



Ministry of Education
and Sports

HOME-STUDY LEARNING

S E N I O R
1

GEOGRAPHY

August 2020



Published 2020

This material has been developed as a home-study intervention for schools during the lockdown caused by the COVID-19 pandemic to support continuity of learning.

Therefore, this material is restricted from being reproduced for any commercial gains.

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FOREWORD

Following the outbreak of the COVID-19 pandemic, government of Uganda closed all schools and other educational institutions to minimize the spread of the coronavirus. This has affected more than 36,314 primary schools, 3129 secondary schools, 430,778 teachers and 12,777,390 learners.

The COVID-19 outbreak and subsequent closure of all has had drastically impacted on learning especially curriculum coverage, loss of interest in education and learner readiness in case schools open. This could result in massive rates of learner dropouts due to unwanted pregnancies and lack of school fees among others.

To mitigate the impact of the pandemic on the education system in Uganda, the Ministry of Education and Sports (MoES) constituted a Sector Response Taskforce (SRT) to strengthen the sector's preparedness and response measures. The SRT and National Curriculum Development Centre developed print home-study materials, radio and television scripts for some selected subjects for all learners from Pre-Primary to Advanced Level. The materials will enhance continued learning and learning for progression during this period of the lockdown, and will still be relevant when schools resume.

The materials focused on critical competences in all subjects in the curricula to enable the learners to achieve without the teachers' guidance. Therefore effort should be made for all learners to access and use these materials during the lockdown. Similarly, teachers are advised to get these materials in order to plan appropriately for further learning when schools resume, while parents/guardians need to ensure that their children access copies of these materials and use them appropriately. I recognise the effort of National Curriculum Development Centre in responding to this emergency through appropriate guidance and the timely development of these home study materials. I recommend them for use by all learners during the lockdown.



Alex Kakooza
Permanent Secretary
Ministry of Education and Sports

ACKNOWLEDGEMENTS

National Curriculum Development Centre (NCDC) would like to express its appreciation to all those who worked tirelessly towards the production of home-study materials for Pre-Primary, Primary and Secondary Levels of Education during the COVID-19 lockdown in Uganda.

The Centre appreciates the contribution from all those who guided the development of these materials to make sure they are of quality; Development partners - SESIL, Save the Children and UNICEF; all the Panel members of the various subjects; sister institutions - UNEB and DES for their valuable contributions.

NCDC takes the responsibility for any shortcomings that might be identified in this publication and welcomes suggestions for improvement. The comments and suggestions may be communicated to NCDC through P.O. Box 7002 Kampala or email admin@ncdc.go.ug or by visiting our website at <http://ncdc.go.ug/node/13>.



Grace K. Baguma
Director,
National Curriculum Development Centre

ABOUT THIS BOOKLET

Dear learner, you are welcome to this home-study package. This content focuses on critical competences in the syllabus.

The content is organised into lesson units. Each unit has lesson activities, summary notes and assessment activities. Some lessons have projects that you need to carry out at home during this period. You are free to use other reference materials to get more information for specific topics.

Seek guidance from people at home who are knowledgeable to clarify in case of a challenge. The knowledge you can acquire from this content can be supplemented with other learning options that may be offered on radio, television, newspaper learning programmes. More learning materials can also be accessed by visiting our website at www.ncdc.go.ug or ncdc-go-ug.digital/. You can access the website using an internet enabled computer or mobile phone.

We encourage you to present your work to your class teacher when schools resume so that your teacher is able to know what you learned during the time you have been away from school. This will form part of your assessment. Your teacher will also assess the assignments you will have done and do corrections where you might not have done it right.

The content has been developed with full awareness of the home learning environment without direct supervision of the teacher. The methods, examples and activities used in the materials have been carefully selected to facilitate continuity of learning.

You are therefore in charge of your own learning. You need to give yourself favourable time for learning. This material can as well be used beyond the home-study situation. Keep it for reference anytime.

Develop your learning timetable to cater for continuity of learning and other responsibilities given to you at home.

Enjoy learning

Term 1

TOPIC: WAYS OF STUDYING GEOGRAPHY: FIELDWORK, PHOTOGRAPHS, STATISTICS, CHARTS AND GRAPHS

Instructions:

- You will be studying one lesson each day. Try to do all activities programmed for each day.
- Remember that some activities may take you more than one hour to complete.
- Read the instructions carefully before you begin doing each activity.
- In case you find any activity difficult, ask an older person around you to assist you.

Lesson 1: Learning Geography through Fieldwork

Learning outcomes

By the end of this lesson, you should be able to:

- a. know what fieldwork is.
- b. understand how to use and apply different techniques used in fieldwork.
- c. use fieldwork to study a local area.
- d. appreciate that fieldwork is important because geography is the study of the real world.

Materials you need:

a notebook, pen, pencil, clipboard, rubber, and telephone hand set or camera (if you can get one)

Introduction

You already know how to use a map to show the Geography of an area. Do you remember how we represent things on a map? To draw a map of an area which we can reach, we visit the area so that we can collect information about it. In this lesson you are going to learn about fieldwork as one of the methods of learning about places and features. You are also going to look at the importance of fieldwork in finding out geographical information.

What is fieldwork?

Activity 1

Walk around your home area and do the following:

1. Look around and write down the natural and built features.
2. Ask people about the activities they carry out in the area and the reasons why they do so.
3. Write a report about what you have found out.
4. Share your findings with your school year mate in the neighbourhood if there is one.

As you moved around your home area you were able to see the different features. You also identified the activities carried out by the people. The information you collected is the Geography of the area around your home. The area from where you collected the information is called the **field**. This field is, therefore, a source of geographical information. The visit you made to the field to collect information is called a **fieldwork study**.

How do we study geography through field work?

In order to use fieldwork to get information about a given area, there are certain steps which you have to follow. Also, there methods which you can use. To help you understand this, do the following Activity.

Activity 2

1. In your exercise book write down the things you did in preparation for the field.
2. If possible, share your work with your school year mate and make comparisons.

You have probably written that you created a topic of your study, reasons for the study, and ways of collecting information about the area, planned the route you would follow and where you would end. The reasons for going to the field are called the **objectives** of the field study. You may also have written down the things you needed to go with. All these activities are called **preparation for fieldwork**.

Collecting information in the field

Activity 3

In your notebook:

1. Explain how you used the collected information in the field.
2. Suggest a suitable name you can give to each of the methods you have explained in (1) above.
3. Draw a sketch map of the area you studied and on it show physical and human features.
4. If possible, share your work with your school year mate and make comparisons.

In Activity 3, you have probably explained the methods you used, such as use of your eyes to see features and activities carried out in the area. This is known as **observation**. You could also have asked people questions about the activities they carry out. This is known as **interviewing**.

