners' knowledge and motivation and to encourage them to be inquisitive, skilled, confident and mutually supportive.

## Using resources effectively

In order to help learners gain the most draw on as many resources as possible. This section contains some suggestions on how best to use the resources in the learner's book and how to make use of other resources that may be available. The factual material in the learner's book is useful but it should be used alongside other information that the learners find out for themselves. It is important that learners learn techniques for finding out additional information.

### Low-resource schools

Some schools do not have electronic devices. Teachers in such situations should prepare in an entirely different way from the better-equipped schools especially in urban areas. However, there are numerous parts that do not require learners to be working on a computer. Teachers might be able to use the following ideas:

- Prepare flashcards with key words by placing a picture on one card and its definition on another card. Hand one card to each learner randomly and ask learners to find their match.
- Ask learners to explain or describe in their own words their understanding of their key word.
- Create or provide classroom posters for your display boards. Use these for reference during explanations.
- Create 'find the matching words' activities by using the key words lists.
- Create 'fill in the missing words' worksheets.
- Draw information-rich sketches on a writing board, developing a discussion or explanation as the drawing is being developed and using the learner's book as a point of reference.
- Ask learners to do the activities in the learner's book or the teacher's guide that do not require the use of a computer.
- Arrange learners in groups to work through questions in the learner's book or teacher's guide.

### Using the local environment

The study of Science and Technology is about the whole of your learners' social and cultural surroundings. The resources lie around the learner's life. For example, some learners have easy access to cellphones, tablets, computers at both home and school. Let them utilise these resources as they learn in class. Take the learners out into their environment so that they can appreciate how digital the world has gone. That way, learners will enjoy the subject more.

Bring software technicians and network technicians into the school to talk about their roles in the community; make the most of local examples. These resource people and other valuable material to be used as teaching aids are called realia.

# Topic 1

## Health and hygiene

### Unit 1: Personal hygiene

#### Unit objectives

**By the end of the unit, learners should be able to:**

- a** state the functions of human body parts.
- b** discuss the importance of personal hygiene habits.
- c** demonstrate basic personal hygiene habits.
- d** identify the five senses.

#### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book pages 1–9.
- Science and Technology Infant syllabus.
- Soap, toothbrush, water container, towel.
- Pictures of hygiene habits.
- Chart showing five senses.

#### Teaching notes

- Personal hygiene means keeping our body clean to stay healthy.
- Our hands help us hold soap, scrub and wash our bodies.
- Legs help us walk to the bathroom or water source.
- Teeth help us chew food and need to be brushed regularly.
- Eyes, ears, nose, tongue and skin (our five senses) help us detect dirt, bad smells or sounds that remind us to stay clean.
- Good hygiene habits include washing hands, brushing teeth, and bathing regularly.
- These habits prevent the spread of germs and keep us from getting sick.

## Let us start

Show learners the pictures on page 1 and ask:

- 1 What do you do every morning to stay clean?  
I wash my face. I brush my teeth.
- 2 Why do we wash our hands before eating?  
To remove germs.
- 3 How do your body parts help you stay healthy?  
My hands wash my body. My teeth chew food. My eyes see dirt.

## New words

|        |   |                                           |
|--------|---|-------------------------------------------|
| Germ   | – | Tiny things that make us sick.            |
| Soap   | – | Used to clean.                            |
| Clean  | – | Not dirty.                                |
| Brush  | – | Used for cleaning teeth.                  |
| Senses | – | Ways we feel, smell, see, hear and taste. |

## Activity 1.1: Functions of human body parts

- a Ask learners to point to their hands, legs and teeth. Ask:
  - What do your hands help you do?
  - What do your legs help you do?
  - What do your teeth help you do?

### Model answers:

- Hands: Wash my body.
  - Legs: Walk to the bathroom.
  - Teeth: Chew food.
- b Play “Simon Says” (for example: Simon says touch the part you use to brush your teeth).

## Exercise 1.1

- |         |                |
|---------|----------------|
| 1 scrub | 3 strong       |
| 2 walk  | 4 sense things |

## Activity 1.2 : Importance of hygiene

- a Ask: What happens if you don't brush your teeth?  
Your teeth can hurt or fall out.
- b Story sharing prompt:  
“One day, Thuba forgot to wash her hands...”

### Model answer:

She touched her food and got a sore stomach.

### Exercise 1.2

- |   |         |   |            |
|---|---------|---|------------|
| 1 | keeping | 3 | toothaches |
| 2 | germs   | 4 | sweat      |

### Activity 1.3: Hygiene habits

- a Ask learners to pretend to be doctors teaching others how to wash hands.
- b Provide toy soap and toothbrush. Ask learners to show how to clean properly.

#### Model demonstration steps:

- **Handwashing:** Wet hands → Rub soap → Scrub → Rinse and dry
- **Brushing:** Use pea-sized toothpaste → Brush up and down

### Exercise 1.3

- |   |         |   |             |
|---|---------|---|-------------|
| 1 | wetting | 4 | pea-sized   |
| 2 | 20      | 5 | up and down |
| 3 | dry     |   |             |

### Activity 1.4: The five senses

- a Ask learners to close their eyes and smell or listen.
- b Play a guessing game using hygiene items.  
“This is used for brushing teeth. What is it?” (Toothbrush)

### Story time model discussion prompts

- Ask: Why did Chipo get sick?  
She did not wash her hands after playing with dirty stones.
- Ask: What did her mother teach her?  
To wash hands before eating.

### Unit exercise

- 1 True or False
  - (a) True
  - (b) False
- 2 Match body part to its use
  - Hands → Scrub dirt

- Mouth → Chew food
- Nose → Smell soap

- 3 (a) hands  
(b) toothaches

- 4 Tongue

- 5 soap

- 6 Learners draw themselves washing hands. Ensure they label **soap** and **water**.

- 7 germs

- 8 Learners pretend to be doctors teaching brushing. Expected response:  
– “Use small toothpaste. Brush up and down.”

## Unit 2: Food hygiene

### Unit objectives

**By the end of this unit, learners should be able to:**

- a state clean and unclean food handling practices.
- b discuss the importance of safe food handling.
- c demonstrate safe food handling practices.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner’s Book pages 10–16.
- Science and Technology Infant syllabus.
- Cups, plates, spoons (clean and unclean examples).
- Pictures or posters showing food hygiene.

### Teaching notes

- Food hygiene means keeping food clean and safe.
- We must wash our hands with soap before touching food.
- Use clean utensils like spoons, knives, and plates.
- Place food on clean surfaces only (for example, washed tables).
- Eating food with dirty hands or unclean utensils can cause sickness.
- Safe food handling helps prevent germs from spreading.

## Let us start

Show learners the pictures on page 10 and ask:

- 1 What do you do before touching food?  
– Wash hands with soap and water.
- 2 Why is it important to use clean utensils?  
– To avoid spreading germs.
- 3 What happens if we eat food with dirty hands?  
– We can get sick.

## New words

|                 |   |                                                                |
|-----------------|---|----------------------------------------------------------------|
| <b>Clean</b>    | – | Free from dirt or germs.                                       |
| <b>Unclean</b>  | – | Dirty, not safe to use.                                        |
| <b>Utensils</b> | – | Tools used when preparing or eating food (for example, spoon). |
| <b>Surfaces</b> | – | Places where food is placed.                                   |
| <b>Germs</b>    | – | Tiny things that make us sick.                                 |

## Clean food handling practices

- Wash hands before touching food.
- Use clean utensils.
- Place food on clean, washed surfaces.

## Unclean food handling practices

- Using dirty hands or dirty utensils.
- Placing food on unwashed surfaces.

## Activity 2.1: Clean and unclean practices

- a Ask learners to name two clean and two unclean practices.

### Model answers:

- Clean: Washing hands, using clean spoons.
  - Unclean: Touching food with dirty hands, placing food on a dirty table.
- b Sorting game – Clean and unclean
    - Prepare flashcards with pictures of clean and unclean things (clean clothes, dirty dishes, tidy room, littered street).
    - Place the flashcards mixed together on a table or floor.
    - Divide learners into small groups or pairs.
    - Explain: “We will sort these pictures into two piles — clean and unclean.”
    - Let learners take turns picking a flashcard and placing it in the correct pile.
    - After sorting, review the piles with the whole class, correcting any mistakes.

### Model answer:

- **Clean pile:** clean clothes, washed hands, swept floor, brushed teeth
- **Unclean pile:** dirty dishes, muddy shoes, littered street, overflowing dustbin

### Exercise 2.1

- |   |         |   |       |
|---|---------|---|-------|
| 1 | clean   | 3 | serve |
| 2 | prepare | 4 | eat   |

### Activity 2.2 – The importance of food hygiene

- a** Ask: What happens if we eat with dirty hands?  
Model answer→ We get sick from germs.
- b** Learners share stories:

#### Model stories

- 1 “I always wash my hands before eating. It keeps germs away and helps me stay healthy.”
- 2 “My mother cooks meat until it is well done. This keeps our food safe to eat.”
- 3 “We keep milk in the fridge so it stays fresh. Cold milk is safe and tastes nice.”

### Exercise 2.2

- 1 sickness
- 2 clean
- 3 spreading

### Activity 2.3: Safe food handling

- a** Learners pretend to be a chef showing Taboka safe food handling

**Chef:** “Hello, Taboka! Are you ready to cook?”

**Taboka:** “Yes, Chef!”

**Chef:** “First, we must wash our hands. Pretend this toy sink has water. Wet your hands, add soap, rub for 20 seconds, rinse, and dry.”

**Taboka:** (pretends to wash hands) “My hands are clean now!”

**Chef:** “Good! Now let’s clean our utensils. Take this toy spoon. Wash it in warm soapy water, rinse it, and dry it.”

**Taboka:** (pretends to wash spoon) “The spoon is clean, Chef!”

**Chef:** “Great work, Taboka! Clean hands and utensils keep our food safe.”

- b** Let learners use real or toy utensils to demonstrate safe handling.

## Exercise 2.3

- |         |         |
|---------|---------|
| 1 wash  | 3 rinse |
| 2 scrub | 4 soap  |

## Unit revision

- 1 a-ii , b-iii, c-i
- 2 (a) False (b) True
- 3 (a) soap (b) utensils
- 4 A
- 5 Two clean food handling practices are **washing hands** before touching or preparing food and **cleaning utensils and surfaces** before and after use.

## Unit 3: Environmental hygiene

### Unit objectives

By the end of this unit, learners should be able to:

- a identify clean and unclean environments.
- b discuss the importance of a clean environment.
- c demonstrate basic cleaning tasks.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book pages 17–23.
- Science and Technology Infant syllabus.
- Brooms, dustpans, cloths, dustbins (real or toy versions).
- Pictures of clean and unclean environments.

### Teaching notes

- Environment means the space where we live, work, and play.
- It can be clean or unclean.
- A clean environment has:
  - No litter on the ground
  - Clean floors, walls, and windows
  - Fresh air
- An unclean environment has:
  - Litter, bad smells
  - Dirty floors and surroundings
  - Flies and pests
- Cleaning tasks like sweeping, dusting, and proper litter disposal keep our environment safe and pleasant.

## Let us start

Show learners the pictures on page 17 and ask:

- 1 What do you see in the clean environment?
  - Clean floors, no litter.
- 2 What do you see in the unclean environment?
  - Litter everywhere.
- 3 Why is it important to keep our environment clean?
  - To stay healthy and avoid sickness.

## New words

|         |   |                                      |
|---------|---|--------------------------------------|
| Clean   | – | Not dirty.                           |
| Unclean | – | Dirty.                               |
| Litter  | – | Trash or rubbish on the ground.      |
| Broom   | – | Tool for sweeping.                   |
| Dustbin | – | Container for throwing away rubbish. |

## Activity 3.1: Clean and unclean environments

- a Learners look at two pictures.
  - Ask them to tick the clean environment and cross out the unclean one.
- b Prepare flashcards showing pictures of clean and unclean environmental scenes, such as:
  - Clean park, swept street, planted garden, recycling bins (Clean).
  - Littered river, overflowing dustbin, smoky factory, graffiti walls (Unclean).
- Mix the flashcards and place them face up on a table or the floor.
- Explain the task to learners:
  - “We will sort these flashcards into two piles — *Clean Environment* and *Unclean Environment*.”
- Call learners in turns to pick a flashcard and place it under the correct heading.
- Discuss their choice:
  - If correct, praise and ask why it belongs in that pile.
  - If incorrect, guide them to think again with a question like, “Does this place look safe and healthy?”
- After sorting all cards, review the piles together and talk about:
  - Why we should keep our environment clean.
  - What dangers come from an unclean environment.

### Model answer:

- Clean environment pile: park with flowers, clean water in a river, street with dustbins, children planting trees.
- Unclean environment pile: river with plastic bottles, street full of litter, dumpsite near houses, smoky chimneys.

### Exercise 3.1

- |   |       |   |        |
|---|-------|---|--------|
| 1 | work  | 3 | litter |
| 2 | fresh | 4 | flies  |

### Importance of a clean environment

- 1 Keeps us **healthy** and happy.
- 2 Prevents **sickness** by keeping away germs and pests.
- 3 Provides **fresh air** for breathing.
- 4 Looks **beautiful** and makes us feel good.

### Activity 3.2: A dirty environment

- a Ask: What happens if we live in a dirty place?  
Model answer→ We get sick or feel bad.
- b Model stories
  - One day, Thuba played near a dirty stream. The water smelled bad and had rubbish floating in it. Later, Thuba felt sick and her mother said it was because he touched dirty water.
  - Mai and Thuba walked through a park full of litter. There were plastic bottles, paper, and food waste everywhere. They decided to pick up the rubbish so the park would be safe for playing.
  - Thuba lived near a dumpsite. Flies and bad smells came into her home every day. Her family talked to the community, and they agreed to move the rubbish to a safe place and keep the area clean.

### Exercise 3.2

- |   |         |   |      |
|---|---------|---|------|
| 1 | healthy | 3 | good |
| 2 | flies   | 4 | air  |

### Activity 3.3: Cleaning tasks

- a Learners pretend to be cleaners teaching others how to sweep and dust.
- b Use toy cleaning tools to demonstrate.

### Model demonstration response:

“I sweep the floor with a broom and throw dirt into a dustbin.”

### Story time discussion

- Ask: What did Duduzile learn after cleaning the garden?
  - Clean places help plants and flowers grow.

### Unit exercise

- 1 Match task to importance
  - (a) Sweeping → (i) Keeps the environment tidy
  - (b) Dusting → (iii) Removes dust from surfaces
  - (c) Disposing of litter → (ii) Prevents sickness
- 2 True or False
  - (a) True                      (b) True                      (c) False
- 3 (a) broom                      (b) bin
- 4 Throw it in a dustbin
- 5 Keeps us healthy. Makes places look nice.
- 6 Learners draw themselves sweeping and label:
  - Broom, dustbin, dustpan.
- 7 healthy.
- 8 Learners pretend to dust a table and explain the steps.
- 9 Draw and label one cleaning tool (broom).

## Unit 4: Health and wellness

### Unit objectives

**By the end of this unit, learners should be able to:**

- a state healthy habits.
- b discuss the importance of healthy habits.
- c demonstrate healthy habits.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner’s Book pages 24–30.
- Science and Technology Infant syllabus.
- Pictures showing healthy foods, exercise, rest and sleep.

## Teaching notes

Healthy habits help us stay strong and happy. These habits include:

- Eating a balanced meal: This means eating fruits, vegetables, grains, and proteins.
- Exercising: Playing games, running, or dancing keeps our bodies active and strong.
- Sleeping well: Children should sleep 8–10 hours each night to allow the body to grow and recover.
- Resting: Taking breaks during the day helps us to relax and stay energetic.

### Healthy habits:

- Make muscles strong.
- Give us energy to grow.
- Help the body recover.

## Let us start

Show learners the picture on page 24. Ask:

- 1 What do you see in the picture?  
– A child eating food at a table.
- 2 Why is it important to eat fruits and vegetables?  
– They help us grow and stay strong.
- 3 How does playing outside help your body?  
– It keeps the body active and fit.

## New words

|          |   |                                              |
|----------|---|----------------------------------------------|
| Healthy  | – | feeling well and strong.                     |
| Exercise | – | moving your body to stay fit.                |
| Rest     | – | taking a break.                              |
| Sleep    | – | closing your eyes and resting for hours.     |
| Balanced | – | having the right amounts of different foods. |

## Suggested answers

### Activity 4.1: Healthy habits

- a Name two healthy habits you know.  
– Eating fruits, sleeping well.
- 2 Matching game – learners match flashcards of habits to their benefits.

### Model answers:

- Exercise → Keeps the body active.
- Sleep → Helps the body recover.
- Balanced meal → Gives us energy.

## Exercise 4.1

- 1 Eating a balanced meal means including **vegetables**.
- 2 Physical activities keep your body **active**.
- 3 Sleeping well means sleeping for **8–10** hours.
- 4 Resting means taking breaks to **relax**.

## Activity 4.2 : Group work

- a Talk about why eating fruits and vegetables is important.
  - They give us vitamins and help us grow.
- b Share stories:
  - One day, Thuba did not sleep well and felt tired at school.
  - Thuba loves running and skipping with her friends every afternoon. Playing outside keeps her body strong and her mind happy.
  - At lunch, Thuba’s plate has *sadza*, vegetables, and chicken. She says eating different foods gives her energy for school and play.
  - Every night, Thuba goes to bed early. She sleeps well and wakes up fresh, ready to learn and play the next day.

## Exercise 4.2

- 1 Physical activities keep our hearts **healthy**.
- 2 Balanced meals help us **grow**.
- 3 Sleep and rest help our bodies **recover**.

## Activity 4.3: Healthy habits

- a Pretend to be a chef teaching Taboka how to prepare a balanced meal
  - Set up the role-play area with toy food, pictures, or real safe-to-handle foods (fruits, vegetables, grains, proteins).
  - Choose a learner to be the chef and another to be Taboka.
  - Chef starts the role-play:
    - “Hello, Taboka! Today I will teach you how to make a balanced meal.”
    - “First, we add fruits like apples and bananas for vitamins.”
    - “Then, we add vegetables like spinach and carrots to keep us healthy.”
    - “Next, we add grains like rice or *sadza* to give us energy.”
    - “Finally, we add proteins like beans, eggs, or chicken to make our muscles strong.”
  - Chef shows the full plate and says: “This is a balanced meal — it has everything your body needs to grow and stay healthy.”
  - Allow different learners to swap roles and repeat.

- b** Role-play playing soccer or dancing with friends:
- Ask learners to form small groups of 4–6.
  - Tell them: “Pretend you are playing soccer or dancing with your friends.”
  - Let each group act it out — running, kicking, passing, or dancing in rhythm.
  - After acting, guide a short discussion:
    - “How do you feel after playing?” (Answers: tired, happy, strong).
    - “Why is it important to play and be active?” (Answers: keeps body fit, makes us strong, good for the heart).
  - End with a teacher reminder: “Physical activities like playing soccer or dancing help us stay active, build strong muscles, and keep our hearts healthy.”

### Exercise 4.3

- 1** Eating a balanced meal means including fruits, vegetables, grains and **proteins**.
- 2** It is important to drink plenty of **water**.
- 3** Dancing to **music** is a good way to stay active.
- 4** Taking breaks during the day helps you to **relax**.

### Unit exercise

- 1** True or False:
  - (a) A balanced meal includes only sweets – **False**.
  - (b) Sleeping for 8–10 hours is good for your body – **True**.
- 2** **Matching (Habit ↔ importance)**
  - Eating → Gives energy and helps growth.
  - Exercising → Makes muscles strong.
  - Sleeping → Helps the body recover.
- 3** **Fill in the blanks**
  - (a) We should drink plenty of **water**.
  - (b) Playing games keeps our **bodies** strong.
- 4** Play outside.
- 5** Sleeping well, eating fruits.
- 6** Draw a picture of yourself eating a balanced meal.  
Label the fruits and vegetables.
- 7** To rest the body.
- 8** Pretending to be a coach showing a friend how to play soccer.
  - Warm up your body before playing.
  - Use your feet to kick and pass the ball.
  - Work as a team to move the ball towards the goal.
  - Try to score by kicking the ball into the other team’s net.
  - Follow the rules and play safely.
- 9** Demonstrate drawing and labelling one healthy habit practised every day.  
– (eating fruits, playing soccer).

## Unit 5: Disease prevention

### Unit objectives

**By the end of this unit, learners should be able to:**

- a** state common diseases.
- b** state the causes of common diseases.
- c** discuss ways of preventing common diseases.
- d** demonstrate good hygiene habits.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book page 31-37.
- Science and Technology Infant syllabus.
- Soap and water or handwashing poster.
- Clean food and water containers (pictures or real items).
- Mosquito net.
- Flashcards with disease names and symptoms.

### Teaching notes

Use simple and clear explanations.

