GRAMSOL

NEW CURRICULUM

Geography
Form 1

Approved by Ministry of Primary and Secondary Education
ZIMBABWE

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GRAMSOL

Geography

Form 1

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BOOK FEATURES

Catchy opening images captivate the learner.

ICT links provide learner-centred internet activities that are engaging.

Vibrant images and informative captions throughout the book.

Fascinating facts are found throughout the book.

BOOK FEATURES

Access to Geography

environment from its nature designed state to an environment which is degraded. Processes such as agriculture, mining, urbanisation and industrialisation are damaging to the environment yet very essential for human livelihoods. It is therefore critical to strike a balance between the need to protect the state of the environment, and at the same time deriving benefits from the environment.

that has been spared from use is called **pristine**. The degraded environment has suffered from abuse by human beings and as such it is fast losing its natural flare. This is usually seen through heavily polluted rivers dams and lakes, polluted air and degraded land with gullies and eroded soils. The pristine environment is left on its natural state without human disruptions. In most cases the pristine environment is protected by the law and can be considered as a nature bank for future generations.

Activity 8.4: Brain writing

1. Describe the state of environments shown on **Fig. 8.5.**
2. Explain the reason for the degraded environments in **Fig. 8.5.**

Activity 8.5: Class discussion

1. Discuss the state of environment in your community.
2. Give the reasons for the state of the environment in your community.

DID YOU KNOW?

Increasing paper litter is a major environmental concern yet paper can be recycled for six times; only after that is the fibre too weak to hold together.

An environment that has been negatively altered by human beings and animals is considered **degraded** whilst an environment

Fig. 8.6 Pristine environments

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Access to Geography

industries to produce a finished good depends on industrial development. This explains that industries are interdependent, and they are very important in making sure that human necessities are met. They add value to what could have been seen as useless.

Industries also develop infrastructure in the country such as roads schools, clinics and many others. In Zimbabwe there are some schools such as Rio Tinto, Trojan and many others which were built from the initiatives of companies. Industries provide revenue to the government through company taxes and this can go a long way in assisting development of other important sectors of the economy such as education and health. Communities near industries usually benefit through cooperation or provision of income to develop community projects.

Case study: Proton bakery

Proton bakery is located in the provincial city of Mashonaland East, Marondera. The bakery has been in operation for more than 40 years and has grown its market to areas outside Mashonaland East such as Harare and Manicaland, Proton bakery is an embodiment of resilience as it has managed to thrive despite some economic hardships which were experienced in the country particularly after the fast trek land reform programme. The bakery employs people who operate during the day and during the night. It is one of the biggest employers in the city of Marondera and has undertaken a lot of social responsibility programmes such as the funding of sports tournaments at schools, funding speech and prize giving programmes in local schools, spearheading HIV and AIDS awareness campaigns. The bakery has made it possible for the province to get a constant supply of bread and other bakery products. Most local high schools get their bread from Proton on a daily basis, an advantage for them as they consume fresh bread straight away from the oven. The municipality of Marondera has also benefited from Proton bakery through some partnerships in infrastructure development.

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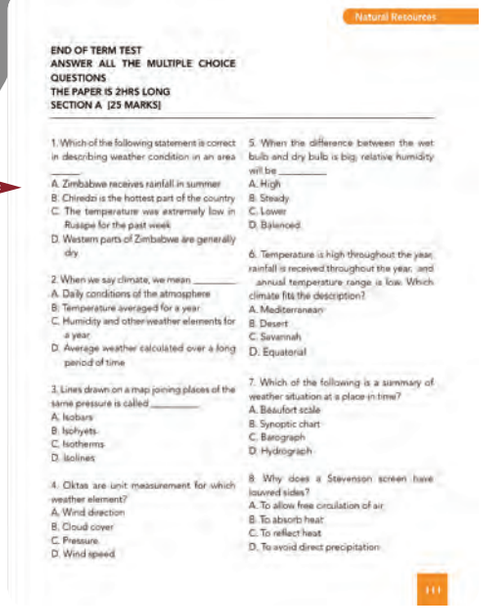
Each topic has a unique and relevant case study.

In-text activities keep learners busy.



Natural Resources

END OF TERM TEST
ANSWER ALL THE MULTIPLE CHOICE QUESTIONS
THE PAPER IS 2HRS LONG
SECTION A [25 MARKS]

1. Which of the following statement is correct in describing weather condition in an area _____
A. Zimbabwe receives rainfall in summer
B. Chiredzi is the hottest part of the country
C. The temperature was extremely low in Rusape for the past week
D. Western parts of Zimbabwe are generally dry

2. When we say climate, we mean _____
A. Daily conditions of the atmosphere
B. Temperature averaged for a year
C. Humidity and other weather elements for a year
D. Average weather calculated over a long period of time

3. Lines drawn on a map joining places of the same pressure is called _____
A. Isobars
B. Isohyets
C. Isotherms
D. Isolines

4. Oktas are unit measurement for which weather element?
A. Wind direction
B. Cloud cover
C. Pressure
D. Wind speed

5. When the difference between the wet bulb and dry bulb is big, relative humidity will be _____
A. High
B. Steady
C. Lower
D. Balanced

6. Temperature is high throughout the year, rainfall is received throughout the year, and annual temperature range is low. Which climate fits the description?
A. Mediterranean
B. Desert
C. Savannah
D. Equatorial

7. Which of the following is a summary of weather situation at a place in time?
A. Beaufort scale
B. Synoptic chart
C. Barograph
D. Hydrograph

8. Why does a Stevenson screen have louvred sides?
A. To allow free circulation of air
B. To absorb heat
C. To reflect heat
D. To avoid direct precipitation

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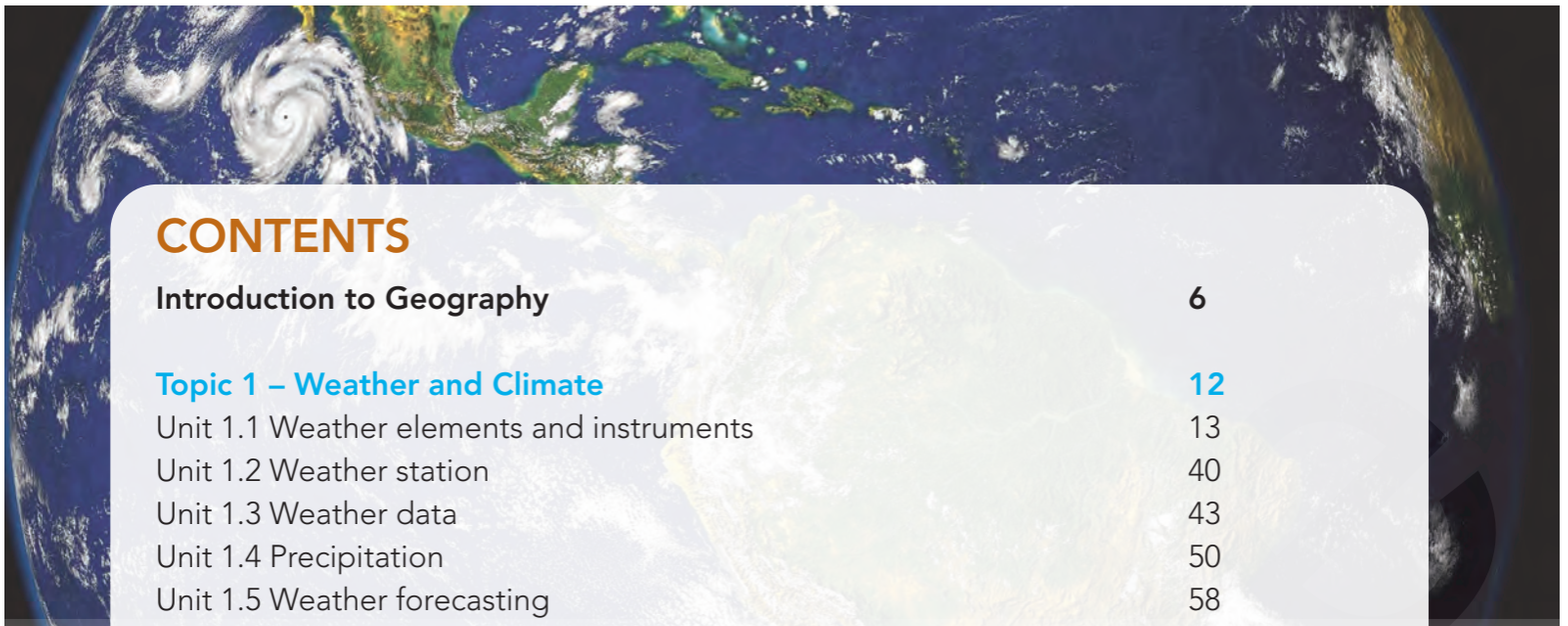
End of term revision tests help with assessment.