Other ways of collecting information may include drawing field sketches, collecting and studying samples of say, soils; finding out distance or size of some features in the field. We usually use three or more of these methods in order to get detailed information about an area.

Writing a fieldwork report

When we collect information about an area, we use it to write the geography of the area. This is called **writing a fieldwork report**. This report describes what the area we have studied looks like at the time of our study. Basing on the fieldwork study which you carried out in activity 1, list the things you think should be included in a fieldwork report. Do the following activity to check the list which you have written.

Activity 4

Use the information which you collected in activity 3 to write a field work report of the area around your home. Follow the steps below:

1. Write down the topic and objectives of your study. The topic should include **what** was studied and **where** you studied it.
2. Draw a sketch map of the area of your study.
3. Write down the information that you found out about every objective of your study.
4. If you collected any information in form of mathematical figures, present it in tables. You may also represent the same information using charts or graphs.
5. If you took any photographs include them in your report.

Summary

In this lesson you have learnt that:

- One way of finding out geographical information is by carrying out fieldwork studies.
- A fieldwork study involves three steps, namely preparation, collecting information in the field, and writing a fieldwork report.
- The different methods we use to collect information from the field include observation, interviewing, measurement, sampling, drawing field sketches and others.
- A fieldwork report is important because it describes what the area studied looked like at the time of the study.

Follow-up activity

1. Explain why it is important to learn geography through fieldwork.
2. Carry out a fieldwork study of a farm or a trading centre or a town in your home area.
3. Write a fieldwork report about the study.

Lesson 2: Learning Geography through Photographs**Learning outcomes**

By the end of this lesson, you should be able to:

- a. use maps, aerial images, photographs, to communicate information.
- b. recognise the different types of photographs.
- c. describe an area from a photograph.
- d. appreciate that reading photographs is important because Geography is the study of the real world.

Materials you need:

Photographs of different types, a map of any area, telephone hand set or photographic camera, pen, and pencil.

Introduction

In Lesson one, you learnt how we can learn about places which we can reach using fieldwork. However, in geography we also learn about faraway places, and therefore we cannot use fieldwork all the time. In this lesson you are going to learn about photographs and their types and how we can use photographs to learn about faraway places.

How can we learn geography from a photograph?

In order to learn about a place, you have not been to, you can use photographs of that place. You will understand this better as you do **Activity 1**.



Figure 2.1: A highland area in Kisoro

Activity 1

Look at **Figure 2.1** and do the following:

1. In your notebook, write down the natural and human features shown in the photograph.
2. Explain how the human features are related to the natural features in the area.
3. Suggest how the human features might affect the natural environment in the area shown in the photograph.
4. Explain the difference between a photograph and a map.

All that you have found out from the photograph is the geography of the place where the photograph was taken. This has helped you to understand that information about places we have never been to can be got from photographs too. Therefore, photographs are an important source of geographical information just like the field is. You have also learnt that a photograph differs from a map in that whereas a map shows a larger area, a photograph shows features in a smaller area. Also, the photograph shows real objects while a map uses symbols to represent the objects. Additionally, a map uses a compass rose or direction finder to show positions of features on the ground while a photograph does not?

Types of photographs

Activity 2



(a)



(b)

Figure 2.2: Major types of photographs

Look at Figure 2.2 and do the following:

1. Copy the table below into your notebook and fill in the characteristics of each photograph.

Characteristics	
Photograph (a)	Photograph (b)

2. Why do you think the two photographs have different characteristics?

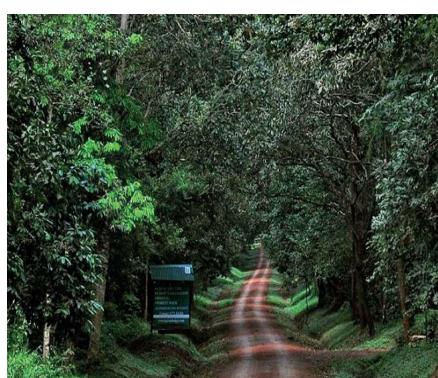
In Activity 2 you have noted that the two photographs are very different. You could have suggested that they are different because they represent different places. This could be true but it is not the reason for such great differences. In fact, photographs differ depending on the angle at which the photographer was looking at the ground.

A photograph taken when the camera is directly facing the features usually shows the features as they appear in reality. It also shows one side of the features. Such a photograph is called a **ground photograph**. Ground photographs can be divided into two types.

Ground photographs taken when the camera is pointing directly at the features without any tilt are called **close up ground photographs**. Such photographs do not show the skyline or horizon at the far end. On the other hand, ground photographs taken when the camera is tilted at an angle less than 90° are called **oblique ground photographs**. Such photographs show the skyline.

Activity 3

Look at Figure 2.3 and do the following:



(a)



(b)

Figure 2.3: Ground photographs

1. Describe the characteristics of each photograph.
2. Decide which of the two photographs is a close up ground photograph and which one is a ground oblique photograph. Give reasons for your answer.

On the other hand, photographs which are taken when the photographer is seeing the features from the air are called **aerial photographs**. An aerial photograph can be taken from an air craft, a freight balloon, or from a tall building. Aerial photographs are also of different types. Those taken when the photographer is looking at the features directly from above, just like a bird in the air would do, are called **vertical aerial** photographs. The one taken at a slanting angle is called an **aerial oblique** photograph. You are going to understand this better by looking at the photographs in Figure 2.3.



(a)



(b)

Figure 2.4: Aerial photographs

Activity 4

Look at **Figure 2.4** and do the following tasks:

1. Identify the features shown in each photograph.
2. Describe the characteristics of each photograph.
3. Decide which one of the two photographs is a vertical aerial photograph. Give reasons for your answer.
4. Which one is an oblique aerial photograph? Give reasons for your answer.

In the activity, you have found out that vertical aerial photographs show all the features on the ground as flat objects, just like a map does. This is because the photographer looked at only the top view of every object. They show linear features such as roads and rivers having uniform width. They do not show the effect of perspective on the objects.

You could also have found out that oblique aerial photographs show both the top view and side view of the objects. Objects appear real and in three dimensions, that is to say, the photo reader can see the length, width, and height of individual objects.

Summary

In this lesson, you have learnt:

- That reading photographs is one of the ways we can learn about places which are far away from where we live or go to school.
- The major types of photographs: ground photographs and aerial photographs.
- That the types of photographs depend on the angle at which the photographer looks at the objects through the camera.
- That both ground and aerial photographs can be divided further into more specific types. These are ground close ups and ground oblique photographs; and vertical aerial and oblique aerial photographs, respectively.

Follow-up activity

1. Using a mobile telephone hand set or a digital camera, if you have one, take a picture of your home and its immediate surroundings.
2. Go to a raised ground or climb a nearby tree and take a picture of the same home again.
3. Compare the two pictures and draw a table with two columns in your notebook to show the features of each photograph.
4. Determine the types of photograph which you have taken. Give reasons to support your classification.