- Flu makes people cough, sneeze and feel tired.
- Cholera comes from dirty drinking water.
- Diarrhoea is caused by eating dirty food.
- Malaria comes from mosquito bites.
- Emphasise that these diseases make people sick and can be prevented.
- Teach good habits:
  - Wash hands with soap.
  - Drink clean water.
  - Eat clean food.
  - Sleep under a mosquito net.

### Let us start

Show learners the pictures on page 31. Ask:

- What do you see in the pictures?
  - A girl washing hands, clean food, and dirty room with mosquitoes.
- What do you do to avoid getting sick?
  - Wash hands, eat clean food, sleep under a net.

- Can you name some common diseases?  
– Flu, cholera, diarrhoea, malaria.
- Why is it important to drink clean water?  
– To stay healthy and avoid getting sick.

## New words

|                   |   |                                             |
|-------------------|---|---------------------------------------------|
| <b>Flu</b>        | – | A sickness that makes you cough and sneeze. |
| <b>Cholera</b>    | – | A disease from dirty drinking water.        |
| <b>Diarrhoea</b>  | – | When you go to the toilet many times.       |
| <b>Malaria</b>    | – | A disease from mosquito bites.              |
| <b>Prevention</b> | – | Stopping something from happening.          |

## Suggested answers

### Activity 5.1: Common diseases

- a** Name the disease in the picture.  
– Diarrhoea
- b** Play a matching game.  
– Use flashcards to match disease name to symptom:
- Flu – sneezing.
  - Cholera – dirty water.
  - Diarrhoea – stomach pain.
  - Malaria – mosquito bites.

## Exercise 5.1

- 1 Flu can make you cough, sneeze, and feel **tired**.
- 2 Cholera is caused by **dirty** water.
- 3 Diarrhoea makes you go to the **toilet** many times.
- 4 Malaria is caused by **mosquito** bites.

### Activity 5.2 : Good hygiene

- a** Pretend to be a doctor teaching Taboka how to wash hands.  
– Show each step: wet hands, add soap, rub well, rinse, dry.
- b** Role-play drinking clean water and eating clean food.  
– Learners act out using a cup and clean plate.

## Unit exercise

- 1 Match the disease to its cause:
  - Flu – (c) Germs from coughing.
  - Cholera – (b) Dirty water.
  - Malaria – (a) Mosquito bites.
- 2 True or False
  - Washing hands prevents flu. → True.
  - Dirty food can cause diarrhoea. → True.
- 3 (a) We should drink clean water.  
(b) Sleeping under a mosquito net prevents malaria.
- 4 Wash your hands.
- 5 Malaria
- 6 Model answer: Teach them to drink clean water.
- 7 Model answer: Drawing of handwashing or drinking clean water.

## Topic revision exercise

- 1 Match the habit to its importance:
  - Brushing teeth → (ii) Prevents toothaches
  - Washing hands → (iii) Removes germs
  - Bathing → (i) Washes sweat
- 2 Eyes – to see; Hands – to hold things
- 3 Sight (eyes), smell (nose), hearing (ears), taste (tongue), touch (skin)
- 4 Ask learners to draw a picture of themselves washing their hands, label soap, water and hand
- 5 Diseases.
- 6 Demonstrate cleaning utensils with soap and water.

7



- 8 Washing hands regularly with soap and clean water.
  - Eating clean, well-cooked food and drinking safe water.
  - Keeping the environment clean to stop germs from spreading.
  - Covering your mouth and nose when coughing or sneezing.

# Topic 2

## Food and nutrition

### Unit 6: Food groups

#### Unit objectives:

By the end of this unit, learners should be able to:

- a** state classes of food.
- b** classify food into food groups.

#### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book pages 38–43.
- Science and Technology Infant syllabus.
- Food samples or pictures.
- Sorting trays.

#### Teaching notes

- Food is grouped into classes based on how it helps the body.
- There are 3 main food groups:
  - (a) Carbohydrates – give us energy to play and learn (for example rice, bread, potatoes).
  - (b) Proteins – help the body grow and repair itself (for example beans, fish, eggs).
  - (c) Vitamins – help us stay healthy and fight sickness (for example oranges, spinach, carrots).
- Learners should be encouraged to classify foods and describe their function.
- Use simple examples and real-life experiences to help learners relate to the content.

#### Let us start

Show learners the picture on page 38. Ask:

- What foods do you eat to feel strong and energetic?
  - Rice, bread, potatoes, *sadza*.
- Can you name a food that helps you grow taller?
  - Eggs, meat, beans, fish.

- Why should we eat fruits and vegetables every day?
  - To stay healthy and fight diseases.

## New words

|                      |   |                                                     |
|----------------------|---|-----------------------------------------------------|
| <b>Carbohydrates</b> | – | Foods that give us energy.                          |
| <b>Proteins</b>      | – | Foods that help us grow and become strong.          |
| <b>Vitamins</b>      | – | Foods that keep us healthy and help fight sickness. |
| <b>Nutrition</b>     | – | Getting the right food to help our bodies grow.     |
| <b>Classify</b>      | – | To group things that are alike.                     |

## Suggested answers

### Activity 6.1: Classes of food

- a** Look at the pictures. Name the class of each food.
- Banana → Vitamins
  - Bread → Carbohydrates
  - Nuts → Proteins
  - Cereal → Carbohydrates
- b** Sing the song:
- “Carbohydrates give us energy, proteins make us strong, Vitamins keep us healthy all day long!”

### Activity 6.2: Classifying foods

- a** Use sorting trays or picture cards to group foods:
- **Carbohydrates:** rice, bread, cereal.
  - **Proteins:** eggs, beans, chicken, fish.
  - **Vitamins:** oranges, spinach, carrots, banana.
- b** Create a “Food Group Plate”:
- Learners draw or place food items on paper plates, sorted into 3 sections: Carbohydrates, Proteins, Vitamins.

## Exercise 6.1

- 1 Rice and bread are examples of **carbohydrates**.
- 2 Beans and eggs are rich in **proteins**.
- 3 Oranges and carrots give us **vitamins**.

## Unit exercise

1

| Food    | Its group     |
|---------|---------------|
| Rice    | Carbohydrates |
| Eggs    | Proteins      |
| Carrots | Vitamins      |

### True or False

- 2 Bread gives us energy. → **True**  
Spinach is a protein. → **False**
- 3 Proteins help build strong muscles.  
Fruits like oranges are rich in **vitamins**
- 4 B. Potato
- 5 Draw a food from each group →
- Carbohydrate: Bread or rice
  - Protein: Egg or beans
  - Vitamin: Orange or carrot

## Unit 7: Food demonstrations

### Unit objectives

By the end of the unit, learners should be able to:

- a identify food samples.
- b demonstrate the process of cooking.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book pages 44–49.
- Science and Technology Infant syllabus.
- Real or toy cooking utensils.
- Samples or pictures of food (indigenous and modern).

### Teaching notes

**Indigenous foods** are traditional foods that have been eaten in a community for many years. Examples: *sadza*, dried vegetables, okra, dried fish.

**Modern foods** are popular foods that often come from other countries or are newer in the culture. Examples: burgers, pancakes, pizza.

## Let us start

Show learners the picture on page 44. Ask:

- 1 What is your favourite food to eat at home?  
– Possible answers: sadza, rice, pancakes, chicken.
- 2 Can you name a traditional food from your culture?  
– (*sadza*, okra, dried fish]
- 3 Why is it important to learn how to cook?  
– So we can prepare food and help at home.

## New words

|                   |   |                                      |
|-------------------|---|--------------------------------------|
| <b>Indigenous</b> | – | found in a place from the beginning. |
| <b>Modern</b>     | – | new or of today.                     |
| <b>Cooking</b>    | – | making food ready to eat.            |
| <b>Utensils</b>   | – | tools used for cooking or eating.    |

## Suggested answers

### Activity 7.1

- a Look at the pictures. Name each food and say if it is indigenous or modern.
  - Burger → Modern
  - Mopane worms → Indigenous
  - French fries → Modern
- b Play a sorting game. Group flashcards:
  - *Indigenous*: *sadza*, mopane worms, okra.
  - *Modern*: pancakes, burgers, fries.

### Exercise 7.1

- 1 Indigenous foods are traditional foods eaten for many **years**.
- 2 An example of an indigenous food is **okra**.
- 3 Modern foods are often from other **countries**.
- 4 An example of a modern food is **burger**.

### Activity 7.2

- a Pretend to cook *sadza* using toy kitchen utensils.
- b Role-play making pancakes with a toy frying pan and spoon.

## Demonstration

### Cooking indigenous food (Sadza)

- 1 Boil water in a pot.
- 2 Add maize meal slowly while stirring.
- 3 Keep stirring until it thickens.

### Cooking modern food (pancakes)

- 1 Mix flour, milk, and eggs in a bowl.
- 2 Pour batter onto a hot frying pan.
- 3 Flip the pancake when bubbles form.

## Story time

Let learners read or listen to the story and answer:

- What foods did they see?
  - Sweet potatoes (indigenous), bread (modern).
- What did the characters say about the foods?
  - Both are delicious and important.

## Unit exercise

- 1 Match the food to its type:
  - (a) *Sadza* → (ii) Indigenous
  - (b) Pancakes → (i) Modern
- 2 True or False:
  - (a) Sadza is a modern food → **False**
  - (b) Pancakes are cooked on a frying pan → **True**
- 3
  - *Sadza* is an example of indigenous food.
  - To cook pancakes, you need **flour** and eggs.
- 4 B
- 5 Ask learners to draw themselves cooking their favourite food after you have demonstrated.

## Unit 8: Sources of food

### Unit objectives

By the end of the unit, learners should be able to:

- a** list the sources of food.
- b** discuss local food sources.
- c** explain the importance of food.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book page 50-56.
- Science and Technology Infant syllabus.
- Market/farm pictures.

### Teaching notes

- Food comes from two main sources: **plants** (maize, beans, fruits, vegetables) and **animals** (meat, milk, eggs, fish).
- Local food sources include gardens, farms, and markets within the community.
- Food is important for energy, growth, and health.
- Some foods are indigenous (*sadza, mufushwa*), others are modern (pizza, burgers).
- Learners should understand why food is essential daily.

### Let us start

Show learners the pictures on page 50. Ask:

- 1** Where does your food come from?  
– *From animals and plants.*
- 2** Can you name a food that grows in your community?  
– *Maize, tomatoes, groundnuts, leafy greens.*
- 3** Why do we need to eat food every day?  
– *To grow, to be strong, and to stay healthy.*

### New words

|         |   |                             |
|---------|---|-----------------------------|
| Sources | – | where something comes from. |
| Market  | – | a place where food is sold. |
| Local   | – | nearby or in the community. |
| Energy  | – | power to work or play.      |
| Crops   | – | plants grown for food.      |

## Suggested answers

### Exercise 8.1

- |   |         |   |       |
|---|---------|---|-------|
| 1 | animals | 4 | eggs  |
| 2 | plants  | 5 | beans |
| 3 | animals |   |       |

### Exercise 8.2

- 1 (groundnuts)
- 2 (chickens)
- 3 (milk)

### Activity 8.1: Sources of food

- 1 Ask learners to draw or write foods they eat at home.
- 2 Help them sort into plant and animal foods.

#### Model answers:

- Plant foods: maize, mangoes, beans.
- Animal foods: meat, fish, milk, eggs.

Sing the song to the learners once while they listen using *twinkle twinkle little star* tune.

- 1 Ask learners to repeat each line after you.
- 2 Sing together as a group, clapping hands or making simple actions.
- 3 Repeat the song faster or softer for fun.

#### Song:

*Plants give us, maize and beans*

*Maize and beans x2*

*Maize and beans:*

*all the time*

*Animals give us milk and eggs*

*Milk and egg x2*

*All the time*

### Activity 8.2

- a Drawing food sources
  - Show learners examples of local foods (either real items, pictures, or flashcards).
  - Explain that they will draw foods that come from plants and animals in their community.

- On the board, demonstrate how to draw one example (maize with label “maize” or a cow with label “cow”).
- Ask learners to include labels for each food in their drawings.
- Walk around the class, checking and guiding their work.
- Invite a few learners to show and explain their drawings to the class.

**b** Role-play

- Choose two learners — one will be a farmer, the other a market seller.
- Give them simple props if available (basket, toy vegetables, or real fruits).
- The “farmer” pretends to bring fresh produce from the farm.
- The “market seller” pretends to buy and prepare to sell them.
- Encourage them to use the model line: *“These tomatoes are from my garden.”*
- Allow other pairs to take turns, using different foods from the community.

## Activity 8.3

### Importance of food

- a** Make a class poster about the uses of food.
- b** Cut and paste food pictures into groups:
  - Energy
  - Growth
  - Health

### Model explanation:

- Food gives us energy to play.
- Food helps us grow and stay strong.
- Food fights germs to keep us healthy.

## Exercise 8.3

- 1** energy
- 2** tall
- 3** germs

### Unit exercise

- 1** Matching
  - Maize → **(i)** Plant
  - Milk → **(iii)** Animal
  - Eggs → **(iii)** Animal

## 2 True or False

(a) Vegetables come from plants → True

(b) Fish is a plant source → False

## 3 Food

- chickens

## 4 Ask learners to draw one plant food and one animal food.

– (*maize and meat*)

## 5 Gives us energy.

Helps us grow.

Keeps us healthy.

## Topic revision exercise

### 1 Maize, spinach, milk, eggs

### 2 grow

### 3 Milk and eggs – animals; beans & spinach – plants

### 4 Indigenous: *sadza*; Modern: pizza

### 5 To be healthy and eat safe food

### 6 Indigenous: *sadza*, madora; Modern: pizza, burgers

### 7 fight sickness

### 8 Match food to food group:

- Maize → Carbohydrates
- Chicken → Proteins
- Banana → Vitamins

# Topic 3

## Crop, plants and animals

### Unit 9: Crop plants

#### Unit objectives

By the end of this unit, learners should be able to:

- a name different types of plants.
- b identify plant families.

#### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book pages 57–62.
- Science and Technology Infant syllabus.
- Pictures of different types of plants.

#### Teaching notes

- Begin by exploring what plants learners see around their home or school.
- Introduce the concept that plants can be grouped into families based on their characteristics.
- Use the following four plant families:
  - **Trees** – tall with woody stems (for example mango, apple).
  - **Legumes** – have pods with seeds (for example beans, peas).
  - **Roots** – grow underground (for example carrots, potatoes).
  - **Grasses** – have thin leaves and short stems (maize, wheat).
- Explain the importance of plants, especially in providing food.

#### Let us start

##### Teacher prompts with model answers:

Show learners the picture on page 57. Ask:

- 1 What plants do you see around your home or school?

– Mango trees, maize, beans, grass.

2 Can you name a plant that gives us food?

– Beans, maize, carrots, peas.

3 Why are plants important to us?

– They give us food.

## New words

**Trees** – Tall plants with strong stems called trunks.

**Legumes** – Plants with pods that have seeds inside.

**Roots** – Parts of plants that grow under the soil.

**Grasses** – Short plants with thin leaves.

**Families** – Groups that plants belong to because they have similar parts.

## Suggested answers

### Exercise 9.1 (page 59)

1 woody

2 legumes

3 underground

4 Carrots

5 grasses

### Activity 9.1: Different types of plants

1 Take learners outside or let them look through the classroom window.

2 Ask them to list plants they see (write these on the board).

3 Sing together:

“Trees are tall, legumes have pods, roots grow down, and grasses are short.”

### Model answers:

- Tree: Mango
- Legume: Beans

- Root: Carrot
- Grass: Maize

### Activity 9.2: Plant families

a Prepare flashcards with plant names or pictures. Ask learners to match them to the correct family.

- Example: Peas → Legumes

b Play a guessing game: “I grow underground. What am I?” → Answer: Root (carrot)

### Exercise 9.2

1 Trees

2 pods

3 Roots

4 thin

### Activity 9.3: Classifying plants

- a** Give learners pictures or real samples of plants.
  - Let them sort into groups: trees, legumes, roots, grasses.
- b** Provide old magazines. Let learners cut out plant pictures and create a “Plant Family Collage.”

### Unit exercise

- 1** Match the plant to its family:
  - (a)** Mango → **(ii)** Trees
  - (b)** Beans → **(i)** Legumes
  - (c)** Carrots → **(iii)** Roots
- 2** True or False:
  - (a)** True
  - (b)** True
- 3**
  - (a)** Roots
  - (b)** legumes
- 4** Tree – Apple; Legume – Bean; Root – Potato; Grass – Wheat
- 5** They give us food.

## Unit 10: Vegetable gardening

### Unit objectives

**By the end of this unit, learners should be able to:**

- a** name garden tools.
- b** identify ways of caring for garden tools.
- c** discuss different types of vegetables.
- d** demonstrate planting of vegetables.
- e** practice caring for vegetables.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner’s Book pages 63–70.
- Science and Technology Infant syllabus.
- Real or toy garden tools (hoe, rake, watering can, gloves).
- Vegetable pictures (leafy, root, fruit).
- Toy seeds or real seeds.

## Teaching notes

### 1 Garden tools and their uses:

- Hoe: Digs soil and removes weeds.
- Rake: Levels soil and gathers leaves.
- Watering can: Gently waters plants.
- Gloves: Protect hands from dirt and thorns.

### 2 Caring for garden tools:

- Wash tools after use.
- Dry them properly to prevent rust.
- Store tools safely in a shed or on a rack.

### 3 Types of vegetables:

- **Leafy vegetables:** Spinach, cabbage
- **Root vegetables:** Carrots, onions
- **Fruit vegetables:** Tomatoes, peppers

### 4 Steps for planting vegetables:

- Dig soil using a hoe and mix compost.
- Make small holes and plant seeds.
- Water gently using a watering can.

### 5 Caring for vegetables:

- Water regularly (keep soil moist, not muddy).
- Pull out weeds to prevent competition for nutrients.
- Use natural pest repellents like crushed eggshells and ash.

## Let us start

Show learners the picture on page 63. Ask the questions on the page:

### Possible answers

- 1 Hoe, rake, watering can, gloves.
- 2 So they last longer and work well.
- 3 Tomato, cabbage, onion.

## New words

|                     |   |                                              |
|---------------------|---|----------------------------------------------|
| <b>Hoe</b>          | – | A tool for digging and removing weeds.       |
| <b>Watering can</b> | – | A container used to gently water plants.     |
| <b>Seedlings</b>    | – | Young plants grown from seeds.               |
| <b>Compost</b>      | – | Rotting leaves and food used to enrich soil. |
| <b>Weeds</b>        | – | Unwanted plants that grow among crops.       |

## Suggested answers

### Exercise 10.1

- |   |              |   |        |
|---|--------------|---|--------|
| 1 | Hoe          | 3 | Rake   |
| 2 | Watering can | 4 | Gloves |

### Activity 10.1: Garden tools

- a Use flashcards of rake, hoe, gloves, watering can
- 2 Sing:  
“Hoe, rake, watering can – Tools help us grow!”

### Activity 10.2 – Role play: Caring for tools

- 1 Divide learners into small groups.
- 2 Provide each group with real or improvised gardening tools (for example, hoe, rake, watering can) or toy versions for safety.
- 3 Tell them they have just finished “gardening” in the school garden.
- 4 Ask them to act out how they would clean and store the tools properly.
- 5 Encourage them to use polite, complete sentences when describing their actions.
- 6 Rotate roles so each learner gets a turn to handle different tools.

#### Model answers:

- “I washed the hoe and put it in the shed.”
- “I dried the watering can and stored it on the rack.”
- “I wiped the rake and placed it in the tool corner.”

#### Teacher tip:

- Remind learners to pretend they are using water and cloths for cleaning.
- Emphasise safety by demonstrating how to carry and store tools correctly.
- Praise learners for speaking clearly and acting responsibly.

### Exercise 10.2

- 1 clean
- 2 rust
- 3 shed

### Activity 10.3 – Classifying vegetables

Use vegetable pictures and sort into 3 groups:

- Leafy – Spinach, cabbage
- Root – Carrots, onions
- Fruit – Tomatoes, peppers

### Exercise 10.3

- 1 leafy
- 2 onion
- 3 fruit

### Activity 10.4: Planting demonstration

Use toy tools and seeds. Guide learners through steps:

- 1 Prepare soil.
- 2 Plant seeds.
- 3 Water gently.

### Exercise 10.4

- 1 dig
- 2 holes
- 3 watering can

### Exercise 10.5

- 1 moist
- 2 weeds
- 3 eggshells

### Activity 10.5: Weeding practice

- 1 Prepare a pretend garden by placing strips or shapes of green/brown paper (“weeds”) among real or pretend plants (can be cut-out flowers, vegetable pictures, or small potted plants).
- 2 Arrange the “garden” on the classroom floor, a mat outside in a safe area.
- 3 Explain to learners that weeds are unwanted plants that compete for water and nutrients with crops.
- 4 Demonstrate how to pull weeds carefully without disturbing the good plants.
- 5 Let learners take turns “weeding” by picking up or pulling out the paper weeds.
- 6 Collect the weeds in a container or bucket to show proper disposal.

