

GEOGRAPHY

TEACHER'S GUIDE
Grade 9

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MINISTRY OF EDUCATION

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Authors, Editors and Reviewers:

Menur Hassen (M.Sc.)

Jember Tigabu (B.Ed.)

Hari Shankar Sharma (Ph.D., Professor)

Yirgalem Mahiteme (Ph.D.)

Nell Angelo (M.A.)

Evaluators:

Haftu Araya

Tamrat Fitie

Yitagesu Demsie



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INTRODUCTION

Geography is one of the various social science subjects which can be applied directly to daily life. By its very nature, Geography seems to be dynamic, fast growing as well as multidisciplinary area of study. Its depth and approach varies from junior and secondary to pre- college levels. In grades 7 and 8, the basic concept of Geography has been introduced as a social studies subject combined with history. In grade 9, the nature of the field of Geography will be discussed concisely and clearly. The logical interconnections of its units are well organized and designed in the student's book. However, the role of the teacher in delivering the lessons should be the most vital of all things.

The teacher has to use the participatory approach so that the delivery of lessons are attractive and more practical. The class activities and assignments set after every lesson are very much helpful for this purpose. A teacher, who could not have access to modern technologies and teaching aids, can create his own materials using locally available resources. Hence, if you implement the teaching learning process as to the guidelines designed, adding on your creativity, then you will successfully achieve the objectives stated for this grade level and your students develop interest in the subject.

I. General Information to the Teacher

The teacher-centred teaching-learning process had been treating students as a passive receivers. The teacher had been occupying the whole 40-45 minutes. Students' share in the classroom had been minimal. That tradition has been now denounced in many aspects. Many educational experts came to realize and recognize that students learn best and develop the required attitudes only when they are active participants in the class room. This character can be achieved when teachers apply the most widely accepted and recommended teaching-learning methods, i.e. the enquiry method or, as usually called, the active-learning method.

The active-learning method has advantages to both the teacher and the students. It really emancipates the students from the teacher's authoritarian approach and gives opportunities to involve, practice, and develop their own skills, etc. For the teacher, she/he will have opportunities to evaluate, follow up, realize their weaknesses and look for solutions. Besides, the students share the load and the teacher obtains time to make critical assessments.

There are different techniques and strategies to practice the participatory or active learning method suggested by teachers and educators. We hope that you will study them well and

broaden your understanding by reading more books and by discussing with your colleagues regarding what each of them mean and how they could be presented in the classroom.

1. Organizing Groups: You can organize your students into groups based on the nature of the topic at hand and the type of group task to be performed. It may range from pairwork to a whole class discussion. When you organize groups:

- i. You need to have the list of all the students in the class.
- ii. Decide how many groups are needed to be formed.
- iii. Then put your students into the required number of groups. To do so, you can follow the following techniques:
 - **Seat grouping:** - students sitting on a bench, in the same row, etc.
 - **Ability grouping:** grouping students according to their abilities
 - a) **Similar ability grouping:**
 - slow learner with slow learner, medium learner with medium learner, and fast learner with fast learner.
 - b) **Mixed ability grouping:** In this type of grouping the students of all ability types: slow, medium and fast learners can be in one group; it is you, who decides which method of grouping fits the task to be performed.
 - c) **Lottery method grouping:** This is a method of grouping students in random by pulling them out of their seats or by randomly numbering them.

2. Discussion: This can be done in pairs, groups, or the whole class as a group. Discussion eases much of your burden, especially for classes with large number of students.

In all units, sections and sub-topics, there are activities suggested for the students to do them in groups. Whenever you let your students discuss on a certain aspect of a topic:

- follow up whether every student is participating in the discussion or not and how well she/he is participating,
- be part of the discussion in some of the groups for a while and see if the group discussion is held in the way intended; give assistance and guidance whenever it is needed,

- give some clues when you think they will get stuck in some points or when you see them facing difficulties, and
 - in some occasions ask questions related to the topic in order to facilitate the group interaction in the manner or direction required.
- 3. Presentation:** In a geography class presentation can be considered as vital. Because the students can be doing a lot of things and activities. For example, they can present
- the results of their group discussion,
 - the information they gained from a field trip,
 - data they gathered or interpreted, and
 - maps, diagrams, models, charts, samples, etc.

Whenever the students present any topic, you should make sure that only a few students are not outshining and all the activities are performed by equal participation. The emphasis is that the students' participation should be maximized. To assure this:

- i. Check that all members have roles in the presentation. Prepare a mechanism by which you can check whether the task is performed in equal participation of the group members.
 - ii. Let groups present their tasks turn by turn and check that all members of the group have a common understanding of their topic.
 - iii. Give chance to members of other groups to ask questions regarding the topic under discussion.
- 4. Organizing Concepts:** In a participatory class there might be different ideas and concepts that may come up out of the class interaction. Sometimes students may be confused when such new ideas sprang. This is because most students often think that there should be a single route to pass through and their coming to class is to identify that route. Therefore, whenever different ideas are raised with regard to a given topic they may fear that they have lost or couldn't find that single route. Such views might be reflected particularly in discussions and presentations. Thus, the teacher's major role is to harmonize concepts forwarded by the students during or after presentations and discussions or during other class activities. In such occasions you are expected to make a mini-lecture. In the lecture you should:
- explain only points which you think are unclear to the students,
 - give short answers to their questions,
 - correct wrong conclusions or deductions,
 - add some ideas or uncover concepts, and
 - explain untouched parts of the topic.

5. Making Continuous Assessment: A continuous assessment is not a process by which you accumulate a student's marks, but rather a process by which you can judge his/her overall personality. Accumulated marks are indicators of a student's performance throughout the whole academic year or during a certain period of time. They are usually attained by assessing achievements in quizzes, tests, homework, mid and final examinations, etc. However, these tools could not give you a good picture of the general performance of a student. To get such a picture, every activity of the student should be assessed throughout each topic, each section, subject, period, grade level, etc.

Therefore, this is achieved by recording each and every performance of the student. That means, you have to have a recording list. The list should contain columns or portions that show the students':

- level of involvement in each discussion,
- participation in group works,
- classroom participation frequencies,
- playing roles,
- role in presenting and organizing activities,
- ability in suggesting new ideas,
- accuracy and consistency in doing class works, home works, quizzes, tests and exams,
- consistency in attending classes,
- punctuality,
- classroom conduct,
- his/her relation with his/her friends, teachers and other members of the school,
- the value that he/she gives to the rules and regulations of the school, and
- care for the school's properties as his/her own and use them properly, etc.

N.B: You should not be bored with these activities for they are bulky and routine but rather be proud of and consistent in accomplishing them. As your profession is a profession of moulding individuals' personality, these are your raw materials to build their personalities in the manner and direction wanted.

6. Supplementary Activities: Only the activities given in the students' textbook may not be adequate to obtain the expected affirmative outcome. Even worse, some of the activities and tasks given in the textbook may not fit to the needs and requirements of

some of your students in the class. Hence, you should have always contingency plans and ready-made materials to use them whenever necessary.

Therefore:

- i. Always have questions which are marked asterisk (*) for fast learner students.
 - ii. Prepare some more questions that can be given in the classroom.
 - iii. Give some home-take tasks to whom you think they are slow during the classroom interaction.
 - iv. Find some puzzles related to your subject which can motivate students.
7. **Short Notes:** It is necessary to give short notes to students from the teacher's guide and other related reference books. You can foster the students' understanding of the notes in their book by giving various tasks, activities and additional exercises. You can also show them how to take short notes from the textbook. But, by any means, don't impose the burden of copying by turning pages after pages of their textbooks. That forces your students to hate the subject in general and you and your approach in particular.
8. **Giving Answers to Exercises:** You may give different exercises to your students. These may be the ones at the end of each unit or additional exercises given by you. Therefore, take time to discuss the answers and to give corrections; don't pass over questions at all. Leaving question untouched or passing them undiscussed may mean many things to your students. They may lose confidence in you and even think that you may not know the answer.
9. **Using the Appropriate Teaching Method:** Your ability in applying the right type of teaching method to the topic you are teaching in a particular period is vital. It plays a significant role by highly motivating them or facilitating their learning. Therefore, take time to select the appropriate method to your topic.

Suggested Methods to Foster Active Learning

Though there are a number methods of teaching, the following are preferred by many education scholars to create an active learning atmosphere in the classroom. However, you have the right to use any other methods you believe they are appropriate to your lesson and activity intended.

1. **Grouped Lectures:** It is not wise to make a long and continuous lecture for it may bore the students. Instead it is advisable if the total lecture is divided into small sections. Hence, follow the following approaches in order that your lecture could become effective and attractive:
 - divide your lecture into small sections of about 15 minutes,
 - give your students a short and quick activity of about 5 to 10 minutes, and
 - continue to lecture for another 15 minutes that can be followed by another activity (if necessary) as to the length of the allotted period. It would be advisable if the activities are those which consolidate the concept of the proceeding lecture and give some clues to the forth-coming ones.
2. **Cooperative or Collaborative Learning:** This method can be implemented in fostering group works, projects, and assignments. It helps the students to cooperate in doing some activities and sharing their experiences.
3. **Small group/Pair Discussion:** Such groups might be formed to perform short activities, such as role playing, and presentations. It may involve from two to six students in one group. The small number of students in a group helps to actively participate in the group activity. This form of teaching method is always to your immediate use for it does not take much time and space to form.
4. **Demonstration:** It is a method by which the students are presented with something visual that represents how something is structured, what it is made from, how it functions, etc. For example, to show types of rocks and their structures or how temperature is measured, and so on.
5. **Drawing Pictures, Maps, Graphs, etc:** As most of the topics of Geography are location oriented, this method can be used more frequently in a geography class. They enable the learner to visualize and conceptualize knowledge, concepts and information. This method is mainly applicable for topics, such as fold mountains distributions, vegetation distributions, earthquake and volcanoes distributions, population density, weather conditions, etc.

6. **The Inquiry Approach:** You can use this method in lecturing. It helps you to capture your student attention and inspire them to take part in the lecture by listening and giving answers. They will really stay active expecting that he/she may be asked a question. However, you should be careful to make your questions firmly related to the topic being lectured. They should also be short and precise that the students can complete them by saying one or two words only, or by saying 'Yes' or 'No'. If the questions are too long, hard or complicated that need much thinking, the students may lose interest and be bored.

Thus, when you implement this method:

- i. don't ask complete questions but pause for a while at some part (but at the most important) of your sentence or leave a blank space in the middle of your sentence and wait for some students to fill it in. It would be advisable if the blank space is after words, such as 'is known as _____', 'is called _____', 'are called _____', 'is/are _____', etc.
- ii. but don't wait too long for the answers. If the students cannot complete the task quickly, you have to give them some clues or tell them the answers yourself. If not, the students will be frustrated and be worried for not knowing the right answer,

Visualized Presentation: This is a method by which the students are assisted to actively participate by providing them with real objects. This may include models, projectors, pictures, graphs, charts, films, videos, photos, etc. This can mainly be used in describing various human activities on earth, land forms, natural phenomena, such as volcano, earthquakes, etc.

7. **Brainstorming:** In this method the students will be let to write everything they know or feel with regard to the topic in mind. It is not obligatory for the students to know the exact answer to the question, but express and exchange their prior knowledge about things concerning the new topic for discussion. This activity can be done individually, in pairs, in groups or the whole class at a time. It is useful in narrowing the gap between individual students regarding that particular subject or topic.
8. **Field-visit reporting:** You can make your students write reports based on visits they made recently. The main importance of field visits is to enable the students to compare and contrast what they have learnt in the class with facts they encounter in the real world. The reports they write based on such incidents help them to be keen observers and good interviewers.

Field visits are one means of scientific, technical or social investigation made by going to the exact sites or places. Such visits are usually made by geologists, students of social science or other surveyors. A survey or an observation is made by closely watching or visiting, or by asking people who knows about what is surveyed or observed.

However, your effectiveness cannot be deduced and be acclaimed only from your ability to select and match the best method to your topic. You need also to be well informed and aware of identifying, rating and grading the contents of the subject to be taught.

- 1 **Identifying:** This indicates teacher's ability to tell who or what something is
- 2 **Rating:** This is a process of valuing or judging the value of an object, idea or concept or topic to the purpose or the grade level.
- 3 **Grading:** It is an activity or process of arranging or including a topic or content in to grades in sequences in order that it is found to be presented, taught or learnt without any complication.

These three are the procedures through which a teacher selects a certain topic to a certain group of students.

First he/she has to identify what he/she is going to teach. Then he/she has to rate it as to the time allotment, level of the students and the grade level; next the materials or contents identified should be graded in sequences, degrees of strength and complexity.

Only identifying, grading and rating cannot still be an end unless the teacher is there in the class and be able to present his/her lesson to students. However, before the teacher enters into the class he/she needs to accomplish one significant task – preparing a lesson plan.

A good lesson plan contains four major stages or parts:

1. Introduction
2. Presentation
3. Consolidation/stabilization
4. Evaluation

1. **Introduction:** This is the part of the lesson in which the teacher:
 - i. introduces a new topic,
 - ii. relates the present topic to the past.

2. **Presentation:** This is the stage where the teacher presents and explains the topic to the students. It is at this stage that all the activities discussed earlier be implemented.
3. **Consolidation:** At this stage, the teacher strengthens the topic learnt in the presentation part by explaining the main points or by letting the students perform some tasks that consolidate the main lesson.
4. **Evaluation:** This is the stage where the teacher checks whether the students have understood the topic to the level and amount required. This can be done by asking some questions or by making them do some tasks just after the lesson.

These are the didactic elements of the teaching learning process taking place in the classroom. These activities should be set and stated clearly and vividly in a manner that shows the logical interaction to one another and in accordance with the instructional elements given in the body of the lesson. The instructional elements of the body of the lesson includes, the instructional activities taking place in the given period, teaching materials and teaching aids, units and sub-units, etc.

The format of the lesson may be left to you or a concerned body may provide you with it. However, what you need to take care of is your being sequential, orderly and logical in order that your lesson is comprehensive and the teaching learning process in the classroom is interactive. A good lesson plan would enable the teacher to present the lesson in the given time order and manner. Therefore, topics to be taught, methods to be employed, the teaching materials to be used, and the procedures to be followed should be stated clearly.

It is assumed that the additional activities are common to all students regardless of their differences in attitude, knowledge and skill.

Therefore, the teacher is required to organize the class on the basis of the efficiency of students. The questions should be addressed in terms of the aggregate ability of the students in the group formed for fast, average and slow learners.

You can also refer to the assessment at the end of each unit in the syllabus and needs to stress on it while you are dealing with any activities.

After students study geography, at the end of first cycle secondary education the expected learning outcomes are that students will be able to:

- Develop a basic understanding of the geologic history of the earth in general and Ethiopia in particular;

- Analyze factors and processes of landform formation;
- Comprehend the elements of weather and climate and the mechanisms that create discernible climate pattern in Ethiopia and the world at large;
- Relate major types of natural resources and associated problems and there by develop a set of values and feelings of concern for the resources and the motivation for actively participating in their protection;
- Realize some basic concepts, major theories as well as the impact of population growth on socio – economic development and the environment and measures taken to harmonize them in Ethiopia and the world;
- Appreciate major types of economic activities practical in Ethiopia and the world at large, factors affecting their distribution as well as their levels of development;
- Acquire basic skills in understanding, reading, using and interpreting maps;
- Know the distribution and types of natural regions of the world and appreciate the unique feature of Ethiopia.

Grade level learning outcomes for Grade 9 Geography

After completing grade nine geography lessons, the students will be able:

1. To develop understanding and acquire knowledge of:
 - The term geography, the development of geography as a discipline and the branches of geography.
 - Meaning of map, basic uses of map
 - Some of the marginal information given on maps as well as
 - Convectional sings and symbols used to represent different features on maps
 - The resulting landforms formed by each internal and external forces
 - The meaning of weathering, its types and landforms resulted from chemical weathering
 - Types and characteristics of agents of erosion and associated landscapes with it.
 - The process of deposition and its associated landforms.
 - The meaning, origin, composition and layer of the earth’s atmosphere

- Weather and climate and the concept of temperature
 - Formation and types of rainfall as types of wind
 - The concept of region and regional study
 - Major characteristics of tropical zone
 - Sub-regions of tropical zone; the characteristics of equatorial rain forest and hot desert regions.
 - Major characteristics of temperate zone and its sub-regions.
 - The general characteristics of the Mediterranean and the coniferous regions, and
 - The term ecosystem, its components and interdependence
 - The concept and facts about human population
 - Sources of population data, densely and sparsely populated areas of the world
 - Settlement patterns of population
 - The five types of economic activities and their major characteristics
 - The concept of land use
 - The concept of natural resources
 - Classification of natural resources as renewable & non-renewable
 - Direct and indirect use of natural vegetation
 - The economic significance wild animals
 - The importance of soil
2. To develop skills and abilities of:
- Determining the scope of geography
 - Categorizing maps based on scale and purpose
 - Converting and calculating scale of the map
 - Constructing statistical diagrams
 - Using simple line graph, simple bar graph and pie chart bases on the data provided.

- Appraising the variation of temperature
 - Demonstrating how to measure and record temperature data
 - Computing and interpreting temperature laps rate and data
 - Practicing measuring and recording of rainfall
 - Demonstrating the temperature zones of the world
3. To develop the habits and attitude of :
- Appreciation to the historical development of map
 - Discrimination of the impact of relief on climate over the influence of latitude in Ethiopia
 - Recognition of the major characteristics of frigid zone, its sub regions, tundra and polar ice caps
 - Identification and demonstration of the interdependence in the ecosystem
 - Appreciation for the varied uses of minerals
 - Realization of the prevalence and impact of HIV/AIDS
 - Accept and participate in the implementation of Ethiopian environment policy
 - Realization of the elements of Ethiopian economic policy for development

Unit **1**

THE CONCEPT OF GEOGRAPHY AND MAP READING

Total Periods Allotted: 12

1. Introduction

Most of the contents in this unit are familiar to the students as they were introduced to them in the lower grades in social studies. At this level, the contents are treated in more detail. This unit gives emphasis to introducing basic concepts.

The first sub-unit (**Introduction to the Concept of Geography**) deals with the meaning of Geography, scope of Geography, branches of Geography and what makes Geography a science.

The second sub-unit (**Introduction to the Concept of Map Reading**) deals with the meaning of maps and reading maps, historical development of maps, uses of maps, classification of maps, magnetic declination, the relationship between linear and areal scale, finding scales of maps, measurements of regular and irregular shaped areas and statistical diagrams.