Lesson 3: Describing where Things are on a Photograph

Learning Outcomes

By the end of this lesson, you should be able to:

- a. use aerial images and photographs to communicate information.
- b. describe information shown on a photograph.
- c. appreciate that reading photographs is important because Geography is the study of the real world.

Materials you need:

photographs of different types, foot ruler, pen, pencil, and rubber

Introduction

In some of the learning activities you did in Lesson 2, you identified the features shown in photographs of different types. You certainly could not accurately and precisely come up with places where each feature is found. This is because unlike maps, photographs do not have directions. We can capture features of any area using a camera without aligning the camera to the compass North. In this lesson, you are going to learn how we can accurately describe the positions of the features on a photograph.

Describing positions of the features on ground and oblique aerial photographs

When you look at ground and oblique aerial photographs you see that features nearest to you are bigger than those which are far away. Even roads and rivers become smaller as they move away from you. This is called **perspective**. The features which are closer to the photographer are normally bigger than those which are far away from the camera. The distance of the features on the photograph enables us to describe where they are.

You already know how to find out where things are on a map. Can you remember some of those ways? Such ways are not the same as the ones you use to describe where features are on a photograph. Unlike a map, a photograph does not have (a word or words are missing); instead it has areas. These are called **grounds**.

Activity 1

Carefully look at **Figure 3.1** and do the tasks that follow.



Figure 3.1: A Ground photograph

1. Look at the photograph and identify the area where the features appear closest to you. Mark that area across the photograph as the foreground.
2. Identify the area where the features begin to decrease in size. Mark that area across the photograph as the middle ground.
3. Identify the area where the features are furthest from you and are smallest. Mark that area as the background.
4. Identify the area on the photograph which has the sky line or the air above the ground. That one is called the horizon.
5. Now get a foot ruler and a pencil and draw straight lines across the photograph to show where each ground ends.

I hope you have come up with divisions which are similar to those shown in Figure 3.2.



Figure 3.2: Parts of a photograph

In the previous activity you have learnt that for us to be able to state where things are on a photograph, we divide it into three major grounds. The ground close to you is called the **foreground**. Next to that is the **middle ground**. The ground furthest from you is the **background**. Above the background is the **skyline** or horizon. These grounds depend on how far the features in the photograph are from the photo reader.

Activity 2

1. Draw a sketch of the photograph in your notebook and mark the features in each ground.
2. Describe the position of each feature on the photograph.

In learning activity 3, you have given the general ground in which each feature is found. However, you could not point out the exact place or position on the ground where each feature is found. To be able to pin point the exact places where things are, we divide the photograph further into smaller sub divisions or grounds.

Activity 3

Look at Figure 3.1 again and do the following:

1. Use a pencil and foot ruler to divide it further as shown in the diagram below. Label all the sub divisions.

Left background	Centre Background	Right Background
Left Middle ground	Centre Middle ground	Right Middle ground
Left foreground	Centre foreground	Right foreground

Now describe where each feature is found on the photograph.

Have you realised that this kind of description is more accurate? It allows us to understand and to communicate the actual geography of the area shown in the photograph. For instance, you have specified that all the people are found in the centre foreground while the foot path is in the centre middle ground.

Describing where things are on vertical aerial photographs

In Lesson 2, you learnt about the characteristics of Vertical aerial photographs. Do you remember them? List them in your notebook. You have probably pointed out that vertical aerial photographs do not have foreground or background. To describe where things are on such photographs you use words like top, bottom, left, right, and centre. To help you understand this well, do the following activity.



Figure 3.3: A Vertical Aerial photograph

Activity 4

Look at **Figure 3.3** and do the following:

1. Identify the following features on the photograph: river, bridge, natural vegetation, built-up area, and recreation ground.
2. Describe where each feature is found on the photograph.

You have realised that by dividing the vertical aerial photograph into parts like top, bottom, left, right, and centre we can be able to describe the geography of the area it represents.

Summary

In this lesson, you have learnt:

- How you can interpret ground and aerial photographs by describing where features in the photograph are.
- That when describing ground and oblique aerial photographs, you divide the photograph first into three main divisions or grounds: foreground, middle ground, and background.
- To be able to pin point the place of each item on the photograph, you divide the main grounds into nine sub divisions: Left foreground, centre foreground, right foreground; Left middle ground, centre middle ground, right middle ground; Left background, centre background, and right background.
- Positions of features on vertical aerial photographs can be described by looking at the parts of the photograph in terms of top, bottom, centre, left, and right.

Follow-up activity



Figure 3.4: A ground photograph

1. Identify the economic activity taking place in the area shown in the photograph.
2. What human feature is shown in the foreground of the photograph?
3. Using evidence from the photograph, identify the effects of human activities on the natural environment of the area.
4. Suggest three ways in which the economic activity shown in the photograph benefits the people living in the area.
5. Suggest the time of the day when the photograph might have been taken. Give reasons to support your suggestion.
6. If possible, share your work with your school year mate and make adjustments.

Lesson 4: Drawing a sketch from a photograph and finding out information from statistics

Learning Outcomes

By the end of this lesson, you should be able to:

- a. draw a sketch of a photograph to show the selected information about an area.
- b. use photographs to communicate information.
- c. use statistics, graphs, and charts to communicate information.
- d. analyse and present statistics gathered in fieldwork.

Materials you need:

Photographs of different types, notebook, pen, pencil, foot ruler, and rubber

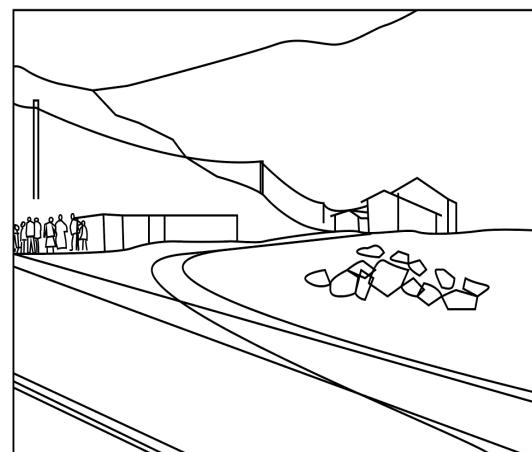
Introduction

In Lessons 2 and 3 you learnt how to describe the geography of an area from photographs. Did you realise that some of the information in a photograph might not be very important to us? We can understand the geography of an area by looking at the most important features and characteristics of the area shown on a photograph. You may also be aware that mathematical figures, graphs, and charts can be used to show some information. In this lesson you are going to learn how we can draw a sketch of a photograph to show only the most important features in the area where the photograph was taken. You will also look at how we can learn geography by interpreting mathematical figures, graphs, and charts.