#### Teacher tip:

- Emphasise that weeding helps plants grow better.
- Remind learners to be gentle with the good plants.
- Praise careful work and teamwork during the activity.

## Unit exercise

- 1 (a) Hoe – (iii) Digs soil.  
(b) Watering can – (i) Waters plants.  
(c) Garden rake – (ii) To gather leaves and dry grass.
- 2 (a) True  
(b) False
- 3 (a) Root  
(b) Rake
- 4 Demonstrate how to draw any garden tool and vegetable of your choice. Ask learners to draw their own after the demonstration.
- 5 Make them grow.

## Unit 11: Animals

### Unit objectives

**By the end of this unit, learners should be able to:**

- a name domestic and wild animals.
- b discuss the importance of domestic and wild animals.
- c name animal habitats.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book pages 71–77.
- Science and Technology Infant syllabus.
- Flashcards of animals.
- Pictures of animals.

### Teaching notes

- Domestic animals are animals that live with or near humans. Examples: cows, goats, dogs, cats.
- Wild animals live in natural habitats without human care. Examples: lions, elephants, zebras, giraffes.
- Importance of animals:
  - Domestic: give food (milk, meat), help with work (ploughing, guarding), companionship.
  - Wild: keep nature in balance, attract tourists.

- Animal habitats are homes where animals live depending on their needs.
  - Dogs – kennel
  - Chickens – fowl run
  - Bees – beehive
  - Fish – dams/rivers/oceans
  - Birds – nest
  - Lions – den
  - Cows – kraal

## Let us start

Show learners the pictures on page 71. Ask the questions:

### Answers

- 1 dog, goat, lion, elephant
- 2 wild – lion; domestic – goat
- 3 They give us food, help us, and keep nature in balance.

## New words

|                 |   |                                    |
|-----------------|---|------------------------------------|
| <b>Domestic</b> | – | animals that live with people.     |
| <b>Wild</b>     | – | animals that live in the bush.     |
| <b>Savanna</b>  | – | grassland area where animals live. |
| <b>Forest</b>   | – | area with many trees.              |
| <b>Habitat</b>  | – | place where an animal lives.       |

## Activity 11.1: Domestic and wild animals

- 1 Show flashcards or pictures of animals.
- 2 Let learners sort them into domestic and wild categories.
- 3 Sing the rhyme: “Cows and goats live on farms, lions and zebras roam free.”
- 4 Play a guessing game: “I live on a farm and give milk. Who am I?”
- 5 Learners draw and label one domestic and one wild animal.

### Model answers:

- Domestic: cow, dog, goat
- Wild: lion, giraffe, zebra

## Exercise 11.1

- |            |            |
|------------|------------|
| 1 with     | 4 lion     |
| 2 domestic | 5 domestic |
| 3 natural  |            |

## Activity 11.2: Importance of animals

### 1 Dramatisation

- Let learners pretend to be a farmer feeding or milking cows, collecting eggs from hens, or a wildlife guide showing tourists animals in a park.
- Encourage them to speak in role, “This cow gives us milk every day.”

### 2 Poster creation

- Provide paper, crayons, or markers.
- Ask learners to draw or paste cut-out pictures showing at least three ways animals are important.
- Display their posters on the classroom wall.

### 3 Story writing or narration

- Give learners the title: “*How a Cow Helped My Family.*”
- Guide them to write or orally narrate short stories.
- Example model lines: “The cow gave us milk to drink and sell. We used the money to buy school uniforms.”

### Model answers/statements:

- “A goat gives us meat.”
- “A donkey helps carry water.”
- “Wild animals bring tourists to our country.”

### Teacher tip:

- Use both local and well-known animals to make the discussion relatable.
- Encourage creativity during role-play and stories.
- Praise learners for linking animals to real-life benefits.

## Exercise 11.2

- |          |             |
|----------|-------------|
| 1 food   | 4 herbivore |
| 2 work   | 5 tourists  |
| 3 nature |             |

## Activity 11.3: Animal habitats

- 1 Show pictures of animals and where they live.
- 2 Learners match each animal to its home.
- 3 Create a diorama (model) using boxes or blocks.
- 4 Let learners say, “I live in a \_\_\_\_ (fowl run). What am I?”
- 5 Draw and label one animal and its home.

## Model chart

| Animal  | Habitat           |
|---------|-------------------|
| Dog     | Kennel            |
| Chicken | Fowl run          |
| Cow     | Kraal             |
| Bee     | Beehive           |
| Fish    | Dam, river, ocean |
| Bird    | Nest              |
| Lion    | Den               |

## Unit exercise

- 1 Cow – Domestic  
Lion – Wild
- 2 (a) True (b) True
- 3 (a) Cattle (b) bush
- 4 in nature
- 5 Ask learners to draw one domestic animal and one wild animal, after a demonstration.

## Unit 12: Food chain

### Unit objectives

By the end of this unit, learners should be able to:

- a identify components of a food chain.
- b create simple food chains.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learners Book pages 78–83.
- Science and Technology Infant syllabus.
- Picture cards of grass, goat, lion, hyena, rabbit, fox.
- Charts showing different food chains.

### Teaching notes

- A **food chain** shows how energy moves from one living thing to another.
- **Producers** are plants. They make their own food using sunlight (grass).
- **Consumers** are animals that eat plants or other animals (for example, goat, lion, hyena).

- A simple food chain starts with a producer and ends with a consumer.  
Example: Grass → Goat → Hyena
- Food chains help maintain balance in nature.

## Let us start

Show learners the picture on page 78. Ask:

- What do animals eat to survive?  
– [Model answer: Plants or other animals]
- Can you name something that plants need to grow?  
– [Model answer: Sunlight, water]
- Why is the food chain important in nature?  
– [Model answer: It helps animals get food / It keeps balance in nature].

## New words

|                   |   |                                                       |
|-------------------|---|-------------------------------------------------------|
| <b>Food chain</b> | – | How animals get energy by eating other living things. |
| <b>Producer</b>   | – | A plant that makes its own food.                      |
| <b>Consumer</b>   | – | An animal that eats plants or other animals.          |
| <b>Grass</b>      | – | A type of plant eaten by animals.                     |
| <b>Hyena</b>      | – | A wild animal that eats other animals.                |

## Suggested answers

### Activity 12.1: The basic components of a food chain

#### 1 Display flashcards

- Show learners flashcards or pictures of *grass*, *goat*, and *hyena*.
- Briefly explain what each picture represents.
  - Grass → a plant that makes its own food.
  - Goat → an animal that eats plants.
  - Hyena → an animal that eats other animals.

#### 2 Group into producers and consumers

- Ask learners: “Which one makes its own food?” (Grass → producer).
- “Which ones eat plants or other animals?” (Goat and hyena → consumers).
- Place the flashcards under the correct heading on the board.

#### 3 Sing and act

- Teach the simple song: “*Grass grows, goat eats, hyena hunts*”.
- Add actions:
  - Grass grows → learners raise their hands up like plants growing.
  - Goat eats → pretend to chew grass.
  - Hyena hunts → pretend to sneak and pounce.

#### 4 Match animals to their food sources

- Give learners drawings or flashcards of different plants and animals.
- Let them match each animal to what it eats.
- For example, goat → grass, hyena → goat.

#### 5 Draw and label a food chain

- Ask learners to draw grass → goat → hyena.
- Show them how to use arrows to show the flow of energy.
- Help them label each part clearly.

#### Model answers/statements:

- “Grass is a producer.”
- “The goat is a consumer because it eats grass.”
- “The hyena is a consumer because it eats the goat.”

### Exercise 12.1

- 1 Producers are \_\_\_\_ → **plants**
- 2 Producers make their own \_\_\_\_ → **food**
- 3 Grass and trees are examples of \_\_\_\_ → **producers**
- 4 Consumers are animals that eat \_\_\_\_ → **plants or other animals**
- 5 A goat eats \_\_\_\_ → **grass**

### Exercise 12.2

- 1 A food chain starts with a \_\_\_\_ → **producer**
- 2 In the example, the goat eats the \_\_\_\_ → **grass**
- 3 The \_\_\_\_ is the consumer in the food chain → **hyena**
- 4 A food chain ends with a \_\_\_\_ → **consumer**

### Activity 12.2: Constructing simple food chains

- 1 Demonstration with picture cards:
  - Show learners picture cards of *grass*, *rabbit*, and *fox*.
  - Arrange them on the board in order: **grass** → **rabbit** → **fox**.
  - Explain that the arrows show the direction of energy flow — from plants to animals that eat them, then to animals that eat other animals.
- 2 Pair work with toy animals.
  - Give each pair of learners a set of toy animals and, if possible, small plant models or cut-outs.
  - Ask them to arrange the toys into a food chain, starting with a plant.
  - Example: maize plant → chicken → human.

- 3 Food chain puzzle:
- Provide a puzzle with mixed-up pictures of plants and animals.
  - Learners must arrange the pieces in the correct order to form a food chain.
  - Encourage them to say each step aloud as they place it.

### Model food chain examples:

- Grass → cow → human.
- Leaves → caterpillar → bird.
- Maize → mouse → snake.

### Teacher tip:

- Remind learners that every food chain starts with a plant.
- Use local plant and animal examples to make it relatable.
- Praise learners for working together and explaining their choices.

### Unit exercise

- 1 Match component to its role:
- Grass = Producer (makes its own food).
  - Goat = Consumer (eats plants).
- 2 True or False:
- Plants are producers → **True**
  - A hyena is a producer → **False**
- 3
- (a) Lions / Producers make their own food → **Producers**
- (b) Consumers eat plants or other animals → **True**
- 4 Drawing a food chain:
- [Grass → Goat → Hyena]
- 5 food

### Topic revision exercise

- 1 Grass, goat, hyena
- 2 Grass → \_\_\_\_ → Hyena → Goat
- 3 Goat, cow; lion, hyena
- 4 Match animals to habitats:
- Elephant → Forest
  - Cow → Farm
  - Fish → Water
- 5 Cabbage, spinach; carrot, beetroot
- 6 By cleaning it after use.
- 7 Tree: mango, msasa; Legume: bean, pea
- 8 They feed consumers.
- 9 They give us food.

# Topic 4

## Environmental awareness and conservation

### Unit 13: Climate and weather

#### Unit objectives

By the end of this unit, learners should be able to:

- a** name the four seasons.
- b** describe different seasons.
- c** explain the influence of different seasons on human activities.

#### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book pages 84–90.
- Science and Technology Infant syllabus.
- Weather chart wheel.

#### Teaching notes

- There are four main seasons: summer, autumn, winter, and spring.
- Each season has different weather conditions (hot, cool, cold, blooming).
- Human activities such as farming, dressing, playing, and travelling are influenced by these seasonal changes.
- Summer (Nov–Mar): hot and sunny — people swim, eat ice cream, wear light clothes.
- Autumn (Apr–May): cool and dry — people harvest crops and wear sweaters.
- Winter (Jun–Aug): cold — people stay indoors, wear warm clothes.
- Spring (Sep–Oct): blooming — people clean homes, plant seeds, enjoy flowers.

#### Let us start

Show learners the pictures. Ask:

- 1** What is your favourite season? Why?  
– (Learner may say summer because of swimming, or spring because of flowers.)

- 2 Can you name the four seasons?  
– Summer, Autumn, Winter, Spring
- 3 How does the weather change in different seasons?  
– In summer it's hot, in autumn it's cool, in winter it's cold, and in spring it's warm and blooming.

## New words

|         |   |                                               |
|---------|---|-----------------------------------------------|
| Summer  | – | the hot season.                               |
| Spring  | – | the season with blooming flowers.             |
| Autumn  | – | the cool season for harvesting.               |
| Winter  | – | the cold season.                              |
| Weather | – | how hot, cold, windy, or rainy it is outside. |

## Suggested answers

### Activity 13.1: The four seasons

- a Teach the season song: “Summer, autumn, winter, spring – seasons change everything.”
- b Use flashcards to name and describe:
- Summer – hot and sunny.
  - Autumn – cool and dry.
  - Winter – cold and cloudy.
  - Spring – warm and blooming.
- c Use the weather chart wheel:
- Learners spin and name the season shown.

### Activity 13.2 : Different seasons

- a In portfolio books, learners draw or paste pictures:
- Winter: snow or jackets.
  - Spring: flowers
  - Summer: swimming, sun.
  - Autumn: crops, dry leaves.
- b Learners draw and label their favourite season (“Summer – sun, swimming, ice cream”)
- c Role-play:
- Summer: pretend swimming, sunbathing.
  - Winter: wear sweaters, warm up by fire.
  - Autumn: pick crops, gather leaves.
  - Spring: plant seeds, smell flowers.

## Exercise 13.1

- |           |                    |
|-----------|--------------------|
| 1 four    | 4 Winter           |
| 2 Summer  | 5 Blooming flowers |
| 3 Harvest |                    |

## Activity 13.3 : Influence of seasons on human activities

- a Talk about the effects:
- Farmers plant in spring and summer, harvest in autumn
  - People stay indoors in winter, clean in spring
- b Draw a chart with 4 columns:
- Season – What people do.
  - Summer – Swim, go on vacation.
  - Autumn – Harvest crops.
  - Winter – Stay warm indoors.
  - Spring – Plant seeds, clean houses.
- c Story writing:
- “In my favourite season, summer, I swim and eat ice cream. It is sunny and fun!”

## Unit exercises

- 1 **Matching**
- (a) Summer → (ii) Hot and sunny
- (b) Winter → (i) Cold and snowy
- 2 **True or False**
- (a) Spring is the season of blooming flowers → **True**
- (b) Autumn is the hottest season → **False**
- 3
- (a) In **winter**, people experience cold.
- (b) Farmers harvest crops in **autumn**.
- 4 **Drawing Activity**
- Learner draws *swimming in summer*, or *planting in spring*, or *warming by fire in winter*, depending on their favourite.
- 5 Spring is important for farmers because they...
- **plant seeds**

## Unit 14: Soil

### Unit objectives

By the end of the unit, learners should be able to:

- a state types of soil.
- b identify components of soil.
- c describe the properties of different types of soil.
- d discuss the importance of soil.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learners Book pages 91–94.
- Science and Technology Infant syllabus.
- Soil samples (sand, clay, loam).
- Clear jars or plastic containers.

### Teaching notes

- Soil is the top layer of the earth where plants grow.
- There are three main types of soil: **sandy**, **clay**, and **loamy**.
  - **Sandy soil:** Feels gritty and drains water quickly.
  - **Clay soil:** Feels sticky and holds water.
  - **Loamy soil:** A mix of sand, clay, and organic matter; best for growing plants.
- Soil is made up of important components:
  - **Water:** Helps plants grow.
  - **Air:** Provides oxygen for plant roots.
  - **Organic matter:** Decayed plants and animals that make soil rich.
  - **Living organisms:** Worms and insects that keep the soil healthy.

### Let us start

Show learners the picture on page 91. Ask:

- 1 **Where do plants grow?**
  - In the soil.
- 2 **Can you name the different types of soil?**
  - Sandy soil, clay soil, loamy soil.
- 3 **Why is soil important for plants and animals?**
  - It helps plants grow and gives animals a place to live.

## New words

|                       |   |                                                   |
|-----------------------|---|---------------------------------------------------|
| <b>Sand</b>           | – | Tiny, loose grains of soil.                       |
| <b>Clay</b>           | – | A smooth, sticky type of soil.                    |
| <b>Loam</b>           | – | Rich soil made of sand, clay, and organic matter. |
| <b>Organic matter</b> | – | Dead plants and animals that enrich soil.         |
| <b>Water</b>          | – | Liquid that helps plants grow.                    |

## Activity 14.1: Types of Soil

- a** Provide three soil samples (sandy, clay, loam). Ask learners to observe and name each.
- b** Teach and sing the song:  
“Sandy, clay and loam-soil is where plants call home.”
- c** Guide learners to draw and label the three types of soil.

### Model answers for drawings:

- **Sandy soil** – Light brown, dry, with dots.
- **Clay soil** – Dark brown, smooth and sticky.
- **Loamy soil** – Rich, dark, with bits of leaves.

## Exercise 14.1

- 1** **Sandy** soil feels gritty and drains water quickly.
- 2** **Clay** soil feels sticky and holds water.
- 3** **Loamy** soil is best for growing plants.

## Activity 14.2: Components of soil

- a** Use jars to collect and observe soil layers (water, organic matter.).
- b** Let learners use magnifying glasses to look for worms or insects.
- c** Guide learners to make a “Soil Profile” poster.  
– Label layers: water, air, organic matter, living organisms.

### Model poster

- Top layer: worms and insects (living organisms).
- Middle: dark bits of leaves (organic matter).
- Bottom: water and air bubbles.

## Exercise 14.2

- 1** **Water** helps plants grow.
- 2** **Air** provides oxygen to plant roots.
- 3** **Organic matter** comes from decayed plants and animals.
- 4** **Living organisms** like worms keep the soil healthy.

### Activity 14.3

- a** Feel and describe the texture of sandy, clay, and loamy soil:
- **Sandy soil** – Feels gritty and rough, drains water quickly.
  - **Clay soil** – Feels sticky when wet, smooth when dry, holds water.
  - **Loamy soil** – Feels soft and crumbly, holds water but drains well.
- b** Conduct an experiment:
- Collect three containers and fill each with a different soil type (sandy, clay, loamy).
  - Pour the same amount of water into each container.
  - Observe how fast the water drains from each soil.
    - Sandy soil: Water drains fastest.
    - Loamy soil: Water drains at a moderate rate.
    - Clay soil: Water drains very slowly.
- c** Short report: Which soil is best for planting?

#### Report:

Loamy soil is best for planting because it holds enough water for plants to use, but also drains well to prevent waterlogging. It also contains nutrients and feels soft and crumbly, making it easier for plant roots to grow.

### Exercise 14.3

- 1 gritty
- 2 sticky
- 3 crumbly

### Exercise 14.4

- |         |           |
|---------|-----------|
| 1 Food  | 3 insects |
| 2 water | 4 houses  |

### Activity 14.4:

- a** Model answer
- Farmers need healthy soil because it is important because it has nutrients that plants need to grow. It holds water, lets roots grow easily, and helps plants stay strong and healthy so farmers can produce more food.
- A poster: “Why Soil is Important?”

#### Ideas for poster content:

- Title: **Why soil is important?**
- Pictures: Plants, farmers working in fields, soil layers.

## Key points:

- Soil gives plants nutrients.
- Soil holds water for plants.
- Soil supports roots and keeps plants standing.
- Soil is home to worms and other helpful organisms.

**b** A picture of a plant growing in the soil:

- Ask learners to draw a plant with leaves above the soil and roots below.
- Ask them to colour the roots brown or light yellow.
- They should show soil as brown and add small stones or worms for detail.

## Unit exercise

**1** Clay soil → Holds water.

- Sandy soil → Drains water quickly.
- Loamy soil → Best for growing plants.

**2** True or False

**(a)** Organic matter enriches the soil. — True

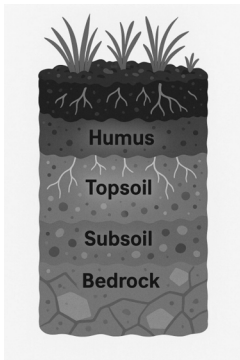
**(b)** Clay soil feels gritty. — False

**3** Fill in the blanks

**(a)** Loam soil is best for growing plants.

**(b)** Soil contains water, air and organic matter.

**4**



**5** Plants need soil to grow.

## Unit 15: Water

### Unit objectives

By the end of this unit, learners should be able to:

- a state the properties of water.
- b discuss the three states of water.
- c discuss the importance of water conservation.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book pages 100–106.
- Science and Technology Infant syllabus.
- Pictures showing uses and states of water.

### Teaching notes

Water is essential for life. It exists in **three states**:

- **Liquid** – flows and takes the shape of the container.
- **Gas (steam)** – invisible and fills space.
- **Solid (ice)** – hard and keeps shape.

Water has **special properties**:

- It is **colourless** (no colour),
- **Odourless** (no smell),
- **Tasteless** (no taste) and
- a **universal solvent** (dissolves many things like sugar or salt).

**Water conservation** means using water wisely to ensure we have enough for the future. We save water to keep ecosystems healthy, support farming, and maintain life.

### Let us start

Show learners the pictures. Ask:

- 1 What do you use water for every day?  
– Drinking, washing, cooking, bathing.
- 2 Can you name the three states of water?  
– Liquid, gas, and solid.
- 3 Why is it important to save water?  
– So we do not run out of clean water.