CONTENTS

Introduction to Geography

THE BIG PICTURE

- As we begin this exciting journey we need to have a clear understanding of where we are going and where we are coming from.
- Geography as a subject is grounded in the environment which we are already a part of.
- Some of the issues are already in our minds and we have already experienced them.
- In this topic, we are going to create a sign post of the direction we are going to take.

Objective

By the end of this unit, learners should:

- Have an understanding of Geography and why they are studying the subject.

What is Geography?

Geography is the study of the relationship between people and the environment in which they live. The environment includes all living bodies like plants, animals, insects and non-living organisms such as rocks, land, rivers, oceans and the air, among others. By learning geography, we get to understand how the environment influences people and how they can also influence the environment. This allows us to develop relationships that benefit both the people and the environment.

Out of the billions of stars, planets and moons in the universe, Earth is the only place known to harbour life. The '**Rising Earth**' is a famous picture taken by **astronauts** that first landed on the moon in 1968. It shows planet Earth 'rising' when observed from the moon. It is much like the sun or the moon rising when seen from Earth. The picture shows just how precious our home is. We must take good care of our planet, for our continued survival, and **Geography** will help us do that.

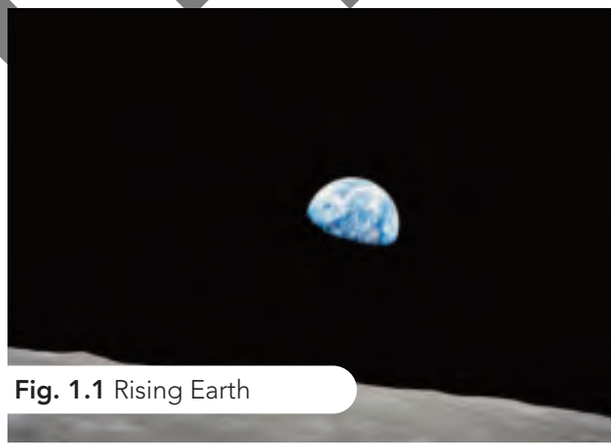


Fig. 1.1 Rising Earth

Topical issues that need answers:

- Weather conditions
- Poverty
- Migration
- Overpopulation
- Economic growth
- Health
- Wildlife extinction
- Pollution

Activity 1.3: Group discussion

In pairs, discuss the topical issues that are being discussed on the news lately. Present your answers to the rest of the class.

Cross-cutting themes

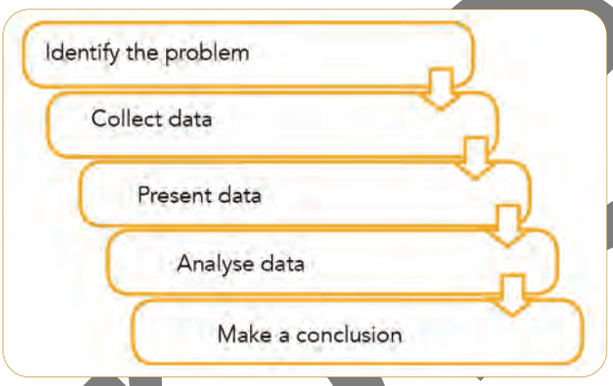
We will explore the following **cross-cutting themes,** some of which are fundamental topics in Geography:

- Environmental issues
- Safety and health
- Disaster risk management
- Enterprise
- Sexuality, HIV and AIDS
- Heritage
- Climate change
- Financial literacy
- Gender
- Technology

Geographical skills and fieldwork

To answer some of the most pressing geographical questions, we have to go through an enquiry process. This means that for you to understand Geography you will need to participate actively. For example, you may need to investigate a geographical issue through collecting data from fieldwork and then analysing it to solve the problem. The enquiry process involves the following stages below:

Fig. 1.5 Enquiry process



Problem solving process

In this book, you will have plenty of opportunities to go into the field, carry out some research and make conclusions. This will help improve your problem solving skills.

Career prospects

By taking this subject as part of your curriculum you have started on a journey of gaining knowledge of how human beings and the entire world operate. The subject opens a lot of opportunities; you could work as a cartographer, climatologist, demographer, commercial or residential surveyor, environmental consultant, geographical information systems officer, planning and development surveyor, academic or town planner.

Activity 1.4: Research

1. Do some research on the above professions.
2. Identify the one that you like the most and give reasons why you would want it as a profession.
3. Present your reasons to the class.

TOPIC 1 Weather and Climate

THE BIG PICTURE

- People, animals and vegetation are influenced by weather every day and by climate over a longer time.
- We often see people wearing warm clothes, carrying umbrellas, or putting on light clothing, a clear response to the prevailing weather conditions.
- Some places have become associated with specific forms of agriculture and other economic activities over a long period of time as influenced by climate.
- Places in some parts of the world are regarded as hot whilst others are cold, because of their climate.
- Whilst climate change is gradual, recent evidence has shown a shift in climates. This is caused by both human and natural factors.
- The effects of global warming are being felt world over as temperatures continue to escalate due to the increase of greenhouse gases such as carbon dioxide from industries, veld fires and volcanic eruptions. In this chapter, we will explore weather and climate in detail.

Units covered

1.1 Weather elements and instruments
1.2 Weather station
1.3 Weather data
1.4 Precipitation
1.5 Weather forecasting

WEATHER MYTHS

Most people believe that lightning does not strike twice on the same spot, but this is one of the many weather myths, as lighting can strike tall objects like trees or antennas multiple times, especially in slow-moving storms.

Activity 1.2: Class discussion

1. What is the difference between weather and climate?
2. Describe the weather in your local community over the past week.
3. Describe the climate conditions in your area (you can ask the elders in the area).

Elements of weather

To determine weather conditions, we need to understand **weather elements**. These weather elements are:

- Temperature
- Pressure
- Humidity
- Wind speed and direction
- Sunshine
- Cloud Cover
- Rainfall
- Visibility

In the next unit, we will discuss how these elements are measured using various weather instruments.

Topic link

You will learn more about weather measurements and instruments in **Unit 1.2**

Temperature

Temperature describes how hot or cold a place is at a given time. The atmosphere has layers, which have different levels of heat energy, and this explains atmospheric temperature. The main factor that influences temperature is the angle of the sun. For example, it is generally hot during the day because the sun is directly above us and it is cold at night because the sun is on the opposite side of the earth. On a map, lines that join places of the same temperature are called **isotherms**.

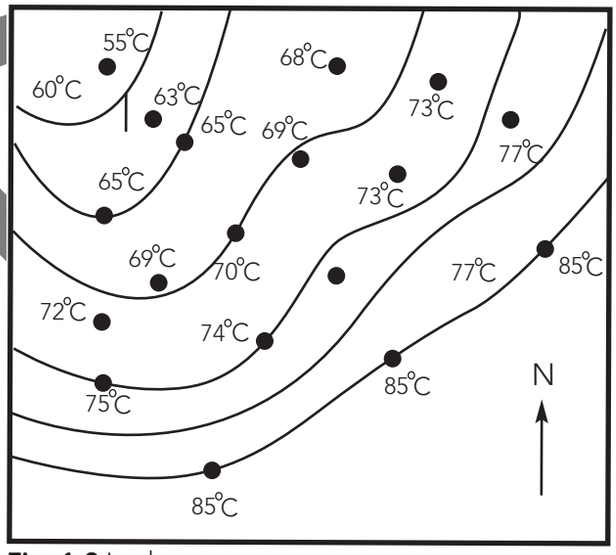


Fig. 1.2 Isotherms

Activity 1.3: Group discussion

What can you say about the temperature today and tomorrow?

The graph on page 16 shows how temperatures may vary on a typical day.