Activity 1



(a)



(b)

Figure 4.1: Kilembe Mines

Look at Figures 4.1 and do the following:

1. Identify the features which are found in both pictures (a) and (b).
2. Copy Figure 4.1 (b) into your notebook and on it label the:
 - (i) Highlands,
 - (ii) Valley,
 - (iii) Slope cleared of vegetation,
 - (iv) Power line,
 - (v) Mineral ore,
 - (vi) Railway lines, and
 - (vii) Settlements
3. Can you understand what the area shown in Figure 4.1(b) looks like by looking at Figure 4.1(b)?
4. Suggest a name which can be given to each of the pictures shown in Figure 4.1.

In the previous activity you have realised both pictures in Figure 4.1 show the same area. However, picture (b) has less information than picture (a). You could have suggested that (b) is a **sketch drawing** of picture (a). You are right.

Sometimes it is useful to draw a sketch based on a photograph to show the **most important** features of the photograph. You do not need to show everything on the photograph but simply what kinds of things are found in each part or ground. To understand this, do the following activity.

Activity 2

1. Draw a sketch of **Figure 4.2**.
2. Describe the area which you have drawn on your sketch.
3. Suggest a place in East Africa where the photograph could have been taken. Give reasons to support your suggestion.



Look at **Figure 4.2** and do the following tasks:

Finding out information from statistics

Activity 3

Study the table below showing Tea production in Uganda for different years and do the tasks that follow.

Year	Tea production in tonnes
1986	3,300
1987	3,500
1988	3,500
1989	4,200
1990	6,600
1991	8,300

1. Identify the year when Uganda's tea production was:
 - (i) Highest,
 - (ii) Lowest,
 - (iii) Increased most.
 - (iv) Did not change.
2. Draw a bar graph to show the information in the table above.
3. Compare the table and the graph you have drawn and decide which of the two is easier to understand. Give reasons for your answer.

Research work

1. Carry out a library or an Internet search about the sources of geographical information
2. Write a report of your findings.
3. In your opinion, which source of geographical information is the most important? Give reasons for your answer.
4. When schools reopen, hand your report to your teacher of Geography for further assistance.

In Activity 3 you have learnt how you can learn about the activities people do by looking at and interpreting mathematical figures. Those figures are collected about the activities. You can also collect similar figures about say, amount of crops produced in your area, number of people in each parish in your sub county, sizes of houses in your home area, amount of rainfall received in your home area in six months, and others. Such figures are called **statistics**.

You can use these statistics to draw graphs, pie charts, flow diagrams, and other drawings. Such drawings are called **statistical drawings**. You will learn more about these drawings as you learn geography.

Summary

In this lesson, you have learnt:

- How to draw a sketch of a photograph and use it to describe an area.
- That on a sketch we do not include all the features in the photograph. We select only the most important features.
- That we can learn about places, people and their activities from statistics and statistical drawings such as graphs, charts, and diagrams.
- How you can communicate information using statistics, charts, and graphs.

Follow-up Activity

Get a photograph of any area. You can even use those ones which you used in the earlier lessons or a newspaper cut out.

1. Divide the photograph into suitable grounds
2. Describe the features found in each part of the photograph.
3. Describe the relationship between the features shown in the photograph.
4. Draw a landscape sketch of the photograph and on it mark and name the main features.

Glossary

Field- Area outside the classroom where fieldwork is carried out which we can visit to learn about physical and human features.

Oblique-Seeing an object of place at an angle less than 90° .

Sketch - A hand-drawn picture made from a map or photograph. It is drawn to show the main features of the area where the map or photograph was taken.

Perspective -A situation whereby objects which are far away from your eye appear smaller than their actual size.

Photograph - A picture of an object or place produced using a camera with a light-sensitive film or digital mechanism.

TOPIC: THE EARTH AND ITS MOVEMENTS

Lesson 5: The shape and movements of the Earth

Learning Outcomes

By the end of this lesson, you should be able to:

- understand the shape of the earth.
- understand the relationship between the earth and the sun and how this affects the temperatures and seasons.
- draw diagrams to show the relationship between the earth and the sun's rays and the causes of differences in temperature.

Materials you need

A ball or globe, if possible, an orange, a candle or torch, marker, iron rod or nail, map of the world, secondary school atlas, pencil, pen, and notebook.

Introduction

You are already aware of the planets in the solar system. Can you name them? You have probably named the earth as one of the planets. In this lesson, you are going to learn about the shape of the earth, its movements and how these affect time. You will also find out how earth movements affect climate and people's ways of life in the different parts of the world.

What shape is the earth?

You and all other living things live on planet earth. Other planets do not have life. Can you think of why it is so? The earth has enough supply of oxygen. Can you mention the value of oxygen to life?

Activity 1

Look at the globe, football or an orange and,

- Identify its top, middle, and bottom.
- Describe what it looks like at the top, in the middle, and at the bottom.
- Write about three sentences to describe its shape.

You might have written that the object which you have looked at is round or spherical. The shape you have described is very similar to that of the earth. When you closely look at the globe the earth is flattened at both ends. These ends are called **poles**. The middle part is enlarged. This is the area at the equator. As you move towards the poles the earth becomes smaller. The earth is flat at the poles. To understand this, look at **Figure 5.1**.



Figure 5.1: A Globe representing the Earth

Therefore, the earth is not perfectly round or spherical. It has an **oblate** shape. The enlargement of the earth at the equator is caused by the earth's rotation.

The Movements of the Earth

Activity 2

1. Draw a diagram showing the shape of the earth in your notebook.
2. On the diagram indicate the major lines of latitude and longitude.
3. Carry out a text book research about the solar system and write a report of your findings.
4. Remind yourself about the number of planets that make up the solar system.
5. Find out why it is called the solar system.

You may have found out that there are nine planets in the solar system. All planets in the solar system move around the sun. Each planet follows a path called an **orbit**. No planet enters the orbit of the other. If this ever happened the whole solar system would get destroyed. This would mark the end of life on earth.

Have you ever imagined that the earth moves? You have always seen the sun appearing to be moving. In actual sense the sun does not move. The fact that you are on the surface of the earth prevents you from seeing it moving. In its movement the earth spins around on its axis. The earth makes two types of movements. Can you name them? Probably you have heard about the daily movement of the earth on its axis. This is called the earth's **rotation**. In a year the earth moves around the sun once. This yearly movement of the earth around the sun is called **revolution**.

Rotation of the earth

At a certain time of the day the temperature is cool, hot, warm or cold. Can you tell at what time each of these conditions happens? Temperature is not the same all the time. The earth receives heat from the sun. This change in temperatures is caused by the daily rotation of the earth on its axis. This can be illustrated by Figure 5.2.