## New words

|                     |   |                                  |
|---------------------|---|----------------------------------|
| <b>Liquid</b>       | – | Water that flows, like in a cup. |
| <b>Gas</b>          | – | Water in steam form.             |
| <b>Solid</b>        | – | Water in ice form.               |
| <b>Steam</b>        | – | Hot gas from boiling water.      |
| <b>Conservation</b> | – | Saving or using carefully.       |

## Suggested answers

### Activity 15.1

#### Stating properties of water

**a** Learners describe water:

- Show learners a glass of clean water.
- Ask them to look at it carefully, smell it, and (if safe) taste it.
- Guide them to describe water's properties:
  - **Colourless** – It has no colour.
  - **Odourless** – It has no smell.
  - **Tasteless** – It has no taste.

**b** Experiment: Demonstrating water as a universal solvent:

- Provide each group with a clear glass of clean water and a spoonful of sugar.
- Ask learners to stir the sugar into the water until it disappears.
- Discuss what happened: Sugar dissolved completely in the water.
- Explain: Water can dissolve many substances, which is why it is called a **universal solvent**.

**c** **Song** (to reinforce learning in a fun way):

- Teach the class the song:  
“Water is clear, it has no smell,  
It’s the best drink, as far as I can tell.”
- Add clapping or simple actions:  
Point to eyes for “clear”.  
Point to nose for “no smell”.  
Pretend to drink for “best drink”.

### Exercise 15.1

- 1** Water is **colourless**.
- 2** Water is **odourless**.
- 3** Water is **tasteless**.
- 4** Water can dissolve **many** substances.

## Activity 15.2

- a Observe liquid water in a glass.
- b Boil water to see steam (gas) and freeze to make ice (solid).
- c Learners create a chart with examples:

| State of water | Example               |
|----------------|-----------------------|
| Liquid         | River, drinking water |
| Gas            | Steam from kettle     |
| Solid          | Ice cubes             |

## Exercise 15.2

- 1 **Liquid** – flows and takes shape.
- 2 **Gas** – fills space, invisible.
- 3 **Solid** – hard and keeps shape.

## Activity 15.3

- a Group brainstorm on how to save water
  - Divide learners into small groups.
  - Give each group a large sheet of paper or chalkboard space.
  - Ask them to list or draw ways people can save water at home, school, and in the community.
  - Encourage sharing ideas such as:
    - Fix leaking taps.
    - Collect rainwater for watering gardens.
    - Use a bucket instead of a hose to wash a car.
    - Water plants in the morning or evening to reduce evaporation.
    - Reuse water from washing vegetables for watering plants.
  - Groups present their ideas to the whole class.
- b Poster: “10 ways to save water”
  - Learners create colourful posters showing water-saving tips.
  - Example ideas to include:
    - Close the tap when brushing teeth.
    - Fix dripping taps immediately.
    - Take shorter baths or showers.
    - Reuse water for watering plants.
    - Collect rainwater.
    - Use a broom instead of a hose to clean driveways.
    - Wash full loads of clothes instead of small loads.

- Check for leaks in pipes.
- Water plants in cool hours of the day.
- Educate others about saving water.

**c** Role-play: water-saving superheroes

- Assign each learner or group a superhero name (“Captain Tap Stopper,” “Dr. Leak Fixer,” “Aqua Saver”).
- Give them a short scenario to act out, such as:
  - Finding a tap left running in the school bathroom.
  - Seeing a neighbour using clean water to wash the driveway.
  - Spotting a leaking pipe.
- Each superhero explains the problem and gives water-saving advice.
- Encourage creative costumes or props ( capes, masks, blue buckets).
- Class applauds each performance.

## Story time

Ask questions after reading:

- What did Maria say about water?
  - It can be a liquid, gas, or solid.
- Why did Chipo say we must save water?
  - It’s important for all of us.

## Unit exercise

**1 Matching**

- (i) Liquid → (b) Drinking water  
 (ii) Gas → (iii) Steam  
 (iii) Solid → (a) Ice cube

**2 True/False**

- (a) True  
 (b) True  
 (c) True

**3 (a) solvent**

- (b) Gas

**4 Drawing**

Learners draw and label:

- Ice (solid),
- Tap water (liquid),
- Steam from pot (gas).

## Unit 16: Minerals

### Unit objectives

By the end of this unit, learners should be able to:

- a** name common minerals.
- b** identify sources of minerals.
- c** discuss the importance of minerals.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book pages 107–113.
- Science and Technology Infant syllabus.
- Pictures of minerals (gold, coal, iron).
- Toy mining tools or sandbox.

### Teaching notes

Minerals are natural substances found in the ground.

- **Examples of common minerals:**
  - **Coal** – black rock used for fuel
  - **Gold** – shiny yellow metal used for jewellery and money
  - **Diamond** – hard sparkling gem used in jewellery
  - **Chrome** – shiny metal used to make cars and tools
  - **Iron** – strong metal used to build bridges and machines
- **Sources of minerals:**
  - Minerals are found in **rocks** and **soil**.
- **Uses of minerals:**
  - **Coal** – used for fuel and to produce electricity
  - **Gold and Diamond** – used to make jewellery
  - **Iron and Chrome** – used for construction (bridges, machines, tools)

### Let us start

Show learners the picture on page 107. Ask:

- 1** What shiny objects do you see in jewellery or tools?
  - Gold, diamond, chrome.
- 2** Can you name a mineral found in the ground?
  - Coal, gold, diamond, chrome, iron.
- 3** Why are minerals important to us?
  - They are used to make jewellery, machines, electricity, and buildings.

## New words

|         |   |                                                   |
|---------|---|---------------------------------------------------|
| Coal    | – | a black rock used for fuel.                       |
| Gold    | – | a shiny yellow metal used for jewellery.          |
| Diamond | – | a sparkling stone used in jewellery.              |
| Chrome  | – | a shiny metal used to make cars and tools.        |
| Iron    | – | a strong metal used to make bridges and machines. |

## Suggested answers

### a Use mineral samples or pictures to name and describe minerals.

- Coal – used for fuel
- Gold – used for jewellery
- Diamond – very hard, used in jewellery
- Chrome – shiny, used for cars
- Iron – strong, used for machines

### b Sing a song

- Teach learners the song:

#### Lyrics:

*“Coal and gold and diamonds so bright,  
Minerals are treasures shining the light.”*

#### Suggested tune:

Sing to the tune of *“Twinkle, Twinkle, Little Star”* — this is familiar to most young learners and has a simple rhythm.

#### Example singing pattern:

- “Coal and gold and diamonds so bright” ♪ (Twinkle, twinkle, little star)
- “Minerals are treasures shining the light” ♪ (How I wonder what you are)

#### Encourage learners to add simple actions:

- Pretend to dig for coal (hands like shovels).
- Show gold with both hands together as if holding something shiny.
- Pretend to hold up a diamond to look at its sparkle.

### c Draw and label one mineral and its use

- Give learners plain paper and coloured pencils.
- Ask them to choose one mineral from the lesson (for example, gold, coal, diamond, chrome, iron).
- Draw the mineral and colour it.
- Write a simple label under the drawing.
- **Example:** A yellow bar with the label “Gold – used for jewellery.”

## Exercise 16.1

- 1 Gold
- 2 Coal
- 3 Iron

## Activity 16.2

- a Use toy mining tools to dig for minerals.

### Preparation:

- Bring toy mining tools such as small shovels, scoops, and buckets.
- Hide small stones, coloured beads, or plastic “minerals” in a sandbox, soil tray, or box filled with sand.

### Activity steps:

- Explain to learners that they will pretend to be miners digging for minerals.
- Show them how to use the toy tools safely.
- Let each learner to take turns digging to find the hidden “minerals.”
- After digging, ask each learner to name the mineral they “found” and say one use for it.

*Example:* “I found gold – it is used for jewellery.”

- b Match minerals to their sources.

### Preparation:

- Prepare flashcards or pictures of minerals (gold, coal) and their sources (rocks, soil).
- Place the mineral cards in one set and the source cards in another set.

### Activity steps:

- Show learners one mineral card at a time.
- Ask: “Where does this mineral come from?”
- Learners match the mineral to the correct source by placing the two cards together.

*Example:*

- Gold → Rocks
- Coal → Soil

## Exercise 16.2

- 1 rocks
- 2 soil
- 3 diamond

## Exercise 16.3

- |        |        |
|--------|--------|
| 1 Coal | 3 Iron |
| 2 Gold |        |

## Activity 16.3

- a** Drawing a plant growing in soil with visible roots.

### Preparation:

- Give learners plain paper, pencils, crayons, or coloured pencils.
- Show a sample picture or draw a quick example on the board.

### Activity steps:

- Ask learners to draw a plant (a flower, tree, or vegetable) growing in soil.
- Remind them to include roots underground and the stem, leaves, and flowers/fruits above ground.
- Encourage them to colour the roots brown to show they are in the soil.
- Ask them to draw soil layers by using different shades of brown or adding small stones in the soil area.

- b** Naming two items made from minerals:

### Preparation:

- Display the given illustration from the Learner's Book showing different objects.

### Activity steps:

- Point to each item in the picture and ask learners: "What is this object made from?"
- Guide them to identify:
  - Pot – made from iron or chrome.
  - Bracelet – made from gold or diamond.

## Unit exercise

- 1** Match the mineral to its use:

- (a) Coal → (iii) Fuel  
(b) Gold → (ii) Jewellery  
(c) Iron → (i) Construction

- 2** True or False:

- (a) Diamonds are used to build bridges → False  
(b) Minerals are found in rocks and soil → True  
(c) Gold is a shiny metal used in jewellery → True

- 3** (a) **Gold** is a shiny metal used in jewellery.

- (b) **Coal** is used to produce electricity.

## Unit 17: Land use

### Unit objectives

By the end of this unit, learners should be able to:

- a identify different types of land use.
- b discuss the importance of land.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book pages 114–119.
- Science and Technology Infant syllabus.
- Picture charts of farms, homes, parks, and factories.

### Teaching notes

- Land is used for different purposes: to build houses (residential), grow crops (agricultural), produce goods (industrial), and relax or play (recreational).
- Residential land is where people live (homes and apartments).
- Agricultural land is for farming (growing crops and raising animals).
- Industrial land is for factories and businesses.
- Recreational land includes parks and playgrounds used for fun and relaxation.
- Land is important because it provides food, homes, jobs, and space to play.
- Help learners connect land use with what they see in their communities.

### Let us start

Show learners the picture on page 114. Ask:

- 1 What do you see when you look around your community?  
– Buildings, farms, parks, people, houses.
- 2 Can you name places where people live, work or play?  
– Home, school, farm, factory, park.
- 3 Why is land important to us?  
– We use land for homes, jobs, food, and play.

### New words

|              |   |                                           |
|--------------|---|-------------------------------------------|
| Land         | – | ground we use for homes, farms, or parks. |
| Residential  | – | where people live.                        |
| Agricultural | – | where crops grow or animals are raised.   |
| Industrial   | – | where factories and businesses are.       |
| Recreational | – | where people relax or play.               |

## Suggested answers

### Activity 17.1

**a** Use pictures to identify and name residential, agricultural, industrial, and recreational areas

- **Preparation:**

- Prepare large, clear pictures of each land use type (house, farm, factory, park).
- Display them on the board or show them in a slideshow.

- **Steps:**

- Hold up one picture at a time and ask: “What is this place used for?”
- Guide learners to name the type of land use.

- **Model answers:**

- House → Residential
- Farm → Agricultural
- Factory → Industrial
- Park → Recreational

**b** Sing song:

Lyrics:

“Houses, farms, factories, parks \_\_\_\_\_

Land is used in many ways.”

Suggested Tune: Sing to the melody of “Row, Row, Row Your Boat” so it’s easy and repetitive.

Example:

♪ Houses, farms, factories, parks,  
Land is used in many ways. ♪

**c** Draw and label one type of land use

- Give learners paper and crayons/pencils.
- Ask them to pick one land use type from the pictures.
- Instruct them to draw it and write a label underneath.

Model answer: A drawing of a house labelled “Residential land.”

### Exercise 17.1

- 1** Residential land is used for building **homes**.
- 2** Agricultural land is used for growing **crops**.
- 3** Industrial land is used for **factories** and businesses.
- 4** Recreational land is used for **fun and relaxation**.

## Activity 17.2

- a** Sort picture cards into categories: residential, agricultural, industrial, and recreational
- Prepare small cards with images of land uses.
  - Place four boxes or areas labelled with the categories.
  - Let learners place each picture card in the correct category.
  - **Model answers:**
    - Farm → Agricultural
    - Factory → Industrial
    - Park → Recreational
    - House → Residential
- b** Play a matching game:
- Mix two sets of cards: one set with pictures, one set with category names.
  - Learners work in pairs to match the picture to its correct category.  
Example: Match “farm” to “agricultural.”
- c** Create a “Land use collage”
- Provide old magazines, newspapers, or printed pictures.
  - Learners cut out and paste images of different land uses onto a large sheet.
  - They label each image under its correct category.

## Activity 17.3

- a** Tell the class what you would build if you had a piece of land:
- Give learners thinking time.
  - Each learner shares their idea aloud.  
Model answer: “I would build a playground.”
- b** Sing this short song:
- Lyrics:**
- “Land is precious, wide and green,  
Growing food and homes, we’ve seen,  
Playgrounds too, trees that grow,  
Land gives life we all know!”
- Suggested Tune: Sing to the melody of “Mary Had a Little Lamb”.
- Example:**
- ♪ Land is precious, wide and green,  
Wide and green, wide and green,  
Growing food and homes, we have seen,  
Land gives life we all know! ♪

## Unit revision exercise

- 1 Match the land use to its example:  
(a) Residential → (ii) Construction  
(b) Agricultural → (i) Farm  
(c) Recreational → (ii) Playground
- 2 (a) True  
(b) False
- 3 (a) **Residential** land is used for building homes.  
(b) **Agricultural** land is used for growing crops.  
(c) **Industrial** land is important for **factories and business**.
- 4 Model answer: Drawing of a farm labeled “Agricultural Land – gives us food.”
- 5 growing crops and raising animals.

## Unit 18: Environmental conservation

### Unit objectives

By the end of this unit, learners should be able to:

- a identify natural resources.
- b discuss the importance of natural resources.
- c state human impact on the environment.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner’s Book pages 120–124.
- Science and Technology Infant syllabus.
- Flashcards (natural resources, pollution, conservation).
- Pictures or drawings of natural resources.
- Clean waste materials (for recycling demo).
- Song or rhyme about the environment.

### Teaching notes

- **Natural resources** are things from nature that help us live (for example, water, air, soil, plants, animals).
- These resources give us food, oxygen, water, and materials like wood.
- Human activities such as pollution, littering, and deforestation harm the environment.
- We must **conserve** natural resources by protecting, reusing, recycling, and avoiding waste.

## New words

|                          |   |                                                 |
|--------------------------|---|-------------------------------------------------|
| <b>Natural resources</b> | – | things we get from nature like water and trees. |
| <b>Pollution</b>         | – | making the environment dirty.                   |
| <b>Littering</b>         | – | throwing rubbish anywhere.                      |
| <b>Recycling</b>         | – | using waste materials again.                    |
| <b>Deforestation</b>     | – | cutting down many trees.                        |
| <b>Conservation</b>      | – | protecting and saving natural resources.        |

## Let us start

Show the picture on page 120. Ask:

- 1** What natural resources do you use every day?
  - Water, air, plants, soil, sunlight
- 2** Can you name a human activity that harms the environment?
  - Burning plastic, cutting trees.
- 3** Why is it important to protect natural resources?
  - To make sure they are available for future generations.
  - To keep the environment clean and healthy.
  - To support plants, animals, and human life.

## Suggested answers

### Activity 18.1

Naming natural resources

- a** Use flashcards to identify and name water, soil, air, plants, and animals
  - **Preparation:**
    - Prepare flashcards with clear pictures of each natural resource.
  - **Steps:**
    - Show one flashcard at a time.
    - Ask learners: “What is this?” and let them respond.
    - Help them pronounce the names clearly.
    - Model answers: Water, soil, air, plants, animals.
- b** Sing a song:

#### Lyrics:

“Water, air, soil, plants and animals \_\_\_\_\_

Natural resources for everyone!”

Suggested Tune: Sing to the melody of “If You’re Happy and You Know It”.

**Example:**

♪ Water, air, soil, plants and animals, (clap clap)

Natural resources for everyone! (clap clap) ♪

- c** Draw and label one natural resource and its use
- Give learners paper and colouring pencils.
  - Ask them to choose one natural resource from the lesson.
  - Draw it and write a simple label showing its use.
    - Model answer: A tap with water labelled “Water – for drinking.”

## Exercise 18.1

- |                |                  |
|----------------|------------------|
| <b>1</b> water | <b>3</b> food    |
| <b>2</b> air   | <b>4</b> animals |

## Activity 18.2

Importance of natural resources

- a** Discuss why natural resources like water and trees are important for people and animals.
- Ask learners to share their ideas.
  - Write key points on the board.
  - Model answers:
    - Water is important for drinking and growing food.
    - Trees give us oxygen and shade.
    - Both are homes for many animals.

## Activity 18.3

Human impact on the environment

- a** Use pictures to identify pollution, deforestation, and waste.
- Display pictures showing each type of environmental harm.
  - Ask learners: “*What do you see?*”
  - Let them name each one.
    - Model answers: Pollution, deforestation, waste.
- b** Role-play
- Divide learners into groups.
  - Give each group a scenario:
    - Cleaning up litter.
    - Planting trees.
    - Reducing smoke by using clean energy.
  - Each group acts it out in front of the class.

- c** Write a short report: “How Humans Harm the Environment”
- Learners write 3–4 short sentences.
  - Model answer:  
“People harm the environment by cutting down too many trees.  
Some throw litter in rivers and on the ground.  
Smoke from factories pollutes the air.”

## Exercise 18.2

- |                     |                    |
|---------------------|--------------------|
| <b>1</b> hydrated   | <b>4</b> materials |
| <b>2</b> oxygen     | <b>5</b> nature    |
| <b>3</b> structures |                    |

## Activity 18.4: Tree planting and recycling

Go outside with learners and:

- a** Identify a safe place to plant tree seedlings in the school or community.
- Walk around the school grounds or nearby community space with learners.
  - Look for an open, sunny area away from pathways or buildings.
  - Discuss why the location is safe (no disturbance from foot traffic, access to water).
  - Mark the spot for planting.
- b** Help them set up labelled recycling bins (paper, plastic, cans).
- Show learners three clean bins or boxes.
  - Use large, clear labels or colour codes:
    - Blue for paper.
    - Green for plastic.
    - Yellow for cans.
  - Explain what can and cannot go in each bin.
  - Place the bins in an accessible area of the school.
- c** Guide learners to form a class “Green Team” to promote environmental care.
- Invite volunteers to join the “Green Team.”
  - Assign simple roles such as:
    - Tree watering.
    - Bin checking and emptying.
    - Reminding others about recycling rules.
  - Create a chart with team members’ names and duties.
  - Encourage the Green Team to lead future environmental projects.

## Unit exercise

- 1 Match the natural resource to its use:

| Natural resource | Use                         |
|------------------|-----------------------------|
| (a) Water        | (ii) Used for drinking      |
| (b) Air          | (i) Provides oxygen         |
| (c) Soil         | (iii) Supports plant growth |

- 2 (a) Deforestation helps animals. → **False**  
 (b) Recycling reduces waste. → **True**
- 3 (a) **Pollution** is making air, water and soil dirty.  
 (b) Plants give us food and **oxygen**.
- 4 Model answer (drawing task): A tree, with a label: "Protect trees by planting more."
- 5 Pollution

## Topic revision exercise

- 1 Match human activity to its impact

| Human activity    | Its impact                  |
|-------------------|-----------------------------|
| (a) Pollution     | (ii) Dirtying air and water |
| (b) Deforestation | (i) Cutting down trees      |

- 2 Plant trees / Pick up litter / Recycle plastic

- 3 Match the season to its influence

| Season     | Its influence               |
|------------|-----------------------------|
| (a) Summer | (i) Flowering               |
| (b) Spring | (ii) Swimming and vacations |

- 4 the weather

- 5 *Clay, sand, loam*

- 6 *Liquid, solid, gas*

- 7 **Gold** – used for jewellery.

- **Salt** – used for cooking.

- 8 Match the mineral to its source.

| Mineral | Source |
|---------|--------|
| Salt    | Soil   |
| Gold    | Rocks  |

- 9 Salt helps in cooking / Gold is used for making jewellery.

- 10** List the four types of land use and one example of each.

| Land use              | Example           |
|-----------------------|-------------------|
| (a) Residential land  | Houses            |
| (b) Agricultural land | Farming fields    |
| (c) Industrial land   | Factories         |
| (d) Recreational land | Parks or stadiums |

- 11** Farming / housing / building schools / markets

# Topic 5

# Tools, equipment and implements

## Unit 19: Everyday tools and implements

### Unit objectives

By the end of this unit, learners should be able to:

- a name tools and implements.
- b discuss uses of household and garden tools.
- c demonstrate safe handling of everyday tools and implements.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book pages 129–137.
- Science and Technology Infant syllabus.
- Real or picture tools (broom, scissors, hammer, hoe, spade, wheelbarrow).
- Safety gear (gloves, closed shoes).