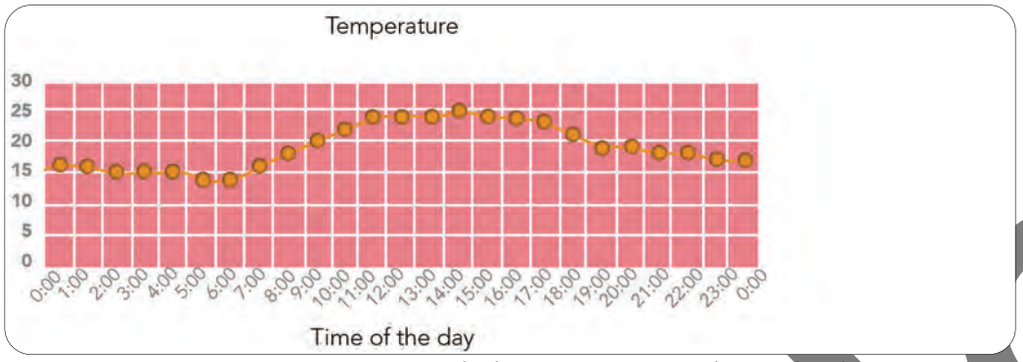


Fig. 1.3 Temperature graph showing variations during the day

Calculating temperature range

The temperature range

The lowest temperature recorded is called the **minimum temperature.**

The highest recorded temperature is called the **maximum temperature**.

The temperature range is calculated by subtracting the daily minimum temperature from the maximum temperature. For example, if the highest recorded temperature was 30 and the lowest was 19, the daily range will be 11.

The same method can be used to find the weekly range, monthly range, and annual range, where the lowest temperature for the week, month or year is subtracted from the highest respective temperatures.

The mean temperature

It is the average temperature of the atmosphere as indicated by a properly exposed thermometer during a given period, usually a day, month, or year.

Daily **average temperature/ mean temperature** is calculated by adding the maximum and minimum temperature for the day and then dividing by two.

The weekly average is calculated by summing up the daily averages and dividing by seven.

The average temperature for the month is calculated by adding the daily averages for the whole month and then dividing this by the number of days in the month.

Annual average is calculated by adding monthly averages and then dividing by twelve (the number of months in a year).

The following table shows recordings done at a weather station at Viriri Secondary School in Rusape during the first week of November 2017.

Activity 1.4: Brain writing

Complete the table on the next page by filling in the averages and ranges for each day. Use the answers for the questions that follow. The first day has been done for you.

Topic link
Precipitation will be covered in more detail in **Unit 1.4**.

Atmospheric Pressure

This is the 'weight' of the atmosphere on a surface at a particular place and time. Air has weight and it exerts the weight on Earth and this is what constitutes atmospheric pressure. A simple demonstration of atmospheric pressure at work is shown when we drink a liquid with a straw. When air is sucked out of the straw, atmospheric pressure pushes the liquid up as shown in **Fig. 1.5**.

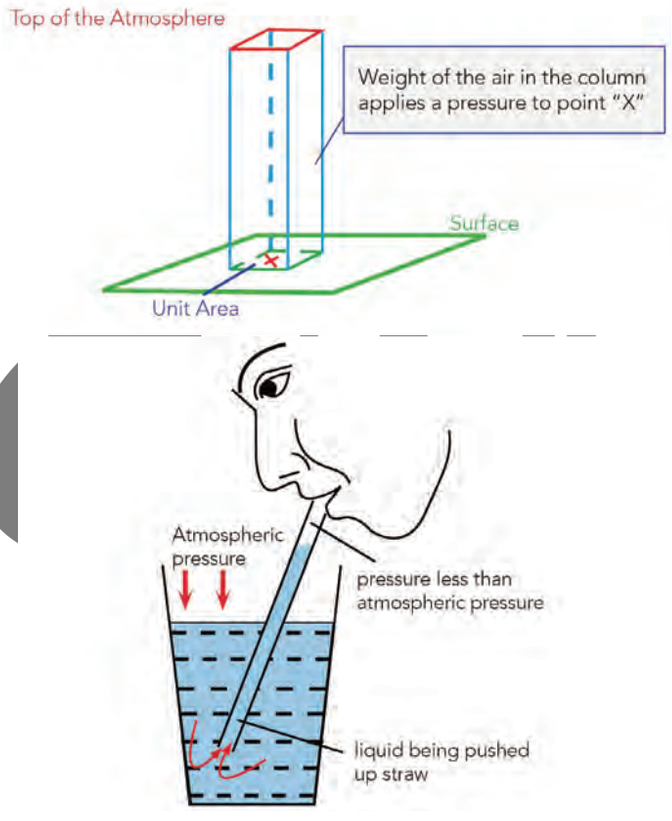


Fig. 1.5 Pressure exerted by the weight of atmosphere

The height above **sea level** is called **altitude,** it has a great impact on atmospheric pressure. Pressure decreases as altitude increases because the weight of the atmosphere becomes less and less.

Pressure is measured in **millibars on a barometer**. There are different types of barometers and the two that are commonly used are **mercury** and **aneroid** barometers, much will be discussed about barometers in the next unit. On a map, the lines that join places of the same pressure are called **isobars.**

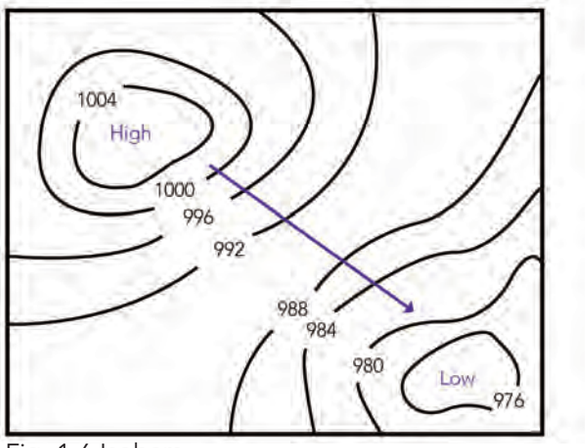


Fig. 1.6 Isobars

Temperature also affects pressure. High temperature creates low pressure conditions whilst low temperature increases pressure. When the temperature is high, the air is heated and it becomes light causing it to rise. This results in low pressure. When temperature drops, the air becomes heavy causing it to sink. This results in high pressure.

Sunshine

This represents the sun's light that is unbroken by cloud cover. Simply put, sunshine is the direct light from the sun. It is measured using a **sunshine recorder** in hours per day. The amount of sunshine has an impact on a lot of industries like tourism and agriculture as it influences weather patterns.

Fig.1.10 Shining sun

Activity 1.8: Group discussion

1. How is sunlight important for tourism and agriculture?
2. Can you think of other industries that are impacted by weather?
3. In what ways are they impacted?

Cloud cover

A cloud is a mass of water droplets or ice crystals floating in the atmosphere. Cloud cover is the fraction of the sky that is **obscured** by clouds. It is usually measured through eye observation. The unit of measurement is the **oktas.** Clouds have a huge impact on weather and climate. They bring rain and reflect sunlight back to **space**, contributing to the cooling of our planet.

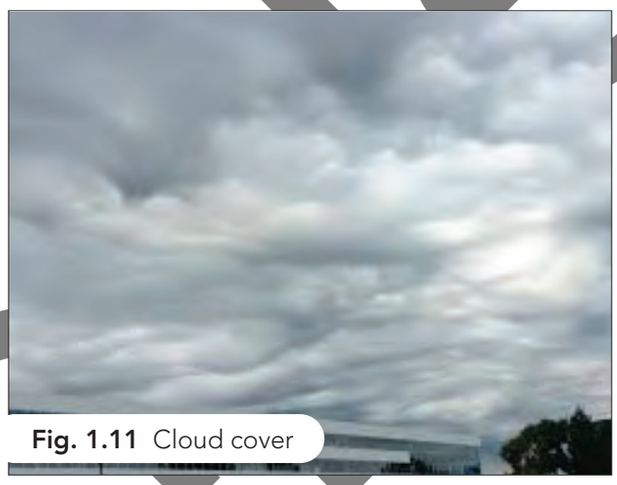


Fig. 1.11 Cloud cover

There are several types of clouds and we need to classify them. The classification can be done in terms of height, form and colour. However, the most popular classification is by height. As shown in **Fig. 1.12**, low clouds include cumulus and nimbostratus. These are heaped clouds that give rise to rainfall. The cumulonimbus is associated with heavy rainfall, thunder and lightning. The middle clouds are the stratus, altostratus and stratocumulus, which are layered clouds. The high clouds are the cirrus, cirrocumulus and cirrostratus, which are wispy and feathery.

Did You Know?
One can tell the temperature by counting a cricket's chirps.