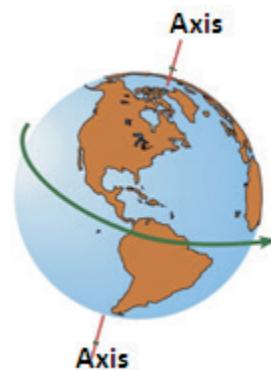


Figure 5.2: Illustration of the earth's axis

The earth's axis always points in the same direction. It is permanently tilted at an angle of 66° to the earth's orbit.

You have probably noticed that nights are usually cool. This is because the sun, which is the source of heat for the earth, is hidden away from the side of the earth on which you live. During night time the sun heats the side of the earth which is opposite to the one on which you live.

Activity 3 Get a friend to help you with this Activity. Now follow the following steps:

1. Get a globe or a ball or an orange, a candle or a torch, and a marker.
2. Using the marker write an X-mark on the ball in case you don't have a globe.
3. Hold the globe or ball in your hands.
4. Let your friend standing in front of you flash light on the X-mark using a torch.
5. Rotate the globe or ball and observe what happens to the X-mark.
6. Write down what you have observed.
7. Using the observation you have made, explain how day and night form on earth.

The earth rotates in a way similar to how you have turned the globe or ball. It rotates from the east to the west. This movement takes 24 hours. You always see the sun rising from the East and setting in the West. As the earth rotates, one half of it faces the sun while the other half is hidden from the sun. The part of the earth facing the sun is experiencing **day time**. The part of the earth which is hidden from the sun experiences **night time**.

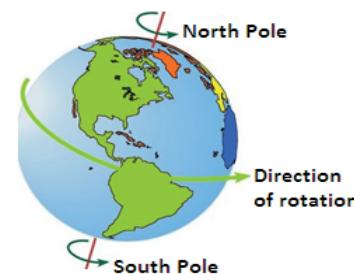


Figure 5.3: Rotation of the earth on its axis

Time differences

You have probably heard people talk about 2:00pm East African Standard Time. Other areas like South Africa, America and Britain also have their own time. This means that time is not the same for all places on earth. This is caused by the earth's rotation. The world Time Zones are based on the Prime Meridian which you learnt about earlier. As you move 15° from the Prime Meridian Eastwards you gain one hour. You will lose one hour for every 15° of longitude you move westwards.

At 12:00 mid-day or noon, the sun reaches its highest position in the sky. At this time the Prime Meridian is under the sun. This is called 12 noon local time along the Prime Meridian. The local Time at Greenwich is called the Greenwich Mean Time (GMT).

Revolution of the earth

It takes a year for the earth to complete its journey around the sun. Can you tell how many days these are? This complete journey is called a **revolution**. After every four years, the earth takes 366 days to complete the same journey. The fourth year is called a **leap year**. All the other years have 365 days.

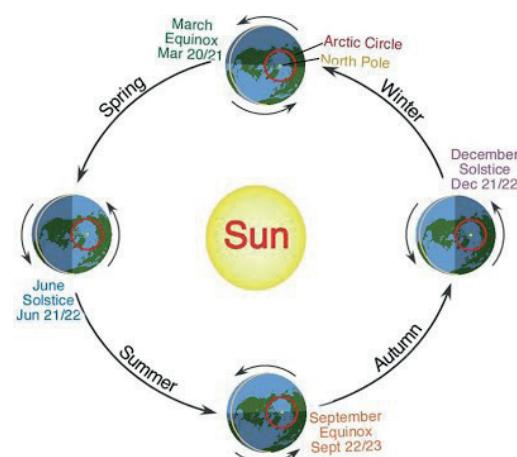


Figure 5.4: Revolution of the Earth

You will also find that the earth's revolution leads to changes in the position of the latitudes in relation to the sun. Every year the sun is overhead the equator on two days. The day when the sun is overhead the equator is called **Equinox**.

Activity 4

Look at Figure 5.4 and do the following tasks:

1. Find out and write in your notebook the days when the earth experiences:
 - (i) Equinoxes
 - (ii) Summer and winter solstices
2. Identify the seasons in a year and write at least two sentences to explain what you understand by each season.

The day when the sun is overhead the Tropic of Cancer is called the **Summer Solstice**. When the sun is overhead the Tropic of Capricorn it is called the **Winter Solstice**.

Activity 5

1. Carry out a text book or internet research about how the four seasons affect people's activities and ways of life.
2. Write a report of your findings.
3. If you can, share your findings with your school year mate and make comparisons.

Summary

In this lesson, you have learnt that:

- The earth is in a nearly spherical planet which is enlarged at the equator and flattened at the poles.
- The earth is one of the planets making up the solar system.
- The sun does not move, but the earth moves around it following a path called an orbit.
- The earth makes two movements: rotation on its axis and revolution around the sun.
- The movements of the earth affect the way we live and the economic activities we carry out.

Follow up Activity

1. Find out the climatic seasons which occur in the area where you live.
2. Explain how changes in seasons affect the activities people in your community carry out.

Lesson 6: Major Climatic Regions of the World

Learning outcomes:

By the end of this lesson, you should be able to:

- a. understand how the relationship between the earth and the sun affects the temperatures on earth.
- b. draw diagrams to show the relationship between the earth and the sun's rays and the causes of differences in temperature in different parts of the world.
- c. understand why the world is divided into climatic zones/regions.

Materials you need

A ball or globe, torch, map of the world showing climatic regions, secondary school atlas, pencil, pen, and notebook.

Introduction

You have possibly heard about tropical, temperate and polar climatic regions or zones. These are the major climate zones of the world. The world has been divided into these climates depending on differences in temperatures experienced in each zone. In this lesson you are going to look at these climatic regions and how they are affected by the position of the earth in relation to the sun.

Activity 1

Carry out a textbook or internet research about world climate zones and in your exercise book,

1. Draw a diagram of the earth and on it mark and name the equator, tropic lines, and Arctic and Antarctic circles.
2. Mark out the tropical, temperate, and Polar Regions or zones.
3. Copy the table below in your notebook and complete it by filling in the characteristics of each climatic region.

Tropical region/ Zone	Temperature region/ zone	Polar region/ zone

4. Suggest other factors which might cause differences in temperatures of an area.
5. If possible, share your work with your school year mate in the neighbourhood and make comparisons.

In Lesson 5 you learnt that the earth is permanently tilted at an angle of 66° from the sun. Therefore, different places on earth also lie at different angles in relation to the sun. The sun's rays reach places at different latitudes at different angles. Because of this, places on earth receive different amounts of heat from the sun. The more direct the sun's rays strike an area the smaller the area heated. This makes heat to build up in that area leading to great rise in temperature. You will understand this better through doing the following Activity.