To deal with these contents, group discussion, explanation, demonstration, field visit, practical activities, observation, questioning, and report writing are suggested as major methodologies. The start-up questions and activities are given in each sub-unit to encourage students. Summaries and exercises are also designed to explore the key concepts in more detail.

2. Unit Outcomes

At the end of this unit, the students will be able to:

- *Recognize the concept, scope and branches of Geography.*
- *Express the meaning, historical development, uses and types of map.*
- *Compute field distance and areas of irregular shaped figures.*
- *Construct and interpret statistical diagrams.*

3. Main Contents

1.1 INTRODUCTION TO THE CONCEPT OF GEOGRAPHY

1.2 INTRODUCTION TO THE CONCEPT OF MAP READING

1.1 INTRODUCTION TO THE CONCEPT OF GEOGRAPHY

Periods Allotted: 4

1. Competencies

At the end of this lesson the students will be able to:

- ✚ Define the term Geography.
- ✚ Describe the development of Geography as a discipline.
- ✚ Determine the scope of Geography.
- ✚ Identify the branches of Geography.
- ✚ Identify the characteristics that make the subject of Geography a science.

2. Contents

1.1.1 Meaning of Geography

1.1.2 Scope of Geography

1.1.3 Branches of Geography

1.1.4 What makes Geography a science

3. Overview

There is no one single definition given to Geography as an academic discipline due to its dynamic nature and the large number of areas that it covers. Geography is a science that deals with the distribution and arrangement of all elements of the earth's surface. The word 'geography' was adopted in the 200s BC by the Greek scholar Eratosthenes, and it means "earth description."

Geographic study encompasses the environment of the earth's surface and the relationship of humans to this environment, which includes both physical and cultural geographic features. Physical geographic features include the climate, land and water, and plant and animal life. Cultural geographic features include artificial entities such as nations, settlements, and lines of communication, transportation, buildings, and other modifications of the physical geographic environment. Geographers use economics, history, biology, geology, and mathematics in their studies.

The development of Geography was not an overnight process but rather its development took a long period of time. Hence, Geography is one of the oldest disciplines. Today Geography has become an applied science through the application of problem-oriented approaches in all its sub-fields.

The scope of geography is very wide; this is so because it deals with physical, social and economic aspects of the world. Geography may be divided into two fundamental branches:

Systematic and Regional Geography. Systematic Geography is concerned with individual, physical and cultural elements of the earth. Regional Geography is concerned with various areas of the earth, particularly the unique combinations of physical and cultural features that characterize each region and distinguish one region from another. Because the division is based only on a difference in approach to geographic studies, the two branches are interdependent and are usually applied together. Each branch is divided into several fields that specialize in particular aspects of Geography.

4. Teaching-Learning Process

4.1 Suggested Teaching Aids

- Pictures that show ancient world maps.
- Charts that show the branches of Geography.

4.2 Suggested Teaching Methods

- Ask students what they know about Geography and help them to arrive at a correct definition and then to determine the scope and branches of Geography.
- Arrange small-group discussions so that students discuss what makes an academic subject a science and equate it to prove that Geography is a science.
- Have the small-group discussions be presented to the whole-class in order to arrive at the desired points through a whole class discussion.

4.3 Pre-lesson Preparation

- Make charts of branches of Geography and pictures ready.
- Refer to relevant materials on the concept of Geography.

4.4 Presentation of the Lesson

a) Introduction of the lesson

Introducing the lesson by asking the question like

- What is Geography?
- What are the major areas of studies of Geography?
- Is Geography a science or an art?
- Explain the scope of Geography
- What do we mean by scope?
- Distinguish between natural and human phenomena
- What makes Geography broad?

b) Body of the lesson

- Give a general definition of Geography;
- Based on the given definition, indicate Geography's major areas of concern.
- Define what a scope means and the scope of Geography.
- Explain the major issues that Geography deals with.

- By using a chart, identify the major branches of Geography
- Help your students to present real life examples from the surroundings about physical and human feature.

c) Stabilization

Ask students to identify the key point of the lesson and then stabilize your lesson presentation by reviewing all essential points, including those not mentioned by the students. You may mention the following.

- Geography as a branch of science that studies the earth's surface and the distribution arrangement and interaction of natural and human features and their causes and effects.
- Geography's scope is very wide. As the scope is dynamic, it changes often as new discoveries and ideas enter the field.
- The two branches of geography is physical and human geography.
- Geography being a science the main tools uses to gather and analyze information is observation, systematic description, systematic recording and mapping.

4.5 Evaluation and Follow up

a) Evaluation

Ask questions like the following.

- What is Geography?
- What are the main areas in the field of Geography?
- What makes Geography a broad discipline?
- What is scope?
- What are the two major branches of Geography?
- What are the major differences between the two branches?

b) Follow up

- Encourage students to list and discuss; in groups, the major elements and events available in their surroundings and categorize these elements under physical and human Geography.
- Help them to present their group findings to the class.

c) Additional Activities

1. Why that geography does not have a well defined meaning?
2. Mention the major issues that compose the scope of geography.

4.6 Answer for the Activities

Activity 1.1

1. I agree, because geographic study encompasses the environment of the earth's surface and the relationship of humans to this environment, which includes both physical and cultural geographic features. Physical geographic features include the climate, land and water, and plant and animal life. Cultural geography features include artificial entities such as nations, settlements, and lines of communication, transportation, buildings, and other modification of the physical geographic environment. Geographers use economics, history, biology, geology, and mathematics in their studies.
2. I do not agree, because the following are major issues that geography deals with as a field of study:
 - The shape, size and movement of the earth.
 - The distribution and position of continental land masses and water bodies.
 - The rocks and relief of the earth's surface
 - The climate of the earth's surface and the elements that it is composed of
 - Types and distribution of vegetation and animals of the earth.
 - The interrelationship and interaction among the elements of the environment.
 - The human population: major, races, pattern of population growth and distribution, effects of rapid population growth, etc.
 - The varied activities of human kind.
 - The responses, relationships and interactions between humans and their environment.
3. I am not agree, because the scope of geography is very wide; it deals with physical, social and economic aspects of the world.

Activity 1.2

1. Yes, because it is an applied science. Please, teachers, give students freedom to asses and discuss the issue in their perspective.
2. Yes, because it is acquiring knowledge through scientific methods. These methods include observation, systematic description, systematic recording and mapping.
3. The area of the study of geography has five themes. The five themes are location, place, human-environment interaction, movement and region.
4. Geography has common areas of study with a number of other fields of study. Generally geography is classified into two broad categories: physical and human. The physical parts of geography are related to the natural sciences and the human aspects are strongly associated with the social sciences.

Answer for Additional Activities

1. This is because geography is dynamic subject and large number of area that it covers.
2. Hydrosphere, biosphere, atmosphere, and lithosphere.

Exercise 1.1

Part I

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

Part II

5. C
6. D
7. C
8. D
9. D

Part III

10. Physical and Human Geography
11. The distribution, arrangement and interaction of natural and human features and their causes and effects.
12. Biogeography
13. The distribution of political systems and the ways people use them to exercise power and make decisions.
14. It studies the distribution of natural features of the world, such as climate, landform, soil, vegetation, and drainage system.

1.2 INTRODUCTION TO THE CONCEPT OF MAP READING

Periods Allotted: 8

1. Competencies

At the end of this lesson the students will be able to:

- ✚ Explain the meaning of a map
- ✚ Appreciate the historical development of maps
- ✚ State the basic use of a map
- ✚ Distinguish the conventional signs and symbols used to represent different features of maps
- ✚ Categorize maps based on scale and purpose
- ✚ Identify some of the marginal information given on maps
- ✚ Convert linear scale to areal scale
- ✚ Calculate the scale of a map
- ✚ Calculate the areas of regular and irregular shaped figures by referring to the scale of a map
- ✚ Construct statistical diagrams using simple line graph, bar graph and pie chart based on the provided data.

2. Contents

1.2.1 The meaning of 'map'

1.2.2 Historical development of maps

1.2.3 Uses of maps

1.2.4 Classification of maps

1.2.5 Marginal Information on maps

1.2.6 The relationship between linear and area scales

1.2.7 How to find scale of a map

1.2.8 Measurement of Regular and Irregular shaped areas

1.2.9 Statistical Diagrams

3. Overview

A map is a representation of a geographic area, usually a portion of the earth's surface, drawn or printed on a flat surface as viewed from vertically above. In most instances, a map is a diagrammatic rather than a pictorial representation of a terrain; it usually contains a number of generally accepted symbols, which indicate the various natural, artificial, or cultural, features of the area it covers. A map shows physical, human, political or other features. Each feature on a map corresponds to its geographical position on the ground according to a definite scale or proportion.

Map making is known as cartography. A map maker is known as a cartographer. Maps can be made in traditional or modern ways. The traditional one is very tiresome; it covers a small area and lacks accuracy. Modern map making is carried out in a scientific way using specially designed techniques and modern technology including aerial photographs, satellite images and geographic information systems (GIS).

GIS is a computer data-base which ties every piece of information to a geographic location. It is used to collect, store, retrieve, analyze and display spatial data. The data may be input or output data. As input or output, it may be in a form of maps, numbers, graphs, and diagrams, or in any other form that makes sense to the user. The importance of GIS lies in the move from a static representation in a map form to a dynamic analysis of many kinds of spatial data.

Presently, the function of maps is highly diversified and has got depth. Maps have become very effective tools or devices for recording and communicating information about the environment. Furthermore, maps can be used to identify location and directions and to measure areas and distances.

Types of Maps

Types of maps may be categorized based on purpose, information conveyed and variation in scale. Types of maps based on purposes include physical and cultural maps. Physical maps are concerned with depicting information related to natural phenomena. Such maps include relief maps, geological maps, climatic maps, vegetation maps and bathometric maps. Cultural maps, on the other hand, represent various features that are created by human activities. Cultural maps include ethnographic maps, linguistic maps, economic maps, demographic maps, urban maps, rural maps, political maps and commercial maps.

Other types of maps are those based on the information they convey. Such maps include reference, general purpose maps and thematic (topical) maps.

Reference maps represent a combination of both natural and human-made features of a given landscape. That means, various information can be conveyed simultaneously. To convey large information on a map, its scale should be large.

Thematic (topical) maps indicate information about a specific topic superimposed on a base map. Therefore, they show a single or (one type of) feature. Thematic maps include geologic, forestry, soil, land use, slope, historical-events, commercial etc. maps. These maps are useful to compare the characteristics of different regions.

Finally, types of maps can be characterized based on variation in scale. Thus, according to variations in scales, maps are named as:

1. Large scale maps—drawn at a scale of 1:50,000 or larger. They show detailed information of small areas like villages, towns, cities, etc.
2. Medium scale maps—drawn at a scale of between 1:50,000 - 1:250,000.
3. Small scale maps—drawn at a scale of less than 1:250,000. They show very general or summarized information about large areas like countries, continents and the world.

Map Information

Any conventional map conveys complete basic information about the title, date, key, scale, grid references and magnetic declination (variation).

Maps, as tools of communication, convey spatial messages with the help of signs and symbols. These signs and symbols help not only to transmit messages but also to distinguish features from one another on the same map. Different maps may use different signs and symbols, which are explained on the key, legend or reference of the map. In addition to signs and symbols, colors also serve as a means of distinguishing features on maps.

One of the items of marginal information is scale. Map scale is generally divided into two, namely linear scale and areal scale.

Linear scale includes scale statement, graphic scale and representative fraction. It is possible to change one form of linear scale into another form of its type.

Areal scale is used to describe the relationship between the areas of features plotted on a map to the area of the same features on the earth's surface. This scale is understood better in terms of representative fraction, i.e., any size of representative fraction can be squared to express areal scale.

If the scale of a map is not given, two methods are employed to find the scale of the map. These methods are using known distance between points, shown on the map and using latitudes.

Graphic or diagrammatic (pictorial) representation of statistics is one of the most practiced and popular work. It is simple for construction and interpretation. Moreover, it has a wide variety of uses ranging from depicting the climate to population trends, crop and mineral production, and trade commodities by volume of a given area. Generally, statistical diagrams have visual appeal and the information they convey is clearly and easily understood.

Steps used to draw a line graph:

- Draw a horizontal line (x – axis) and a vertical line (y – axis), preferably on graph paper.
- Select a fixed interval and plot the population size on the vertical axis and time or year on the horizontal axis.

Steps used to draw a simple bar graph

- Choose a fixed interval for the variable. Define the interval so that it is appropriate for the range of the data's value.
- Draw a horizontal line indicating the 'zero' value then, above the zero-value line, draw additional lines, using the value of the interval to separate them.
- Draw a vertical line at the left margin. On it label the horizontal lines.

Steps used to draw a pie chart

- Draw a circle with a convenient radius.
- Express each of the component values as a percentage of the respective total.
- Express each components' proportionality in degree.
- Divide the circle into convenient parts, with their sizes based on the degrees.
- Label the parts according to the proportion.

4. Teaching-learning Process

4.1 Suggested Teaching Aids

- Large, medium and small scale maps.
- Diagrams that show magnetic declination.

- Sketch maps that show regular and irregular shaped areas.
- Rulers and pencils
- GPS(Geographical Positioning System)

4.2 Suggested Teaching Methods

- Review the meaning of a map and discuss its historical development.
- Organize small groups to discuss the uses of a map, its classification and marginal information.
- Let students review the scale of a map in small groups and then practice conversion of linear scales into a real scales.
- Demonstrate the ways of finding the scale of a map and then let students practice how to find the scale of a map.

Provide given data of population, production, and climate, then organize students and make them show the data in simple line graphs, bar graphs and pie charts.

4.3 Pre-lesson Preparation

- Get the materials suggested as teaching aids ready.
- Collect sample maps in each case so that they are displayed in class.
- Select different maps with marginal information.
- Prepare a sketch map and show important marginal information on it.
- Draw diagrams that demonstrate different scales.
- Collect different graphs and display them in the classroom.
- Collect data on climate, population, crop production, trade, commodities, etc.

4.4 Presentation of the Lesson

a) Introduction of the lesson

Ask the following questions to start the lesson:

- What is a map?
- What is the difference between traditional and modern maps?
- What are the basic uses of a map?
- What are the types of map you know?
- What are the basic factors for map classification?

You may also ask students to distinguish the difference among line graphs, bar graphs and pie charts that you have displayed in the classroom.

b) Body of the lesson

- Review the meaning of map and discuss its historical development.
- Explain the importance of marginal information on a map.
- Ask students to read information from a map with the help of marginal information.
- Let students review the scale of a map in small groups and then practice conversion of linear scales into a real scales.
- Explain how types of maps are categorized based on purposes, information conveyed and variation in scales.
- Let students compare and contrast physical and cultural maps.
- Ask students to compare and contrast general maps and thematic maps.
- Discuss types of maps based on variation in scales.
- Generalize the lesson by briefing the various types of maps.
- On a sketch map, demonstrate how to represent different information with the help of signs and symbols.
- Help students to practice representing information using signs and symbols on a sketch map.
- Discuss points that should be considered for constructing simple line graphs, simple bar graphs and pie charts.
- By using data, demonstrate how to construct the various graphs and diagrams.

c) Stabilization

You may stabilize the lesson by revising the key ideas and concepts of the lesson such as

- A map is a simplified, diminished, plane representation of all or parts of the earth's surface as viewed from vertically above.
- Maps are basically used for finding location, distance, area and direction
- Maps can be classified; based on purpose function, information they convey and scale
- The scale of a map is the ratio between the measurement of distance on the map and the corresponding measurement on the earth's surface.
- There are two major map grid systems. These are international! (Geographic) grid system and national grid system.

4.5 Evaluation and Follow up**a) Evaluation**

Ask questions like the following:

- What is a map?
- What are the two grid references?

- Compare and contrast signs and symbols.
- What is a map scale?
- What is the difference between linear scale and areal scale? Support your answer by providing examples.
- What types of map do you know?
- How are maps categorized into two types?
- Explain the main uses of line graphs.
- List the different types of graphs and explain what purpose each serves.
- Describe the procedures used to draw a pie-chart.

b) Follow up

1. Organize students into small groups to discuss the uses of a map, its classification as well as marginal information.
2. Let students draw a sketch map and use different signs and symbols to show various features of their school compound.

c) Additional Activities

1. What does a map scale indicate?
2. What are the four cardinal directions?
3. In what direction do lines of longitude run?
4. What is one advantage of using graphs, charts, or tables to display information?
5. Change the following data to a line graph.

Month	J	F	M	A	M	J	J	A	S	O	N	D
°C	24	25	23	19	15	12	10	11	13	15	18	22

6. Draw a pie chart by using the following data:

X = 60.5%	N = 8.5%
Y = 14.7%	P = 5.0%
W = 10.8%	Z = 0.5%

4.6 Answer for the Activities

Activity 1.3

1. It is a flat piece of paper. It is also a flat sheet of paper.

2. **Globe**

- It cannot show all geographical phenomena at a time
- It is three-dimensional
- It is difficult to measure distance on a globe
- Globes are always made on small scales
- It is expensive

Map

- It can show all geographical phenomena at a time
- It is two-dimensional
- It can measure distance on a map
- Maps can be made on small, medium and large scale
- It is less expensive

- Please teachers encourage students to prepare their own sketch map and show on the sketch map the settlement pattern of their locality.

Activity 1.4

- Modern map making is characterized by extensive map production and intensive use of more accurate and detail maps of atlas, globe and charts.
- Components of GIS are computer technologies, both hard ware and software, GIS data base, GIS infrastructure.

Activity 1.5

- Ethiopia is located south of Eritrea, north of Kenya, west of Djibouti, North West of Somalia and East of Sudan.
- Kenya

Activity 1.6

- Yes, by using scale
- | | |
|---------------------------------------|---------------------------------------|
| Large – scale map | Small – scale map |
| - cover small areas | - Cover large areas |
| - contain highly detailed information | - Contain less – detailed information |
- 1: 250,000, because small scale map is $\leq 1: 250,000$

Activity 1.7

- Please, teachers, find a political map of Ethiopia and have the students try identifying marginal information on the map. This marginal information includes; title of the map, year of publication, author, place of publication and publisher, scale, legend, type of projection and the magnetic declination.
- Please, teachers first, try to show how to make as ketch map by using scale and symbols. Finally, have the students sketch a map of their school compound.