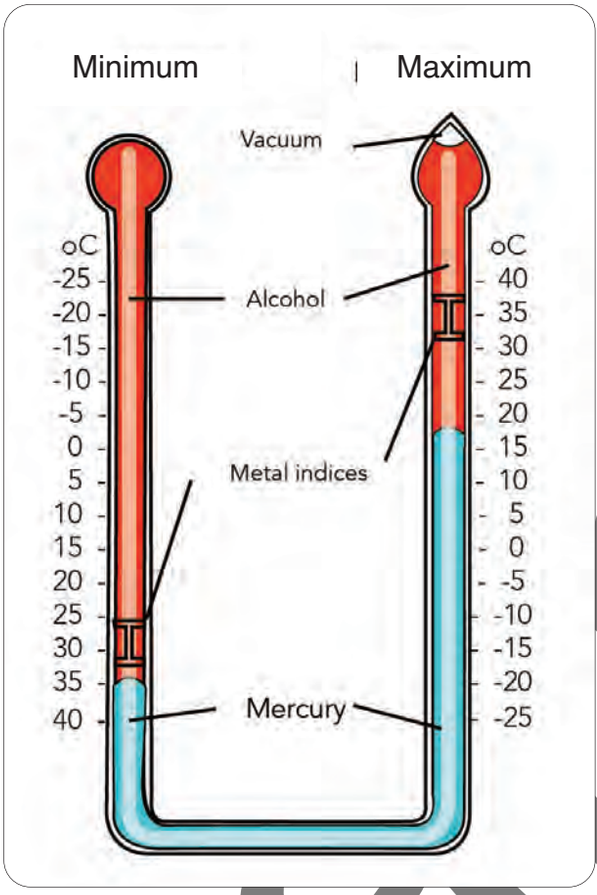


Fig. 1.17 Six's thermometer

How it works

The Six's thermometer is a single instrument with a U shape. It is believed to have been discovered by a British scientist by the name James Six around 1789. The right-hand side is the maximum side which records the maximum temperature whilst the left-hand side is the minimum side that measures the lowest temperature reached.

1. When the temperature rises, the alcohol expands and pushes the mercury up on the maximum side, which in turn pushes up the metal index on the right to record the maximum temperature reached.
2. When the temperature drops, the alcohol contracts, drawing the mercury up on the minimum side. Alcohol pulls the metal index with its **meniscus**.
3. On both sides, the alcohol measures the temperature whilst the mercury displays it.
4. As the temperature changes, the metal indices will remain in their new positions unless the temperature becomes higher or lower than already recorded.
5. In Six's thermometers, the expansion of alcohol indicates the temperature changes.
6. After the recording is done, the Six's thermometer must be reset with a magnet, which pulls the metal indices back to their original positions.
7. The bulb at the top of the minimum scale is full of alcohol, whist the bulb at the top of the maximum scale is a **vacuum**. The empty bulb allows the free movement of mercury and alcohol.

Activity 1.10: Group discussion

What purpose is served by the following in a Six's thermometer?

- Alcohol
- Mercury
- Metal index
- Vacuum

WORD POWER

Condensation change of a gas into liquid.

Dew point temperature is the level at which water vapour is cooled to saturation, triggering the process of condensation which changes water vapour to liquid.

Infiltration entry of water into the soil under the influence of a gradient.

Water table the boundary that separate the permanent zone of saturation from the zone of non-saturation.

Types of rainfall

Rainfall is classified into three types, depending on how the air rises to form clouds. These three types are convectional rainfall, relief rainfall and frontal rainfall.

Activity 1.23: Brain writing

1. Describe the main processes leading to the formation of rain.
2. What are the sources of moisture that give rise to rainfall formation?

Convectional rainfall

Convectional rainfall occurs when the sun heats the ground, causes warm air to rise, cools then expands. The cooling continues up to condensation level as the air ascends. Water vapour then condenses to form clouds, which bring rainfall. The type of cloud associated with this type of rainfall is the cumulonimbus, which causes heavy rainfall, sometimes with thunder and lightning.

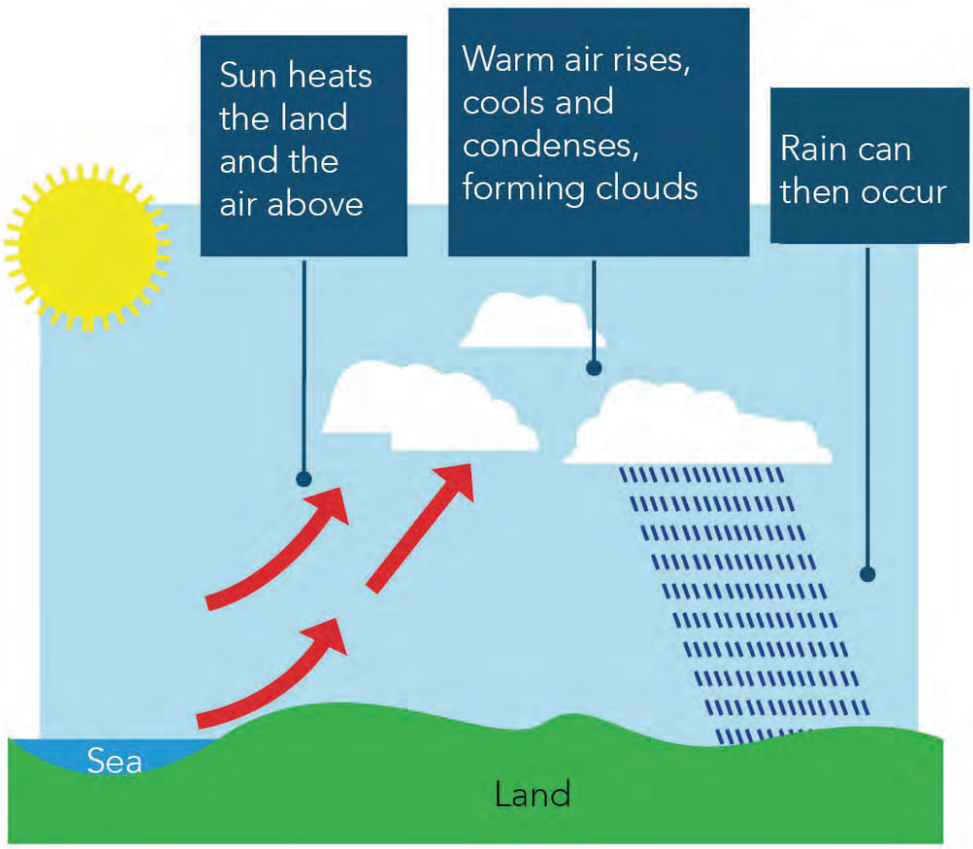


Fig. 1.48 Convectional rainfall

Case Study: Climate change

Zimbabwe is not spared from the threats of climate change, which has become an unfortunate reality in the world. When we say climate change, we are looking at the shift from the climate and weather trends which used to happen in the past. Climate change is mainly caused by global warming emanating from both human and natural factors. Global warming is a topical challenge as human beings mostly cause it. It is the gradual increase in global temperatures as caused by increasing greenhouse gases in the atmosphere. The gases mostly come from industries and increased veld fires.

These gases trap atmospheric heat causing temperatures to increase. This has caused a lot of problems such as increased incidences of droughts, pests and diseases. Evidence of climate change is the melting ice mostly in extremely cold areas, which has been recently experiencing rising temperature. This has contributed to the increase in flooding, another hazard which is linked to climate change. It is a known fact that Zimbabwe experienced droughts in 1982, 1992, 2002, 2012 and 2016, these are a clear indication of the problems of climate change. In Southern Africa, the Elnino weather phenomena is also causing droughts as the movement of wind is affected by low pressure over the Pacific Ocean. The increase in weather hazards is also an indication that climate is changing, and the world must brace for more of these hazards such as floods, droughts and heat waves.

TOPIC LINKS

You will learn more about weather hazards and climate change in Forms 2 and 4, topic 1 respectively.

Droughts

A drought occurs when rainfall is below the normal level for a given region, over a long period. It is the lack of water in an area at a given time and has great effects on human beings, crops and animals. The causes and effect of droughts will be covered in form two. It important to highlight that Zimbabwe faced droughts in 1982, 2002, 2012, a trend which translates into the conclusion that the country is likely to have a drought within a period of ten years.

TOPIC 2 Landforms

THE BIG PICTURE

- The study of landforms and landscapes is very important to learners as it allows them to appreciate the natural and man-made features within their communities and the country at large.
- These features can be a source of community and national wealth through activities such as tourism or even direct extraction of resources such as minerals.
- Human beings have designed landscapes that have complimented natural landforms in beautifying the environment. The Great Zimbabwe is an example of an amazing landscape built by human beings and together with the surrounding hills, the landscape has become an amazing scenery.
- An exploration of landforms and landscapes will made with some visual presentation of the features.