Activity 2. Carefully look at Figure 5.5 and do the following tasks:

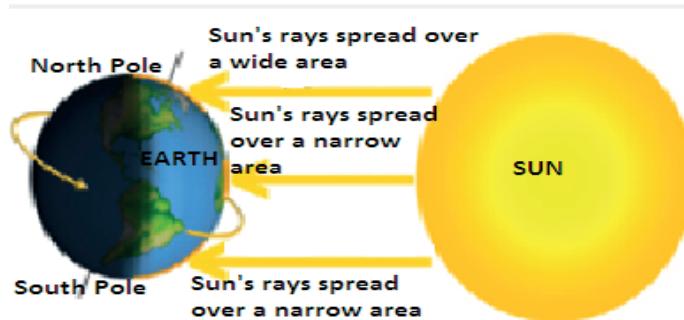


Figure 6.1: Sun's rays striking the earth's surface

1. Copy Figure 6.1 into your notebook.
2. Identify the part of the earth which represents the:
 - (i) Region around the equator/Equatorial region
 - (ii) Polar regions
3. Which of the two regions, Equatorial and Polar, experiences more heating by the sun's rays?
4. Explain why there is a difference in the amount of heating between the equatorial region and Polar Regions.

In the previous activity you have found out that the whole earth gets most of its heat from the sun. Rays from the sun reach areas around the equator at right angle; after travelling through a shorter distance. Heat from these rays, spreads over a smaller area. Rays heating the poles travel through longer distances from the sun to the earth. Heat brought by these rays, spreads over a wider area.

Summary

In this lesson you have learnt that:

- The earth is divided into three main climatic zones or regions: tropical, temperate, and Polar Regions.
- Places lying at different latitudes experience different amounts of heat from the sun. Equatorial lands are heated more than temperate and polar regions.
- The differences in temperature between climatic regions affects the way people live and the activities they carry out.

Topic: Weather and Climate

Lesson 7: Weather and how it is measured

Learning Outcomes

By the end of this lesson, you should be able to:

- a. understand the difference between weather and climate.
- b. understand the elements of weather and how they are measured.

Materials you need

notebook, pen, pencil, 2 transparent plastic bottles, a pair of scissors or knife, marker, and foot ruler

Introduction

In Primary School Social Studies, you learnt about weather, and how it is measured. In this lesson, you are going to learn more about weather and its elements. You will also learn about how the elements are measured and recorded. Knowledge about weather will help you plan for your daily activities.

What is weather?

Have you ever noticed that some people in your community or even in your own home at times carry umbrellas with them while at other times they carry sweaters and overcoats? What do you think determines the things those people carry with themselves for their journeys? You have probably thought of changes in weather as the reason.

Activity 1

1. Walk around the compound and look at the air and the sky and also feel the temperature of the air around you.
2. How would you describe the weather around your home?
3. What was the weather like around your home yesterday?
4. Is today's weather different from that of yesterday or the last three days? If yes, describe the differences.
5. In your own words, explain what you understand by weather.

When we talk of **weather**, we are actually talking about the conditions of the air or atmosphere at a certain time. The weather may be sunny or cloudy. It may be hot or cold, windy or calm. It may also be rainy. Our country has many different kinds of weather at any one time. You have probably realised that even a small area like the one where you live experiences different weather conditions every day.

Elements of Weather

Activity 2

1. List the things you have talked about when describing the weather around your home in activity 1 (above).
2. How many things have you used to describe the weather?
3. Suggest a name which you can give to the things you have listed.

You have probably suggested that the things you used to describe the weather around your home are called **elements of weather**. You are right. There are other elements of weather which may not be present around your home now. To understand this, do the following Activity.

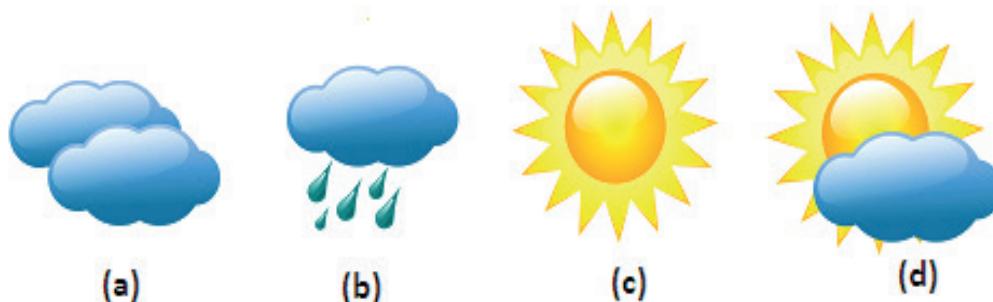


Figure 7.1: Some elements of weather

1. Identify the elements of weather shown in Figure 7.1.
2. Which of these elements are prevailing around your home now?
3. Which of these elements prevailed in your home area yesterday?
4. Identify elements of weather which are prevailing in your home area but are not shown in Figure 7.1.
5. Which elements do you think may prevail in your home area four hours from now? Give reasons to support your answer.

Rainfall, sunshine, hotness, and coldness (temperature), air pressure, air humidity or moisture in the air and clouds are all things which determine the weather conditions of a place.

Have you realised that the weather of a place can be described by combining two or more elements? For example, weather can be rainy and warm, sunny, and calm; cloudy, hot, and calm, rainy, and windy; humid, and cool, and so on.

How is weather different from climate?

Activity 3

1. Ask the older person around you the time of the year when your home area experiences:
 - (i) Heavy rains
 - (ii) Little or no rainfall
 - (iii) Hottest temperature
 - (iv) Coolest temperature
 - (v) Hail storms
2. Using the information, you have collected, describe the weather pattern for your home area.
3. Suggest a name which you can give the weather pattern you have described.

In describing the weather pattern of your area, you could have found that there are particular months in the year when you receive heavy rainfall. You have also pointed out some months when the area receives little or no rainfall at all. You have also pointed out how temperature and wind movement change over the year. The weather pattern which you have described is the **climate** of your home area. Unlike weather which changes from time to time even in the same area, climate takes a very long period of time to change.

Additionally, you have realised that in describing the climate of your home area you used mainly two elements of weather; precipitation, especially rainfall, and temperature. These are the most important elements we use to describe climates in the world.

What is precipitation?

Activity 4

Look at the pictures in figure 6.2 and do the tasks that follow.

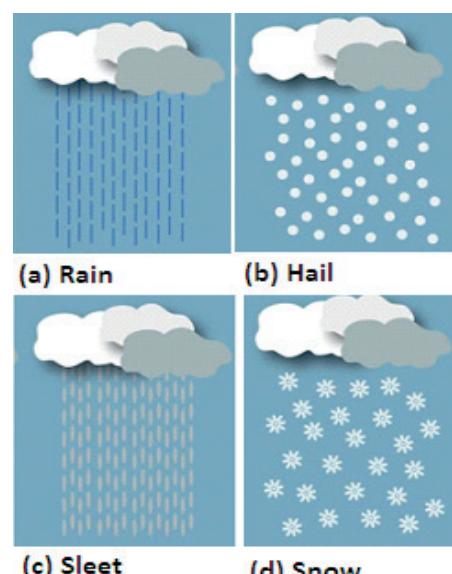


Figure 7.2: Types of precipitation

1. Identify the types of precipitation shown in Figure 6.2 and write them down in your notebook.
2. Write at least two sentences to describe each type of precipitation.
3. Name the type of precipitation which is commonly received in your home area.
4. Which of the types of precipitation shown in Figure 6.2 is not received in Uganda and East Africa?
5. Why do you think the type you have mentioned in (4) above does not occur in Uganda and East Africa?
6. Explain what you understand by precipitation.