Activity 1.8

- 1cm to 2km

$$\text{Areal scale} = \frac{\text{dis tan ce on the map}}{\text{dis tan ce on the ground}} = \frac{(1\text{cm})^2}{(2\text{km})^2}$$

$$\text{Areal scale} = 1\text{cm}^2 \text{ to } 4\text{km}^2$$
 - 1: 100,000

$$1\text{cm to } \frac{100,000 \text{ cm}}{100,000} = (1\text{cm})^2 \text{ to } (1\text{km})^2$$

$$\text{Areal scale} = 1\text{cm}^2 \text{ to } 1\text{km}^2$$

c) 5cm to 25km

$$\text{Areal scale} = \frac{5\text{cm}}{5} \text{ to } \frac{25\text{km}}{5}$$

$$(1\text{cm})^2 \text{ to } (5\text{km})^2$$

$$\text{Areal scale} = 1\text{cm}^2 \text{ to } 25\text{km}^2$$

d) 3cm² to 9km²

$$\frac{3\text{cm}}{3} \text{ to } \frac{9\text{km}}{3}$$

$$(1\text{cm})^2 \text{ to } (3\text{km})^2$$

$$\text{Areal scale} = 1\text{cm}^2 \text{ to } 9\text{km}^2$$

2. a) linear scale = $\sqrt{\text{areal scale}}$

$$= \sqrt{\frac{4\text{cm}^2}{400\text{km}^2}} = \frac{2}{20} \text{cm to } \frac{20\text{km}}{2}$$

$$1\text{cm to } 10\text{km}$$

b) $\frac{4\text{cm}^2}{4}$ to $\frac{16\text{km}^2}{4}$

$$1\text{cm}^2 \text{ to } 4\text{km}^2$$

$$\text{linear scale} = \sqrt{\frac{1\text{cm}^2}{4\text{km}^2}}$$

$$1\text{cm to } 2\text{km}$$

c) $\frac{5\text{cm}^2}{5}$ to $\frac{500\text{m}^2}{5}$

$$1\text{cm}^2 \text{ to } 100\text{m}^2$$

$$\text{linear scale} = \sqrt{\frac{1\text{cm}^2}{100\text{m}^2}}$$

$$1\text{cm to } 10\text{m}$$

d) 1cm² to 4km²

$$\text{linear scale} = \sqrt{\frac{1\text{cm}^2}{4\text{km}^2}}$$

$$1\text{cm to } 2\text{km}$$

Activity 1.9

1. Solution

$$\text{MD} = 5\text{cm}$$

$$\text{GD} = 100 \text{ km}$$

$$\text{Scale} = ?$$

Where MD – map distance, GD - Ground distance

$$\text{scale} = \frac{\text{MD}}{\text{GD}} = \frac{5\text{cm}}{5} \text{ to } \frac{100\text{km}}{5}$$

1 cm to 20 km

1 cm to $20 \times 100,000$ cm

Scale = 1: 2,000,000

2. Solution

5°N latitude

10°N latitude

MD = 10cm

GD = 555km

Scale = ?

Where MD – distance on the map, GD –distance on the ground

GD = $10^\circ\text{N} - 5^\circ\text{N} = 5^\circ$

Where 1° latitude $\approx 111\text{km}$

= $5^\circ \times 111\text{km} = 555\text{km}$

$$\text{scale} = \frac{\text{MD}}{\text{GD}}$$

$$= \frac{\cancel{10}\text{cm to } \cancel{555}\text{km}}{\cancel{10}} = 1\text{cm to } 55.5\text{km}.$$

Scale = 1 to 5,550,000

Activity 1.10

1. Solution

b = 3cm

h = 6cm

Scale = 1cm to 2km

A = ? where b = base, h = height, A = area

$$A = \frac{1}{2} \times b \times h$$

$$b = \frac{3\text{cm} \times 2\text{km}}{1\text{cm}} = 6\text{km} \quad h = \frac{6\text{cm} \times 2\text{km}}{1\text{cm}} = 12\text{km}$$

$$= \frac{1}{2} \times 6\text{km} \times 12\text{km},$$

A = 36km^2

2. Solution

r = 4cm

scale = 1cm to 5km

ground area = ?

$$r = \frac{\cancel{4}\text{cm} \times 5\text{km}}{\cancel{1}\text{cm}}$$

$$r = 20\text{km}$$

$$A = \pi r^2 \text{ where } \pi = 3.14, r = \text{radius}$$

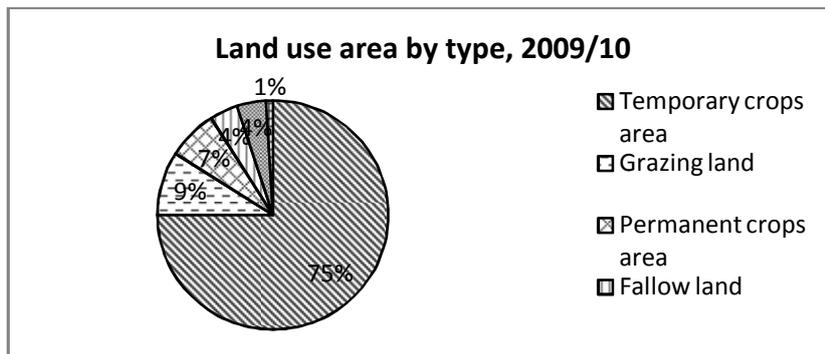
$$= \pi \times (20\text{km})^2$$

$$A = 3.14 \times 400\text{km}^2$$

$$A = 1256 \text{ km}^2$$

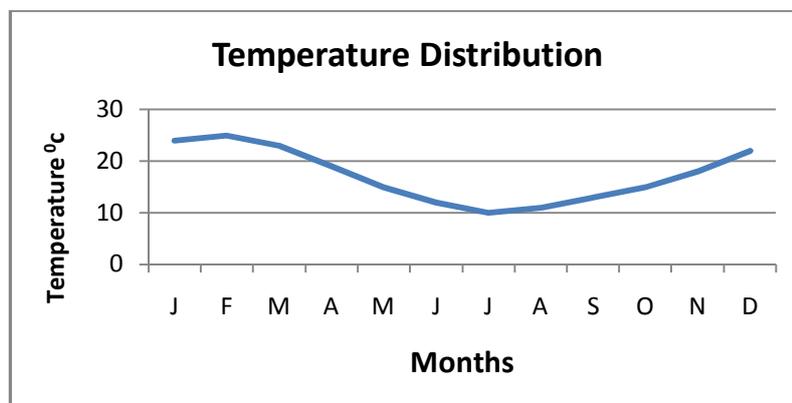
Activity 1.11

1. Line graph, bar graph, pie-chart, histogram, etc.
2. Gives students the freedom to collect data for the male and female populations of their school and to try to draw a simple bar graph.
- 3.

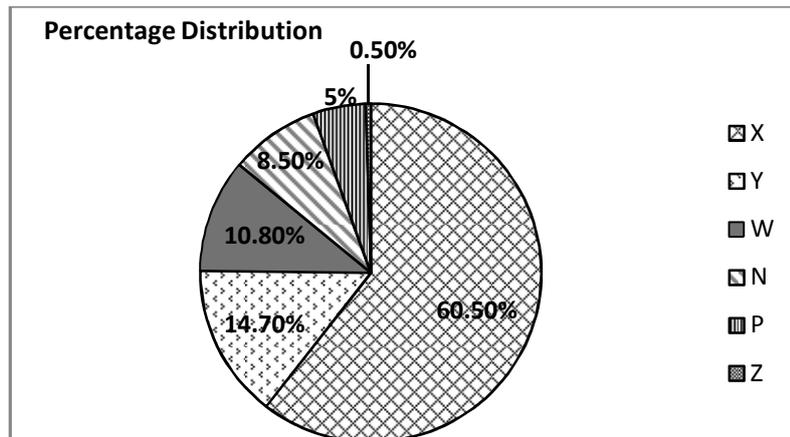


Answer for Additional Activities

1. The scale of a map indicates the ratio between the measurement of distance on the map and the corresponding measurement on the earth's surface.
2. North, South, East and west.
3. Towards east.
4. Statistical diagrams are particularly important tools for presenting large amounts of statistical data.
- 5.



6.



Exercise 1.2

Part I

1. B 2. A 3. B 4. C 5. B

Answer for Review Exercise on Unit 1

Part I

1. A 2. B 3. D 4. C 5. E

Part II

6. B 7. A 8. D 9. B 10. A 11. A 12. C

Part III

- a. Scale - the ratio of the distance between two points on a map and the actual distance between the two points on the earth's surface.
- b. Statistical diagrams are pictorial representations of numerical information.
- c. Legend – explains the meaning of the signs and symbols used in the map.
- d. Linear scale – expresses the ratio of map distance to ground distance.
- e. A real scale – shows the relationship between map area and ground area.
- f. Map – is a graphic representation of the entire worlds or part of it is on a plane surface in simplified with using a scale.
- g. Magnetic declination – is the difference between the magnetic north and true north.

Check List

Check the student’s performance according to the given competencies referring the questions under the check list for every unit. Put a tick (✓) mark against each task weather they are able to perform in the competencies of each unit. The students are expected to respond saying Yes or No. then, you can make your own evaluation whether the competencies are met or not.

Can you:

	Yes	No
1. define the term geography?-----	<input type="checkbox"/>	<input type="checkbox"/>
2. describe the development of geography as a discipline?-----	<input type="checkbox"/>	<input type="checkbox"/>
3. determine the scope of geography -----	<input type="checkbox"/>	<input type="checkbox"/>
4. identify the branches of geography; and? -----	<input type="checkbox"/>	<input type="checkbox"/>
5. identify the characteristics that make the subject of geography a science	<input type="checkbox"/>	<input type="checkbox"/>
6. explain the meaning of a map?-----	<input type="checkbox"/>	<input type="checkbox"/>
7. appreciate the historical development of maps? -----	<input type="checkbox"/>	<input type="checkbox"/>
8. state the basic uses of maps? -----	<input type="checkbox"/>	<input type="checkbox"/>
9. categories maps based on scales and purposes? -----	<input type="checkbox"/>	<input type="checkbox"/>
10. distinguish the conventional signs and symbols used to represent different features on maps?-----	<input type="checkbox"/>	<input type="checkbox"/>
11. identify some of the marginal information given on maps?-----	<input type="checkbox"/>	<input type="checkbox"/>
12. convert linear scale to areal scale?-----	<input type="checkbox"/>	<input type="checkbox"/>
13. calculate the scale of a map?-----	<input type="checkbox"/>	<input type="checkbox"/>
14. calculate the areas of regular and irregular shaped figures by referring to the scale of a map?-----	<input type="checkbox"/>	<input type="checkbox"/>
15. construct statistical diagrams using simple line graphs, bar graphs and pie charts based on the provided data? -----	<input type="checkbox"/>	<input type="checkbox"/>

Unit Assessment

Students' performance has to be assessed continuously over the whole unit. The assessment will be made by comparing students' performance with the specified level of competencies. Besides, the teacher has to recognize the level of performance of each student and provide assistance accordingly.

Thus:

A student at a minimum requirement level will be able to define geography; describe development, determine the scope and identify the branches of geography, explain the meaning, appreciate the historical development, state the basic uses of maps, identify some of the marginal information, distinguish conventional signs and symbols on maps and categorize maps based on scale and purpose; convert linear scale to areal scale; calculate scales of maps and areas of regular/irregular shaped areas from a map and construct simple statistical diagrams.

In addition, a student working above the minimum requirement level and considered as higher achiever should be able to evaluate varied definitions of geography, state the fundamental differences of maps that are classified based on scale, design her/his own signs and symbols to convey information on maps, calculate the scales of maps based on given degree distance information, and evaluate the relationships and differences of two kinds of information presented on maps, using simple statistical diagrams.

Students working below a minimum requirement level will require extra help if they are to catch up with the rest of the class.

Students reaching the minimum requirement level but achieving a little bit more should be supported so that they attain the higher-achiever competencies. Students who fulfil the higher-achiever competencies also need a special support to continue and achieve more.

Unit **2**

PHYSICAL ENVIRONMENT OF THE WORLD AND ETHIOPIA

Total Periods Allotted: 34

1. Introduction

The physical environment of the world is not in a static state. It is in continuous change. There are very many forces and agents that create such change.

Thus, this unit gives priority to the introduction of the basic concepts of *forces that change the surface of the earth, weather and climate, natural regions of the earth, ecosystem and villagization of the world through distance-time decay*. Each topic is presented by giving concise and clear explanations and illustrative diagrams, tables and charts. To deal with the contents, we suggest you use group discussions, explanations, demonstrations, field visits, practical activities, observation, questioning, and report writing as major techniques of presentation. The start-up questions and activities are given in each sub-unit to encourage students. Summaries and exercises are also designed to explore the key concepts in more details.

2. Unit Out comes

After completing this unit, students will be able to:

- *Analyze the internal and external forces that change the surface of the earth and relate them with the resulting land forms;*
- *Appreciate the origin, composition and the layers of the earth's atmosphere;*
- *Analyze the association between elements and controls of climate and interpret climatic data.*
- *Realize the concept of region, distinguish different temperature zones of the earth and describe Ethiopia as a tropical mountainous country;*
- *Assess the concepts, components, interdependence and factors that affect the distribution and features of ecosystems.*

3. Main Contents

2.1 FORCES THAT CHANGE THE SURFACE OF THE EARTH

2.2. WEATHER AND CLIMATE

2.3. NATURAL REGIONS OF THE EARTH

2.4. ECOSYSTEM

2.5. VILLAGIZATION OF THE WORLD THROUGH DISTANCE- TIME DECAY

2.1 FORCES THAT CHANGE THE SURFACE OF THE EARTH

Periods Allotted: 8

1. Competencies

At the end of this lesson, students will be able to:

- ✚ *list the landforms formed by each internal force;*
- ✚ *describe the process of each internal force;*
- ✚ *relate some major landforms with their respective internal forces;*
- ✚ *explain the effects of earthquakes on infrastructure; like buildings, dams, roads;*
- ✚ *review external forces;*
- ✚ *state the meaning of weathering;*
- ✚ *distinguish the different types of weathering;*
- ✚ *identify land features resulting from chemical weathering; stalactite, stalagmite, pillar etc;*
- ✚ *explain the types and characteristics of agents of erosion;*
- ✚ *relate types of erosions;*
- ✚ *state the effects of erosion on human activities; with various land scapes;*
- ✚ *explain the process of deposition;*
- ✚ *recognize erosion-deposited soils and landforms.*

2. Contents

2.1.1 Internal forces

- Folding
- Faulting
- Volcanism
- Earthquake

2.1.2 External forces

- Weathering
- Types of weathering (physical and chemical)
- Erosion Agents (wind and water)
- Types of erosion (sheet, rill, gully)
- Deposition
- Landforms created by wind and water deposition

3. Overview

The surface of the earth is always changing. Earth movements within and below the crust produce landforms of wide area and often great height, while the agents of denudation: rain, frost, river, ice, wind and sea wave, constantly work on the landforms modifying their surfaces and sometimes completely changing their appearance.

Earth movements cause rocks to fold and fault, and they give rise to earthquakes and volcanoes.

Isostatic adjustment and plate movement cause stress in rocks that make up the earth's crust. Crustal stress occurs when lithosphere plates collide, separate, or rub together. Such a stress causes a strain in crustal rocks. Strain is a change in the shape or volume of rocks that results from the stress of being squeezed, twisted, or pulled apart. The three main types of stress are compression, tension and shearing.

When rocks respond to stress by becoming permanently deformed without breaking, the result is *folding*. Folding is most easily observed where, gradually, compressional forces move rock layers from horizontal positions into alternating ridges, anticlines, troughs, and synclines. The sides of a fold are called limbs. If compression continues, then simple folds are changed first to asymmetrical folds, then into over-folds and finally into over-thrust folds.

The highest mountain chains in the world are made up of folded mountains and are commonly found where continents have collided. The process of fold-mountain building is called *orogeny*.

Faults are fractures along which movements take place. Faulting can be caused by either lateral or vertical forces, or either compression or tension.

In a non-vertical fault, the hanging wall is the rock above the fault plane and the foot wall is the rock below the fault plane.

The following are the three types of faults.

- A reverse fault forms when compression causes the hanging wall to move up relative to the foot wall.
- A thrust fault is a special type of reverse fault. The fault plane of a thrust fault is nearly horizontal. Because of the low angle of the fault plane, the rocks in the hanging wall are pushed up and over the rocks in the foot wall.
- A strike-slip fault is when the rock on either side of the fault plane slides horizontally. Strike-slip faults often occur along transform boundaries.

Earthquakes are sudden vibrations or tremors in the earth's crust. Earthquakes are also results of internal forces. Earthquakes occur most commonly near places where collision occurs. The main collision regions where earthquakes occur are the mid-oceanic ridges, the ocean trenches and volcanic islands, and regions of crustal compression. The sliding of two plates past each other in a horizontal or vertical direction also produces violent waves which cause earth tremor.

Beneath the earth's crust there is hot, liquid rock called magma. Where plates separate from or collide with each other, the magma can sometimes force its way up through cracks in the crust until it reaches the surface. This process and effect are known as volcanic eruption.

Landforms associated with volcanism may be classified into intrusive and extrusive rock formations. The product of intrusive volcanicity is sills, dikes, batholiths, while the extrusive volcanicity are lava plateaus, geysers, and hot springs.

External forces act upon the surface of the earth. Rocks at the earth's surface are constantly wearing away or denuding by the force of weathering and erosion.

Weathering is the simple breaking down of rocks which lie exposed to weathering. There are two types of weathering: mechanical and chemical weathering. Mechanical weathering breaks rocks up into smaller pieces. Its main agents are frost, temperature change, plants and animals. Chemical weathering causes rock to dissolve or decompose. Its main agent is rain.

Erosion is also a form of weathering -the breaking down of rock particles. Erosion is caused by moving water moving ice, and moving air. Materials which are carried away by the forces of erosion are eventually dropped (deposited) in other areas. This is known as deposition.

4. Teaching-learning Process

4.1 Suggested Teaching Aids

- Diagrammatic and animated films that show the process of folding, faulting, volcanism, earthquake and the formation of rift valley and block mountains.
- Pictures and photographs that show the formation of earthquakes.
- Diagrams color Pictures, Photographs and animated films that show the formation of landforms in association with external forces.

4.2 Suggested Teaching Methods

- Brain storming sessions on internal forces.
- Discussions on the processes through which folding, faulting, volcanism and earthquakes can happen, based on the expressions diagrammatic, animated films.
- Discussion the internal forces in small groups.
- Presentation on effects of earthquakes and volcanism on infrastructure like buildings, dams, etc.
- Demonstration of what happens to soil when it interacts with water, temperature conditions and plant roots through animated films, diagrams, colour pictures or other means.
- Field visit to observe the effects of erosion in their surroundings, and to distinguish land forms associated with different agents of erosion.