Units covered

2.1 Landforms

2.2 Landscapes

WORD POWER

Deposition dumping of material by water in the river.

Gradient steepness of the land or the terrain of the surface.

Lateral erosion removal of materials on river-banks.

River-bed the potion in which water flows in the river.

Vertical erosion the removal of material on the river-bed.

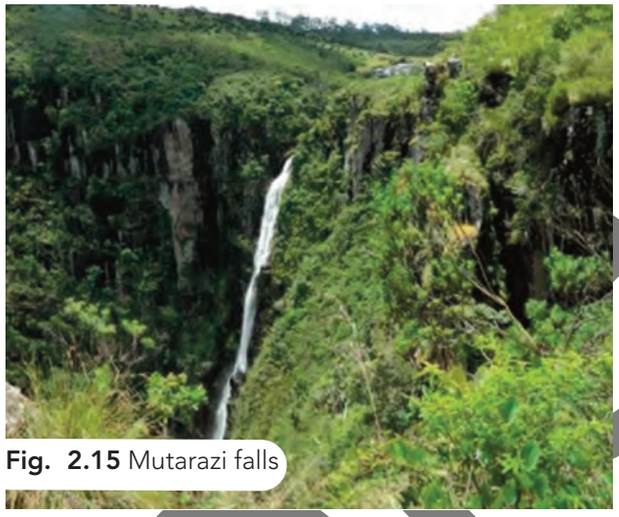


Fig. 2.15 Mutarazi falls

Landforms on the upper course of the river include steep-sided valleys, **interlocking spurs**, and waterfalls. These are formed because of fast-flowing water which has energy, thereby causing vertical erosion. The middle course is characterised by both erosion and deposition, forming features such as **meandering streams**, potholes and bluffs. The lower course is dominated by deposition and the main feature is usually the **flood plain** which is the low-lying plain of deposited material found at the lower course of the river. River landforms such as **oxbow lakes**, rapids and many others are found either on the middle course or lower course depending on the nature of the river-bank and river-bed **Deltas** are formed at the mouth of the river when the rate of deposition is higher than the rate of wave erosion.

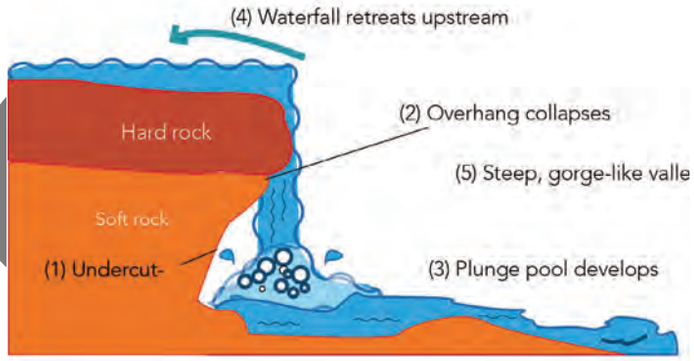


Fig. 2.16 Sketch of a water fall

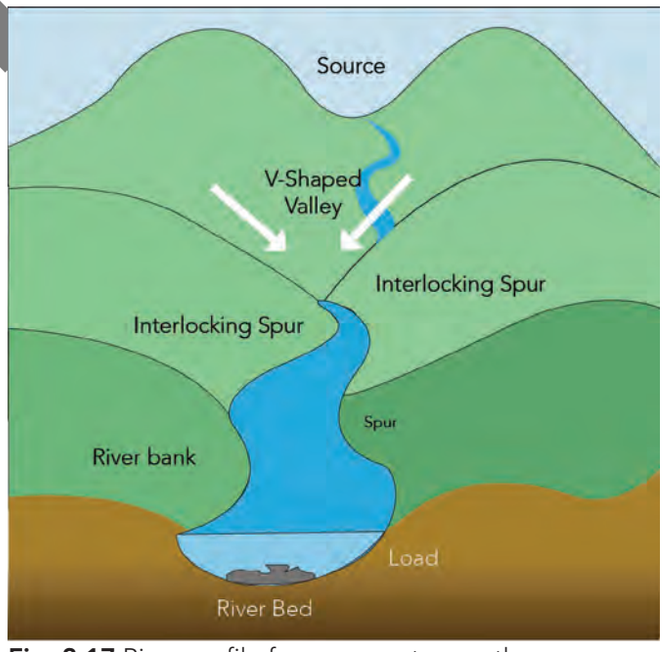


Fig. 2.17 River profile from source to mouth

Activity 2.11: Brain writing

In pairs, answer the following questions

- When was the Great Zimbabwe build?
- Where is it found?
- What is the great enclosure and why was it important?

Did You Know?

The present name of the country was derived from Great Zimbabwe. Naming the country after the famous ruins was a move to form a national identity from its past.

SUMMARY

- Landforms are found everywhere that is at a local, regional and global level.
- Some examples of landforms are mountains, hills, escarpments, and gaps among many others.
- Landforms are being constantly shaped by processes such as weathering and erosion.
- Rivers have a lot of features within them, which are formed because of erosion and deposition.
- Landscapes form the view of the land as influenced by specific landforms and human activities.
- Human beings and animals derive many benefits from landforms: animals can use them as shelter while human beings can get minerals and use the landforms as religious shrines.

GLOSSARY

Delta a landform which is formed at the mouth of the river due to deposition of sediments.

Erosion the removal of top soil by either running water or wind.

Floodplain a low-lying area adjacent to the river formed as a result of deposition in the lower course of the river

Landforms physical features that make the outlook of the surface.

Landscape natural and man-made features of the earth's surface.

Castle kopje a blocky hill formed due to weathering along the rock joins to leave blocks of rocks stacked above one another.

Pilgrimage a journey to a location of spiritual significance.

Ruware an emerging granite outcrop initially formed under the surface through volcanic intrusion and then exposed through erosion.

Tectonic activity crustal movement of either continental or oceanic crusts.

Wetland an area that is permanently or seasonally waterlogged.

EXERCISE 2

1. A plateau is known by having a top part that is _____.

   A. steep B. round
   C. flat D. narrow

2. The process leading to the formation of castle kopjes is _____.

   A. weathering. B. Deposition
   C. lateral erosion D. Earthquakes

TOPIC 3 Ecosystems

THE BIG PICTURE

- Living and nonliving things are linked together through various processes which allow a give and take relationship.
- It is therefore important to study ecosystems which explores the components of the earth both living and nonliving to get an appreciation of interactive processes which sustain them.
- In this case, learning is not a journey of disjointed episodes but an integrated venture meant at establishing how life is intricately linked to the lifeless.
- In this topic comprising of three units the learners shall walk through the knowledge of systems, components of the ecosystems and their linkages.
- The knowledge shall form the basis of understanding what surrounds them in their communities.

Units covered

3.1 Components of ecosystems
3.2 Micro ecosystem
3.3 Interdependency in ecosystems

In an ecosystem, there are distinct parts which combine to make a whole; just like the human body is made up of different body parts that work together to form a functioning system. The study of an ecosystem entails the study of how living things (**biotic**) interact with the non-living things (**abiotic**).

Biotic components

The biotic components include the plants, human beings, animals, micro-organisms and their waste materials and other living organisms. Biotic components can be classified into three categories:

Producers these include all the **autotrophs**. They use light energy and synthesise food on their own, for example plants.

Consumers these include all the **heterotrophs** that directly or indirectly depend on producers for their food. Consumers are further categorised as herbivores, carnivores, omnivores and parasites.

Decomposers these include **saprophytes** which act on dead matter and decay them for their nutrition.

Abiotic components

Abiotic components of an ecosystem include all chemical and physical elements that is, non-living components. Abiotic components can vary from region to region and from one ecosystem to another. They mainly take up the role of life supporter. They determine and restrict the population growth, number, and diversity of biotic factors in an ecosystem. Hence they are called limiting factors. Use **Fig. 3.2** to identify the living and nonliving components of the ecosystem.