### Teaching notes

Tools and implements are things we use to help us do work more easily.  
There are two types:

- 1 **Household tools** – used at home for cleaning or fixing things.
- 2 **Garden tools** – used outside for digging and planting.

### Examples and their uses:

- **Broom** – Sweeps floors.
- **Scissors** – Cuts paper or cloth.
- **Hammer** – Drives nails into wood.
- **Hoe** – Loosens and digs soil.
- **Shovel** – Scoops and moves soil.
- **Wheelbarrow** – Carries heavy loads.

## Safety rules when using tools

- Hold tools properly.
- Store them in a safe place.
- Wear protective gear like gloves and closed shoes.
- Never play with tools.

## Let us start

Show learners the pictures on page 129. Ask:

- 1 What tools do you use at home or in the garden?  
– Broom, hoe, spade, hammer, scissors
- 2 Can you name a tool used for digging or cleaning?  
– Hoe – digging, broom – cleaning
- 3 Why is it important to use tools safely?  
– To avoid getting hurt or injured.

## New words

|                    |   |                                             |
|--------------------|---|---------------------------------------------|
| <b>Broom</b>       | – | a tool used to sweep dirt or dust.          |
| <b>Hoe</b>         | – | a tool used for digging and loosening soil. |
| <b>Shovel</b>      | – | a tool used for scooping or moving soil.    |
| <b>Wheelbarrow</b> | – | a tool used to carry heavy things.          |
| <b>Safety</b>      | – | being careful to avoid danger or harm.      |

## Suggested answers

### Activity 19.1: Household tools and implements

- a Show learners pictures of a broom, scissors, and hammer. Ask them to name each one.
  - Hold up one picture at a time.
  - Ask: “What is this tool called?”
  - Let learners answer, then repeat the correct name together.
  - Briefly explain the use of each tool.

- b Sing the rhyme:

#### Lyrics:

“Brooms sweep, scissors cut,

Hammers nail—tools help us a lot!”

Suggested tune: Sing to “Rain, Rain, Go Away” for a catchy rhythm.

#### Example:

♪ Brooms sweep, scissors cut,

Hammers nail—tools help us a lot! ♪

- c Ask learners to draw and label one household tool.
- Give paper and coloured pencils.
  - Learners draw their chosen tool and write its use.
  - Model answer:
    - Drawing of broom
    - Label: “Broom – used for sweeping the floor.”

## Exercise 19.1

- 1 **Broom** is used for sweeping floors.
- 2 **Scissors** are used for cutting cloth.
- 3 A hammer is used for driving **nails** into wood.

## Activity 19.2: Garden tools

- a Show learners real garden tools or pictures (hoe, fork, spade, wheelbarrow). Let them name each.
- Hold each tool or picture.
  - Ask: “*What is this tool called?*”
  - Learners answer; repeat correct names together.
- b Play a matching game.
- Place tool cards on one side and use cards (digging, scooping soil, carrying soil) on the other.
  - Learners match correctly.
  - Model answers:
    - Hoe → Digging
    - Spade → Scooping soil
- c Ask learners to draw and label one garden tool.
- Learners choose one tool to draw and label.
  - Model answer:
    - Drawing of hoe
    - Label: “*Hoe – used for digging soil.*”

## Exercise 19.2

- 1 A hoe is used for **digging** soil.
- 2 A garden **fork** is used for aerating soil.
- 3 A shovel is used for **scooping** soil.

## Activity 19.3: Role-playing the uses of tools

- a Ask learners to pretend to be a carpenter and demonstrate hammering.
- Encourage correct grip and gentle tapping action.

- b** Ask them to pretend to be a farmer using a spade to dig.
  - Show how to bend knees and dig carefully.
- c** Show the three pictures on page 134 and ask:
  - Which tool is used for fixing? → Hammer
  - Which one is used for digging? → Spade
  - What is the woman doing? → Cooking (not using a tool from this unit)

### Exercise 19.3

- 1** Brooms help to **clean** floors.
- 2** Scissors are used to **cut** things.
- 3** Wheelbarrows are used to **carry** items.

### Activity 19.4: Safe handling of tools

- a** Learners pretend to sweep or dig safely.
- b** Show them how to store tools neatly (for example, in a shed or corner).
- c** Ask them to help you make a safety checklist.

#### Model safety checklist:

- 1** Hold tools properly.
- 2** Keep tools in one place.
- 3** Wear gloves and shoes.
- 4** Don't run with tools.
- 5** Ask an adult before using sharp tools.

### Story time

- 1** What does a hoe do?
  - It is used for digging.
- 2** What is the garden fork used for?
  - It helps loosen the soil.
- 3** Why should we handle tools safely?
  - So no one gets hurt.

### Unit exercise

- 1** Match the tool to its use:
  - (a)** Broom → Sweeping floors.
  - (b)** Spade → Digging soil.
  - (c)** Wheelbarrow → Carrying soil.

- 2 (a) Scissors are used for cutting. → **True**  
(b) Garden forks are used for cooking. → **False**
- 3 (a) A **shovel** is used for scooping soil.  
(b) Always wear **gloves** when using tools.
- 4 *Learner's own drawings* (broom and hoe).
- 5 To prevent accidents.

## Unit 20: Measuring devices

### Unit objectives

By the end of the unit, learners should be able to:

- a identify measuring tools.
- b measure length, weight and volume using appropriate devices.
- c compare measurements.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book page 138–144.
- Science and Technology Infant syllabus.
- Real measuring tools.
- Pictures or drawings of tools.

### Teaching notes

- **Ruler** – Measures length (how long or short something is).
- **Scale** – Measures weight (how heavy or light something is).
- **Measuring jug** – Measures volume (how much liquid something holds).
- Measuring tools are used to find the size, weight, or amount of something.
- Accurate measurements help us compare and use things correctly.
- Length is compared using rulers; weight using scales; volume using jugs.
- We can record measurements in charts or short reports.

### Let us start

Show learners the pictures on page 138. Ask:

- 1 What tools do you see in the pictures?  
– Ruler, scale, measuring jug.
- 2 Can you name something you measure at home or school?  
– **At home:**

- Water in a jug.
- Flour or sugar for cooking.
- Length of a table.
- Weight of vegetables or fruit.
- Temperature of a room.

## At school:

- Height of a learner.
- Length of a chalkboard.
- Amount of water in a science experiment.
- Time taken to finish a race.
- Weight of books in a bag.

- 1** Why is it important to measure things accurately?  
 – (To know the right amount, to compare things properly.)

## New words

|                      |   |                                             |
|----------------------|---|---------------------------------------------|
| <b>Ruler</b>         | – | a tool used to measure length.              |
| <b>Scale</b>         | – | a tool used to show how heavy something is. |
| <b>Measuring jug</b> | – | a container used to measure liquid.         |
| <b>Length</b>        | – | how long something is.                      |
| <b>Weight</b>        | – | how heavy something is.                     |
| <b>Volume</b>        | – | how much space a liquid takes up.           |

## Suggested answers

### Activity 20.1: Measuring tools

- a** Show flashcards of tools. Let learners name them aloud.
- **Preparation:**
  - Prepare flashcards or real examples of a ruler, scale, and measuring jug.
  - **Steps:**
  - Hold up one card/tool at a time.
  - Ask: “*What is this tool called?*”
  - Let learners say the name aloud together.
  - Briefly explain its purpose:
    - Ruler → measures length.
    - Scale → measures weight.
    - Measuring jug → measures volume/liquids.

- b** Teach the song

*Lyrics:*

“Rulers measure length,

Scales measure weight,

Jugs measure volume—

Measurements are great!”

Suggested tune: Sing to the melody of “*This Is the Way We...*”

**Example:**

♪ Rulers measure length, (clap, clap)

Scales measure weight, (clap, clap)

Jugs measure volume— (clap, clap)

Measurements are great! ♪

**Add actions:**

- Pretend to measure with a ruler.
- Pretend to lift something heavy for weight.
- Pretend to pour water into a jug.

- c** Ask learners to draw and label one measuring tool and its use

- Provide paper and coloured pencils.
- Learners pick one tool and draw it.
- They write a short label showing its use.

• **Model answer:**

– Drawing: A ruler.

– Label: “*Ruler – used to measure the length of a pencil.*”

## Exercise 20.1

- 1** A ruler is used to measure **length**.
- 2** A scale is used to measure **weight**.
- 3** A measuring jug is used to measure **volume**.

## Activity 20.2: Measuring length, weight and volume

- a** Give learners rulers and ask them to measure the length of a pencil or book.
- b** Let them weigh a fruit or toy using a scale.
- c** Ask them to measure water in a cup using a measuring jug.

**Model answers:**

- a** The pencil is 15cm long.
- b** The orange weighs 1kg.
- c** The jug holds 300ml of water.

## Exercise 20.2

- 1 A **ruler** is used to measure how long or short something is.
- 2 A **scale** is used to check how heavy or light something is.
- 3 A **measuring jug** is used to show how much liquid something holds.

## Activity 20.3: Comparing measurements

- a Give learners two pencils and ask which one is longer
  - **Preparation:**
    - Choose two pencils of noticeably different lengths.
  - **Steps:**
    - Place the pencils side by side on a flat surface.
    - Ask: “Which pencil is longer?”
    - Let learners answer aloud.
    - Model answer: “The red pencil is longer.”
  - **Extension:**
    - Let learners use a ruler to measure both pencils to check their answers.
- b Give two fruits and ask which is heavier using the scale.
  - **Preparation:**
    - Select two fruits of different weights (mango and orange).
    - Have a kitchen or classroom scale ready.
  - **Steps:**
    - Ask learners to guess which fruit is heavier by holding them.
    - Place each fruit on the scale to compare.
    - Model answer: “The mango is heavier than the orange.”
  - **Extension:**
    - Let pairs of learners take turns weighing and comparing different objects.
- c Provide two jugs with different amounts of water and ask which has more
  - **Preparation:**
    - Fill two jugs with different amounts of water (Jug A: 1 litre, Jug B: 500ml).
  - **Steps:**
    - Ask learners to look at the water levels and decide which jug has more.
    - Model answer: “Jug A holds more water.”
  - **Extension:**
    - Pour the water into a measuring jug to confirm.

## Exercise 20.3

- 1 We compare the length of objects to see which one is **longer**.

- 2 We compare the weight of two items to find out which one is **heavier**.
- 3 We compare volumes to check which jug holds **more** water.

### Activity 20.4: Recording measurements

- a Provide different objects. Ask learners to record their length, weight, and volume in a chart.
- b Let them write a sentence or short paragraph:

#### Model answer:

Today I measured a pencil (15cm), a fruit (1kg), and a cup of water (250ml).

### Unit exercise

- 1 Match the tool to its use:  
(a) → (ii) Measures length  
(b) → (i) Measures weight  
(c) → (iii) Measures volume
- 2 (a) False  
(b) False
- 3 (a) A **ruler** measures how long something is.  
(b) A **scale** measures how heavy something is.
- 4 Drawing – allow any appropriate tool with label).
- 5 We measure things accurately so that we **find the length or volume of things**.

## Unit 21: Digital devices

### Unit objectives

By the end of the unit, learners should be able to:

- a identify digital devices.
- b discuss basic functions of digital devices.
- c describe the functions of digital devices at home and school.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book pages 145–152.
- Science and Technology Infant syllabus.
- Real digital devices (smartphone, tablet, radio, television, computer).
- Pictures of digital devices.

## Teaching notes

- Digital devices use technology to help us work, learn and play.
- Common digital devices include:
  - **Computer** – for typing, researching, and playing games.
  - **Tablet** – for watching videos, calling, and texting.
  - **Television** – for watching shows and learning.
  - **Radio** – for listening to music and news.
  - **Smartphone** – for making calls and texting.
  - **Microscope** – for seeing small or faraway things clearly.
- Digital devices are used both at home (for example, watching television) and at school (for example, using a computer).
- Learners must be taught **safe use** of digital devices:
  - Take breaks to rest the eyes.
  - Sit properly when using a device.
  - Limit screen time to avoid straining the eyes and body.

## Let us start

Show learners the picture on page **145**. Ask:

- 1** What digital devices do you use at home or school?
  - Tablet, television, computer, phone, radio
- 2** Can you name a device that helps you learn or have fun?
  - Computer helps me learn. Television helps me have fun.
- 3** Why is it important to use digital devices safely?
  - To protect our eyes and health.

## New words

|                   |   |                                               |
|-------------------|---|-----------------------------------------------|
| <b>Computer</b>   | – | A machine used to type or play games.         |
| <b>Tablet</b>     | – | A flat device used to call or watch videos.   |
| <b>Television</b> | – | A screen used to watch shows.                 |
| <b>Radio</b>      | – | A box that plays music or talks.              |
| <b>Microscope</b> | – | A device that helps us see very small things. |

## Suggested answers

### Activity 21.1: Digital devices

- a** Use pictures to identify and name digital devices.
  - Preparation:
    - Gather clear pictures or flashcards of: computer, tablet, television, radio, smartphone.

- Steps:
  - Show one picture at a time.
  - Ask: “*What is this digital device called?*”
  - Learners answer aloud and repeat the correct pronunciation together.
  - Briefly explain one use for each device.

## **b** Sing a song

*Lyrics:*

“Computers, tablets, televisions too,  
Digital devices help me and you.”

**Suggested tune:** Sing to the melody of “*Twinkle, Twinkle, Little Star*”.

**Example:**

♪ Computers, tablets, televisions too,  
Digital devices help me and you. ♪

**Add simple actions:**

- Pretend to type for “computers.”
- Pretend to swipe for “tablets.”
- Pretend to hold a remote for “televisions.”

## **c** Draw and label one digital device and its use.

- Give learners paper and coloured pencils.
- Ask them to draw a device they choose.
- They label it with its name and one use.

**Model answer:** Drawing of a phone labelled “*Phone – used to call.*”

## Exercise 21.1

- 1** We use a smartphone to **text** messages.
- 2** **Computers** are used for typing and researching.
- 3** Draw two digital devices and name them.
  - Computer – typing. Radio – music.

## Activity 21.2

- a** Drawing and colouring a digital device you use or have seen
  - Learners choose one device (mobile phone, computer, or television).
  - They draw, colour, and write a simple label stating its use.

**Example:** “Computer – used to type.”

## Exercise 21.2

- 1** We use a **television** for entertainment at home.

- 2 Name the digital device we use at school for learning.
  - Computer
- 3 We use a **microscope** to see very small and faraway things.
- 4 We must limit screen time to protect our **eyes**.

### Activity 21.3: Digital devices at home and school

- a Role-play use of devices at home and school.
  - Give learners scenarios:
    - Watching television at home.
    - Typing on a computer at school.
  - Learners act out how they would use the device.
- b Create chart: “Digital Devices at Home vs School”
  - On the board, draw two columns: Home and School.
  - Ask learners to suggest devices for each.Model answer:
  - Home: television, tablet
  - School: computer, microscope
- c Write short report: “How I use digital devices”  
Model answer:  
“I use my tablet to play and learn.  
I use a computer to type.”

### Exercise 21.3

- 1 Sit **up** straight when using a computer.
- 2 Use devices for a **short** time each day.
- 3 Using digital devices safely protects our **eyes**.

### Activity 21.4: Safe use of digital devices

- a Role-play safe device use.
  - Learners demonstrate:
    - Sitting properly.
    - Taking breaks.
    - Keeping screen at eye level.
- b Create safety checklist: “How to use digital devices safely”  
Model checklist:
  - Sit properly.
  - Take breaks.
  - Use for a short time.

- Keep screen at eye level.
- Do not use in the dark.

## Unit exercise

1 Match the device to its use:

| Device         | Its use                     |
|----------------|-----------------------------|
| (a) Computer   | (ii) Typing and researching |
| (b) Television | (i) Watching shows          |
| (c) Tablet     | (iii) Listening to music    |

- 2 (a) Tablets are used for calling and texting. → **True**  
 (b) Microscopes help us see faraway things. → **True**
- 3 (a) A **computer** helps us type and research.  
 (b) We should take **breaks** when using screens.
- 4 Drawing one digital device and its use.  
 – Learner draws a phone or computer and writes: “Phone – to call.”
- 5 It is important to use digital devices safely to **protect our eyes and health**.

## Unit 22: Science and Technology careers

### Unit objectives

By the end of this unit, learners should be able to:

- a name careers related to Science and Technology.
- b identify careers related to Science and Technology.
- c describe duties of Science and Technology professionals.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner’s Book pages 153–161.
- Science and Technology Infant syllabus.
- Pictures or drawings of people doing different jobs.

### Teaching notes:

- Careers in Science and Technology help people and solve problems using tools, equipment, machines, or digital devices.
- Examples include:
  - **Farmer** (Agriculture): grows crops and raises animals.
  - **Miner** (Mining): digs underground to find minerals like gold and coal.

- **Engineer** (Engineering): designs and builds roads, bridges, and machines.
- **Doctor/Nurse** (Health): treats sick people.
- **Software Developer** (ICT): creates computer programs and solves digital problems.
- Help learners understand the value of each career and how it helps the community (e.g. farmers give us food, doctors keep us healthy).
- Encourage learners to dream about their future and appreciate all types of work.

## Let us start

Show learners the pictures on page 153. Ask:

- 1 What jobs do you see people doing in the pictures?
  - Farming and engineering.
- 2 Which job do you like the most?
  - Learner’s own choice (accept all answers).
- 3 How do these jobs help our community?
  - They give us food and help build things we use.

## New words

|                    |   |                                         |
|--------------------|---|-----------------------------------------|
| <b>Career</b>      | – | A job a person does for a long time.    |
| <b>Agriculture</b> | – | Growing crops and keeping animals.      |
| <b>Engineering</b> | – | Building roads, bridges, and machines.  |
| <b>ICT</b>         | – | Using computers and digital devices.    |
| <b>Mining</b>      | – | Getting minerals from under the ground. |

## Activity 22.1: Careers related to Science and Technology

- 1 Put learners in groups.
- 2 Ask them to say jobs they know in Science and Technology.
- 3 Guide them to share a career they admire and say why.

### Model answers:

- “I like being a doctor because they help sick people.”
- “I want to be a farmer to grow food.”

## Exercise 22.1

### Answers:

- 1 Health and engineering.
- 2 Bridges
- 3 Software

## Activity 22.2: Duties of Science and Technology professionals

- a Prepare flashcards with jobs and duties.
- b Let learners match job titles to duties.
- c Discuss how each job helps the community.

### Model matches:

- Farmer → Grows food.
- Miner → Digs for minerals.
- Engineer → Builds roads.
- Doctor → Treats sick people.
- Software Developer → Solves computer problems.

## Activity 22.3: Role-playing different professions

- 1 Let learners choose a role ( doctor, miner).
- 2 Provide simple props or costumes.
- 3 Each learner acts out a task in their job.
- 4 Ask them to say what they do and why it is important.

### Model answer:

- “I am a doctor. I help sick people feel better.”

## Activity 22.4: Career guidance poster creation

- 1 Give learners paper, crayons, and glue.
  - Distribute plain A4 paper, colouring materials, and glue sticks to each learner.
  - If possible, provide old magazines or printed pictures for collage work.
- 2 Ask them to draw different jobs in Science and Technology.
  - Give examples for guidance:
    - Scientist in a laboratory.
    - Doctor or nurse in a hospital.
    - Engineer building a bridge.
    - Farmer using modern machinery.
    - Computer programmer working on a laptop.
- 3 Let them label the pictures.
  - Encourage learners to write the job title and one short sentence about it.
    - Example: “*Farmer – grows crops using machines.*”

- 4 Each learner shares their favourite job with the class.
  - Learners stand up, show their poster, and tell the class:
    - The name of their favourite job.
    - Why they like it.
  - **Model answer:** “My favourite job is being a doctor because I can help sick people get better.”

## Activity 22.5: Field trip to a Science and Technology workplace

- 1 Visit a nearby farm, hospital, or building site (or use pictures).
  - Organise an actual visit if possible, following safety rules.
  - If a trip is not possible, show high-quality pictures or short videos of workers in action.
- 2 Ask learners to observe what workers are doing.
  - Encourage them to watch carefully and note tools, machines, or actions.
  - Remind them not to disturb workers.
- 3 Let learners share what they saw with the class.
  - Back in class, have a sharing session.
  - Learners say one or two things they observed.
  - **Model observations:**
    - “I saw doctors giving medicine.”
    - “The builder was using tools to make a wall.”
    - “The farmer was driving a tractor.”