4.3 Pre-lesson Preparation

- Collect models representing different types of landforms.
- Get diagrams representing fold mountains, volcanoes, block mountains, rift valleys, and different landforms associated with rivers, winds, and seawater
- Collect and arrange different photos, pictures, slides and animations about the formation of internal and external landforms.

4.4 Presentation of the Lesson

a) Introduction the lesson

You can introduce this lesson by asking questions such as:

- How do you think landforms are created?
- What are the factors that influence the formation of landforms?
- What are the different forms of land?
- How are landforms formed in your locality?
- Mention major landforms in your locality?

b) Body of the lesson

- Explain the forces that change the surface of the earth
- Instruct the students to look at the figures in their textbooks.
- Demonstrate the photos, pictures, and figures that you prepared or collected for the lesson and explain to your students.
- In your explanation, be precise and specific to some most important points.
- Create situations in which your students could be participant by inviting them to explain, to give examples, to ask questions, or to discuss at least for 2-3 minutes.
- Help the students to do the activities included in the textbook. Some of the activities may require field trips. Please try to arrange them whenever necessary.
- Give short notes when you think it is vital, but do not make your students copy from their textbooks at all.

c) Stabilization

Ask students to identify the key points of the lesson and then stabilize your lesson presentation by reviewing all essential points, including those not mentioned by the students. You may mention the following.

- Forces that drive energy from the interior part of the earth are internal forces.
- Forces inside the crust cause folding, faulting, volcanism and earthquake.
- External forces lower and raise the level of the land by wearing it away and by **deposition** through the process of **denudation**.
- **Denudation** is carried out by weathering and erosion.
- **Weathering** includes physical weathering and chemical weathering that breaks the rocks into smaller pieces and forms new substances, respectively.
- **Physical weathering** is the breaking of rocks into smaller pieces by the agents of **temperature changes, frost action and plant and animal actions**
- **Chemical weathering** is the process that forms new substances from minerals in the rock by the agents of rain action, plants and animal action, etc.
- **Erosion** is the transporting of weathered material by various natural forces such as moving water, wind and moving ice.
- Erosion occurs where particles of rock or soil are washed away by a river, removed by waves in the sea, crushed under a glacier or blown away by the wind.

4.5 Evaluations and Follow up

a) Evaluation

To evaluate your students' success and/or failure, ask them questions like the following:

- What does the term 'landform' mean?
- Write at least three landforms which are the outcomes of external and internal forces.

- List the major fold mountains in the world?
- List countries crossed by the East African Rift valley
- What is weathering?
- Which areas are frequently affected by earthquakes in the world?
- What is the effect of weathering on land forms?
- Is there any difference between physical weathering and chemical weathering?

b) Follow up

At the end of the lesson, give different tasks to students that enable them to consolidate and broaden their understanding, share ideas, create awareness and do things. You can also give potential tasks such as:

1. Modelling and drawing,
 - Fold mountains
 - Rift valleys
 - Block mountains
 - Volcanoes
2. Indicate major fold mountains, volcanic mountains and the earthquake belt on a world map.
3. Study the agents of erosion affecting your locality most.
4. Write a short report of your observation and present it for a classroom discussion.
 - It is also possible to ask a lot of oral questions; however, you should be well informed that your questions are firmly related to your topic and the answers are well known by yourself. Therefore, you need to be well prepared.

c) Additional Activities

1. List some of the Block Mountains of the world.
2. What is the instrument that measures the magnitude of earthquakes?
3. Name the three types of volcanoes.

4.6 Answer for Activities

Activity 2.1

1. Normal fault is a fault in which the hanging wall moves down relative to the foot wall due to tensional stress. A rivers fault forms when compression causes the hanging wall to move up relative to the footwall.
2. Compressional force is the pushing or squeezing of crust. It can cause for both faulting and folding of rocks. Tensional force is the pulling or stretching of crust. It can cause faulting of the crust only.

3. Yes, a fault is a crack on the earth's crust. It is caused by internal movement in the earth. The force of movement may be a force of tension, i.e. stretching and pulling apart. Or it may be a force of compression i.e. pushing from two directions and becoming smaller so that a crack is formed. Faulting is, therefore, another way by which the surface of the earth is changed.

Activity 2.2

1. East African Rift Valley
2. Give students freedom to assess and discuss the issue in their perspectives.

Activity 2.3

1. Gives students freedom to assess and discuss the issue from their perspectives.
2. The rock that bend downward arch is syncline, the rock that bend up ward form anticline.

Activity 2.4

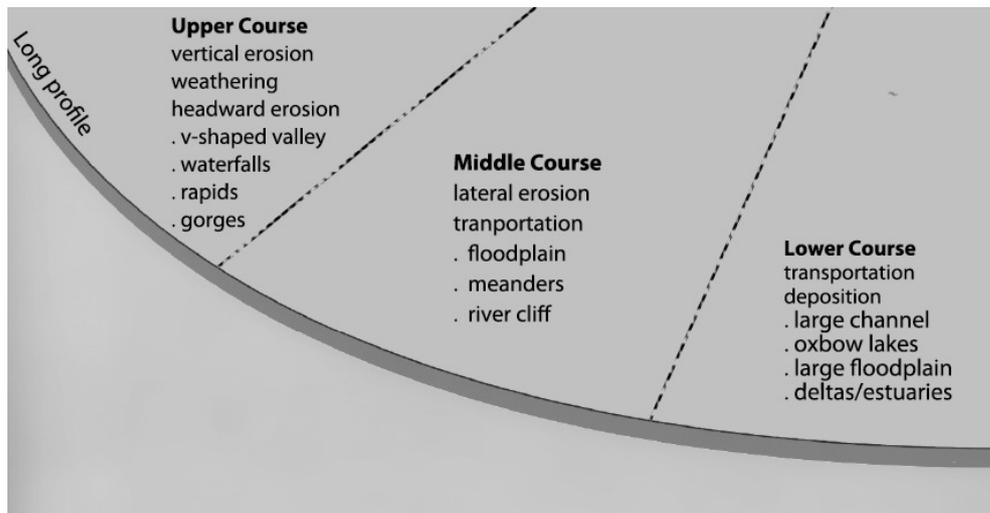
1. Let the students elaborate their works (the models they made) discuss, comment their classmates work. Control the students' activities and give a relevant conclusion (summary).

Activity 2.5

1. The main effects of earthquakes are
 - Deformed ground surface
 - Damage to manmade structures
 - Damage to towns and cities
 - Loss of human and animal life
 - Devastating fires
 - Land slide ,tsunamis, faults, sand blow, etc,
 - The main damage is caused to human, animal life and damage to properties.
2. The Pacific Ring Fire is an area where large numbers of earthquakes and volcanic eruptions occur in the basin of the Pacific Ocean. The following are some of the countries within the Pacific Ring of Fire Chile, Mexico, Japan, New Zealand, Philippines, Canada, Papua New Guinea, Costa Rica, Colombia, Ecuador, etc.

Activity 2.6

1.



2. The upper course of the river is steeper slope.

Activity 2.7

1. Much depends on the speed of the water moving in the river. Fast moving streams and rivers when flooding can cause the movement of huge boulders. Slow moving waters can only carry suspended fine particles. Erosion refers to the moving of particles from one place to another place. Moving water provides the force necessary to move those particles and is responsible for the bulk of erosion that takes place on earth.
2. If it is found possible to facilitate a field trip, help the students to sketch maps, prepare short reports, relate the terms such as meanders, gorges, V-shaped valleys to the real situation.
3. Let the students discuss and comment on the prepared charts and models. Give feedback and summary on the students works and presentation (be brief enough).

Activity 2.8

The most possible answer for the questions in activity 2.8 is

1. **Spit** is a narrow deposit of sand attached at one end to the land and moving deep into the sea in the other ends.
Lagoon is an area of salt water separated from the sea by loose sand banks.
Beach is a strip of land along the sea coast covered by varied types of sediments.

2. **Barchan** is a crescent-shaped dune whose long axis is transverse to the dominant wind direction.

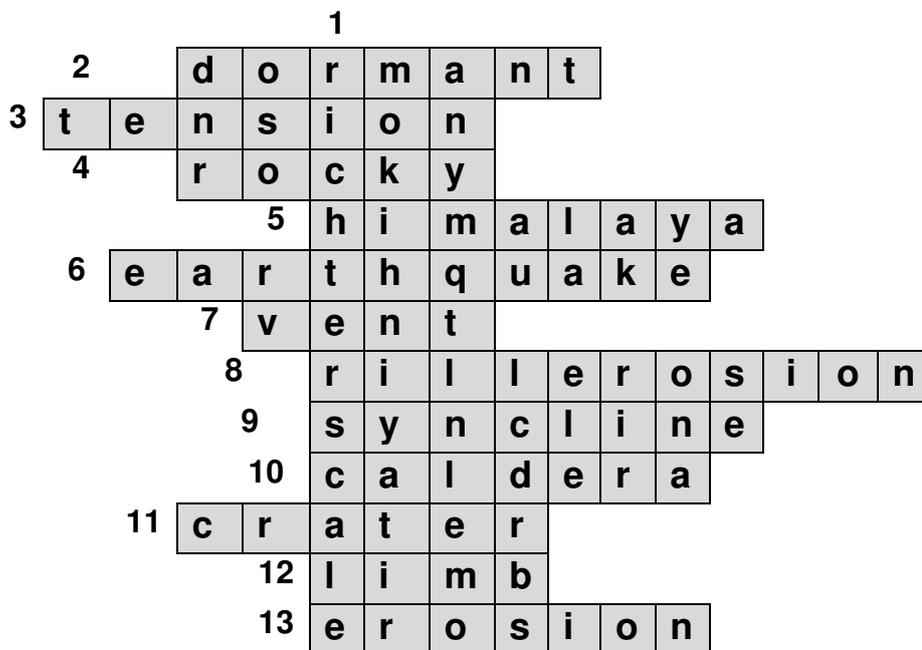
Sand dune is a hill of loose sand formed in areas such as deserts, and seashores where winds are strong and tend to blow from one direction.

Loess Deposits are fertile soils in deserts deposited by wind.

Answer for Additional Activities

1. The Sierra Nevada Mountains in North America, the Harz Mountains in Germany, the Afar block mountain in Ethiopia, etc,
2. Richter scale
3. Active volcano, dormant volcano and extinct volcano.

Answer to Exercise 2.1



2.2 WEATHER AND CLIMATE

Periods Allotted: 8

1. Competencies

At the end of this lesson, students will be able to:

- ✚ explain the meaning of atmosphere;
- ✚ discuss the composition and layers of the earth's atmosphere;

- ✚ *explain weather and climate;*
- ✚ *express the concept of temperature;*
- ✚ *appraise the variation of temperature;*
- ✚ *demonstrate how to measure and record temperature data;*
- ✚ *compute normal temperature lapse rate;*
- ✚ *interpret temperature data;*
- ✚ *explain the formation of rain;*
- ✚ *discuss the types of rainfall;*
- ✚ *relate the various roof slopes of houses in various climatic regions to the respective types of rainfall;*
- ✚ *explain types of cloud;*
- ✚ *practice measuring and recording rainfall data;*
- ✚ *differentiate types of winds (local, monsoon and planetary winds, including cyclones and anticyclones);*
- ✚ *relate direction and deflection of winds to the earth's rotation;*
- ✚ *interpret wind speed and direction from wind gradient map;*
- ✚ *explain how conditions of wind affect structures of buildings and crop production;*
- ✚ *Identify types of atmospheric pressure;*
- ✚ *relate atmospheric pressure with temperature and altitude;*
- ✚ *demonstrate the pressure belts of the world;*
- ✚ *develop the skills of measuring and recording atmospheric pressure;*
- ✚ *analyze the position of the sun at various latitudes at noon time of Dec. 22/June 21;*
- ✚ *examine the impact of latitude on temperature;*
- ✚ *justify the effect of altitude on the characteristics of temperature, rainfall and air pressure;*
- ✚ *compare and contrast the condition of rainfall and temperature between places of coastal and interior areas;*
- ✚ *express the meaning and types of ocean current;*
- ✚ *identify the impacts of ocean currents;*
- ✚ *recognize the effects of ocean currents on temperature and rainfall on land surfaces;*

- ‡ *discuss the types and location of pressure belts of the world;*
- ‡ *state seasonal movements of pressure belts in relation to the apparent movement of the sun;*
- ‡ *relate movements of planetary winds with pressure belts;*
- ‡ *predict the impact of cloud cover on temperature.*

2. Contents

2.2.1 Earth and the atmosphere

- Definition of the atmosphere
- Composition of the atmosphere
- Structure of the atmosphere

2.2.2 Meaning of weather and climate

- Elements of weather and climate
- Temperature
- Rainfall
- Wind
- Air pressure
- Clouds (types of clouds)

Controls of weather and climate

- Latitude
- Altitude
- Distance from the sea
- Cloud cover
- Ocean current
- Planetary winds and pressure
- Measuring and recording elements of weather and climate
- Major pressure belts of the world
- The relationship between planetary winds and pressure belts.

3. Overview

Earth's atmosphere is a mixture of gases, floating solids, and liquids that surrounds the planet. Dry air is consisted of 78%nitrogen, 21% oxygen, 0.93% argon, 0.039% carbon dioxide, and small amounts of other gases. Air also contains variable amount of water vapours, on average around 1%.

Earth's atmosphere is divided into layers based on temperature increases or decreases with altitude from crust up, as follows: Troposphere, Stratosphere, Mesosphere, Thermosphere

(Ionosphere, exosphere). The Troposphere, which we are most familiar with, contains the majority of earth's weather. The Stratosphere contains the jet stream and ozone layer. Many of the commercial jets fly in or near this layer. The Mesosphere is where meteoroids burn up and leave a streak in the night. The Thermosphere includes in it both the Ionosphere and Exosphere. The Ionosphere reflects radio waves back to the earth. The ions and dust particles also create a fabulous light show known as the *aurora borealis*, sometimes called northern lights. The Exosphere is what we often term as space; it is the area that holds the satellites that allow us to communicate through TV, radio, etc.

Weather is the condition of the atmosphere at any time, whereas climate is the average weather condition of the atmosphere in a particular area or a country in a long period of time. The major elements of weather and climate are temperature, precipitation, wind and air pressure. These are simply components of the air out of which a given climate is compounded. The elements of weather and climate vary from place to place and from time to time. The change is attributed to the collective function of different factors known as control of climate. The controls of climate include altitude, latitude, ocean currents, and distance from the sea, cloud cover, air pressure and winds.

4. Teaching-learning Process

4.1 Suggested Teaching Aids

- Charts of the layer of the atmosphere
- A world map that shows the direction of cold and warm ocean currents.
- Climate map of the world that shows the pressure belts and pressure cells.
- Wind vane and anemometer to show the direction and the speed of winds
- Barometer.
- Mercury and alcohol thermometers to measure and record minimum and maximum temperatures.

4.2 Suggested Teaching Methods

- Explanation of the composition and structure of atmosphere.
- Discussion of the meaning of weather and climate.
- Demonstration of the methods of measuring, and recording climate data.
- A field visit to a nearby metrological station to enrich students skills in practicing, measuring and recording weather and climate data.
- Demonstration of the pressure belts, and their respective wind systems.
- Discussion of the controlling factors of elements of weather and climate.
- Brainstorming sessions on the characteristics of winds.

4.3 Pre-lesson Preparation

- Get the suggested teaching aids and materials ready; don't forget that your students have also to play roles as much as possible.
- Collect enough information on the elements of weather and climate from different sources.
- Refer to relevant materials about the earth's atmosphere
- Find relevant photographs and films showing the structure of the earth's atmosphere.
- Arrange a field visit to a nearby meteorological station if any.
- Arrange your materials in order of their necessity and importance.

4.4 Presentation of the Lesson

a) Introduction of the lesson

You may begin your lesson by setting your students to discuss points, such as:

- Earth's atmosphere.
- Composition of atmosphere and layers of atmosphere.
- Elements of weather and climate and their characteristics.
- Controls of weather and climate.

During the discussion, you are expected to facilitate, coordinate and control the students' activities. Be sure that your students in each group are discussing the definitions, similarities and differences of each item with fairly equal individual participation.

b) Body of the lesson

When you pass to this part of your lesson, expose your students to the general definitions of atmosphere, weather and climate in any way of your preference (not that much of the work has to be done by the students themselves). However, you are responsible to facilitate the teaching learning process by:

- Showing the students how temperature, rainfall, wind speeds, wind directions, and air pressure are measured and recorded by thermometers, rain gauge, anemometer, wind vane, and barometer, respectively.
- Identifying the differences among local, monsoon, planetary, cyclone, and anticyclone winds in relation to its direction and deflection due to earth's rotation.
- Listing elements of weather and climate.
- Identifying types of rainfall.

- Showing the sources and transfer of energy in the atmosphere.
- Showing the process of water cycle.
- Explaining effects of latitude, altitude, distance from the sea and cloud cover on temperature variation and distribution.
- Discussing the effects of ocean current, pressure and winds on the overall changes on temperature and rainfall variation and distribution of a given area.

c) **Stabilization**

You may stabilize the lesson by reviewing the key ideas and concepts of the lesson such as:

- The air that surrounds the earth is called the atmosphere.
- Earth's atmosphere is the mixture of gases suspended dust particles and condensed moisture droplets which are collectively known as **aerosols**.
- Earth's Atmosphere can be divided into four layers. These are **Troposphere, Stratosphere, Mesosphere and Thermosphere**
- **Weather** is the condition of the atmosphere over a short period of time.
- **Climate** is the average of all weather conditions of an area over a long period of time.
- The major elements of weather and climate are **temperature, rainfall, winds, Air pressure, clouds, etc.**
- Temperature is the amount of hotness or coldness of an object. Sun is the primary source of heat of the earth and its atmosphere.
- The sun's energy is called insolation or solar radiation and this turns in to heat energy at the earth's surface.
- Factors affecting the temperature of a place **latitude, altitude, and distance from the sea, cloud cover, ocean current, planetary winds and pressure.**
- The three types of rainfall are **Convictional rainfall, Orographic or relief rainfall and Cyclonic rainfall.**
- Wind is air in horizontal motion parallel to the earth's surface.
- The three types of winds are **planetary, monsoon and local winds.**
- The air around us has a weight. This weight exerts on the surface of the earth. This is what we know as **atmospheric pressure.**

4.5 Evaluation and Follow up

a) **Evaluation**

At this stage you can ask your students questions like:

1. Explain what the following terms mean
 - Atmosphere - Distance from the sea
 - Rainfall - Pressure

- Water cycle - Cloud cover
 - Weather - Wind
 - Altitude- Ocean current
 - Climate - Latitude
2. Describe the composition of the atmosphere.
 3. Explain the difference between weather and climate.
 4. What is temperature?
 5. How is temperature transferred from one body to another?
 6. What is the relationship between pressure and wind?
 7. Can an ocean affect the nature of climate in an area? If yes, how?
 8. How do winds affect the distribution of heat and moisture in the world?
 9. Explain what causes differences in the distribution of rainfall.
 10. What is the relationship between temperature and precipitation?

b) Follow up

At this stage you can:

- Instruct your students to collect information /data on seasonal distribution of rainfall and temperature of their locality, and then to prepare charts and graphs of various types for presentations in the class.
- Ask to prepare a model showing the different layers of the atmosphere.
- Make students to show the seasonal distribution of the following on the climate map of the world:
 - temperature
 - pressure and wind
 - Rainfall.

c) Additional Activities

1. List some factors that determine the amount of solar energy that an area receives.
2. What are the types of winds?
3. If there is a breeze blowing from ocean to the land on the coast of Kenya, about what time is it? How do you know?