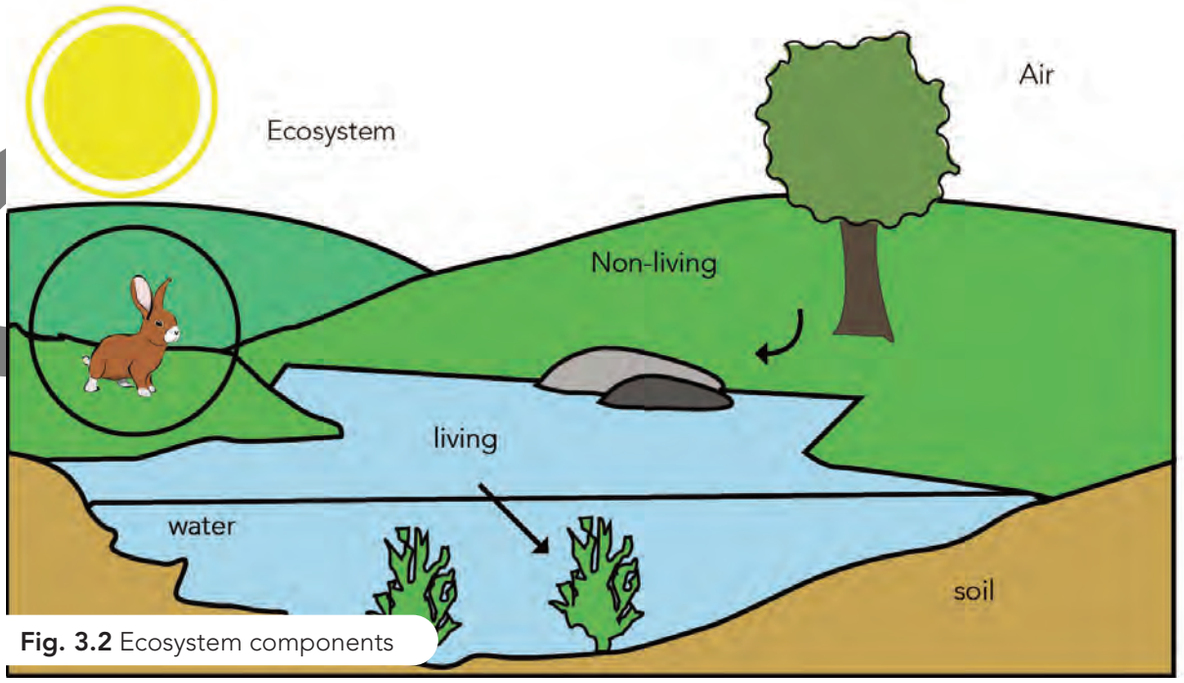


Fig. 3.2 Ecosystem components

Did you know?

Hwange National Park is home to one of the highest concentration of game, especially elephants. Covering more than 14,600 square kilometers (5,863 square miles) or 1,460,000 hectares it has more animals and a greater variety of species - 107- than any other park in the country, and more than 400 species of birds. It is situated at south west of Zimbabwe between Bulawayo and Victoria Falls.

WORD POWER

Photosynthesis a process by which green plants manufacture food in the presence of sunlight water and carbon dioxide.

Trophic levels can be illustrated using food **pyramids of numbers**, which show stages in the feeding system of a food web. At each stage, there is a decrease in the quantity of organisms. For example, in an ecosystem lions feed on hares hence the lions should be fewer than the hares. Herbivores should not be too many for the vegetation in an area as this can cause depletion of the vegetation and the ecosystem is disrupted. Organisms in lower trophic levels should be more than those in upper trophic levels to maintain a balance in the ecosystem. At each trophic level, there is loss of energy due to metabolic action, passage of waste and tissue building.

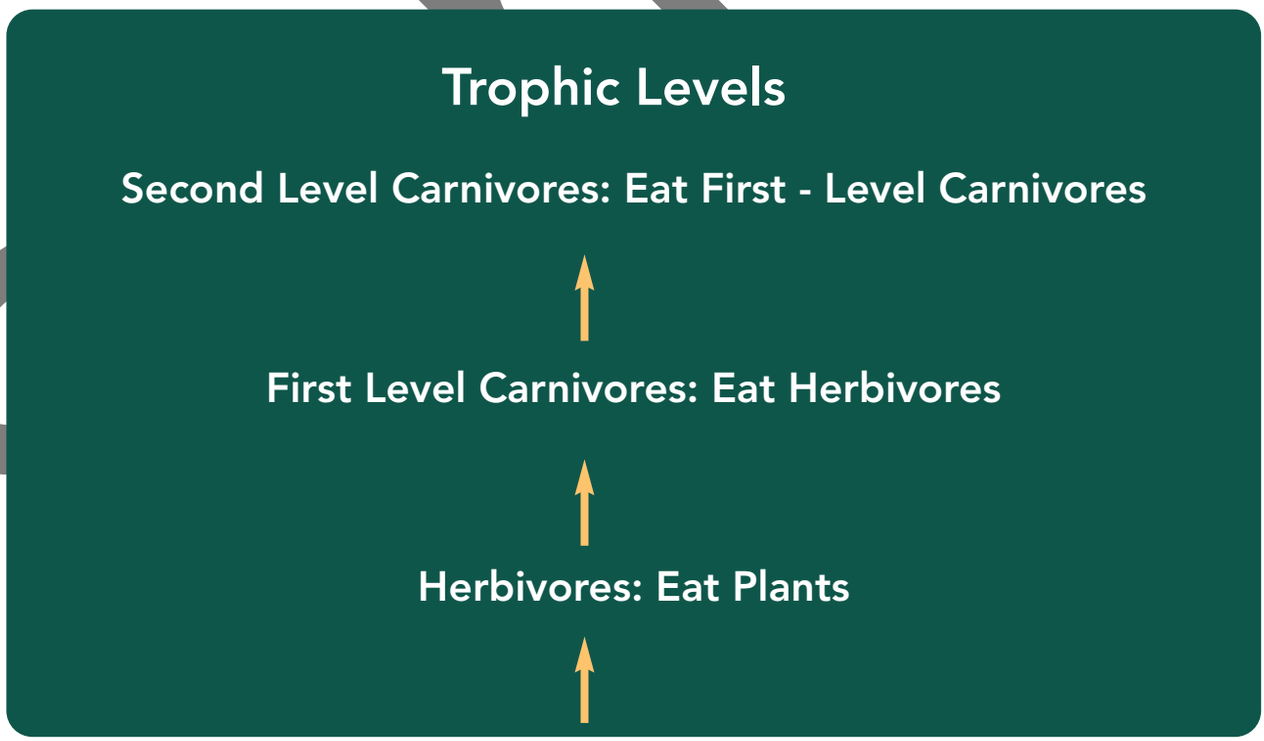


Fig. 3.7 Trophic levels

Case study: Natural resource, wild life management

In Zimbabwe, we have natural resources, such as wildlife, which are under threat from human exploitation. Efforts to sustainably manage wildlife include the Communal Management Programme For Indigenous Resources (**CAMPFIRE)** projects in districts such as Tsholotsho, Bulilima and Guruve. These projects have integrated local communities in the management of their local resources and the sense of ownership created has given rise to the proper management of the resources. Under CAMPFIRE, local communities collectively manage their resources from which they benefit through tourism, controlled hunting or legal selling of wildlife. The fact that communities have direct benefits from local wildlife means that they will be motivated to conserve wildlife for continued benefits in future. This is an example of how resources can be sparingly used to create sustainability.

Topic link

You will learn about wildlife management in **Book 3, Topic 4.**

Activity 4.7: Class discussion

Why is management of natural resources important for communities and the nation at large? (Refer to CAMPFIRE projects).

Forestry conservation

Forest resources are also under threat as demand for **arable land** continues to rise. To address this, efforts have been made to ensure that the law protects indigenous trees. Furthermore, a tree planting programme has been given **impetus** through the presidential declaration of the first Saturday of December as a tree planting day in the entire country. Institutions such as schools, colleges and even communities have been encouraged to participate in this important project. The forest commission is partnering with some communities in establishing woodlots; a case in point is the Leaf Tobacco Company plantations near Macheke as we move along the Mutare Harare main road. Some schools such as Peter House have come up with very good afforestation programmes through thriving gum tree plantations at their schools. The afforestation programme is also being funded by the leaf tobacco company. The **conservation** and **preservation** of forests in Zimbabwe forms the basis for the protection of our critical form of natural heritage.

Fig. 4.8 People planting trees on tree planting day

9. Which of the following is an example of a landform?

A. Volcano
B. Bridge
C. Monument
D. Village

10. The difference between a landform and a landscape is that _____.

A. Landforms are spectacular whilst landscapes are low
B. Landforms are human made whilst landscapes are natural
C. Landforms are a result of natural processes whilst landscapes are from both natural and human processes
D. Landforms are formed under the earth's surface whilst landscapes are formed on the surface

11. The landform is a blocky inselberg which was formed under the surface and exposed through erosion. The landform described is a _____.

A. Ruwares
B. Dwala
C. Fold mountain
D. Castle kopje

12. Mr and Mrs Tshuma from Umguza rural district live near a hill. What benefit are they likely to derive from this landform?