## Story time

Read the story about Chipo and Xolani. Ask:

- What job does Chipo want to do? → Engineer
- What job does Xolani want to do? → Health worker.
- Why are they important? → They help people and build things.

## Unit exercise

- 1 Farmer
- 2 Miners
- 3 Doctor
- 4
  - Farmer → Grow crops.
  - Engineer → Build bridges.
  - Doctor → Treat sick people.

## Topic revision exercise

- 1 Matching items to descriptions:
  - Tractor in field → Growing crops and raising animals.
  - Miner → Extracting minerals from the earth.
  - Construction site → Designing and building structures.
- 2 Careers related to Science and Technology:
  - Farmer, engineer
- 3 Picture drawing:
  - Learner's own drawing (accept all drawings).
- 4 Household and garden tools:
  - Household: broom, mop.
  - Garden: hoe, rake.
- 5 Match the tool to safety tip:
  - (a) Broom → (i) Store in a shed.
  - (b) Hoe → (ii) Grip firmly.
- 6 Shovel safety tip:
  - Hold it properly and dig carefully.
- 7 Two digital devices and uses:
  - Phone – for calling.
  - Computer – for typing and searching.
- 8 Safe use of digital devices:
  - Do not play with wet hands.
- 9 They solve problems and help others.
- 10 Match measurement to tool:
  - Length → Ruler
  - Weight → Scale
  - Volume → Measuring cup

# Topic 6

# Energy and fuels

## Unit 23: Forms and uses of energy

### Unit objectives

By the end of this unit, learners should be able to:

- a** name different forms of energy.
- b** identify different forms of energy.
- c** discuss uses of energy.

### Suggested teaching and learning materials:

- PlusOne Science and Technology Grade 2 Learner's Book, pages 162–167.
- Science and Technology Infant syllabus.
- Flashcards with energy names and pictures.
- Pictures or drawings of items that use different types of energy.
- Real-life examples (torch, speaker, fan).

### Teaching notes

- Energy is what we use to do work. It helps us move, see, hear, cook, and more.
- There are different forms of energy:
  - **Electrical energy** – powers lights, televisions, phones.
  - **Heat energy** – warms homes and cooks food.
  - **Light energy** – helps us see.
  - **Sound energy** – allows us to hear music and voices.
- Energy is important because it makes life easier and helps us do everyday tasks.

### Let us start

Show learners the picture on page **162**. Ask:

- 1** What do you use to light your home or cook food?
  - Electricity, gas, firewood, solar energy.

- 2 Can you name a form of energy you use every day?  
– Electrical, light, heat, sound
- 3 Why is energy important to us?  
– It helps us cook, see, hear, and live comfortably.

## New words

|            |   |                                |
|------------|---|--------------------------------|
| Energy     | – | The power we use to do things. |
| Electrical | – | From electricity.              |
| Heat       | – | Makes things warm or hot.      |
| Light      | – | Helps us to see.               |
| Sound      | – | What we hear.                  |

## Activity 23.1: Different forms of energy

- a Show learners pictures of the sun, fan, television, and a guitar
- **Preparation:**
    - Print or display large, clear pictures of each object.
    - Arrange them so all learners can see.
  - **Steps:**
    - Hold up one picture at a time.
    - Ask: “What is this?” (Learners name the object.)
    - Follow with: “What form of energy does it use or give?”
    - Guide learners to identify the correct form of energy.
  - **Model answers:**
    - Sun → Light energy.
    - Fan → Electrical energy.
    - Television → Electrical energy.
    - Guitar → Sound energy.

- b Teach learners the energy song:

### Lyrics:

“Electrical, heat, light and sound \_\_\_\_\_

Energy is all around!”

Suggested tune: Sing to the melody of “If You’re Happy and You Know It”.

### Example:

♪ Electrical, heat, light and sound (clap, clap)

Energy is all around! (clap, clap) ♪

### Optional actions:

- Pretend to switch on a light for “light.”
- Rub hands together for “heat.”

- Cup ear for “sound.”
- Pretend to plug in a device for “electrical.”

**c** Give each learner paper to draw and label one form of energy and how it is used

- Learners choose one form of energy from the lesson.
- They draw an object that produces or uses that energy.
- They label the drawing with its name and use.
- Model examples:
  - Picture of sun → Light energy.
  - Picture of guitar → Sound energy.
  - Picture of stove → Heat energy.
  - Picture of TV → Electrical energy.

## Exercise 23.1: Matching

### Answers:

- Sun → Light energy.
- Fan → Electrical energy.
- Guitar → Sound energy.

## Exercise 23.2

- 1 Sound
- 2 Guitar
- 3 Energy

## Activity 23.2: Uses of energy

- a** Show learners pictures of a car, kettle, and lamp.
- **Preparation:**
    - Display printed or projected images of each object.
    - If possible, bring toy models or point to real items.
  - **Steps:**
    - Hold up one picture at a time and ask: “*What is this?*”
    - After learners name the object, ask: “*What kind of energy is being used?*”
    - Guide them to give the correct form of energy.
  - **Model answers:**
    - Car → Fuel energy (petrol/diesel) or electrical energy (for electric cars).
    - Kettle → Heat energy / Electrical energy.
    - Lamp → Light energy.

- b** Teach learners this rhyme

**Lyrics:**

*The sun gives light, the stove cooks food,*

*Energy makes life really good.*

*Keep it safe and use it well,*

*Energy stories we all can tell!*

*Suggested tune: Sing to the melody of “Mary Had a Little Lamb” to make it easy to remember.*

Example:

♪ *The sun gives light, the stove cooks food,*

*Energy makes life good.*

*Keep it safe and use it well,*

*Stories we can tell.* ♪

Optional actions:

- Point up for “sun.”
- Pretend to stir a pot for “stove cooks food.”
- Thumbs-up for “life really good.”
- Pretend to read a book for “stories we can tell.”

## Story time

Read the story aloud. Then ask learners:

- What kind of jobs use energy?
  - Engineers, doctors, farmers, IT workers
- What energy do these jobs use?
  - Engineers – electrical, Farmers – solar/light, Doctors – machines use electricity, IT – computers use electricity

## Unit exercise

- 1** Match the energy form to its use:
  - (a) Electrical → (ii) Powering lights/ hearing music.
  - (b) Heat → (i) Cooking food.
  - (c) Light → (iii) Powering lights.
- 2** (a) Sound energy helps us see. → False
  - (b) Heat energy warms our homes. → True
- 3** (a) Electrical
  - (b) See and brightens the surroundings.
- 4** Learner draws a lamp (light energy) or stove (heat energy).
- 5** People do not go hungry.

## Unit 24: Types and importance of fuels

### Unit objectives

By the end of this unit, learners should be able to:

- a identify different types of fuel.
- b discuss the importance of fuels.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book, pages 168–172.
- Science and Technology Infant syllabus.
- Pictures of petrol pumps, gas cylinders, charcoal, firewood.

### Teaching notes

- **Fuel** is something we burn to get energy.
- Fuels help with transport, cooking, heating, and electricity.
- Common types of fuel include:
  - **Petrol** – used in cars and motorcycles.
  - **Diesel** – used in trucks, buses, and machines.
  - **Wood** – used for cooking and lighting fires.
  - **Natural gas** – used for cooking, heating, and electricity.
- Fuels are very important in daily life, especially for moving vehicles and preparing food.

### Let us start

Show learners the picture on page 168. Ask:

- 1 What do cars, stoves, and fires use to work?
  - Fuel (petrol, diesel, wood).
- 2 Can you name a fuel you use at home or see on the road?
  - Petrol, wood, gas, diesel.
- 3 Why are fuels important to us?
  - They help us cook, drive cars, and keep warm.

### New words

|                    |   |                                     |
|--------------------|---|-------------------------------------|
| <b>Petrol</b>      | – | Fuel for cars and motorbikes.       |
| <b>Diesel</b>      | – | Fuel for trucks and buses.          |
| <b>Wood</b>        | – | Fuel from trees used for cooking.   |
| <b>Natural gas</b> | – | A gas used for heating and cooking. |
| <b>Fuel</b>        | – | Something we burn to get energy.    |

## Activity 24.1: Different types of fuels

- a** Show pictures of petrol, diesel, wood, and gas.  
– Let learners name each fuel.
- b** Teach them the fuel song:  
“Petrol, diesel, wood, and gas - fuels help us move fast.”
- c** Ask learners to draw and label one type of fuel and say how it is used.

### Model answers:

- Petrol → Powers cars.
- Diesel → Powers trucks.
- Wood → Used for cooking.
- Natural gas → Used for cooking and heating.

## Exercise 24.1

- 1** Diesel
- 2** Wood
- 3** Burned

## Activity 24.2: Labelling fuel sources

- a** Ask learners to draw three fuel sources such as:
  - Gas cylinder
  - Firewood
  - Petrol pump
- b** Provide a worksheet with images and ask them to label:
  - Gas cylinder
  - Firewood
  - Charcoal

### Model labels:

- Firewood
- Gas
- Charcoal

## Unit exercise

- 1** Match the fuel to its use:  
(a) Petrol → **(ii)** Powering cars.  
(b) Wood → **(i)** Cooking food.  
(c) Natural gas → **(iii)** Heating homes.

- 2 True or False:
- (a) Diesel is used to power trucks. → **True**
  - (b) Wood is used to generate electricity. → **False**
- 3
- (a) Petrol
  - (b) Cooking
- 4 Learner may draw a car at a petrol station or a pot cooking on firewood.
- 5 Cooking and heating.

## Unit 25: Sources of energy

### Unit objectives:

**By the end of this unit, learners should be able to:**

- a identify different sources of energy.
- b classify energy sources as renewable or non-renewable.

### Suggested teaching and learning materials:

- PlusOne Science and Technology Grade 2 Learner's Book, pages 173–179.
- Picture cards: sun, windmill, hydro dam, coal mine.
- Craft materials for making a windmill or solar oven.
- Chart paper and crayons.

### Teaching notes:

- Energy comes from **sources** like the **sun, wind, water, and coal**.
- **Renewable energy** comes from sources that do not run out: sun, wind, water.
- **Non-renewable energy** comes from sources that will run out: coal, oil, gas.
- Using renewable energy helps protect the environment.

### Let us start

Show learners the pictures on page 173. Ask:

- 1 What do the sun, wind, and water have in common?
  - They give us energy and do not run out.
- 2 Can you name a source of energy that will never run out?
  - Sun, wind, water
- 3 Why is it important to use renewable energy?
  - It can be used again and again.

## New words

|                  |   |                                        |
|------------------|---|----------------------------------------|
| <b>Solar</b>     | – | Energy from the sun.                   |
| <b>Wind</b>      | – | Moving air that gives energy.          |
| <b>Water</b>     | – | Used to make electricity (hydropower). |
| <b>Coal</b>      | – | A black rock burned for energy.        |
| <b>Renewable</b> | – | Can be used again and again.           |

### Activity 25.1: Types of energy sources

- a** Show pictures of sun, windmill, river dam, and coal. Let learners name them.
- b** Teach the energy song:  
*“Sun, wind, water and coal — energy sources power our goal!”*
- c** Let learners draw one energy source and label its use.

#### Model drawing suggestions:

- Sun → heats homes.
- Wind → turns turbines.
- Water → makes electricity.
- Coal → burned for power.

### Activity 25.2: Energy sources

- a** Give learners cards with pictures of energy sources. Ask them to sort into renewable or non-renewable.
- b** Play a matching game: for example, Sun → renewable
- c** Guide learners to create a two-column chart:
  - Left: Renewable → sun, wind, water
  - Right: Non-renewable → coal, oil

### Exercise 25.1

- 1** Sun
- 2** Sun
- 3** Electricity
- 4** Wind / sun / water
- 5** Coal / oil

## Activity 25.3: Making windmills or solar ovens

- a** Help learners build and test a simple windmill.
- Provide materials: cardboard or stiff paper, scissors, pencil, pin, straw or stick.
  - Show learners how to cut the cardboard into a square and make diagonal cuts from each corner toward the centre.
  - Fold every other corner toward the centre and pin them together to make blades.
  - Fix the windmill to a straw or stick so it can spin.
  - Take learners outside or use a fan to test how the windmill spins when wind blows.
  - Briefly discuss: “This is how wind can turn turbines to make electricity.”
- b** Guide them to make and use a basic solar oven.
- Provide small boxes (shoe boxes), aluminium foil, plastic wrap, tape, and black paper.
  - Line the inside of the box with black paper (absorbs heat) and cover the inside lid with aluminium foil (reflects sunlight).
  - Stretch plastic wrap over the top opening to trap heat.
  - Place a small piece of food that can warm easily (for example, a biscuit or slice of bread with cheese) inside the oven.
  - Put the oven in direct sunlight and check after a few minutes to see how warm the food gets.
  - Explain: “Solar ovens use the sun’s heat to cook or warm food without using electricity or fire.”
- c** Let them write (or dictate) a short report on how renewable energy works.
- Give learners a simple writing frame:
    - “We made a \_\_\_\_\_.”
    - “It uses \_\_\_\_\_ to make energy.”
    - “We learned that renewable energy comes from \_\_\_\_\_.”
  - Allow those who can’t write fluently to tell the teacher their answers to be written down.
  - Example report: “*We made a windmill. It uses wind to make energy. We learned that renewable energy comes from things that do not run out.*”

## Story time

Read aloud the story of Tom and Chipu. Then ask:

- What energy did the sun give?
  - Heat and light.
- What did Chipu say about coal and oil?
  - They are non-renewable and will run out.

## Unit exercise

- 1 Match the energy source to its type:  
(a) Sun → (ii) Renewable  
(b) Coal → (i) Non-renewable
- 2 (a) Wind energy is renewable. → **True**  
(b) Coal will never run out. → **False**
- 3 (a) Solar  
(b) Electric
- 4 Drawing one renewable and one non-renewable energy source:
  - Renewable: sun or wind
  - Non-renewable: coal
- 5 It can be used again and again.

## Unit 26: Energy conservation

### Unit objectives

By the end of this unit, learners should be able to:

- a outline ways of conserving energy.
- b describe the importance of conserving energy.
- c demonstrate ways of conserving energy.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book pages 180–183.
- Science and Technology Infant syllabus.
- Pictures of home appliances (television, iron, fan, bulb).

### Teaching notes:

- Energy conservation means using energy wisely and avoiding waste.
- We can save energy by:
  - Turning off lights when not in use.
  - Unplugging devices like chargers and irons.
  - Using energy-efficient appliances such as LED bulbs.
- Saving energy helps reduce bills, protect the environment, and preserve resources for the future.

## Let us start

Show learners the picture on page **180**. Ask:

- 1** What do you do to save energy at home or school?
  - Turn off lights, unplug devices.
- 2** Can you name a device that uses a lot of energy?
  - Iron, heater, stove, TV.
- 3** Why is it important to conserve energy?
  - To save money, help the planet, and reduce pollution.

## New words

|                  |   |                                               |
|------------------|---|-----------------------------------------------|
| <b>Conserve</b>  | – | To save and not waste.                        |
| <b>Efficient</b> | – | Works well without using too much energy.     |
| <b>Unplug</b>    | – | To remove from power.                         |
| <b>Appliance</b> | – | A machine used at home like a fridge or iron. |
| <b>Energy</b>    | – | Power we use to do things.                    |

## Activity 26.1: Ways to conserve energy

- a** Help learners brainstorm ways to save energy at school and home.
  - Examples: turning off lights, unplugging televisions
- b** Let learners create a checklist titled:  
“10 Ways to save energy”

### Model checklist answers:

- Turn off the lights.
  - Unplug the iron.
  - Use LED bulbs.
  - Open windows for fresh air.
  - Turn off the TV when not watching.
  - Don't leave the fan running.
  - Use daylight.
  - Boil just enough water.
  - Do not overcharge phones.
  - Unplug computers.
- c** Ask learners to role-play saving energy:
- Pretend to switch off lights.
  - Pretend to unplug a charger or appliance.

## Exercise 26.1

- 1 Switch
- 2 Pollution
- 3 Bulbs
- 4 energy

## Activity 26.2: Ways to conserve energy

- a Energy saving challenge:  
Ask learners to record how many times they switch off lights or unplug something at school/home. They should bring the results to school, to determine the winner of the challenge.
- b Ask learners to ask their guardians to help them replace one bulb at home with an energy-saving one (real or pretend in discussion).

## Unit exercise

- 1 Match the action to its benefit:  
(a) Turn off lights → (i) Saves money  
(b) Unplug devices → (ii) Reduces pollution  
(c) Use energy-efficient bulbs → (iii) Lowers electricity bills
- 2 (a) Unplugging devices saves energy. → **True**  
(b) Energy-efficient bulbs use more electricity. → **False**
- 3 (a) Save  
(b) Planet
- 4 Learner may draw someone switching off the light or unplugging a charger.

## Unit 27: Renewable energy technology

### Unit objectives

By the end of this unit, learners should be able to:

- a identify renewable energy technologies.
- b demonstrate how renewable energy technologies work.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book pages 184–190.
- Science and Technology Infant syllabus.

- Pictures of solar panels, wind turbines, hydroelectric dams.
- Chart with energy types (renewable vs non-renewable).

## Teaching notes

Renewable energy technology means using natural resources such as the sun, wind, and water to produce electricity. These resources are called renewable because they do not run out.

- **Solar panels** change sunlight into electricity.
- **Wind turbines** spin when wind blows, turning generators to make electricity.
- **Hydroelectric dams** use moving water to turn turbines for electricity.

This type of energy is clean and does not pollute the environment. It helps reduce the use of harmful fuels like coal.

## Let us start

Show learners the pictures of the house with solar panels and wind turbine. Ask:

- 1 What do solar panels, wind turbines, and hydroelectric dams have in common?  
– They all use natural resources to make electricity.
- 2 Can you name a technology that uses sunlight, wind, or water to make energy?  
– Solar panels, wind turbines, hydroelectric dams.
- 3 Why is renewable energy technology important?  
– It gives clean energy and protects the environment.

## New words

|                      |   |                                                          |
|----------------------|---|----------------------------------------------------------|
| <b>Solar panels</b>  | – | flat devices that use sunlight to make electricity.      |
| <b>Wind turbines</b> | – | tall machines that spin in the wind to make electricity. |
| <b>Hydroelectric</b> | – | using moving water to make electricity.                  |
| <b>Renewable</b>     | – | something that can be used again and again.              |
| <b>Technology</b>    | – | the use of science to solve problems.                    |

## Activity 27.1

### Renewable energy technologies

- a Picture identification
  - Show learners clear pictures of a **solar panel**, **wind turbine**, and **hydroelectric dam**.
  - Ask learners to point to each picture as you name them.
  - Then, let learners name each one on their own.
    - **Model answer:** Learners correctly point and say: “Solar panel,” “Wind turbine,” “Hydroelectric dam.”

## **b** Energy song

- Teach the class the song line:  
*“Solar, wind, and water power—  
Renewable energy every hour.”*
- Sing it together slowly, pointing to the corresponding pictures.
- Repeat with actions:
  - Pretend to feel sunlight for *solar*.
  - Make spinning arm motions for *wind*.
  - Move hands like flowing water for *hydro*.

## **3** Drawing and labelling

- Give learners paper and crayons/pencils.
- Ask them to draw **one renewable energy technology** and show its **energy source**.
- Encourage correct labelling of both the device and its source.
  - **Model answer:** A drawing of a **solar panel** with the label “*Sunlight*”.

## Exercise 27.1

**1** Solar

**2** Clean

## Activity 27.2

### Singing

#### **a** Singing

- Write the song on the board or a chart:  
*Solar, wind, and water too,  
Help us all, save energy true.  
Harness nature, it's the way,  
Renewable energy every day!*

#### **b** Suggested tune:

- Sing it to the melody of “*Twinkle, Twinkle, Little Star*” for a familiar rhythm and easy memorisation.
  - Each line matches one phrase of the song.
  - Encourage learners to clap or make hand actions for *solar* (hands over head like the sun), *wind* (wave hands), and *water* (wiggle fingers downwards).
- Repeat the song together several times, then in smaller groups, and finally as a class performance.

- c** Writing a short story
- Ask learners to imagine a family using **solar**, **wind**, or **water** power at home.
  - Let them write 3–4 sentences about what the family does.
  - Allow drawings to accompany the story for younger learners.
    - **Model answer:** “A family uses solar panels to cook. They heat water with the sun. At night, they use electricity from the sun to light their home.”