4.6 Answer for the Activities

Activity 2.9

You can possibly give the following answers to the questions in activity 2.9

1. Yes, plants inhale carbon dioxide and use the carbon to build their structures. They then release the Oxygen in to the atmosphere. Carbon dioxide is also frozen to produce dry ice, and pumped in to fire extinguishers to put out fires. It is also forced

into water, producing carbonic acid ... that's the fizzy stuff that makes soft drinks bubble and makes you burp.

2. Plants need carbon dioxide for photosynthesis. The CO_2 reacts with water, in the presence of sunlight to produce food for the plants.

Oxygen is vital gas required for the survival of all organisms that use aerobic respiration. It is produced by plants freely during the process of photosynthesis.

3. Give students freedom to assess and discuss the issue in their perspective.

Activity 2.10

1. Each of the layers is bounded by "pauses" where the greatest changes in thermal characteristics, chemical composition, movement, and density occur.

Troposphere: The troposphere begins at the Earth's surface and extends to 50 km high. This is the layer of the atmosphere in which we live. The height of the troposphere varies from the equator to the poles. At the equator it is around 16 km high, at 50°N and 50°S , and at the poles just under 8 km high. As the density of the gases in this layer decrease with height, the air becomes thinner. Therefore, the temperature in the troposphere also decreases with height in response. As one climbs higher, the temperature drops from an average around 17°C to -51°C at the top of the troposphere. Almost all weather occurs in this region. The transition boundary between the troposphere and the layer above is called the tropopause. Together the tropopause and the troposphere are known as the lower atmosphere.

Stratosphere: The stratosphere extends from the top of the troposphere up to around 50 km above the earth's surface. This layer holds 19 percent of the atmosphere's gases but very little water vapor. In this region the temperature increases with height. Heat is produced in the process of the formation of ozone and this heat is responsible for temperature increases from an average -51°C at tropopause to a maximum of about -15°C at the top of the stratosphere. This increase in temperature with height means warmer air is located above cooler air. This prevents "convection" since there is no upward vertical movement of the gases and is the reason for the 'anvil-shaped' tops of cumulonimbus clouds. These anvils occur at the tropopause. The transition boundary which separates the stratosphere from the mesosphere is called the stratopause.

Mesosphere: The mesosphere extends from the top of the stratosphere to about 90 km above the earth. The gases, including the oxygen molecules, continue to become thinner and thinner with height. As such, the effect of the warming by ultraviolet radiation also becomes less and less leading to a decrease in temperature with height. On average, temperature decreases from about -15°C to as low as -120°C at the mesopause. However, the gases in the mesosphere are still thick enough to slow down meteors hurtling into the atmosphere, where they burn up, leaving fiery trails in the night sky. Both the stratosphere

Activity 2.14

1. Gravity pulls the gases of the atmosphere towards the earth's surface and holds them there. Due to the pull of gravity, 99% of the total mass of atmospheric gasses is found within 32km of the earth's surface. On average, 1.m² column of air that reaches from sea level to the top of the atmosphere has a mass of 10,300kg and exerts a force of 101, 325 Newtons (N). At sea level, on every square meter of the earth's surface, the atmosphere presses down with an average force of 101, 325N.

The ratio of the surface on which it presses is called **atmospheric pressure**.

2. Because there is less air and therefore less atmospheric mass at higher altitudes, there is less atmospheric pressure at those latitudes. Thus, the atmospheric pressure is lower at higher altitudes.
3. High temperature makes air expand so that it has a lower density. This makes an area of low pressure. On the other hand low temperature makes air contracts so that it has a higher density. This makes an area of high pressure.

Activity 2.15

1. **Monsoon** winds are just like land and sea breezes caused by differential heating during summer and winter, except that they are on a large continental scale instead of just being to the coastal regions. They are most prevalent in countries in Asia especially the sub- continents of India, China, Japan and Southeast Asia. During summer in the Northern Hemisphere the interior Asia is much hotter than the sea around. Rapid heating induces the warm air to rise, creating intense low pressure. At the same time in the Southern Hemisphere, which is experiencing winter, the low temperatures and cool air creates a region of high pressure. Winds are thus sucked across the equator into the Indian Ocean and then the Indian sub-continent, bringing heavy rain in the form of the South-West Monsoon. The inverse takes place in the winter. The interior of Asia in the Northern Hemisphere is much colder than the sea around it. Rapid cooling and denser air create a region of high pressure. Meanwhile in the Southern Hemisphere it is summer and the warm air rises creating a region of low pressure. Winds thus blow out of the continent of Asia into the Indian Ocean as the North-East Monsoon.
2. An **anticyclone** is a system of closed isobars enclosing a high pressure area. Winds blow in a clockwise direction round it in the northern hemisphere. The pressure gradient is usually small and hence winds are light. Weather is usually fair in summer but in winter, conditions are favorable for formation of radiation fog. **Cyclone** is a low pressure region in which winds blow in an anti-clockwise direction (North Hemisphere). This region is generally a region of bad weather with cloud, rain and strong winds depending upon the pressure gradient.

3. A **sea-breeze** (or **onshore breeze**) is a wind from the sea that develops over land near coasts. It is formed by increasing temperature differences between the land and water, which create a pressure minimum over the land due to its relative warmth and forces higher-pressure, cooler air from the sea to move inland. Generally, air temperature gets cooler relative to nearby locations as one moves closer to a large body of water.

At night, the land cools off quicker than the ocean does due to differences in their heat values, which forces the dying of the daytime sea breeze. If the land cools below that of the adjacent sea surface temperature, the pressure over the water will be lower than that of the land, setting up a land breeze as long as the environmental surface wind pattern is not strong enough to oppose it. If there is sufficient moisture and instability available, the land breeze can cause showers or even thunderstorms over the water. Overnight thunderstorm development offshore due to the land breeze can be a good predictor for the activity on land the following day, as long as there are no expected changes to the weather pattern over the following 12–24 hours. This is mainly because the strength of the land breeze is weaker than the sea breeze. The land breeze will die once the land warms up again the next morning.

4. **Land and sea breezes:** They are experienced in coastal areas. Due to differential heating, the atmospheric pressure over the landmass is lower than over the neighboring sea during the day. Therefore, winds blow from sea to land (sea breeze). At night the air pressure over land is higher due to a lower temperature than over the adjacent ocean and the wind start blowing from land to sea (land breeze). Land breeze is not as strong as sea breeze.
5. There are three types of planetary winds. They are:
 - a. **Trade winds:** Trade in German means Track. To blow trade means to blow steadily in the same direction and in a constant course. These are steady currents of air blowing from the sub-tropical high pressure belts towards the equatorial low pressure areas (doldrums). Under the influence of the Coriolis force they blow from the northeast in the northern hemisphere and from the southeast in the southern hemisphere.
 - b. **Westerlies:** Blows from subtropical high pressure to sub-polar low pressure belt. In the northern hemisphere, land masses cause considerable disruption in the westerly wind belt. But, between 40° and 60° south, lies the almost unbroken ocean belt. Westerlies are strong and persistent here, giving rise to mariner's expressions—'Roaring Forties', 'Furious Fifties' and 'Shrieking Sixties'.
 - c. **Polar Easterlies:** Move from high pressure poles to sub-polar low pressure areas. These are deflected by the earth's rotation to become east winds, or the polar easterlies.

Activity 2.16

1. As the earth goes round the sun, the sun is overhead at different places between the two tropics (tropic of cancer and tropic of Capricorn), because the earth's axis is tilted. Therefore, places in the lower latitudes (tropics) receive more isolation than the higher latitudes (poles).
2. The temperature decreases with increase in altitude, because the air is thinner, and not able to hold in as much heat the higher you go.
3. Warm currents bring warm temperatures to the poles, and cold currents bring cold temperatures to the equator to become warm again, and then return to the poles, this process repeats in some currents forever, because most currents are circular. Ocean currents affect the weather and climate in number of ways
 - a. Ocean currents are the source of regulating temperature on the earth. Ocean currents change the temperature of a particular region.
 - b. A warm ocean currents help the weather of the nearby regions to go up, where as cold ocean currents reduce the surrounding temperature.
 - c. Warm ocean currents passing through cold climate give it warmth and helps in sustaining the life in the freezing oceans.
4. As the earth is in the form of a sphere, the angle of incidence of the sun's rays at the earth's surface increases from the equator towards the poles and therefore the amount of heat received on a given area diminishes in the same direction. Temperature is therefore normally highest near the equator and lowest in the poles. There is however, a seasonal variation of temperature owing to the annual changes in the sun's declination between 23.5 degree N and 23.5 degrees. Not only is the inclination of the solar beam is involved, but also the lengthening of the day in summer at the higher latitudes, to some extent, compensates for the reduction of intensity of the solar radiation. But as a whole, the temperature decreases towards the poles.
5. $1000\text{m} = 6.4^{\circ}\text{C}$
 $4620\text{m} = ?$

$$\frac{4620\text{m} \times 6.4^{\circ}\text{C}}{1000\text{m}} = 29.56$$

$$30^{\circ}\text{C} - 29.56 = 0.43^{\circ}\text{C}$$

Answer for Additional Activities

1. Altitude, latitude, cloud cover, etc, are factors affecting Insulation.
2. Planetary winds, monsoon winds and local winds.
3. It is during day time that temperature over the land is higher than over the water. So low pressure forms over the land, while over the sea it is relatively high pressure. Therefore, wind blows from the sea towards the land.

Exercise 2.2

Part I

1. False 1. True 3. True 4. True

Part II

5. D 6. B 7. C 8. C 9. C

Part III

10. Barometer 11. Ultra violet radiation 12. Troposphere 13. Troposphere
14. Nitrogen and Oxygen

2.3 NATURAL REGIONS OF THE EARTH

Periods Allotted: 14

1. Competencies

At the end of this lesson, students will be able to:

- ✚ *analyses the concept of region and regional study;*
- ✚ *demonstrate temperature zones of the world;*
- ✚ *discuss the major characteristics of a tropical zone;*
- ✚ *state the general characteristics of the equatorial rainforest and hot deserts;*
- ✚ *distinguish the major sub regions of the tropical zone;*
- ✚ *explain the major relief features of Ethiopia;*
- ✚ *assess the major characteristics of the temperate zone and sub-regions;*
- ✚ *describe the general characteristics of the Mediterranean region;*
- ✚ *explain the general characteristics of a coniferous region;*
- ✚ *recognize the major characteristics of the frigid zone; and*
- ✚ *differentiate the general characteristics of tundra and the polar icecaps.*

2. Contents

- Concept of region

Temperature zones and sample regions

I. Tropical zone

A. The equatorial rainforest region

- Location
- Climate

- Vegetation
- Human activities

B. Tropical deserts

- Location
- Climate
- Vegetation
- Human activities

C. Ethiopia: a mountainous tropical country in Eastern Africa

- Location of Ethiopia
- Relief of Ethiopia

II. Temperate zone

A. Mediterranean region

- Location
- Climate
- Vegetation
- Human activities

B. Coniferous Forest region

- Location
- Climate
- Natural vegetation
- Human activities

III. Frigid Zone

A. Tundra regions

- Location
- Climate
- vegetation
- Human activities

B. Polar icecaps

- Location
- Climate
- vegetation
- Human activities

3. Overview

A method used in studying the different geographical environments of the earth systematically is known as regional study.

Natural region is an area on the earth's surface with unique and uniform set of physical characteristics, such as climate, soil, relief and life forms. Natural regions are mostly named after the dominant vegetation. However, their division is based on temperature.

Based on the distribution of temperature, the earth is divided into three major natural regions. They are Tropical Zone, Temperate Zone and Frigid Zone.

1. **The tropical zone** is located between Tropic of Cancer and Tropic of Capricorn. It has four distinct climatic regions. These are:
 - **Rainforests**, located within the equatorial low pressure zone, have uniformly high temperature and heavy rainfall throughout the year. Type of rainfall is convectional. Most of the trees are hard woods. The soil of the region and evergreen lack valuable nutrients because of excessive leaching. Such leached soil is called *laetrite* or *lateritic* soil.
 - **The hot deserts** are located between 35°N and 35°S latitudes. The main tropical/hot deserts include Sahara, Kalahari, Atacama, Colorado, Arabia, Tharp and Australian deserts. Factors responsible for the formation of hot deserts mainly rely on their location:
 - in trade wind belts
 - on the leeward side of high mountains
 - in the interior of continents, and
 - along cool ocean current.

The climate of hot deserts is not favourable for plant growth. The type of vegetation consists of different trees and grasses that do not continuously cover the ground.

Ethiopia is located in Eastern Africa. It shares common boundaries with Sudan, Somalia, Eritrea, Kenya and Djibouti.

Ethiopia is found between Equator and the tropic of cancer and as a result it is known as a tropical country. **Ethiopia** has four tips known as the northern most tip, the southernmost tip. These tips are bounded by the parallels of latitudes and meridians of longitude. Thus, Ethiopia's absolute location can be expressed as follows:

- Northern most tip-about 15° N
- Southernmost tip-about 3° N
- Eastern most tip-about 48°E
- Western most tip-about 33 °E

Therefore absolute location of Ethiopia is 3° N to 15° N and 33°E to 48°E.

Major relief features of Ethiopia are divided into two, i.e., highlands and lowlands. Highlands are the most significant physical features of the country. They are divided into three:-

- The northern highlands
- The south-west highlands
- The south east highlands

The northern highlands are further divided into three: the **Tigray plateau**, the **North central massif** and the **Showan plateau**.

The south-west highlands lie to the south west of the southern highlands of Shewa. The south-east highlands are found to the south east of the rift valley. These highlands include: Arsi-Bale Massif, Jemjem Plateaus, and Hararghe highlands.

The lowlands of Ethiopia, as well, are grouped into three:

- The western lowlands
 - The south East lowlands
 - The Awash valley, and the Afar lowlands
2. **The Temperate zone**, located between 23¹/₂^oN and S, is characterized by moderate climate. Most part of the region experiences four definite seasons (summer, winter, autumn and spring).

Factors of weather changes in the temperate zone are

- Angle of the sun
- Length of the day
- Winds and pressure belts
- Effects of continents

The temperate zone is divided into warm temperate and cool temperate regions. The warm temperate region comprises:

- The **Mediterranean regions** (most by south in Europe-northern and southern tip of Africa and located in the western coast of the other continents).
- The **temperate monsoon land**.
- The **warm temperate grass land** of Southern Hemisphere.
- The **temperate deserts** (the interior of continents)

The cool temperate region, on the other land, comprises

- The **temperate grass land** of the northern hemisphere.
- The **cool temperate western margin**.
- The **cool temperate eastern margin**.
- The **coniferous forest belt**.

We shall take one sample region from the two temperate zones and study each in detail

a. Mediterranean region

- Located on the west coasts of continents in the middle latitudes between 30^o to 45^oN and 30^o to 40^oS.

- Includes areas around the Mediterranean Sea, central California, south west and southern Australia (Adelaide, to Milbourne), the tip of the north and south Africa and central Chile in South America.
- Has dry and hot summer, and wet and mild winter. Summer is a time of clear skies and long hour of sunshine, where as winter is a time of rain, cloudiness and lower temperature.
- In areas of sufficient rainfall shrubs and small deciduous trees, such as scrub and oak, are grown.
- The natural forests are destroyed in most Mediterranean lands and replaced by trees and scrub vegetation collectively known as **Maquis**.
- Small scale fruit, food crops, oil and wine production with animal raring are the most common activities. Commercialized, intensive fruit farming and market, and gardening are common in irrigated farms.

b. Coniferous forest belt (Taiga) region is located between 55° N to 70°N, and only found in the northern hemisphere. It extends from North America east ward interrupted by the Atlantic Ocean, and touches the northern Norway, Sweden, and Finland to parts of Asia, south of the Arctic Circle and north of the temperate grassland.

This region experienced short summer and long, cold winters. The temperature drops as low as 40°C below the freezing point. The annual rainfall ranges between 360 mm and 750 mm. Which is sufficient for plant growth, as the rate of evaporation in the area is low. The region receives maximum precipitation during the summer season, and the type of rainfall is mainly cyclonic.

The vegetation in the region consists of conifer trees which grow together in large stands. Conifer trees adapt the harsh climate by their long roots, spongy woods and needle-shaped leaves. The conifer trees are large sources of raw materials for paper mills, pulps and ply wood industry.

The short growing season and the infertile soil do not allow crop production in order to get a continuous supply of timber for wood work industries; reforestation is carried out in the region.

3. **The Frigid Zone** includes the extreme north parts of Alaska, Canada, Russia, Greenland and Antarctica. Summer seasons in this region have continuous period of daylight with temperature slightly above freezing point, and winters are seasons of extremely cold climate. Most precipitation occurs in the form of snow.

In the Northern hemisphere the Frigid Zone divided into two sub-regions. They are the Tundra Land and the Icecap. The tundra lands are characterized with vegetations, much as lichens, mosses, grasses, cushion plants and low shrubs. But the Icecap of both North Pole and South Pole are permanently frozen and, therefore, they are covered with ice.

4. Teaching-learning Process

4.1 Suggested Teaching Aids

- Diagram of the Earth to show temperature zones of the earth based on the Greek's classification.
- A world map showing natural regions of the world.
- Pictures and diagrams showing vegetation types and human activities.