A. Sun bathing
B. Water harvesting
C. Predicting weather
D. Fire wood collection

13. The following landform is in Africa and was formed as a result of faulting.

A. Mount Kilimanjaro
B. Congo basin
C. East Africa rift valley
D. Sahara Desert

14. A system has living and non-living components. Identify the living component of the ecosystem amongst the following.

A. Plants
B. Soil
C. Rocks
D. Air

15. Autotrophs are producers of food in the ecosystem. Which process do they use to produce the food?

A. Respiration
B. Photosynthesis
C. Decomposition
B. Radiation

16. Which of the following is a micro ecosystem?

A. A large forest
B. An extensive dam
C. Tree trunk
D. A mountain

17. Biotic elements of an ecosystem comprise _____.

A. All elements of weather
B. Herbivores in the ecosystem
C. Water and air in the ecosystem
D. Animals and plants in the ecosystem

TOPIC 5 Energy and Power Developement

THE BIG PICTURE

- This topic is very important as it explores the types and sources of energy in the country.
- The learners will appreciate the energy sources in their communities and find ways of managing them well.
- The factors affecting the siting of different power stations will be examined with specific examples from Zimbabwe and the world over.
- The uses of different sources of energy have effects on the environment and it is the responsibility of the citizens to make sure minimum damage to the environment is done.
- The environmental impacts of using some types of energy sources will be exposed with the aim of crafting out ways of providing mitigation measures.
- This is quite an exciting topic which has a great bearing on the development of our communities and the nation at large.

Units covered

5.1 Types and sources of energy
5.2 Siting of power plants
5.3 Power generation
5.4 Environmental impact from generation and use of energy

Renewable energy sources

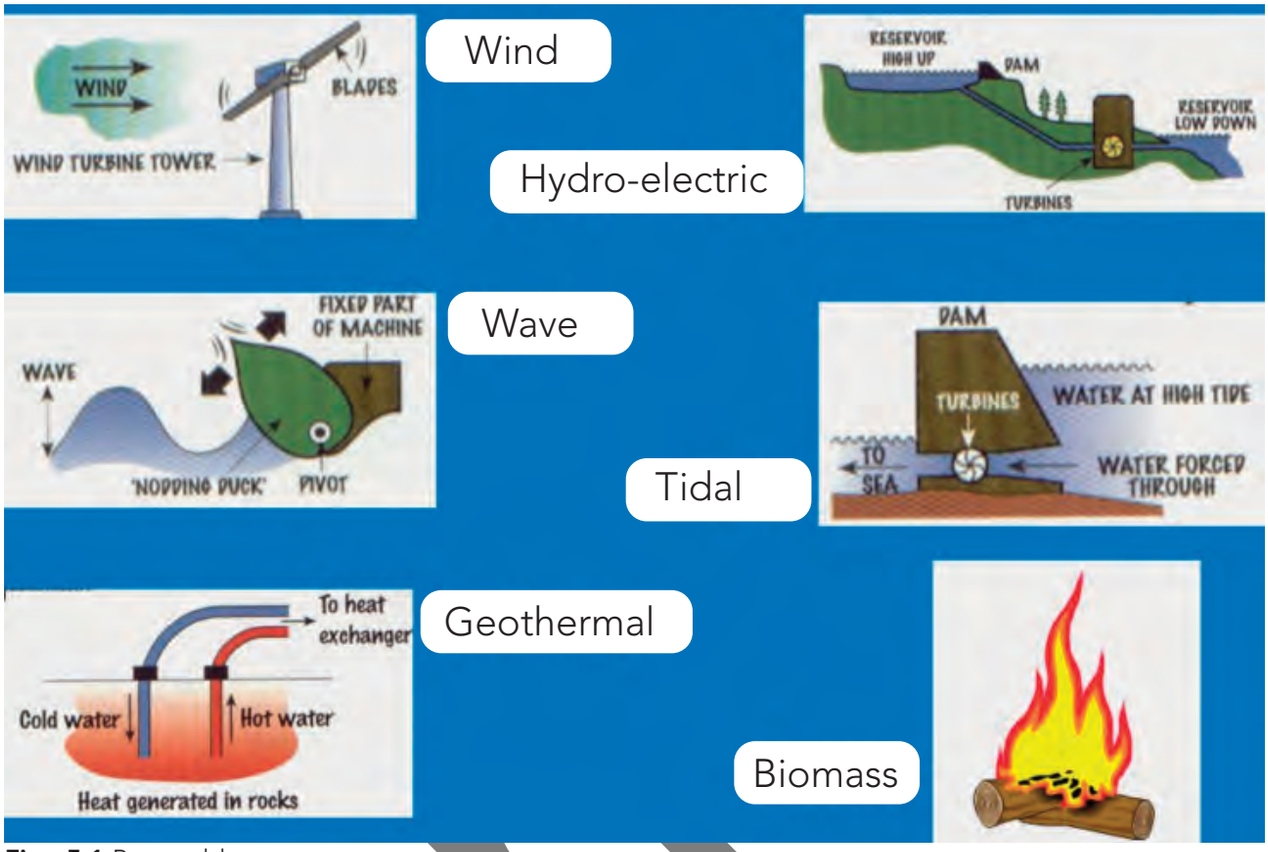


Fig. 5.1 Renewable energy resources

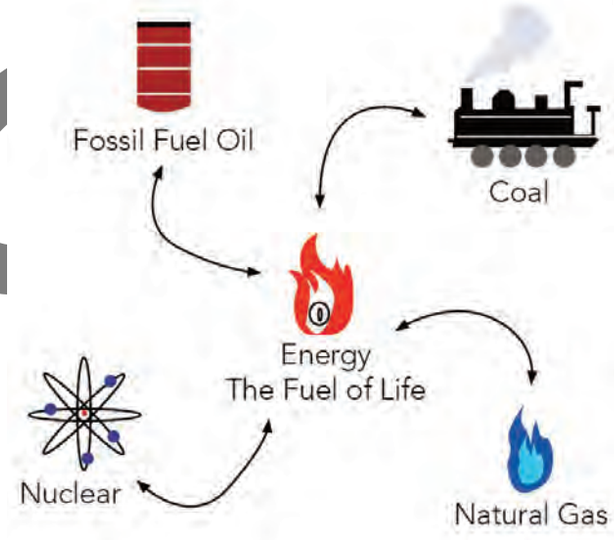


Fig. 5.2 Non-renewable energy resources

Types of fuel and their sources

All energy types, both renewable and non-renewable, have sources as shown in the following table.

Energy type	Sources of the energy
Solar	Sun
Hydro-electric	Running water
Biogas	Decomposing matter
Wood fuel	Trees
Wind power	Air in motion
Fossil fuel	Animal and plant remains
Nuclear	Uranium radiation

Table 5.2 Types of energy

of water, changed water flow and the construction of roads and power lines. Hydro-electric power plants may affect fish living in the water.

- **Expensive** The construction of the hydro power station is expensive as it requires heavy duty machinery, man-power, and funding to ensure the smooth run of the construction process.
- **Affected by weather conditions** In the event that there is low rainfall experienced, the amount of power generated is relatively low.
- **High risk of flooding** When the dam collapses, there are high possibilities of experiencing floods in the nearby areas.