## Activity 27.3

- a** Model wind turbine
- Provide learners with simple craft materials such as cardboard, paper, skewers, bottle tops, and tape.
  - Demonstrate how to cut and shape blades from cardboard or thick paper.
  - Attach the blades to a skewer or stick that can spin freely.
  - Place the model where there is natural wind (near a window) or use a fan.
  - Let learners observe what happens.
    - **Model answer:** *Wind makes the blades spin.*
- b** Solar oven
- Give learners small boxes (shoe box size), aluminium foil, plastic wrap, and black paper.
  - Line the inside of the box with black paper to absorb heat.
  - Cover the opening with plastic wrap to trap warm air.
  - Place aluminium foil on the inside of the lid to reflect sunlight into the box.
  - Put a small snack (for example, a piece of bread with cheese) inside and place it in direct sunlight.
  - After some time, check the temperature of the snack.
    - **Model answer:** *The snack gets warm using the sun.*
- c** Short report writing
- Ask learners to write a simple report with three short sentences explaining how each technology works.
  - Guide them to use clear, simple language.
    - **Model answer:** *Solar panels use the sun. Wind turbines use wind. Hydroelectric dams use water. All produce electricity.*

## Unit exercise

- 1** Solar panel → Sunlight  
Wind turbine → Wind  
Hydroelectric dam → Water

### True or False

- 2 (a) True  
(b) False
- 3 (a) Solar panels  
(b) Wind
- 4 (Learner draws and labels any renewable energy tech + energy source)  
– for example, drawing of wind turbine with “wind”
- 5 It saves the environment.

### Topic revision exercise

- 1 Solar panels – Sunlight  
Wind turbines – Wind
- 2 (a) → (iii)  
(b) → (i)  
(c) → (ii)
- 3 It gives clean energy.
- 4 To light the house / cook / charge devices
- 5 (a) → (ii)  
(b) → (i)
- 6 Cook, light, pump water
- 7 Firewood – cooking  
Petrol – driving
- 8 Switching off lights.
- 9 Saves money / protects the environment.

# Topic 7

## Disaster risk management and resilience

### Unit 28: Hazards and early warning signs

#### Unit objectives

By the end of the unit, learners should be able to:

- a** identify hazards.
- b** describe early warning signs of hazards.

#### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learners Book pages 191–197.
- Science and Technology Infant syllabus.
- Weather chart.

#### Teaching notes

A hazard is a dangerous event or situation that can harm people or the environment.

#### Types of natural hazards:

- 1 Floods** – Caused by heavy rainfall or overflowing rivers.
- 2 Lightning** – Bright flashes of light during a storm.
- 3 Fire** – Can start from lightning, human activity, or accidents.
- 4 Wind** – Strong winds damage trees, roofs, and power lines.
- 5 Earthquakes** – Shaking of the ground caused by movement of rocks.
- 6 Drought** – A long time with no rain, leading to water shortages.

#### Early warning signs of hazards:

- **Thunder and lightning** – Signs of an approaching storm.
- **Heavy rain** – Can lead to floods.
- **Strong winds** – Can indicate a storm or tornado.
- **Cracked ground** – Shows signs of drought.
- **Dark skies and animal behaviour** – Warning of storms or earthquakes.

## Why know warning signs?

To stay safe, protect lives and property, and prepare early.

## Let us start

Show learners the pictures and ask:

- 1 What natural events can be dangerous?
  - Floods, storms, droughts, earthquakes.
- 2 Can you name a hazard you've heard about?
  - Learners may say “lightning,” “fire,” “wind,” among other.
- 3 Why is it important to know warning signs?
  - To stay safe and prepare early.

## New words

|                    |   |                                                        |
|--------------------|---|--------------------------------------------------------|
| <b>Floods</b>      | – | when a lot of water covers land.                       |
| <b>Lightning</b>   | – | a big flash of electricity during a thunderstorm.      |
| <b>Earthquakes</b> | – | when the ground shakes.                                |
| <b>Fire</b>        | – | when something burns.                                  |
| <b>Drought</b>     | – | when there is a long time with very little or no rain. |
| <b>Wind</b>        | – | moving air and strong winds can create storms.         |

## Suggested answers

### Activity 28.1

- a Picture identification
  - Display clear pictures of each hazard: **floods, lightning, fire, wind, earthquakes, drought.**
  - Point to each picture and say the hazard name.
  - Ask learners to repeat the names after you.
  - Let individual learners point to the correct picture when you call out the hazard name.
    - **Model answer:** Learners correctly point to and name: “Floods,” “Lightning,” “Fire,” “Wind,” “Earthquakes,” “Drought.”
- b Hazard song
  - Teach the song line:  
*“Floods, lightning, fire, and wind—  
Hazards can be dangerous, my friend.”*
  - Suggested tune: “If You’re Happy and You Know It” — sing each line to the rhythm for easy memorisation.

- Add hand actions:
  - *Floods*: Move arms like waves.
  - *Lightning*: Point fingers like zig-zag lightning.
  - *Fire*: Wiggle fingers upwards like flames.
  - *Wind*: Blow gently or wave hands.

**c** Model drawing and labelling

- Provide paper and crayons.
- Ask learners to draw cracked ground to show drought.
- Help them write the label “Drought” on the drawing.
- Let them add the effect label “No water” or “Dry land.”
  - **Model answer:** A drawing of cracked brown ground with the words “Drought” and “Dry land”.

## Activity 28.2

**a** Role-play – storm alert

- Ask two learners to stand at the front.
- Tell them to pretend they see dark storm clouds and feel strong wind.
- One learner says: “*It looks like a storm! Let’s stay inside!*”
- Switch roles so everyone gets a turn.
  - **Model answer:** Learner looks up, points to sky, and says the line clearly.

**b** Mimic calling for help in case of fire.

- Ask learners to imagine there is a small fire.
- Let them pretend to use a phone or shout for help.
- Encourage them to say short, clear words like “*Help! There is a fire!*”
  - **Model answer:** Learner holds imaginary phone and says: “*Please come quickly, there is a fire at home!*”

**c** Partner talk – fire safety.

- Pair up learners.
- One learner says: “*If I see fire, I will move to a safe place and call for help.*”
- Partner repeats and then says their own sentence.
  - **Model answer:** “*If I see fire, I will go outside and tell an adult.*”

**d** Rhyme recital

- Read the rhyme from the Learner’s Book aloud once.
- Repeat it slowly, letting learners join in line by line.
- Recite together with actions to match key words (for example, pointing for “see,” moving hands for “wind,” cupping hands for “call”).

## Activity 28.3

- a** Role-play weather alerts:
- Show a picture or describe a weather warning (for example, storm clouds, heavy rain, or strong wind).
  - Learners act as if they hear an alert on the radio or see it on TV.
  - They tell others what to do, e.g.:  
*“There is a storm coming! Let’s stay indoors!”*  
– **Model answer:** Learner points to the “sky” and says, *“Alert! Heavy rain! Stay safe inside!”*
- b** Create a simple “disaster preparedness plan”:
- Ask learners to suggest what families should do to prepare for a disaster.
  - Write their ideas on the board in short points.
  - Help them make a simple 3-point plan:
    - Stay indoors.
    - Pack water.
    - Have a first aid kit.
  - **Model answer:** *“Stay indoors, pack water, first aid kit.”*
- c** Write a short story:
- Ask learners to write 3–4 sentences about a day when a weather hazard happened.
  - They should include what they saw, what was said, and what they did to stay safe.  
– **Model answer:** *“One day, we heard thunder. Dad said to stay inside. We closed the windows and waited until the storm passed. Everyone was safe.”*

## Exercise 28.1

- |                              |                      |
|------------------------------|----------------------|
| <b>1</b> Floods, earthquakes | <b>3</b> Strong wind |
| <b>2</b> Water               | <b>4</b> Natural     |

## Unit exercise

- 1** Match hazard to warning sign:  
Thunder and lightning → Storm  
Heavy rain → Flood  
Cracked soil → Drought
- 2** (a) True  
(b) False
- 3** (a) Thunder  
(b) Drought
- 4** **Drawing one hazard and warning sign:** → Fire + smoke or lightning
- 5** Keep us safe.

## Unit 29: Safety and evacuation

### Unit objectives

By the end of the unit, learners should be able to:

- a** state safe behaviours during emergencies.
- b** identify safe meeting places and evacuation routes.
- c** discuss measures for safety.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book pages 198–203.
- Science and Technology Infant syllabus.
- Posters or charts showing evacuation procedures.

### Teaching notes

- Emphasise the three key safe behaviours:
  - **Stay calm:** Helps in making good decisions.
  - **Follow instructions:** Ensures learners respond correctly.
  - **Know emergency contacts:** Helps them get help quickly.

### New words

|                      |   |                                                          |
|----------------------|---|----------------------------------------------------------|
| <b>Calm</b>          | – | Being quiet and not panicking.                           |
| <b>Instructions</b>  | – | Steps you are told to follow.                            |
| <b>Evacuation</b>    | – | Leaving a dangerous place safely.                        |
| <b>Emergency kit</b> | – | A bag with useful items like water, food, and first aid. |
| <b>Safety</b>        | – | Being free from danger or harm.                          |

### Let us start

Use the picture to ask:

- 1** What should you do if there is an emergency at school or home?
  - Leave the building safely and follow instructions.
- 2** Can you name a safe behaviour during an emergency?
  - Stay calm, follow instructions, know emergency numbers.
- 3** Why is it important to know evacuation routes and meeting places?
  - So that you can leave quickly and meet others safely.

## Suggested answers

### Activity 29.1: Safe behaviours during emergencies

- a** Discuss safe behaviours:
  - Stay calm.
  - Follow instructions.
  - Know emergency contacts.
- b** Checklist example:
  - I will stay calm during emergencies.
  - I will listen to teachers.
  - I know emergency numbers.
- c** Role-play:
  - Teacher simulates a fire drill. Learners practise staying calm and following steps.

### Activity 29.2: Safe meeting places and evacuation routes

- a** “Safety map” Example:
  - Draw classroom with arrows showing routes to playground/parking lot.
- b** Practice evacuation:
  - Walk out calmly to the designated meeting place.
- c** Sample explanation:
  - “We leave through the back door and meet under the big tree. We walk quietly and quickly.”

### Exercise 29.1

- 1** Stay **calm** during emergencies.
- 2** **911** is an important number during emergencies.
- 3** We must know evacuation **routes**.

### Activity 29.3: Measures for safety

- a** Group discussion points:
  - Emergency kits should include: water, food, torch, first aid items.
  - Fire safety equipment includes: fire extinguisher, sand buckets.
- b** Poster suggestion:
  - Title: How to stay safe in emergencies.
  - Include drawings of calm child, emergency kit, fire extinguisher.
- c** Story example:
  - A day we prepared for an emergency.
    - “We had a drill. We stayed calm, walked to the field, and waited for the teacher.”

## Unit exercise

### Matching

- 1 (a) Stay calm → (i) Helps you make good decisions.  
(b) Follow instructions → (iii) Keeps you safe during evacuation.  
(c) Know emergency contacts → (ii) Ensures you know who to call.
- 2 (a) True  
(b) False
- 3 (a) Following rules helps you stay calm during an emergency.  
(b) A playground is a safe spot outside during an evacuation.

### Drawing

- 4 Learners draw torch, bandage, water bottle, among others.
- 5 It is important to know evacuation routes so as to **learn the quickest way to exit a building**.

## Unit 30: Emergency supplies

### Unit objectives

By the end of this unit, learners should be able to:

- a identify emergency supplies.
- b discuss the importance of emergency supplies.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learners Book pages 204–209.
- Science and Technology Infant syllabus.
- First Aid kit (real or toy).
- Pictures or drawings of emergency supplies.

### Teaching notes

Emergency supplies are items that help us during emergencies such as power outages, accidents, or natural disasters. Common emergency supplies include:

- **Flashlight:** Helps us see in the dark when there is no electricity.
- **First Aid kit:** Used to treat injuries and prevent infections. It contains items like bandages, antiseptic, and gloves.
- **Emergency kit:** A pack that includes food, water, blankets, and other essentials to keep us safe during emergencies.

It is important for learners to:

- Recognise and name common emergency supplies.
- Know how these items help during emergencies.
- Practise using emergency supplies through role-plays and checklists.

## Let us start

Show learners the picture on page 204. Ask the following questions:

- 1 What items do you think are important in an emergency?  
– Flashlight, First Aid kit, food, water.
- 2 Can you name something you would need during a power outage or storm?  
– Flashlight, food, water, blanket.
- 3 Why is it important to have emergency supplies at home or school?  
– To help us stay safe and be prepared.

## New words

|                      |   |                                                               |
|----------------------|---|---------------------------------------------------------------|
| <b>Flashlight</b>    | – | A small light you can carry in your hand, used in the dark.   |
| <b>First Aid kit</b> | – | A small box with things to help someone who is hurt.          |
| <b>Emergency kit</b> | – | A bag or box with important items for use in an emergency.    |
| <b>Water</b>         | – | A clear liquid that people, animals, and plants need to live. |
| <b>Food</b>          | – | Something people and animals eat to stay alive and healthy.   |

## Activity 30.1: Emergency supplies

- a Use items or pictures
  - Show learners real or picture items (flashlight, First Aid kit, water bottle, food tin).
  - Ask them to name each one.
- b Sing the emergency song
  - Teach and sing:
  - “Flashlight, First Aid kit, water and food – emergency supplies are good!”
- c Drawing activity
  - Ask learners to draw and label one emergency supply (flashlight or water bottle).
  - **Model answer:** A drawing of a flashlight labelled “Flashlight”.

## Activity 30.2: The importance of emergency supplies

- a Class discussion
  - Ask: Why are emergency supplies important?  
– To help us during power cuts, storms, or when someone is hurt.
- b Create a poster
  - Ask learners to draw or write a simple poster titled:  
“Why We Need Emergency Supplies”

- **Model answer:** A poster showing a First Aid kit, water, flashlight, and words like “stay safe”, “treat injuries”, “see in the dark”.

## Exercise 30.1

- 1 Bandages
- 2 Food
- 3 Flashlight

## Activity 30.3: Use of emergency supplies

- a Role-play using flashlight
  - Learners pretend there is a power cut. They switch the flashlight on and off.
- b First Aid practice
  - Learners practise wrapping a small bandage on a partner’s hand or pretend injury.
- c Create a checklist
  - Learners make a list: “What is in My Emergency Kit?”

**Model answer:** Water, food, blanket, flashlight, First Aid kit.

## Unit exercise

- 1 Matching supply to use  
Flashlight → Provides light.  
First Aid kit → Treats injuries.  
Emergency kit → Contains water and food.
- 2 True or False  
(a) False  
(b) True
- 3 (a) Flashlight  
(b) First Aid Kit
- 4 helps us stay safe and prepared during emergencies.

## Unit 31: Emergency professionals

### Unit objectives

**By the end of this unit, learners should be able to:**

- a list emergency responders.
- b discuss roles of emergency responders.

## Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learners Book pages 210–215.
- Science and Technology Infant syllabus.
- Pictures of police officers, firefighters, and health personnel.

## Teaching notes

- Emergency responders are people who help during accidents, disasters, or other dangerous situations.
- They include **firefighters**, **police officers**, **paramedics**, and **rescue teams**.
- Their job is to **save lives**, **protect people**, and **keep everyone safe**.
- They use special skills and equipment to respond quickly in emergencies.
- They work during floods, fires, accidents, and other emergencies.

## Let us start

Ask learners:

- 1 Who helps us during emergencies like fires, accidents or illnesses?  
– (Police officers, firefighters, nurses, and doctors).
- 2 Can you name an emergency responder and what they do?  
– (A nurse treats sick people; a firefighter puts out fires).
- 3 Why are emergency responders important?  
– (They keep us safe and help during emergencies).

## New words

|                         |   |                                                       |
|-------------------------|---|-------------------------------------------------------|
| <b>Police</b>           | – | people who keep law and order.                        |
| <b>Firefighters</b>     | – | people who stop fires.                                |
| <b>Health personnel</b> | – | nurses, doctors and others who help when we are sick. |
| <b>Responders</b>       | – | people who act quickly during an emergency.           |
| <b>Emergency</b>        | – | a sudden, dangerous situation.                        |

## Suggested answers

### Activity 31.1

- a Picture identification
  - Display pictures of **police officers**, **firefighters**, and **health personnel** (doctors/nurses).
  - Point to each picture and name the responder type.
  - Ask learners to repeat the names after you.
  - Call out the name of a responder and let learners point to the correct picture.  
– **Model answer:** Learners correctly point and say: “Police,” “Firefighters,” “Health personnel.”

## **b** Singing

- Teach the song line:  
*“Police, firefighters, doctors, and nurses—  
Emergency responders help us in crises.”*
- Suggested tune: **“The Farmer in the Dell”** — easy and familiar to young learners.
- Add simple actions:  
*Police:* Salute.  
*Firefighters:* Pretend to spray water with a hose.  
*Doctors/Nurses:* Pretend to check a heartbeat.
- Sing together several times, gradually letting learners sing without teacher support.

## **c** Drawing and labelling

- Give learners paper and crayons.
- Ask them to draw **one type of emergency responder**.
- Help them write a short sentence to describe the person’s job.  
– **Model answer:** A drawing of a **police officer** with the words: *“Protects people and directs traffic.”*

## Exercise 31.1

- 1** A police officer – (Learner draws someone in uniform).
- 2** A nurse – (Learner draws someone helping a patient).

## Activity 31.2

### **a** Drawing

- Give learners paper and crayons/pencils.
- Ask them to draw an **ambulance** with **paramedics** helping a patient.
- Remind them to include key details, such as the ambulance’s red cross symbol and paramedics wearing uniforms.
- Display the finished drawings on a “Safety Wall” in the classroom.  
– **Model answer:** A picture of an ambulance parked nearby while two paramedics help a person lying on a stretcher.

### **b** Discussion guide

- **Police**  
– Ask: *“What do police officers do to keep us safe?”*  
– Guide learners to understand: *“Police keep law and order and direct traffic.”*
- **Firefighters**  
– Ask: *“What do firefighters do when there is a fire?”*  
– Guide learners to answer: *“Firefighters put out fires and teach fire safety.”*

- **Nurses and doctors**
  - Ask: “Who helps us when we are sick or hurt?”
  - Guide learners to answer: “Nurses and doctors help sick or injured people.”

## Exercise 31.2

- 1 I treat illnesses. I am a **nurse**.
- 2 You put out fire. You are a **firefighter**.
- 3 I investigate crimes. I am a **police officer**.

## Activity 31.3: Role-playing and field trips

- a Role-play ideas:
  - Direct traffic like a police officer.
  - Put out a fire like a firefighter.
  - Treat a patient like a nurse.
- b Organise a field trip to:
  - Local police station / fire station / clinic or hospital.
- c Short report (model answer):
  - “I learned that police keep us safe. Firefighters stop fires. Nurses help sick people.”

## Unit exercise

- 1 Match the responder to their role:

| Responder        | Correct role                             |
|------------------|------------------------------------------|
| Police           | Directs traffic and investigates crimes. |
| Firefighters     | Puts out fires.                          |
| Health personnel | Treats injuries and illnesses.           |

- 2 True or False
  - (a) Firefighters rescue people from fires. → True
  - (b) Health personnel investigate crimes. → False
- 3
  - (a) A police officer directs traffic and protects people.
  - (b) Health personnel treat injuries and illnesses.
- 4 Drawing
  - Learner draws any emergency responder and writes their role (“Firefighter puts out fire.”)
- 5 Emergency responders are important to our community because they have specific roles to keep people safe.

## Unit 32: Emotional resilience

### Unit objectives

By the end of this unit, learners should be able to:

- a** identify techniques for managing fear and anxiety during emergencies.
- b** explain the importance of seeking comfort from trusted adults.
- c** identify organisations that offer emotional support.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learners Book pages 216–223.
- Science and Technology Infant syllabus.
- Pictures of emergency responders.

### Teaching notes

- **Emotional resilience** means the ability to cope with strong feelings like fear and anxiety after a disaster.
- After a disaster, children may feel scared, anxious, or confused. These feelings are normal.
- Teach learners calming techniques such as:
  - Deep breathing.
  - Crying if needed.
  - Miming/role-play.
  - Talking to trusted adults
- Help learners identify people and organisations that offer comfort: parents, teachers, police, fire brigade, religious leaders, and child protection committees.
- Emphasise that talking to someone helps learners feel safe and understood.

### Suggested answers

#### Activity 32.1

Identifying techniques for managing fear and anxiety.

- a** Use puppets or dolls to demonstrate calming techniques like deep breathing and miming.
  - Model answer: Use a doll to show breathing in through the nose and out through the mouth. Another doll can pretend to cry or do a calming role-play.
- b** Sing a song: “Breathe in, breathe out, calm your mind – Stay strong, you’ll be fine.”
  - Let the learners sing along with actions.
- c** Draw and label one technique for managing fear and anxiety.
  - Model answer: A drawing of someone breathing deeply or someone talking to a parent. Label: “Deep breathing” or “talking to a trusted adult”.

## Exercise 32.1

- 1 **Crying** releases emotions.
- 2 You can be **scared** after a disaster.
- 3 **Miming** is to pretend playing.

## Activity 32.2

Discussing the importance of seeking comfort.