4.2 Suggested Teaching Methods

- Discussion of the concept of regions
- Explanation of the classification of natural regions.
- Demonstration of divisions of temperature zones of the earth.
- Discussion of the characteristics of earth's temperature zones in small groups.
- Presentation of case studies.

4.3 Pre-lesson Preparation

- Collect different maps of the world representing different natural regions and a map of Ethiopia representing its relief and location.
- Prepare different teaching aids that enable you to make your lesson clear to your students.

4.4 Presentation of the Lesson

a) Introduction of the lesson

As usual, help your students to discuss for sometime on the topic guided by the following questions.

1. What is a region?
2. Can you identify the natural features of your locality?
3. What are the major human activities in your locality?
4. What is the advantage of regional divisions?
What makes one region different from the other re

b) Body of the lesson

In this part of your lesson, you are expected to:

- expose your students to the general definitions of natural regions and regional studies in any way you prefer
- ask the students to discuss why places in their locality differ from one another
- discuss the characteristics of different natural regions

- guide students to find out the spatial distribution of major elements of the environment, such as vegetation, climate, soil, human activities, and classify the places according to common characteristics.
- describe the location of major regions and sub-regions of the Earth using a world map.

c) Stabilization

Stabilize the lesson with a review of key ideas and concepts such as:

- A region is a part of the earth's surface which has similar physical elements and to some extent similar human activities.
- A region can either be natural or human made.
- A natural environment which has uniform climatic conditions may be called a natural region.
- Regional study is the study of the different geographical environments of the earth with their social and economic activities.
- Based on climate the earth is divided in to three major natural regions. These are Tropical region, Temperate region and Frigid Zone.

4.5 Evaluation and Follow up

a) Evaluation

You can ask students questions of the following type:

1. What are the major natural regions of the world?
2. List the sub-regions of each major natural region.
3. Which area receives rainfall all the year round? Why?
4. List major tropical deserts?
5. What is the significance of the latitudinal and longitudinal location of Ethiopia?

b) Follow up

You can instruct students to:

- Collect photographs which represent major human activities in the sub-regions of each major region.
- Draw sketch maps of Ethiopia in groups and locate major relief features of Ethiopia.
- Draw a map representing major natural regions and sub-regions of each natural region in group.
- Make students to write a short report on location, climate and relief characteristics of their locality.

c) Additional activities

1. What are the basic elements that we use to form regions?
2. What is the total annual amount of rain fall off equatorial rain forest region?
3. Why do deserts experience a large difference in temperature between day and night?

4.6 Answer for the Activities

Activity 2.17

You can possibly give the following answers to the question in activity 2.17

1. Nigeria, Ghana, Guyana, Venezuela, Indonesia, Liberia, Malaya, Congo, Colombia, etc.
2. Africa, Sahara desert is the largest desert
3. Africa

Activity 2.18

1. 27.2°C 2. 1°C 3. 2436 cm 4. April and May
5. Please help and guide your students how to plot line and bar graph.

Activity 2.19

1. Equatorial rainforest region is characterized by high temperature and heavy rainfall throughout the year. Such climatic condition is favourable for the growth of plants. That is why the region is covered with thick evergreen forest.
2. Annual average temperature is 27°C and the annual range of temperature is less than 3°C. The rainfall is high. Total annual rainfall ranges from 1500mm to 2500mm. All months have rainfall.
3. Insects, birds, reptiles, and fewer mammals most of the animals are free climbing (arboreal) such as monkeys, bats, squirrels, etc.

Activity 2.20

1. You may treat your students to find and read articles written in newspapers or magazines about plantation and mining in Ethiopia. Make them to share the information with their group.
2. The soil of the tropical rainforest is inherently infertile. Most of the nutrients are kept in the bulk biomass of trees. A long period of abandonment allows the rainforest to regenerate and the fertility of the land to be restored. The nutrient content of both vegetation and soils is replenished. Regeneration protects the soil from erosion and controls the spread of weeds and pests.
3. Deforestation (cutting down trees) is a major problem caused by humans in the tropical rainforest. Global Rates of Deforestation:
 - 1 hectare per second
 - 60 hectares per minute

- 86,000 hectares per day
- 31 million hectares per year

When vegetation is removed, soil is left exposed to the heavy equatorial rainfall. It is rapidly eroded. The removal of topsoil means little vegetation will grow. Also, soil erosion leads to flooding as soil is deposited on river beds.

Deforestation can consume a country's only natural resource. If deforestation is not managed in a sustainable manner, a country's only natural resource could be lost forever.

Rainforest canopies absorb carbon dioxide, which is a gas in the atmosphere. When the rainforests are burned and cleared, the carbon is released. Also, when trees are cut down they can no longer absorb carbon dioxide. This means more carbon dioxide is in the atmosphere. Carbon dioxide allows heat to enter through the atmosphere (sun rays). However, it will not allow reflected energy to escape from the atmosphere. This is called the greenhouse effect and causes global warming.

Activity 2.21

1. Because of the absences of clouds in the desert sky.
2. Due to their location
 - in the trade wind belt
 - on the leeward side of high mountain and
 - in the interior of the continents.
3. By their long roots, few or no leaves, hard bark and an oily leaf surface, etc.
4. Because it's the harsh climatic condition.

Activity 2.22

1. The climate of the Central African Republic is hot and humid; the average annual temperature is about 26°C. Tornadoes and floods are common at the onset of the rainy season, which lasts from June to November. Annual rainfall varies from about 1,800 mm in the Ubangi River valley to about 200 mm in the semiarid north.

The climate of Ethiopia varies mainly according to elevation. The tropical zone below approximately 1,800 m has an average annual temperature of about 27°C and receives less than about 500 mm of rain annually. The subtropical zone, which includes most of the highland plateau and is between about 1,800 and 2,400 m in elevation, has an average temperature of about 22°C with an annual rainfall ranging from about 500 to 1,500 mm. Above approximately 2,400 m is a temperate zone with an average temperature of about 16°C and an annual rainfall between about 1,300 and 1,800 mm. The principal rainy season occurs between mid-June and September, followed by a dry season that may be interrupted in February or March by a short rainy season.

The Central African Republic lies in the heart of equatorial Africa. Most of the land is a plateau that ranges in elevation from about 609.6m to 792.48m. Two ranges of hills in the north and northeast rise to maximum heights of about 1,402.02m.

The climate of the Central African Republic is tropical hot dry winters; mild to hot, wet summers with the average annual temperature remaining at about 26°C. Average annual temperature ranges in Bangui are from 21⁰c to 29⁰c in July or August to 21⁰c to 34⁰ in February. The northern part has a drier climate with temperature reaching as high as 40⁰C, whereas, in the south is lower, as 30⁰c during day and 20⁰C at night.

Even though Ethiopia and Central African Republic are a tropical country their climate type is modified by altitude.

2. Altitude and latitude.

Activity 2.23

1. The major portion of Ethiopia lies on the **Horn of Africa**, which is the easternmost part of the African landmass. Bordering Ethiopia is **Sudan** to the west, **Somalia** to the south-east, **Eritrea** to the north, **Kenya** to the south and **Djibouti** to the east.
2. The south- North extension of Ethiopia is between 3⁰N and 15⁰N and as a result it is known as a tropical country. This indicates that Ethiopia experiences a tropical climate.

Activity 2.24

1. Highlands (above 1000m height from sea level)
 - Northern high lands
 - South western high lands
 - South eastern high lands

Low lands (below 1000m height from sea level)

 - Western low lands
 - South eastern low lands
 - Awash Afar low lands
2. Help your students to identify and indicate the location of lowlands of Ethiopia on the relief map of Ethiopia.

Activity 2.25

1. June, July and August represent summer season.
December, January and February represent winter season.
2. December and July.
3. August and January

Activity 2.26

1. Due to the short growing season of the region.
2. Similar climatic condition and similar vegetation type.
3. During the winter, in this region shifting of the entire pressure belt takes place. Thus, this region comes in the influence of the westerlies causing rain in the winter season.

Activity 2.27

1. Five months
2. Mean annual minimum temperature is -8.66°C
Mean annual minimum temperature is -20.75°C
3. Annual maximum range of temperature is 66°C
Annual minimum range of temperature is 58°C
4. Please guide and Show your students how to plotline and bar graphs.

Activity 2.28

1. Many factors favour the exploitation of the forest resources of the region. Some of them are:
 - Trees are soft wood, which can be easily cut and shaped.
 - The trees are long and straight from which long and flat piece of timber for building can be made.
 - The logs of trees are good for making pulp from which paper and rayon are made.
2. The trees are adapted to the harsh climates of the region. They get and save moisture through their long roots, spongy wood and needle shaped leaves.
3. The coniferous forest region has well developed industrial base. This has been helped by:
 - The availability of many mineral deposits
 - Rich forest resources
 - Cheap and abundant water power of many rivers.

Activity 2.29

1. The month which has highest precipitation is August whereas the lowest precipitation is March.
2. The month which has highest temperature is July whereas the lowest temperature is March.

Activity 2.30

1. In the tundra region there is little or no vegetation. The ground is covered with snow and ice. But in places where the snow cover is not thick, low forms of plants such as lichens, mosses and sedges can grow. On the southern margin of the tundra lands and lower areas there are short trees and bushes and flowering plants that make use of short summer season. These plants adapt the cold desert climate.
The desert vegetation consists of different trees and grasses that do not continuously cover the ground, but are widely spaced. The vegetation has adapted to the hot dry desert condition.
2. There are few scattered people of Eskimos, Lapps, Aleuts, and Tunguses. The people live mostly by hunting, fishing and herding. The life of these peoples is greatly affected by the climate and physical conditions of the environment.

Activity 2.31

1. No, people don't live on the polar ice cap but they do, research on the caps. Because polar ice caps are permanently covered by ice.
2. Because of the locations of the poles, the sunlight reaching them is at a greater angle to the perpendicular, and is both scattered more and reflected more. Additionally, the albino (reflectivity) of snow and ice is greater than that of open seas or land surfaces.

The Earth's axial tilt partially offsets this by decreasing the angle for part of the year (the polar summer). But this exacerbates conditions during the winter for each pole, creating extremely short days that allow for even less solar heating.

Another factor that maintains the cycle of cold at the poles is the circulation of air around the globe. The coldest polar areas have sinking, denser air that flows out to the lower latitudes. The returning warmer air is cooled while being forced to higher altitudes and so does not provide as much heat transfer to the polar regions.

The Arctic Ocean is warmed more effectively than is the Antarctic continent by closer land masses and by warm ocean currents. This provides slightly warmer conditions for some areas of the northern polar regions.

Answer for Additional Activities

1. Physical elements such as climate, relief, natural vegetation, soil, etc
2. It ranges from 1500mm to 2500mm.
3. Because in desert the sky is clear.

Exercise 2.3

Part I

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

Part II

6. B 7. D 8. B 9. A 10. D

2.4 ECOSYSTEM

Periods Allotted: 2

1. Competencies

At the end of this topic, students will be able to:

- ⬇ *define the term ecosystem;*
- ⬇ *identify the components of ecosystem; and*
- ⬇ *demonstrate interdependence in the ecosystem.*

2. Contents

- **Components of ecosystem**
- **Interdependence in the ecosystem**

3. Overview

An **ecosystem** is a community of living and non-living things that work together. Ecosystems have no particular size; an ecosystem can be as large as a desert or a lake or as small as a tree or a puddle. If you have a *terrarium*, that is an artificial ecosystem and in it, the water, water temperature, plants, animals, air, light and soil all work together. If there isn't enough light or water, or if the soil doesn't have the right nutrients, the plants will die. If the plants die, the animals that depend on them will die. If the animals that depend on the plants die, any animal that depends on those animals will die. The natural ecosystems work the same way. All the parts work together to make a balanced system!

Ecosystems have lots of different living organisms that interact with one another. The living organisms in an ecosystem can be divided into three categories: **producers**, **consumers** and **decomposers**. They are all important parts of an ecosystem.

Producers are the green plants which make their own food. Consumers are animals and they get their energy from the producers or from organisms that eat producers. There are

three types of consumers: herbivores which are animals that eat plants, carnivores which are animals that eat other animals and sometimes other carnivores, and omnivores which are animals that eat plants and other animals. The third type of living organism in an ecosystem is the decomposers. Decomposers are plants and animals that break down dead plants and animals into organic materials that go back into the soil.

An ecosystem includes **soil, atmosphere, heat and light** from the sun, **water and living organisms** among others. Soil is a critical part of an ecosystem. It provides important nutrients for the plants in an ecosystem. It helps plants to anchor and keep themselves in place. Soil absorbs and holds water for plants' and animals' use, and is home for lots of living organisms. The atmosphere provides oxygen and carbon dioxide for the plants and animals in an ecosystem. The atmosphere is also part of the water cycle. Without the complex interactions and elements in the atmosphere, there would exist no life at all!

The heat and light from the sun are also critical parts of an ecosystem. The sun's heat helps water evaporate and return to the atmosphere where it is cycled back into water. The heat also keeps plants and animals warm. Without light from the sun there would be no photosynthesis and plants wouldn't have the energy they need to make food.

Without water there would be no life. In fact, you may have heard that humans can go longer without food than they can without water. It's true! Without water all life would die. Water is a large percentage of the cells that make up all living organisms. In addition to being an important part of cells, water is also used by plants to carry and distribute the nutrients they need to survive.

4. Teaching-learning Process

4.1 Suggested Teaching Aids

- Pictures showing the interdependence of biotic and abiotic elements of ecosystem.

4.2 Suggested Teaching Methods

- Discussion of ecosystems.
- Demonstration of the on interdependence of organisms, using a local sample ecosystem.
- Small-group discussion of abiotic and biotic components of an ecosystem.

4.3 Pre-lesson Preparation

- Get the necessary teaching aids suggested above ready.
- Refer to relevant materials about the components of ecosystem and interdependence in the ecosystem.

4.4 Presentation of the Lesson

a) Introduction of the lesson

You can use the following questions as start-up activity.

- What is ecosystem?
- What are the components of ecosystem?

b) Body of the lesson

- Let students talk about the meaning of ecosystem from their experience.
- Explain the difference between abiotic and biotic environments in an ecosystem.
- Illustrate your discussion with local examples.
- By using local diagrams, describe the process of energy flow in an ecosystem.

c) Stabilization

Complete your lesson presentation with a review of the key ideas and concepts of the lesson such as:

- An ecosystem is a community of living things and their non-living environment, and may be as large as a desert or as small as a puddle.
- All plants and animals are linked with the natural environment.
- All ecosystems require energy from an external source. This is usually the sun.
- The living organisms in an ecosystem can be described as **producers, consumers** and **decomposers**.
- Producers are the green plants, which make their own food through photosynthesis.
- Consumers are animals who get their energy by eating other organisms: herbivores eat plants, carnivores eat herbivores or other carnivores, and omnivores eat both plants and animals.
- Decomposers break down dead plants and animals into organic materials that go back into the soil.

4.5 Evaluation and Follow up

a) Evaluation

Ask question like the following in order to check students' understanding of the lesson topic.

1. Define ecosystem
2. What is the difference between abiotic and biotic environments?
3. List major parts of ecosystem.

b) Follow up

- Identify eight things from your locality and group them into Abiotic and biotic.
- Everything in the natural world is inter-connected. Do you agree or disagree with this statement? Why?

c) Additional activities

1. What is an ecosystem?
2. How does energy flow within an ecosystem?
3. What is biotic components of an Ecosystem

Activity 2.32

1. An ecosystem may be defined as a structural and functional unit of the biosphere, comprising living organisms and their non-living environment that interact by means of food chains and chemical cycles resulting in energy flow, biotic diversity and material cycling to form a stable, self-supporting system. An example of ecosystem is tropical forests which are self supporting and produce their own food through the process of photosynthesis. Then, the herbivorous eat the plants which at one point be eaten by other animals. These show the symbiotic relationship among components of an ecosystem.

2. **Abiotic factors** are Non-living components in the **ecosystem**. Example: air, temperature, soil, water, dissolved minerals, etc.

Biotic factors are the living components that is, **plants, animals** and other organisms that constitute an ecosystem. These factors are dependent on one another for sustenance. They interact with the abiotic factors in which they subsist, such as air, water, temperature and soil, thereby functioning together as a unit.

3. **Food chain** forms a series of links by which food energy is passed from one organism to another within a natural community.

4. The answer to the question is 'agreed'. Because everything in the environment is interdependent to one another. For example, if we take a certain locality, all the organisms depend on one another. Green plants are producers that provide energy to all organisms. This energy passes to those animals which feed on green plants. All the second level consumers get energy from the first level consumers. Hence, this creates the process that we call food chain. If this chain is broken the environment would be affected so greatly.

2. Contents

- **Location of economic activities in relation to market in the past and at present.**
- **Location of residence of workers versus offices/factories in the past and at present.**
- **Location of industries.**

3. Overview

The world has become functionally smaller

than ever before, due to advances in communication and transportation and also due to trade agreements that have lowered or eliminated barriers in the exchange of goods. But this growing interdependence has not come without a price.

Villagization (globalization) in this context refers to time-space compression which has resulted in increasingly fast movement and interaction of people from different corners of the world. Today; due to advancement in transportation and other communication technologies, countries of the world are much closer than they were be in the past. These technological advancements have also reduced the time needed to travel from one corner of the world to the other.

Villagization (globalization) can be conceived of as a process which embodies a transformation in the *spatial* organization of social relations and transactions, expressed in transcontinental or interregional flows and networks of activities, interactions and power.

Villagization:

1. involves a *stretching* of social, political and economic activities across the world.
2. Is marked by the intensification, or the growing magnitude, of interconnectedness and flows of trade, investment, finance, migration, culture, etc.
3. can be linked to a *speeding up* of global interactions and processes, as the development of world-wide systems of transport and communication increase.
4. Is the growing *extensity*, *intensity* and *velocity* of global interactions and the ways in which they increasingly impact *places and* distant places and events. Specific local developments can have considerable global consequence. In this sense, the boundaries between domestic matters and global affairs are becoming increasingly fluid.