In the previous activity you have learnt that the earth receives moisture from the atmosphere in different forms. Of these forms you have seen rain, snow, sleet, and hail. Others include mist, fog, and drizzle. These different forms of moisture received on the earth's surface are called **Precipitation**. All forms of precipitation start in the same way of evaporation and condensation. Rainfall and drizzle are the only types of precipitation that reach the ground in liquid form.

Snow and hail is water in solid form. Water from the atmosphere falls as snow when the atmosphere is not hot enough to melt the ice crystals in the sky. Sleet is partially melted snow; it is a combination of rain and small pieces of snow. It occurs when the snow melts in warm air and freezes again as it falls through the cold layers of the atmosphere.

What is Temperature?

Activity

1. Imagine you have woken up in the morning when there is mist in the air outside. What would you feel on your body?
2. What would you feel on your body if you woke up when the morning is sunny?
3. In about two sentences, explain what you understand by the term temperature.

You have probably thought of coldness in the case of a misty morning, and hotness in the case of a sunny morning. The atmosphere usually has different amounts of heat at different times. The amount of heat in the air is called air **temperature**. When you say the morning is cold or the afternoon is hot, you are actually talking about the temperature of the air surrounding you.

Summary

In this lesson you have learnt that:

- Weather is a collection of two or more conditions prevailing in the air at any one time.
- Weather occurs in form of conditions called elements of weather, namely temperature, rain, air pressure, sunshine, humidity, visibility of the atmosphere, mist, and others.
- The type of weather which is commonly experienced in an area over a long period of time is called climate.
- Weather changes from time to time even in the same area while climate takes a long period of time to change.
- Precipitation and temperature are the most important elements of weather and climate.

Follow-up activity

1. Carry out a fieldwork study of your home area to find out how the different types of precipitation affect the:
 - (i) local community,
 - (ii) natural environment.
2. Write a report of your findings.

Lesson 8: Measuring and Recording Rainfall

You already know that a rain gauge is the instrument for measuring rainfall. In this lesson you are going to learn to make and use your own rain gauge to measure rainfall.

Activity 1

You will need to get the following items:

- 2 litre mineral water bottles or a funnel
- ruler
- maker
- basin or saucepan
- knife or pair of scissors
- masking tape
- nail tile
- polythene sheet (transparent)

Follow the following instructions:

1. Cut one of the bottles into half. Use the top half as a funnel. If there are sharp edges, use the nail tile to cut them.
2. Place the funnel on top of the uncut bottle with the edges touching.
3. Use a masking tape to firmly fix the funnel on the bottle.
4. Put the polythene sheet over the funnel opening and press it slightly inwards. This is to enable water easily flow into the bottle.
5. Make a hole inside the polythene sheet to direct water into the bottle.
6. On the bottle, use a maker and mark out cm from the bottom upwards with the help of a ruler. Each cm represents 500 millimetres.
7. Place your rain gauge in an open place.
8. Read off and record the amount of rainfall received every 24 hours in your weather log.
9. After a daily or 24 hour records, pour the water and place the rain gauge back.

In a month you will come up with the total amount of rain received that month. This is called Monthly total rainfall. At the end of the year, you come up with the total rainfall in a year. This is the annual total rainfall. The unit for rainfall measurement is a millimetre.

When you analyse your weather log you will note that some months have rainfall yet others don't. You may therefore want to have a clear picture of rainfall received in your home area. In this case you will need to find the average rainfall received in a year. This is done by dividing the annual rainfall total by the 12 months in a year.

What you get is called the Mean monthly rainfall. The rainfall figures for all the months in a year can be put on a table and they can be represented on a bar graph. This will help you to describe the rainfall pattern of your area.

Activity 2

Study the table in **Figure 8.2**, and in your notebook:

Month	J	F	M	A	M	J	J	A	S	O	N	D
Temp($^{\circ}\text{C}$)	27	27	27	26	25	25	25	26	27	27	26	26
Rainfall(mm)	65	85	150	250	225	125	75	75	75	112	125	125

Figure 8.2: Climate statistics for Entebbe

Source: Geography of Africa, W. J. Minns

1. Write down:
 - (i) The highest rainfall
 - (ii) Lowest rainfall
2. Find out the:
 - (i) annual total rainfall
 - (ii) Mean monthly rainfall
 - (iii) Annual range of temperature
3. Draw a bar graph to show the climate of Entebbe.

You will realise that the rainfall amounts received in your area are similar to those of other places. On a map the places receiving the same rainfall may be represented by drawing lines joining them. These lines are called Isohyets. Such a map drawn is called a rainfall or precipitation map.

Figure 8.3 can help you understand this better.

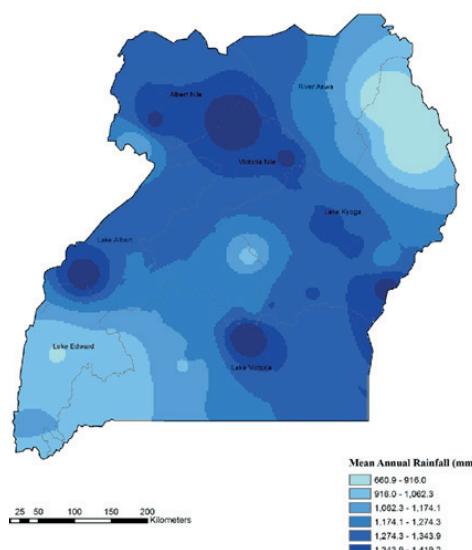


Figure 8.3: Rainfall map of Uganda

Summary

In this lesson, you have learnt:

- How rainfall is measured and recorded at a weather station using a rain gauge.
- That you can use a low cost rain gauge to measure rainfall in your home area.
- How to record rainfall on a map.

Follow-up activity

1. Carry out research about other elements of weather and their measurement.
2. Write notes to describe each element, the instrument used to measure it, and how it is recorded.

TOPIC: LOCATION, SIZE, AND RELIEF REGIONS OF EAST AFRICA

Lesson 9: Location, Size, and Relief Regions of East Africa

Learning Outcomes

By the end of this lesson, you should be able to:

- a. know the East African countries, their approximate population and area.
- b. locate East Africa on a map of Africa and on the world map.
- c. use maps, statistics, graphs, and diagrams to analyse population.