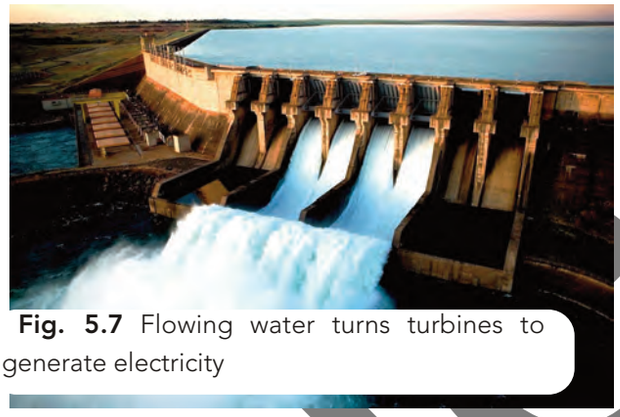
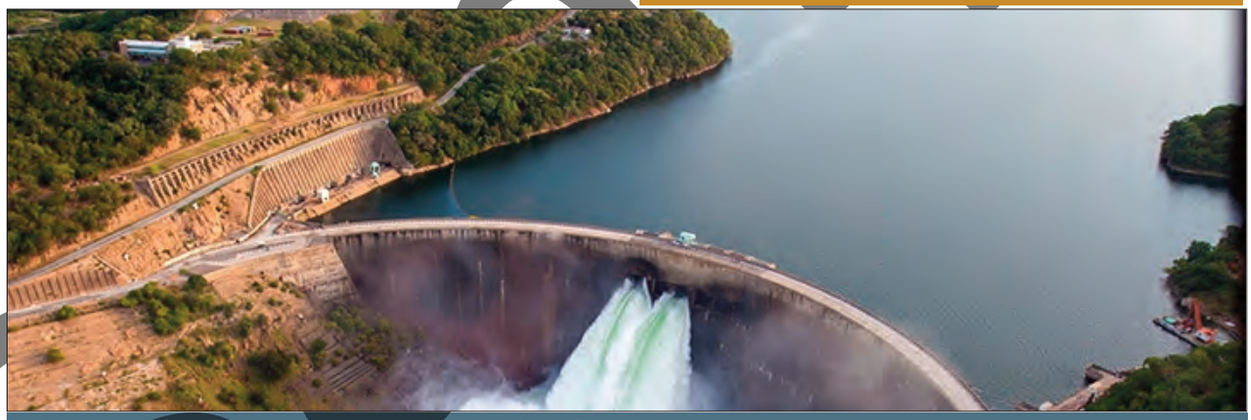


Fig. 5.7 Flowing water turns turbines to generate electricity

Did You Know?

The name Kariba comes from the local word *kariva* or *karinga*, meaning 'trap', which refers to a rock that was thrust out of the swirling water at the entrance of the gorge, where the dam wall was to be built.



Case study: Power generation at Kariba

The Kariba power plant was built during the federation of Rhodesia (Zimbabwe and Zambia) and Nyasaland (Malawi) by an Italian company. This is where most power for Zimbabwe comes from. Water leaves Kariba head waters at a high speed and then passes through the penstock which is made of concrete or steel pipes. The high-speed flowing water reaches the turbines and then turns them into a spinning and rotating motion. The turbines turn the generators which then produce electricity. From the generators the electricity is transmitted to the step down transformer where regulation of electricity is done before the power lines transmit the energy to various parts of the country.

TOPIC 8 Environmental Management

THE BIG PICTURE

- Sustaining environments in a state of quality is a responsibility of human kind, so the inclusion of this topic in the curriculum is a welcome development as it enlightens learners on environmental aspects and how they should be maintained.
- In this topic, the environmental aspects such as air, land and water will be explored.
- The difference between the degraded and pristine environment will be visited with some specific examples.
- The role of indigenous knowledge system in environmental management will be discussed with attention to the Zimbabwean scenario.
- The environment management concept will be analysed as a way of bringing more precision to environmental management issues.

Units covered

9.1 Aspects of the environment
9.2 State of the environment
9.3 Environmental management

Indigenous knowledge system and the environment

Indigenous knowledge refers to the understandings, skills and values developed by people's societies with long histories of interaction with their natural surroundings. The knowledge is locally generated and passed from generation to generation through storytelling and practical interactions. The use of indigenous knowledge system is very important in environmental management particularly in communities which follow their traditions. Knowledge of the natural world is not confined to science. Societies from all parts of the world possess rich sets of experiences, understanding and explanations as a basis for protecting their natural resources. The environment is protected through a set of taboos, totems and sacred places which stop people from abusing the environment.

There are certain plants which are not proper for firewood such as several indigenous fruit trees. This has great effect in stopping desertification. Some water pools are considered sacred hence they remain untouched by human activities protecting them against pollution. Killing a python in an area is believed to cause drought and this has the effect of protecting the python species.

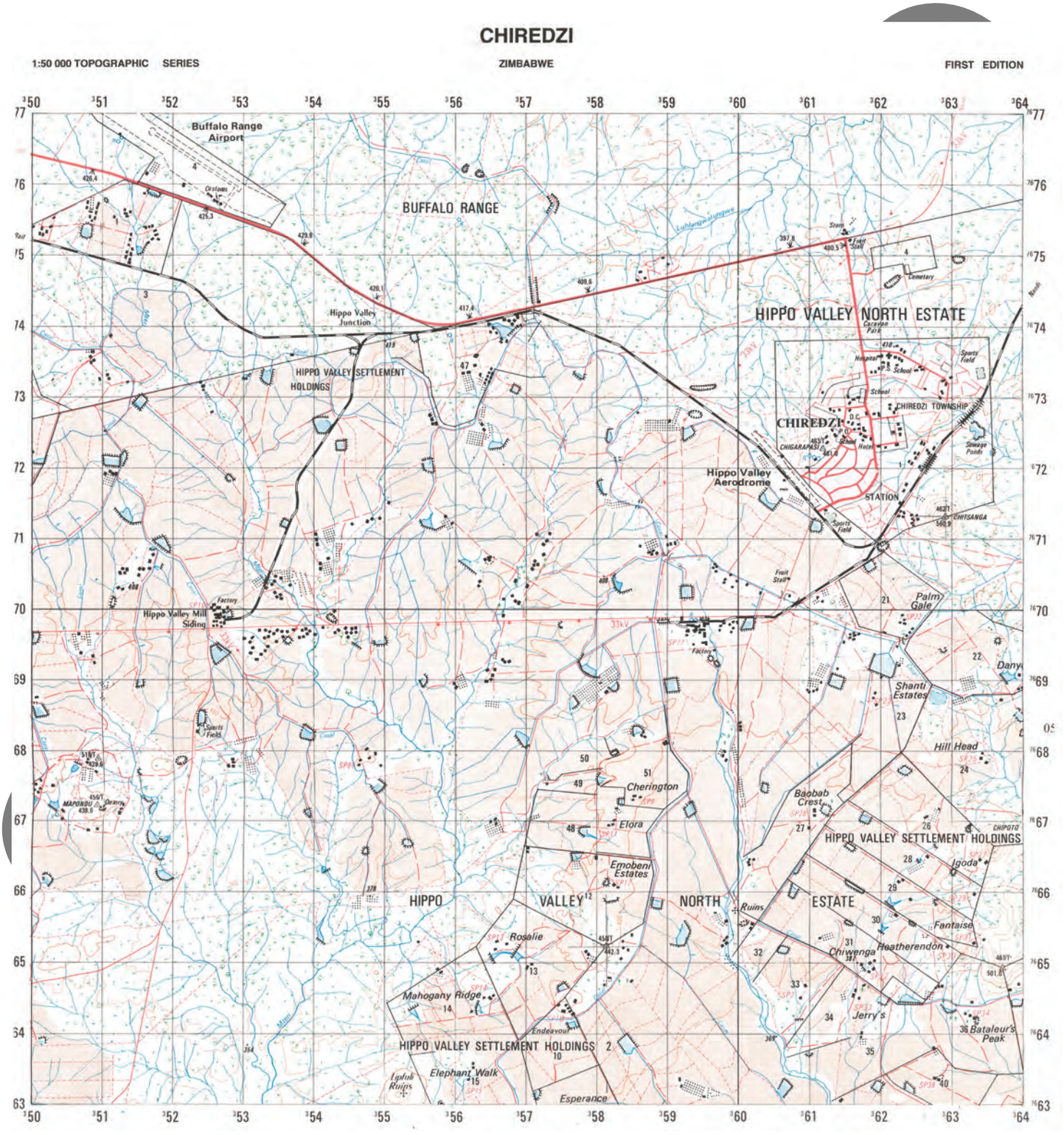
Totems can also go a long way in protecting environmental species as it is taboo to eat animals associated with specific totems. The people with *Shumba/Sibanda* (lion) totem have great respect for the animal lion and as such, they do not subscribe to the animal being killed for no reason. This is the same situation with all other animal related totems and in that respect, wildlife protection is enhanced. It is believed that killing and eating the meat of an animal that belongs to one's totem carries the natural penalty of losing teeth. In Zimbabwe, **totemism** is the practice of symbolically identifying humans with non-human objects such as animals.

Fig. 8.8 Lion (*Shumba/Sibanda* totem)

Some mountains are sacred thereby protecting both the animals and vegetation in the mountain and surrounding areas. Some animals are considered unholy and this can go a long way in protecting them. This is very much linked to the religious beliefs of a society; an example is that the bible discourages the eating of meat of some animals as suggested in the Christian bible in the old Testament.

END OF TERM 2 TEST
ANSWER ALL THE MULTIPLE-CHOICE QUESTIONS
THE PAPER IS 2 HOURS LONG
SECTION A [25 MARKS]

Use the map of Chiredzi provided to answer questions one to 12.



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