Transportation links factors of production in a complex web of relationships between producers and consumers. The outcome is commonly a more efficient division of production by exploitation of comparative geographical advantages as well as the means to

develop economies in scale and scope. The productivity of space, capital and labour is thus enhanced with the efficiency of distribution and personal mobility. It is acknowledged that economic growth is increasingly linked with transportation developments not only in infrastructure but also in managerial expertise. The following are impacts brought by transportation developments:

- **Networks.** Setting of routes enabling new or existing interactions between economic entities.
- **Performance.** Improvements in cost and time attributes for existing passenger and freight movements.
- **Reliability.** Improvement in the time performance, notably in terms of punctuality, as well as reduced loss or damage.
- **Market size.** Access to a wider market base where economies of scale in production, distribution and consumption can be improved.
- **Productivity.** Increases in productivity from the access to a larger and more diverse base of inputs (raw materials, parts, energy or labour) and broader markets for diverse outputs (intermediate and finished goods).

4. Teaching-learning Process

4.1 Suggested Teaching Aids

- Diagrams that show modern means of transport and communication.
- The Internet
- Films
- Simulations

4.2 Suggested Teaching Methods

- Discussion of villagization/globalization.
- Small group discussion and presentation on the location of economic activities in relation to market.
- Presentation about the effects of transport, communication, and technology on the location of economic activity, and the residence of workers versus offices/factories in the past and present.

4.3 Pre-lesson Preparation

- Get one or more of those teaching aids suggested above ready.
- Refer to relevant materials about villagization of the world through distance –time decay.

4.4 Presentation of the Lesson

a) Introduction of the lesson

To start the lesson you can ask the following questions:

1. What do we mean by the expression ‘the developments in science and technology helped the world change into a village’?
2. What does villagization mean?
3. What are the main significant factors or agents of villagization?
4. What are the impacts of villagization on people, especially on peoples in the developing countries?

b) Body of the lesson

- Let students talk about the meaning of villagization from their experience.
- Explain villagization/globalization.
- Illustrate your discussion with local examples.
- Describe the impacts of Villagization by using diagrams, films and simulations.

c) Stabilization

Complete your lesson presentation with a review of key ideas and concepts regarding villagization of the world through distance time decay.

- Villagization refers to time-space compression which resulted in increasing and fast movement and interaction of people from different corners of the world.
- Today due to advancement in transportation and other communication technologies the world is much closer than what it used to be in the past.
- The technological advancements reduced the time needed to travel from one corner of the world to the other.
- Advances in communications technology, such as phones, radio and television broadcasts, and internet, have further decreased the effects of distance.
- Today distance has little or no impact on the production and market of perishable goods.
- Through time due to the advancement of transportation network industrial workers commute from home to work place many kilometres daily.
- Today there is no need of locating industries near sources of energy or natural resources. These components of industries can be easily transported any where they are needed.
- Time-distance decay profoundly affected the socio-economic and physical environments of the world at local, regional and global scale. This process of villagization is widely understood as globalization which affected the cultural, political and economic landscapes of our world.

4.5 Evaluation and Follow up

a) Evaluation

You can ask questions such as the following:

- Can you explain what villagization means?
- Discuss the role transport and communication play in the advancement of globalization.

b) Follow up

- Organize students into small groups to discuss what changes and how changes the developments of transportation and communication technology have brought in economic activities. Make them to present their works to their classmates.

c) Additional activities

1. What is globalization?
2. What are the reasons for globalization?

4.6 Answers to activity 2.33

1. You may treat your students to discuss what they understand and you can give your suggestion at the end.
2. The world is our common house. We all are the members of the families living in this world. The acts or happenings in one room in a house affect the other rooms. In the same way, the incidents in one part of the world affect the other parts of the world. Today, in this twenty first century, due to advanced technology and science and to development of infrastructures, the world has become very small. We can contact our relatives just by sitting in one place, though they are very far apart from us in the USA or China etc. We can also reach many places in the world in a very short period of time with the help of advanced transportation. We can even know and watch the news and condition of many places of the world just by sitting in one place, with the help of advanced means of communication such as radio, television, internet etc. These several advanced technologies have made this world functionally smaller. Thus we can say that the world has become a global village.
3. With the advent of modern transport technology, distance has less effect than it did in the past. Advances in communications technology, such as phones, radio and television broadcasts, and internet, have further decreased the effects of distance.

Answer for Additional Activities

1. Globalization refers to the integration and democratization of the world's culture, economy, and infrastructures.
2. Due to transitional investment, rapid increase of communication and information technologies.

Answer Key for Unit 2 Review Questions**I. True or False Items**

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

II. Matching Items

6. E 7. D 8. B 9. A 10. C

III. Multiple-choice Items

11. C 12. C 13. C 14. D 15. C 16. B 17. C 18. B
19. B 20. B 21. C 22. C 23. C 24. D 25. C 26. A

IV. Completion

27. Climate
28. Compressional force and Tensional force
29. Convectional
30. Orogeny
31. Weathering
32. Denudation

Check List

Check the student’s performance according to the given competencies referring the questions under the check list for every unit. Put a tick (✓) mark against each task weather they are able to perform in the competencies of each unit. The students are expected to respond saying Yes or No. then, you can make your own evaluation whether the competencies are met or not.

Can you:

	Yes	No
1. list the landforms formed by each internal force? -----		
2. describe the process of each internal force? -----		
3. relate some major landforms with their respective internal forces? -----		
4. explain the effects of earthquakes on infrastructure; like buildings, dams, roads?-----		
5. review external forces? -----		
6. state the meaning of weathering? -----		
7. distinguish the different types of weathering? -----		
8. identify land features resulting from chemical weathering; stalactite, stalagmite, pillar, etc? -----		
9. explain the types and characteristics of agents of erosion? -----		
10. identify types of erosions? -----		
11. state the effects of erosion on human activities; with various landscapes? -----		
12. explain the process of deposition? -----		
13. recognize erosion-deposited soils and landforms? -----		
14. explain the meaning of atmosphere? -----		
15. discuss the composition and layers of the earth’s atmosphere? -----		
16. explain weather and climate? -----		
17. express the concept of temperature? -----		
18. appraise the variation of temperature? -----		
19. demonstrate how to measure and record temperature data? -----		
20. compute normal temperature lapse rate? -----		
21. interpret temperature data? -----		

Unit Assessment

The students' performance must be assessed continuously over the whole unit. The assessment will be made by comparing students' performance with the specified level of competencies. Besides, the teacher has to recognize the level of performance of each student and provide assistance accordingly.

Thus

A student at a minimum requirement level will be able to describe the process of internal forces and list down the resulting landforms and relate them with their respective internal forces; state the meaning and distinguish the types of weathering as external forces; explain effects of earth quake and erosion on human made structures; identify land features resulting from chemical weathering; explain the types and characteristics of agents of erosion and the concept of deposition; relate and recognize types of erosion with various landscapes/deposited soils; explain and discuss the meaning; origin, composition, and layers of earth's atmosphere; explain weather and climate, express the concept and appraise the variation of temperature; relate various roof structures of buildings with the type of rainfall and wind of the respective areas; demonstrate how to measure and record temperature; and discuss the type and location of pressure belts of the world.

Besides, they will be able to explain and discuss the formation of the condition of each element of weather and climate with the prospective factor/s of weather and climate; explain the major characteristics of selected sub-regions of each temperature zone of the world and examine the factors for characteristics of ecosystems.

In addition, a student working above the minimum requirement level and considered as higher achiever should be able to interpret temperature data and compute normal temperature lapse rate; interpret wind speed and direction from wind gradient maps; assess why and how different types of winds form in various parts of the world; predict the phenomena caused by the overhead sun at various latitudes by proving concrete examples. Besides, they can relate climatic data with respective altitude and latitude; assess the types of clouds and their major characteristics that exist in different altitudes; compare and contrast varied concepts of region and regional studies; determine the type of sub regions of each zone, based on the patterns of soil, climatic, vegetation and human activities; and predict what will happen if ecosystems are affected at various levels.

Unit 3

HUMAN POPULATION AND ECONOMIC ACTIVITIES

Total Periods Allotted: 16

1. Introduction

In this unit you are going to deal with concepts and facts about human population, economic activities, and natural resources. Each topic is well structured and simplified.

The first sub-unit (Concept and Facts about Human Population) deals with sources of population data, distribution, and settlement patterns.

The second sub-unit (Economic Activities) deals with the classification of economic activities and land use. Similarly the third sub-unit (Natural Resources) deals with concepts and the ways in which natural resources are important.

The methodologies to be employed in teaching the contents in this unit are group discussion, explanation, debating, practical activities, question, and answer, observation, etc.

The startup questions and activities are given in each sub unit to encourage students. Finally, review exercises are given at the end of the unit, The questions are simply provided as examples and could be supplemented by other exercises which the teacher presumes to be appropriate.

2. Unit Outcomes

At the end of this unit, the students will be able to:

- *Analyze the concept of human population and sources of population data;*
- *Indicate the densely, moderately and sparsely populated regions of the world;*
- *Distinguish settlement patterns of world population;*
- *Discuss the major economic activities of the world;*
- *Recognize the importance of natural resources.*

3. Main Contents

3.1 CONCEPTS AND FACTS ABOUT HUMAN POPULATION

3.2 ECONOMIC ACTIVITIES

3.3 NATURAL RESOURCES

3.1 CONCEPTS AND FACTS ABOUT HUMAN POPULATION

Periods Allotted: 3

1. Competencies

At the end of this lesson, the students will be able to:

- ⚡ *Define the concept of human population;*
- ⚡ *Discuss facts about human population;*
- ⚡ *Distinguish sources of population data;*
- ⚡ *Identify the densely and sparsely populated areas of the world;*
- ⚡ *Discuss the settlement patterns of world population.*

2. Contents

A. Sources of population data

B. Population distribution and settlement patterns

3. Overview

The term population, in population studies, refers to the total human inhabitants of a specified area, such as a city, a country, or a continent, at a given time. The human population has been a subject matter of various academic disciplines. Geography, biology, sociology, medical science, history, etc., study the human population from different angles, based on their primary interests. The study of population, as a discipline, is known as demography. Demography is concerned with the size, composition, and distribution of populations; their patterns of change over time through births (fertility), deaths (mortality), and migration; and the determinants and consequences of such changes.

Population geography is a branch of human geography that deals with the number, composition, and distribution of the human population in relation to variations in earth-

space conditions. It is especially concerned with the study of the human population with respect to size, composition, spatial variation and interaction with the environment. It is the science that deals with the ways in which the geographic characteristics of places are formed and, in turn, react upon a set of population phenomena. Unlike to demography; population geography highly emphasizes population-space relationships. This is to mean that population geography focuses more on the spatial aspect of the human population and the interaction and interdependence between the physical and human environment. In this regard, population geography studies:

- Location and characteristics of population.
- Spatial patterns in population distribution; and
- Inter-relationship between population and other elements of the geographical environment.

We study human population for three main reasons, which are:

- To acquire quantitative and qualitative data (information) about the human population in order to:
 - ✓ determine existing labor force in terms of what we have and what we need
 - ✓ identify future needs for social services, resources, etc.
 - ✓ balance population growth and economic development,
 - ✓ identify existing social and economic conditions of the population and take appropriate measures to improve them.
- To identify fertility, mortality and migration trends and characteristics by:
 - ✓ looking into fertility and mortality characteristics, trends, causes and consequences so as to formulate appropriate policies and strategies,
 - ✓ exploring immigration and emigration characteristics and trends; identifying their causes and consequences and taking appropriate actions.
- To discover population-resource relationships and human colonization of the space in:
 - ✓ investigating variations in population densities,
 - ✓ identifying population and resource distribution and existing matches or mismatches and formulating way-out strategies,
 - ✓ examining human impacts on the environment and proposing conservation policies and strategies.

Population Data

Population data refers to information related to human population. Any purposeful study of population strongly depends on quantitatively sufficient and qualitatively reliable data. Population data is essentially useful for all purposes of teaching, researching, planning and satisfying individual needs. Generally, there are three dominant sources of population data, namely census, vital registration and sample surveys. Of all these major sources, the census is the single biggest and the most significant source of population data.

There are some socio-cultural problems which result in incorrect population data. These include inadequate finance, suspicion and ignorance of census, double entry, false information about age and income, etc.

Distribution and Settlement Pattern

Population distribution describes the way in which people are spread out across the earth's surface. The world population distribution shows a wider regional variation. Thus, as there are crowded areas there are thinly populated regions.

In the world there are areas which are densely populated, such as Southern Asia and East Asia, Peninsular Europe and North-East America. Contrary to this, sparsely populated areas include Arctic Ocean in North America and Eurasia, many of tropical desert lands, Amazon basin of South America, Congo basin of Africa and East Indies of Asia, mountainous areas and poor soil regions.

Another important issue that we have to give due attention is settlement. A settlement is a process of inhabiting a place. Human settlements are classified as rural or urban depending on the density of human-created structure and resident people in a particular area. Urban areas can include towns and cities, while rural areas include villages and hamlets.

Rural areas may develop randomly on the basis of the availability of natural vegetations and fauna in a region, whereas urban settlements are proper and planned settlements built up according to a process called urbanization. Many times, rural areas are focused upon by governments and development agencies and turned into urban areas.

Unlike rural areas, urban settlements are defined by their advanced civic amenities, opportunities for education, facilities for transport, business and social interaction, and overall better standard of living. Socio-cultural statistics are usually based on an urban population.

4. Teaching-learning Process

4.1 Suggested Teaching Aids

- A photograph that shows population.
- Ethiopian population and housing census form.
- Dot map showing world population distribution.
- A diagram that shows the hierarchy of settlement.

4.2 Suggested Teaching Methods

- Discussion based on the previous knowledge of students about human population.
- Demonstrate trends of population growth, using Table 3.1 and Figure 3.1 in the student book.
- Organize small groups to discuss population data sources and population distribution.
- Explain population data sources.
- Discuss the main features of censuses.
- Demonstrate the densely and sparsely populated areas of the world by a world map.
- With the help of illustrations, introduce the distribution of world population.
- Discuss and demonstrate the hierarchy of settlement.

4.3 Pre-lesson Preparation

- Get the necessary teaching aids suggested above ready.
- Refer to relevant materials about the various sources of population data and the concept of human population.

4.4 Presentation of the Lesson

a) Introduction of the lesson

Ask these questions by way of starting the lesson:

- What is human population?
- What makes the human population different from animal and plant population?
- Do you think that studying human population is useful and necessary?
- How do we acquire information or data about human population? What do you think makes each source different?
- Explain the reason why population data are useful.

b) Body of the lesson

- Let students explain the meaning of human population from their experience.
- Give justifying reasons for the 'usefulness' of human population study in geography.
- Define and discuss population data.
- By giving relevant examples, explain the significance of population data.
- Discuss the major factors which affect the quality and dependability of population data.

c) Stabilization

Complete your lesson presentation with a review of the key ideas and concepts of the lesson such as:

- Human population has been a matter of study for various academic disciplines, such as geography, biology, sociology, medical science, history, etc.
- The world's population has been experiencing continuous growth since the 15th century.
- Population censuses, sample surveys and vital registration are among the most commonly used methods of gathering information about human population.
- There are densely, moderately and sparsely populated areas in the world.
- Settlements may broadly be divided into rural and urban, based on the density of man-made structures, population concentration and dominant economic activity.

4.5 Evaluation and Follow up

a) Evaluation

Ask questions such as the following:

1. How do you prove the fact that population data are important?
2. What is the basic difference between a population census and a sample survey?
3. What are the factors that affect population data sources?

b) Follow up

Form groups of six students. In each group, three will discuss the concept of human population, and the other three, population data sources. In the end, let the two sets of groups share this ideas with one another.

c) Additional activities

1. Do you think the studies of human population are necessary? Discuss.
2. What are main features of census?
3. What are the major factors that affect the quality of data?

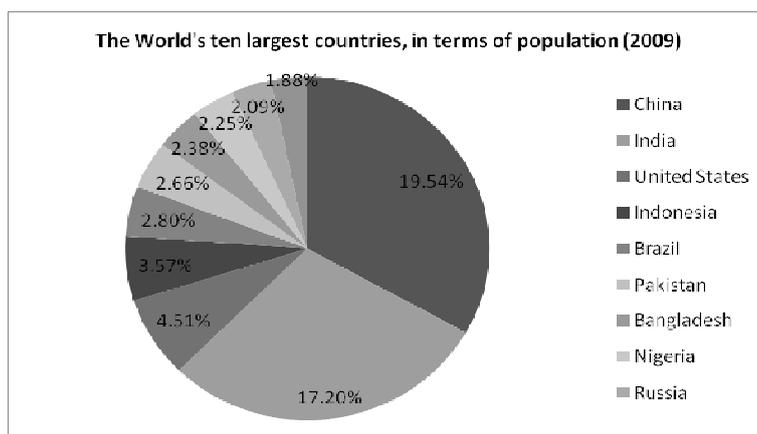
4.6 Answer for Activities

Activity 3.1

1. The term population refers to the total number of human inhabitants of a specified area, such as a city, country, or continent at a given time.
2. It is very dynamics, as it demonstrates significant quantitative and qualitative changes over time and space.
 - Changes in the size, composition, structure and the location of human population may have policy implications:
 - Knowing about the characteristics of human populations is important in order to adjust situations to existing realities
3. It is important for planning in fields such as health, education, housing, social security, employment and environmental preservation.
 - It provides information needed to formulate government population policies, which seek to modify demographic trends in order to achieve economic and social objectives.

Activity 3.2

1.
 - i. Asia
 - ii. Oceania. North America and Latin America and the Caribbean
2.
 - i. China, India and united States of America
 - ii. Asia – China, India, Indonesia, Pakistan, Bangladesh and Japan
 North America – United states of America
 Europe – Russia
 Africa – Nigeria
 Latin America – Brazil
- 3.



Activity 3.3

- a. In the school, the total number of student's data is available in the record office. After they will get the data, categorize by grade, age and sex.
- b. They can get total population from regional population bureau. Based the data they will try to predict the impact of the current population. For example, they can consider the number of school, hospital, and the like.

Activity 3.4

1. There are a number of advantages of studying population. These include:-
 - It is essential for economic planning;
 - Studying population number and its pattern of distribution is important for satisfying social needs;
 - It is important for the overall socio-economic development of a society.
2. Yes, because population data afford individual legal documents, like admission into school, a proof in family relationship, of age to qualify for social security benefits or pension, etc.
3. No, because they are not well informed, because of lack of awareness and the like. Please teacher gives students the freedom to assess and discuss the issue in their perspective.

Activity 3.5

1.

Census

- it is expensive
- it is reliable

Sample survey

- relatively less expensive
- less reliable

2. Sample survey

Activity 3.6

- a. All population data sources required finance. For example, census enumeration is an extremely expensive and labour-intensive activity. Moreover, data collection, compilation, processing and analysing are required a large amount of money. Because of this inadequate finance affect the quality of data.
- b. Lack of awareness about the uses of population information is one of the factor that affect the quality of population data. Most of the time the people are not well informed the important of population data. Because of this they are not cooperate for giving information during data collection. This condition by itself affects the quality of data sources.