- a Discuss why it is important to talk to trusted adults after a disaster.  
– Model answer: It helps you feel less afraid and more understood.
- b Create a poster: “Who can I talk to?”  
– Model answer: Poster with drawings of a teacher, parent, police officer, and church leader.
- c Write a short story: “How talking helped me feel better.”  
– Model answer: “One day after a storm, I felt scared. I talked to my teacher. She gave me a hug and told me I was safe. I felt much better.”

## Exercise 32.2

- 1 **Teachers** are trusted adults at school.
- 2 Trusted adults provide **guidance**.
- 3 Traditional leaders give **spiritual** guidance.

## Activity 32.3

Identifying organisations that offer emotional support.

- a Use pictures to identify and name organisations like police, fire brigade, and child protection committees.  
– Model answer: Police help during emergencies. Child protection committees ensure children’s safety.
- b Role-play: Pretend to seek help from a religious leader or counsellor.  
– Model answer: One learner acts as a child asking for comfort. The other plays a religious leader giving guidance.

## Unit exercise

- 1 Match the technique to its purpose:  
(a) Deep breathing → (ii) Calm down  
(b) Miming → (i) Express emotions  
(c) Seeking comfort → (iii) Feel supported

- 2 True or False
- (a) Crying is a way to release emotions. → **True**
  - (b) Talking to trusted adults does not help after a disaster. → **False**
- 3
- (a) **Deep breathing** helps you calm down during an emergency.
  - (b) **Religious and traditional** leaders can provide emotional support.
- 4 Draw one technique for managing fear and anxiety.
- Model answer: A child crying or talking to a teacher.
- 5 Seeking comfort after a disaster helps you to **feel less alone and provides reassurance**.

## Topic revision exercise

- 1 Match the organisation to its role:
- (a) Police → (ii) Safety and support
  - (b) Religious leaders → (i) Spiritual guidance
- 2 Write one way organisations help after a disaster.
- Model answer: They help children feel safe.
- 3 A **firefighter** is an emergency responder.
- 4 Match the responder to their example:
- Police → Directing traffic
  - Firefighter → Putting out fires
  - Doctor → Treating patients
- 5 List two techniques for managing fear and anxiety:
- Deep breathing, crying
- 6 Match the hazard to its example:
- Flood → Heavy rain
  - Drought → Dry, cracked soil
- 7 Parents can provide **comfort**.
- 8 List two emergency supplies and their uses:
- Torch – for light; Water – for drinking
- 9 First Aid kit

# Topic 8

## Educational technology and innovation

### Unit 33: Everyday technology and its uses

#### Unit objectives

By the end of this unit, learners should be able to:

- a name technological devices.
- b discuss their various uses.

#### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book pages 224–228.
- Science and Technology Infant syllabus.
- Tablets or smartphones.
- Recycled materials (cardboard, paper, glue) for model building.

#### Teaching notes

Technological devices are tools we use every day to make tasks easier. In this unit, learners will explore:

- **Tablet:** A portable device used for reading, learning, and playing games.
- **Smartphone:** A handheld device used for calling, texting, using apps, and browsing.
- **Computer:** A device used for typing, researching, and creating school projects.

Technology helps in three major areas:

- 1 **Communication** – Texting, calling, video chatting.
- 2 **Entertainment** – Watching videos, playing games.
- 3 **Learning** – Reading e-books, doing research, and completing schoolwork.

Encourage learners to use examples from home and school. Use storytelling, songs, drawing, and craft work to reinforce understanding.

## Let us start

Show learners the picture and ask:

- 1 **What devices do you use to learn, play or talk to others?**
  - Tablet, smartphone, computer
- 2 **Can you name a technological device and what it is used for?**
  - A tablet is used for learning and playing games.
- 3 **How does technology help you in your daily life?**
  - It helps me talk to others, learn new things, and play.

## New words

|                      |   |                                                        |
|----------------------|---|--------------------------------------------------------|
| <b>Tablet</b>        | – | A small computer for reading, learning or games.       |
| <b>Smartphone</b>    | – | A phone that can do many things like a small computer. |
| <b>Computer</b>      | – | A device for typing, searching and learning.           |
| <b>Communication</b> | – | Talking or sending messages to others.                 |
| <b>Entertainment</b> | – | Fun things like games, music or videos.                |

## Suggested answers

### Activity 33.1: Common technological devices

- a Use picture cards to identify and name tablets, smartphones, and computers.

**Model answer:**

- This is a tablet. → Used for reading and games
- This is a smartphone. → Used for calling and texting
- This is a computer. → Used for typing and schoolwork

- b Sing a song:

“Tablets, smartphones, and computers too – technology helps me and you.”

- c Draw and label one technological device and its use.

**Model drawing:** A phone with a label: “Smartphone – used for calling.”

## Exercise 33.1

- 1 Tablet
- 2 typing
- 3 Draw a smartphone.
  - Learner’s own drawing.

## Activity 33.2

- a Share with the class how you use technology.

**Model answer:**

– I use a smartphone to call my friends and play music.

- b** Create a poster: How Technology Helps Us
  - Posters can include pictures of devices and uses ( “Phone = talk”, “Tablet = read”)
- c** Draw a picture of a family using devices.
  - Model: Parent on computer, child on tablet, sibling calling on smartphone.

### Activity 33.3: Storytelling and model building

- a** Reading or listening with a tablet/smartphone.
  - Choose a short, age-appropriate story on the tablet or smartphone with clear pictures or engaging narration.
  - Show learners how to hold and operate the device safely (clean hands, gentle touch, no pressing hard).
  - Let small groups take turns reading the story on the screen or listening to the audio version.
  - Ask simple questions afterward to check understanding.
    - **Model answer:** Learners correctly recall characters and events from the story.
- b** Building a model technological device
  - Provide cardboard, coloured paper, scissors (safety type), glue, and crayons/markers.
  - Guide learners to cut out basic shapes:
    - **Phone** = small rectangle.
    - **Tablet** = larger rectangle.
  - Use smaller pieces of paper to make “buttons,” “screens,” or “apps” and glue them onto the rectangle shapes.
  - Encourage learners to decorate the screens with pictures or icons.
    - **Model answer:** A cardboard tablet with a paper “screen” showing a drawing of a storybook page, or a cardboard phone with drawn app icons.

### Unit exercise

- 1** Match the device to its use:
  - (a) Tablet – **(iii)** Reading and playing games.
  - (b) Smartphone – **(ii)** Calling and texting.
  - (c) Computer – **(i)** Typing and researching.
- 2** True or False:
  - (a) Smartphones are used for calling and texting. → **True**
  - (b) Computers are only used for playing games. → **False**
- 3**
  - (a) **Tablet** is used for reading ebooks and playing games.
  - (b) We use **smartphones** to call and text our friends.
- 4** Draw any technological device you have used.
  - Learner’s drawing (e.g. tablet, phone, computer)
- 5** read e-books, research and do school projects.

## Unit 34: Educational technology interaction

### Unit objectives

By the end of this unit, learners should be able to:

- a identify age appropriate educational software.
- b manipulate digital devices.
- c state uses of educational software.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book pages 229–234.
- Science and Technology Infant syllabus.
- Tablets, smartphones, or computers.
- Charts/posters of digital devices.

### Teaching notes

- **Educational software:** Includes apps for reading, math, science, problem-solving, creativity, and stories.
- **Devices:** Learners use devices like tablets, computers, and projectors to access educational content.
- **Interaction:** Technology encourages participation and creativity, making learning fun.
- **Benefits of software:** Enhances learning, improves skills, and encourages creativity.

### Let us start

Show learners the picture on page 229. Ask:

- 1 What apps or games do you use to learn new things?  
– (Answers may include: YouTube Kids, Khan Academy, ABCmouse.)
- 2 Can you name an educational software or app you have used?  
– (Answer: “Yes, I use Read Along or Maths play.”)
- 3 How does technology make learning more fun and interactive?  
– (Answer: “It lets me play, watch, and learn at the same time.”)

### New words

|             |   |                                                     |
|-------------|---|-----------------------------------------------------|
| Software    | – | programs or apps used on devices.                   |
| Interactive | – | allows learners to engage actively.                 |
| Games       | – | fun digital tools used for learning.                |
| Stories     | – | digital or audio texts used for reading.            |
| Devices     | – | tools like tablets and computers used for learning. |

## Activity 34.1: Educational software

### a Exploring apps

- Divide learners into small groups and give each group a tablet or smartphone.
- Preload the devices with safe, age-appropriate educational apps (e.g., math games, reading apps).
- Let learners take turns exploring the apps for a few minutes each.
- Ask them to say what the app does.
- Model examples:
  - “*This is a math game; it helps with counting.*”
  - “*This is a reading app; it helps me read stories.*”

### b Singing the educational apps song:

- Teach the song line:
  - “*Apps and games help us learn,*
  - *Technology makes knowledge earn.*”
- Suggested tune: “**Mary had a little lamb**” for easy rhythm.
- Add actions: pretend to swipe a screen for *apps*, tap fingers for *games*, and open hands wide for *knowledge*.
- Sing together as a group several times.

### c Drawing and labelling an app:

- Ask learners to think of an educational app they know (for example, Duolingo, Read Along).
- Give paper and crayons for them to draw the app’s icon or what it looks like on screen.
- Help them write the app’s name under their drawing.
  - **Model answer:** A green Duolingo owl with label “Duolingo” or a book with “Read Along” label.

## Activity 34.2: Manipulating digital devices

### a Demonstrating device use.

- Show learners a tablet or computer.
- Demonstrate how to tap an icon, swipe left/right, and type letters to open an app.
- Let each learner practise one action on the device.
  - **Model answer:** Learner taps an app icon and says, “*I opened the reading app.*”

### b Role-play in pairs

- Pair up learners.
- One learner pretends to teach the other how to use a device.
- They practise giving clear instructions.
  - **Model line:** “*Click here to open the app.*”

- c Writing or dictating an explanation.
- Ask learners to write (or say for the teacher to write) one short sentence about using the device.  
– **Example:** “*I use the tablet to read a story.*”
  - Let them share their sentences with the class.

## Exercise 34.1

- 1 Software
- 2 Projector
- 3 Learner’s own drawing

## Activity 34.3 :Uses of educational software

- a Using a reading or a math application:
- Choose an age-appropriate reading or math app and load it on tablets or computers.
  - Demonstrate how to open the app and start a simple activity.
  - Let learners take turns using the app in small groups or pairs.
  - Give short challenges, for example:  
– “*Read this sentence.*”  
– “*Solve this puzzle using the game.*”  
– **Model answer:** Learner completes the puzzle and says, “*I solved it!*”
- b Creating a digital picture or story:
- Show learners how to use a simple drawing or word-processing app.
  - Ask them to draw their favourite part of the app (for example, a character, scene, or game level) or type a short story inspired by the app.
  - Save or display their work on the device.  
– **Model answer:** A digital drawing of a puzzle game screen with bright colours.
- c Writing or dictating a report:
- Ask learners to think about what they learned from the app.
  - Let them write a short report (1–2 sentences) or dictate it to you.
  - Encourage them to be specific about the learning benefit.  
– **Example:** “*I learn new words with the story app.*” or “*The math app helps me add numbers.*”

## Story time

- Read the story aloud or let learners act it out.
- Ask: What did Chipu learn using the game?  
– *Answer: Maths and reading.*
- Ask: How did she use the app at home?  
– *Answer: She shared it with her little brother.*

## Unit exercise

- 1 Matching:
  - (a) – (ii) Solving Math problems.
  - (b) – (i) Listening to stories.
  - (c) – (iii) Learning problem-solving.
- 2 True/False:
  - (a) False
  - (b) True
- 3 Fill in the blanks:
  - (a) Learning app.
  - (b) Problem solving.
- 4 Allowing children to create stories, art and projects.

## Unit 35: Robotics and coding

### Unit objectives

By the end of this unit, learners should be able to:

- a identify robotics toys.
- b demonstrate coding skills.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner's Book pages 235–240.
- Grade 3–7 Science and Technology Syllabus.
- Tablets or computers.
- Real or toy robots.
- Charts and drawings of robotics and coding apps.

### Teaching notes

- **Robotics** is the study of robots—machines that can be programmed to perform tasks.
- **Coding** is writing instructions that tell a robot or computer what to do.
- Learners will explore platforms like **Scratch** (used to create animations and games) and **Tynker** (used to build games and control robots).
- Coding helps with **problem-solving** and logical thinking.
- Learners will also role-play as robots and coders to understand how instructions (code) guide robot behaviour.
- Emphasise that coding is not just for computers, but also for controlling devices and solving challenges.

## Let us start

Show learners the picture. Ask:

- 1 What do you think robots can do?
  - Robots can help clean, play music, fly, or do work.
- 2 Can you name a robotics toy or coding app you have heard about?
  - Scratch or Tynker.
- 3 Why is it fun to learn about robotics and coding?
  - It helps us play games, build robots, and solve puzzles.

## New words

|                        |   |                                                |
|------------------------|---|------------------------------------------------|
| <b>Robotics</b>        | – | study of robots.                               |
| <b>Coding</b>          | – | giving instructions to computers or robots.    |
| <b>Scratch</b>         | – | coding app for animations and games.           |
| <b>Tynker</b>          | – | coding app to create games and control robots. |
| <b>Problem-solving</b> | – | finding answers or solutions to challenges.    |

## Suggested answers

### Activity 35.1: Robotic toys

- a Use pictures or real robotics toys.
  - Learners identify and name Scratch and Tynker.
- b Sing:  
“Scratch and Tynker, coding fun—  
Robots and games for everyone.”
- c Draw and label one robotics toy:
  - Sample: A drone – use: it flies and takes pictures.

### Activity 35.2: Demonstrating how robotics toys work

- a Using a robotics toy or coding App:
  - Choose a simple robotics toy ( Bee-Bot, LEGO WeDo, Sphero) or a beginner-friendly coding app ( Scratch Jr, Code.org).
  - Show learners how to connect the toy to a tablet or computer if needed.
  - Demonstrate how to give a basic command – such as moving forward – by selecting or dragging a “move forward” block on the screen.
  - Let learners take turns giving different commands to make the robot move, turn, or stop.
    - **Model example:** Learner programs the robot to move forward two steps, then stop.

- b** Role-play “Human Robot” game
  - Choose one learner to be the “robot” and another to be the “coder.”
  - The “coder” gives simple verbal commands like “walk,” “turn right,” “turn left,” “stop.”
  - The “robot” follows the commands exactly without adding their own ideas.
  - Swap roles so each learner practises being both the coder and the robot.
    - **Model answer:** Learner follows “walk 3 steps, turn right, stop” exactly as instructed.
- c** Writing: “How coding controls robots”
  - Ask learners to write one or two sentences explaining what they learned.
  - Encourage them to use simple words like “instructions” and “tasks.”
    - **Model answer:** “Coding gives instructions that robots follow to complete tasks.”

### Activity 35.3: Coding robotic toys and games

- a** Creating animation or a game (Scratch or Tynker)
  - What is scratch/tynker?
    - **Scratch** (<https://scratch.mit.edu>) and **Tynker** (<https://www.tynker.com>) are free, child-friendly coding platforms that let learners create games, animations, and stories by joining colourful “code blocks” — no typing needed.
    - They work on computers, laptops, and some tablets.
  - How to get started:
    - Go to the Scratch website or open the Tynker app.
    - Choose “Create” or “New Project.”
    - On the left side, you’ll see blocks for movement, looks, sounds, etc.
    - Drag blocks into the coding area and snap them together like puzzle pieces.
  - **Example for class:** Create a simple “bouncing ball” game in Scratch.
    - Select a ball sprite (character).
    - Add code blocks: *when green flag clicked* → *move 10 steps* → *if touching edge, bounce*.
  - **Let learners experiment:** They can change the ball colour, make it move faster, or add sound effects.
    - **Model answer:** Learner creates a ball that bounces around the screen when the game starts.
- b** Solving a puzzle with drag-and-drop code blocks
  - Use the “**Tutorials**” section in Scratch or Tynker, or a free coding game like **Code.org’s Dance Party or Maze**.
  - Show learners how to drag a movement block (for example, “move forward”) and snap it to a start block.
  - Let groups work together to arrange the blocks so the robot moves to a target.

- Encourage testing and fixing (“debugging”) if the robot doesn’t reach the target.  
– **Model answer:** Group arranges code to move the robot 3 steps forward and turn right to reach the goal.

**c** Writing: “What I learnt from coding”

- Ask learners to write 1–2 sentences about their coding experience.
- Guide them to mention what they did and what they learned.  
– **Sample answer:** “I learned that coding helps robots move and do tasks. I had fun making a game.”

## Unit exercise

- 1 Match the tool to its use:  
(a) Scratch → (ii) Creating games and animations  
(b) Tynker → (i) Controlling robots
- 2 True or False:  
(a) True  
(b) False
- 3 Fill in the blanks:  
(a) Scratch  
(b) Challenging
- 4 Learners draw any robotics toy or coding app (e.g., drone, Scratch icon)
- 5 Coding is important for robotics because it allows learners to...  
– **develop problem-solving skills**

## Unit 36: Technology safety

### Unit objectives

**By the end of this unit, learners should be able to:**

- a state safety measures when using technological devices.
- b discuss the importance of safe use of technological devices.
- c state safe use of technological devices.

### Suggested teaching and learning materials

- PlusOne Science and Technology Grade 2 Learner’s Book pages 241–247.
- Science and Technology Infant syllabus.
- Technological devices (tablet, laptop, phone—real or models).
- Poster/chart paper and markers.

## Teaching notes

**Technology safety** means using digital devices like computers and tablets in ways that protect our health and prevent device damage.

### Key safety measures:

- **Proper posture** – Sit upright with the screen at eye level to avoid back or neck pain.
- **Screen breaks** – Take a break every 20 minutes to rest your eyes and reduce eye strain.
- **Safe charging** – Always use the correct charger and avoid overcharging.

### Why technology safety is important:

- It protects learners from health problems (eye strain, back pain).
- It keeps devices working longer.
- It prevents accidents like fires from overcharging.
- It helps learners use devices responsibly and productively.

## Let us start

Show learners the picture. Ask:

- 1 What should you do to stay safe while using a computer or tablet?  
– Sit properly, take breaks, don't overcharge.
- 2 Can you name a safety rule for using technological devices?  
– Use the right charger. Take breaks. Sit straight.
- 3 Why is it important to use technology safely?  
– It protects our health and keeps devices working.

## New words

|                    |   |                                               |
|--------------------|---|-----------------------------------------------|
| <b>Posture</b>     | – | The way you sit or stand.                     |
| <b>Screen time</b> | – | The time spent looking at a screen.           |
| <b>Charging</b>    | – | Giving power to a device using a charger.     |
| <b>Safety</b>      | – | Being protected from harm.                    |
| <b>Devices</b>     | – | Tools or machines like tablets and computers. |

## Suggested answers

### Activity 36.1

- a Talk about safety rules for using devices:
  - Sit straight and keep screen at eye level.
  - Take breaks every 20 minutes.
  - Use the right charger and don't overcharge.
- b Create a checklist (model answer):

## Safety rules for using technology

- Sit straight at your desk.
- Take a screen break every 20 minutes.
- Use the correct charger.
- Do not overcharge devices.
- Wash hands before using shared devices.

### c Role-play (model):

- One learner sits using a tablet showing correct posture.
- Another sets a timer for a 20-minute break.
- Group members remind each other of safe charging.

## Exercise 36.1

- 1 Avoid **overcharging** devices.
- 2 Take breaks every **20** minutes to rest your eyes.
- 3 Keep devices at **eye** level.

## Activity 36.2

### a Importance of using technology safely (example answers):

- To protect eyes.
- To avoid back pain.
- To prevent damage to devices.

### b Poster (model title):

**“Why we should use technology safely”**

Include phrases like:

- Keep eyes safe.
- Take breaks.
- Use safe chargers.
- Sit properly.

### c Short story model:

**“A day I used technology safely”**

“I sat down to use my tablet. I made sure I was sitting upright and took a break after 20 minutes. I used the correct charger. I felt happy and safe using the device.”

## Activity 36.3

### a Demonstrate posture while using a device:

- Sit straight, feet on the floor, device at eye level.

### b Set a timer and look away after 20 minutes.

- Learners can look out the window or close their eyes briefly.

## Unit exercise

- 1 Matching:  
(a) → (i)  
(b) → (ii)  
(c) → (iii)
- 2 True or False:  
(a) True  
(b) False
- 3 Fill in the blanks:  
(a) back  
(b) overcharging
- 4 eye strain

## Topic revision exercise

- 1 20
- 1 Matching:  
(a) → (ii)  
(b) → (i)  
(c) → (iii)
- 2 computers
- 3 Story apps
- 4 software
- 5 Matching:  
Tablet → Watching videos.  
Television → Playing Math games.  
Laptop → Typing stories.
- 6 engaging
- 7 Scratch
- 8 Matching:  
Desktop computer → Building games.  
Tablet → Solving puzzles.