Materials you need

Secondary school atlas, text book on East Africa, Graph paper, notebook, ruler, ICT tools, pen and pencil, and a set of mathematical instruments

Introduction

In Primary School Social Studies, you learnt about East Africa. Can you remember the countries that make up East Africa? In which part of Africa is East Africa? Why do you think it is called East Africa? In this lesson you are going to learn about where East Africa is found, and why it is called so. You will also learn about the population, size, and relief of East Africa.

What is East Africa?

You are going to find out the composition and location of East Africa by doing **Activity 1**.

Activity 1

Look at Figure 9.1 and do the following tasks:

1. Copy both maps into your notebook.
2. Write down the countries that make up East Africa.
3. Use your atlas to find out the names of the countries surrounding East Africa.
4. Draw a sketch map of East Africa and on it,
 - i) Complete the map (a) by filling in the names of the East African countries.
 - ii) Indicate the lines of latitude and longitude between which East Africa lies.
5. Name the countries marked A to I.
6. Using information from the maps you have drawn, describe the location of East Africa.

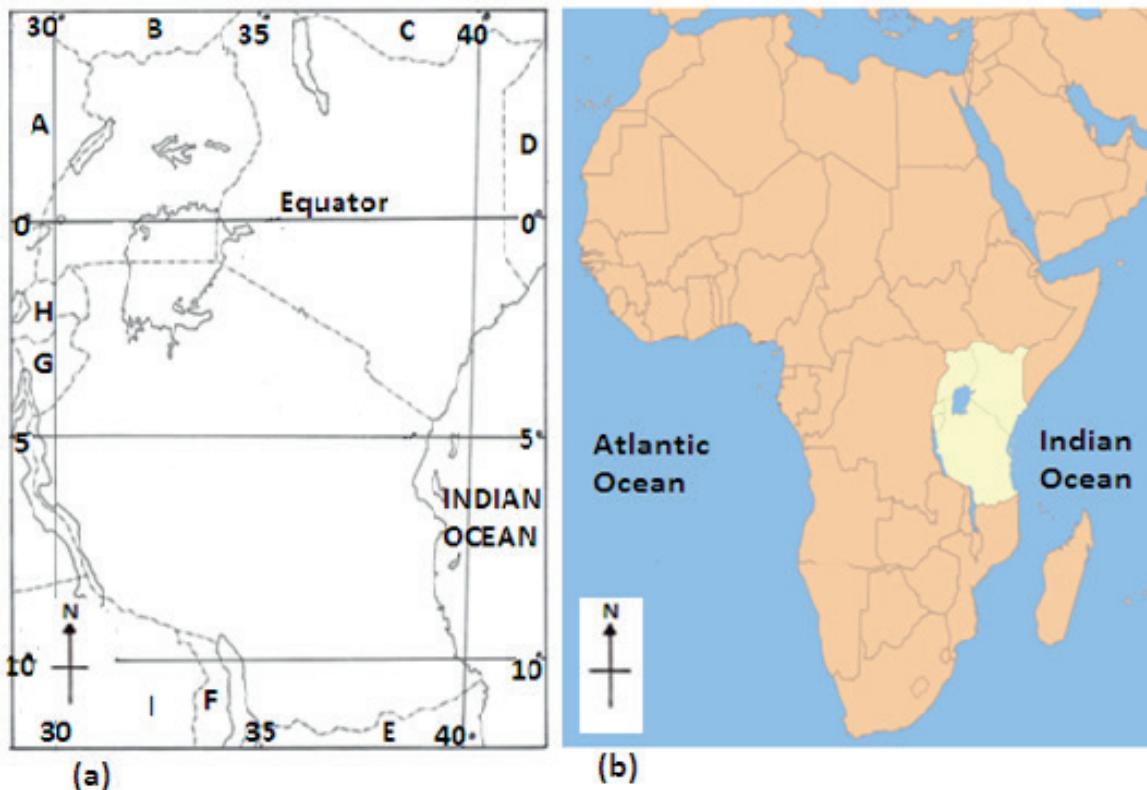


Figure 9.1: Composition and Location of East Africa

In Activity 1 you have probably identified the East African Countries as Uganda, Tanzania, and Kenya. That is the **composition** of East Africa. The other countries you have named on the map are neighbours of East Africa. Some of these countries are members of the East African community. Can you name them?

In describing the location, you have seen that East Africa extends from latitude 32°E to 42°E, and 4°N to 5°S. East Africa is also crossed by the Equator. Part of it lies in the northern hemisphere and the other part lies in the southern hemisphere. This is why you have heard some people say that East Africa lies **astride the equator**. Find out which East African country entirely lies in the southern hemisphere.

As you may find out from the atlas East Africa is found on the eastern half of the African continent. This explains why it is called East Africa. This is the **location** of East Africa.

The size of East Africa

In Lesson 4 you learnt that one of the ways of finding out geographical information is by reading statistics and statistical drawings. You are going to use that method to find out about the size of East Africa.

Activity 2

Look at **Figure 9.2**, a table showing the area of East African countries and do the tasks that follow.

Country	Area (km ²)	Population
Uganda	236,040	45,741,007
Kenya	580,367	53,771,296
Tanzania	945,087	59,734,218
Total	?	159,246,521

Figure 9.2: Area of East African countries

1. Copy the table into your notebook.
2. Find the total area of East Africa.
3. Draw a pie chart to show the population of East African countries.
4. Which country covers the largest area?
5. Which country covers the smallest area?

From both the table and the pie chart you have drawn you can see that the largest country of East Africa is almost three times as large as the smallest country.

The population of East Africa

Like the country's sizes, the population of East African countries also varies. You will understand this better by doing activity 3.

Activity 3

Country	Area (km ²)	Population	Population Density (Persons/km ²)
Uganda	236,040	45,741,000	?
Kenya	580,367	53,771,000	?
Tanzania	945,087	59,734,000	?
Total	?	159,246,000	

Figure 9.3: Area and population of East African countries

Carefully look at Figure 9.3 and do the following:

1. Copy the table into your notebook.
2. Draw a bar graph to show the population of East African countries.
3. Calculate the population density for each country and fill in the table.
4. Which country has the highest density of population?
5. Which country has the lowest density of population?

In activity 3 you have found out that the countries of East Africa have large populations. This affects the speed at which they develop. You will learn more about the population of East Africa in term 3 of Senior Two.

Summary

In this lesson you have learnt:

- The countries that make up the geographical region called East Africa: Uganda, Kenya, and Tanzania; and the countries of the East African Community.
- That population differs from one country to the other; being largest in Tanzania and smallest in Uganda.
- How to represent and interpret population using statistics, pie charts, and bar graphs.



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