- c. Provision of false information by the people being counted is a factor that affects the quality of population data. Those who have been enumerated may give incorrect responses to specific questions, deliberately or because they are not literate. There are at least five sources of such error.
1. Giving incorrect information of age, profession, income, and education, or responding incorrectly to questions.
 2. A recorder can assume or record the wrong information.
 3. There may be errors of judgement during the reconciliation of the information on the questionnaire.
 4. Information may be wrongly coded.
 5. Errors may be committed during the compilation process.

Activity 3.7

1. The most populated areas include the Asiatic population belt, peninsular Europe and North Eastern America

The most sparsely populated areas include tundra, Hot dry land, Hot-wet lands, high relief and areas with poor soil

2. Human population began to increase rapidly in the 15th and 16th centuries.
3. Population is unevenly distributed across the earth's surface. Thus, some areas have high population concentration, while others are sparsely populated. The main factors affecting population distribution can be grouped into two. They are positive factors and negative factors.

Positive factors create favorable conditions for large population. These factors include favorable climatic condition, fertile soil, adequate water supply, and industrial development.

Negative factors discourage large population. These factors include unfavorable climates such as very cold, very hot, very dry or other extreme climates, mountainous landscapes with poor soils, and inhospitable areas where trade is difficult.

Answer for Additional Activities

1. Yes, it is very dynamic as it demonstrates significant quantitative and qualitative changes over time and space
 - Change in the size, composition, structure and the location of human populations can have policy implications.
 - Knowing about the characteristics of the human population is important in order to adjust situations to existing realities
2. Government sponsorship, defined territory, universality, simultaneity, individual units, periodicity and expensiveness
3. In adequate financing
 - The use of different methods of census enumeration by different countries.
 - In adequate awareness about the importance of population data among the general population
 - Double entry
 - Neglecting or ignoring certain groups of people
 - False information about the age and the occupation of people.
 - Lack of equal acceptance of the importance of vital registration by all countries

Answer for Exercises

Exercise 3.1

Part I

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

Part II

6. B 7. F 8. C 9. E 10. A

Part III

11. B 12. B 13. D 14. D 15. D

3.2 ECONOMIC ACTIVITIES

Periods Allotted: 9

1. Competencies

At the end of this lesson, the students will be able to:

- ⚡ *list the five types of economic activities;*
- ⚡ *explain the major characteristics of economic activities;*
- ⚡ *examine how economic activities modify and transform resources;*
- ⚡ *describe concept and meaning of land use;*
- ⚡ *identify land use systems in Ethiopia;*
- ⚡ *differentiate driving forces that change land use system;*
- ⚡ *differentiate rural land use from that of urban land use.*

2. Contents

3.2.1 Classification of economic activities: (6 periods)

- Primary
- Secondary
- Tertiary
- Quaternary
- Quinary

3.2.2 Land use (3 periods)

- Concept and meaning of land use
- Land use in Ethiopia
- Driving forces in changing land use
- Rural land use versus urban land use

3. Overview

In human life, food, shelter and clothing are basic needs for sustenance of life, and goods of luxury and comfort for its enjoyment. To obtain these necessities of life, human beings are engaged in various occupations. These occupations are called economic activities. Some of the occupations or activities are hunting, fishing, farming, grazing, mining, manufacturing, transportation, and trade, among others.

In the world, there are numerous activities through which human beings earn their living. In order to live, a person must produce his/her basic necessities. In the efforts of producing and obtaining their basic needs, humans use elements of natural environment, i.e. natural resources a lot.

Economic activities - processes of making a living and accumulating wealth -encompass different economic sectors that include industries, trade and services, among others. These various economic activities practiced in the world are grouped into five, namely primary, secondary, tertiary, quaternary and quinary. Each type of economic activity is important to a society. The majority of jobs in the economic activities of a country show where a country is on a scale of development.

Primary Economic Activities

Primary economic activities are directly tied to the extraction of resources of the earth. Such economic activities occur at the beginning of the production cycle where people live in close contact with the resources of the land. The primary economic activities which produce basic food stuff and raw materials for industry may include: agriculture, hunting and gathering, pastoral farming, crop cultivation, forestry, mining, logging and fishing.

Agriculture is one of the primary economic activities which is concerned with the production of crops and animals, both traditionally and scientifically. At least half of the world's population relies on agriculture as a major economic activity.

There are different types of agricultural activities that include crop production and animal husbandry. Crop production is concerned with the production of food and cash crops at different levels in modern or traditional methods. Animal husbandry consists of beef farming, dairy farming, and pastoral nomads.

Forestry is also a primary economic activity which is concerned with the exploitation of trees and other forest products.

Fishery is another primary economic activity concerned with the catching of fish and other marine creatures, such as crabs, lobsters, and crawfish. Fishing is one of the oldest occupations of mankind. At present, too, a number of people depend on fishing as the main stay of their livelihood, e.g. Norway, Iceland and Japan. But compared to other economic activities, fishing is the least developed.

Mining, still a primary economic activity, is the process of obtaining useful minerals from the earth's crust. The process includes excavations in underground mines and surface excavations in open-pit, or open cut (strip) mines. In addition, recent technological developments may soon make the mining of metallic ores from the seafloor economically feasible. Mining normally means an operation that involves the physical removal of rock and earth. A number of substances, notably natural gas, petroleum, and some sulfur, are produced by methods (primarily drilling) that are not classified as mining.

Mine work requires both caution and awareness because the environment is unstable and hazardous by nature. An accident which would be relatively minor on the surface may be deadly deep beneath the ground. Although it was once an area reserved solely for men, many women are currently engaged in mining operations.

Secondary Economic Activities

These economic activities add value to the raw materials by changing their forms or combining them into useful and, hence, more valuable commodity. Examples are: steel making from a combination of minerals, milk production from pastoral farming, textile production from cotton farming, furniture production from logging, etc. Manufacturing and processing industries are included in this phase of the production process.

Secondary economic activities include manufacturing, which is a process that turns the raw material into something finished or semi-finished product with additional values.

The mechanical or chemical process of turning raw materials into finished products is known as manufacturing. Whereas, the places where manufacturing activities are done known as industry.

Manufacturing industries require many things such as machines (equipment), energy, raw materials, labor force sufficient amount of capital, markets and government policy. Manufacturing industries vary widely according to their size, production process, stage of technology, location, labour force, capital for investment, etc. Thus, manufacturing industries could be classified based on a wide range of criteria.

Tertiary Economic Activities

The basic characteristic of the tertiary economic activities is the production of services instead of end products. It provides services to other businesses as well as final consumers. Services may involve transportation, distribution and sales of goods. An example list of tertiary economic activities could include education, legal services, medical services, trade, transportation services, tourism, etc. In tertiary activities the result is not a physical product but a service.

Quaternary Economic Activities

The quaternary sector of the economy is a way to describe a knowledge-based part of the economy which typically includes services, such as information generation and sharing, information technology, consultation, education, research and development, financial planning, and other knowledge-based services. This sector evolves well in developed countries and requires a highly educated workforce.

The quaternary sector can be seen as the sector in which companies invest in order to ensure further expansion. Some examples could be: background investigators, financial planners or consultants, real estate appraisers, information technology consultants, who can set-up a computer network for businesses and market research consultants, who determine if a product in development will sell and make a profit.

Quinary Economic Activities

The quinary sector is the last economic activity which involves the highest level of decision making in a society or economy. Having a quinary economic activity means you are the top boss and oversee everything. An example of this would be the president of a country, or companies and industries.

Land use

Land use refers to the human activities which are directly related to land, making use of its resources, or having an impact on them. On the functions for which the land is used and particular reference is made to the management of land to meet human needs.

The term land use includes both rural and urban. Land use automatically involves the concepts of optimizing the land use potential, and of land use planning. Land use may vary in nature and in intensity according to both the purpose it serves, whether it is food production, recreation, or mining, and the biophysical characteristics of the land itself.

Land is one of our most precious assets. It provides food and shelter; it stores and filters water; and it is a basis for urban and industrial development. Land is, however, finite in extent. Factors, such as population growth, limited expansion of arable land, and the growing need for land for non - agricultural purposes increase the pressure on and competition for the available space of land.

Land is, moreover, constantly under threat of degradation, mainly as a result of intensive cropping, mining, poor management, and population pressure.

Assessing the driving forces behind land use is necessary if past patterns are to be explained and used in forecasting future patterns. Driving forces on land use can be anything that influences human activity, including local culture (food preference, etc), economic and environmental conditions (soil quality, terrain, and moisture availability), land policy and development programs (agricultural programs, road building, zoning), and interaction between these factors, including past human activities on the land (land degradation, irrigation and roads). Investigation of these drivers of land use requires a full range of methods from the natural and social sciences: climatology, soil science, ecology, environmental science, hydrology, information systems, computer science, anthropology, sociology, and policy science.

4. Teaching-learning Process

4.1 Suggested Teaching Aids

- Diagram that shows the classification of economic activities.
- Pictures that represent primary, secondary, tertiary, quaternary and quinary economic activities.
- Maps that shows urban and rural land use.

4.2 Suggested Teaching Methods

- Question as a brainstorming activity
- Explanation about primary, secondary, tertiary, quaternary and quinary economic activities.
- Introduce the categories of economic activities with the help of illustrations.
- Discuss about practical land use information and practice of Ethiopia.
- Organizing small groups to discuss the dynamic forces that change the land use over space and time.
- Encouraging students to distinguish urban and rural land use.

4.3 Pre-lesson Preparation

- collect photographs of different sectors of economic activities,
- prepare a diagram and show the relationship among the five economic activities,
- prepare a chart showing the major industrial sectors of the world,
- consult relevant documents on economic activities and land use in Ethiopia.

4.4 Presentation of the Lesson

a) Introduction of the lesson

You may start the lesson by asking the following questions.

1. What is primary economic activity? How does it differ from secondary economic activity?
2. What makes industries different from the primary economic activities?
3. Can you give an example of secondary economic activities?
4. What is the major difference between quaternary and quinary economic activities?
5. What is land use?
6. What are the major driving forces that change land use?

b) Body of the lesson

- Explain the major characteristics of primary, secondary, tertiary, quaternary and quinary sectors of economic activities.
- Help students to distinguish the five types of economic activities.
- Explain how economic activities modify and transform resources.
- Let students compare and contrast primary and secondary economic activities.
- Ask students to discuss, compare and contrast quaternary and quinary economic activities.
- By giving relevant examples of different economic sectors, indicate the relationship among the five types of economic activities.

- List physical and human factors which affect land use.
- Explain how different driving forces change land-use systems.
- Let the students explain how to enlarge a land-use map of Ethiopia. Using the map, students are asked to tell the percentage of each land use by simple or mere approximation.

c) Stabilization

Ask students to identify the key points of the lesson as you stabilize your lesson presentation by reviewing all essential points, including those not mentioned by the students. You may mention the following.

- Economic activity is the production, distribution and exchange of goods and services.
- The economic activities practiced in the world are grouped into five, namely primary, secondary, tertiary, quaternary and quinary.
- Land use refers to the human activities which are directly related to land and to making use of its resources or having an impact on it.

4.5 Evaluation and Follow up

a) Evaluation

Ask questions like the following:

- What is the meaning of manufacturing industry?
- Mention the different types of economic activities.
- Explain the importance of different economic sectors in the world economy.
- What are the major characteristics of secondary economic activities?
- What are the major sectors of tertiary economic activities?
- What is the difference between land use and land coverage?

b) Follow up

- Form the class into six groups. Assign three of them to identify the relationship among the five types of economic activities, while the other three groups to identify what makes each types of economic activity different from the other. Then ask them to share results of group discussions with other groups and the whole class.

- Arrange students into smaller groups to discuss the dynamic forces that change the land over space and time. Finally ask them to present their discussion points/summaries to the whole class.

c) Additional activities

1. What is the difference between manufacturing and industry?
2. What are the major types of secondary economic activities?
3. Which types of economic activities are service sector industry?
4. What types of economic activities depend on a place's natural resources and climate?

4.6 Answer for activities

Activity 3.8

1.
 - a. Agriculture, fishing, forestry, mining and fishery
 - b. Manufacturing, construction and power production
 - c. Education, legal services, medical services, trade, transportation services, tourism, etc.
 - d. Research development, financial services and government activities.
 - e. The special and highly paid skills of top business executives, government officials, research scientists, financial and legal consultants.
2. Primary economic activities focus directly on the extraction of resources from the environment, whereas the category of secondary economic activities is the activity of making articles. Tertiary, quaternary and quinary economic activities are service giving activities.

Activity 3.9

1. Yes, Bazera girar (*Acacia Abyssinia*), girar (*Acacia bussei*), girar (*Faidherbia albida*), sebansa girar (*Acacia Senegal*), Sesa (*Albizia gummifera*), Amibes (*Allophylus abyssinicus*), Wanza (*Cordia Africana*), Bisana (*Croton macrostachyus*), Kitikita (*Dodonaea angustifolia*), wulkefa (*Dombeya torrid*), Lule (*Ekebergia capensis*), Korch (*Erythrina brucei*), Sholla (*Ficus Capensis*), Kosso (*Hagenia abyssinica*), Yehabesha tid (*Juniperus excelsa*), birbira (*Millettia ferruginea*), Weira (*Olea europea*), Zigba (*Podocarpus falcatus*), Tikur inchet (*Prunus Africanus*), Dokima (*Syzygium guineense*).

2. Fuel wood, charcoal, Chair, door, shelf, window, etc.
3. Hyena, Jackal, giraffe, antelopes, gazelles, elephants, rhinoceroses, zebras, wild asses, monkeys, colobus monkeys, baboons, flamingoes, mountain Nayla, Walia Ibex, Lion, Leopard, etc.

Activity 3.10

For activity 3.10 you are expected to guide the students based on the available environment in your surroundings.

Activity 3.11

1. Primarily economic activity: Agriculture, fishery, forestry, mining.
Secondary economic activity: Manufacturing, steel industry, cement industry
2. Please teacher arrange field trip, to visit manufacturing industry and the students gather information on:
 - i. ownership: is it private or government?
 - ii. total capital invested
 - iii. types of raw material and product: is it raw material oriented or power oriented?
 - iv. Number of people employed
 - v. Power source: does it use water, electricity or coal as source of power?
 - vi. Problem of production and distribution: is there transportation problem, etc.?
3. Please give students freedom to prepare their own reports.

Activity 3.12

1. Tertiary economic activity is a service giving activity. Whereas secondary economic activity is an activity that produces finished and semi-finished goods that dependence on raw materials that are obtained from the primary economic sector.
2. It provides services to other business as well as final consumers.

Activity 3.13

1. Because it give service for the movement of people, commodities and mail.
2. Land transport
3. Road transport, rail way transport and back animal
4. Yes, because it is a service giving activity

Activity 3.14

1. Phone, internet, e-mail, radio, news paper, TV, magazine, etc.
2. Two-way radios, cellular telephone, computer, etc.

Activity 3.15

1. Some of the ways in which tourism is important include:
 - Relaxation and refreshment
 - Promotion of foreign exchange earning
 - Fun and excitement
 - Sporting, such as skiing, mountaineering, boating, yachting, fishing, hunting, swimming, etc.
 - Health purposes, such as securing fresh air and sunshine and sometimes bathing in hot springs, etc.
2. It generates foreign currency and also is a source of job opportunities.
3. Tourism is travel for recreational, leisure or business purposes, whereas tourism industry is an industry that gives service.

Activity 3.16

1. The quaternary sector is an advanced form of services activity involving specialized knowledge, technical skills, communication ability or administrative competence.
2. Research and development.

Activity 3.17

1. Local culture, environmental conditions and backward agricultural activity.
2. Land use refers to the human activities which are directly related to land and to making use of its resources or having an impact on it, whereas land utilization is a kind of land use that can be described or defined in greater detail than that of a major kind of land use.

Answer for Additional Activities

1. Manufacturing is a process which turns raw materials into products, using labour, energy and equipment, whereas industry is the place where manufacturing is conducted
2. Manufacturing, construction, and power production
3. Tertiary, quaternary and quinary
4. Primary economic activities

Answer for Exercises

Exercise 3.2

Part I

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

Part II

6. B 7. D 8. A 9. E 10. C

Part III

11. C 12. A 13. D 14. D 15. D

3.3 NATURAL RESOURCES

Periods Allotted: 4

1. Competencies

At the end of this lesson, the students will be able to:

- ✚ Define the concept of natural resources;
- ✚ Classify natural resources into renewable and non-renewable;
- ✚ State the direct and indirect use of natural vegetation;
- ✚ Identify Ethiopia's common woods used for construction purpose;
- ✚ Select Ethiopia's woods potentially significant to furniture and other purposes;
- ✚ Recognize the economic significance of wild animals;
- ✚ Show appreciation of the varied uses of minerals;
- ✚ Express the importance of soil.

2. Contents

3.3.1 Concepts of natural resources (2 periods)

- Types of natural resources renewable and non-renewable

3.3.2 Importance of natural resources (2 periods)

- Natural vegetation
- Wild animals
- Minerals
- Soils

3. Overview

A natural resource is anything that comes from nature and which people can use. Natural resources are extracted from the environment. People do not make natural resources, but gather them from the earth. Examples of natural resources are air, water, wood, crude oil, solar energy, wind energy, hydro-electric energy, coal, and minerals. A natural resource is often characterized by amounts of biodiversity existent in various ecosystems. Many of them are essential for our survival, while others are used for satisfying our wants.

Natural resources may be further classified into different divisions based on different parameters. On the basis of origin, resources may be divided into:

- *Biotic* - Biotic resources are obtained from the biosphere, such as forests and their products, animals, birds and their products; fish and other marine organisms. Mineral fuels, such as coal and petroleum are also included in this category because they are formed from decayed organic matters.
- *Abiotic* - Abiotic resources include non-living things. Examples are land, water, air, gold, iron, copper, silver, etc.

Considering their stage of development, natural resources may be referred to as:

- *Potential resources* - are those that exist in a region and may be used in the future. For example, petroleum may exist in many parts of the world, which have sedimentary rocks, but until it is actually drilled out and put into use, it remains being a potential resource.
- *Actual resources* - are those that have been surveyed, their quantity and quality determined and are being used in present times. The development of an actual resource, such as wood processing, depends upon the technology available and the cost incurred.
- *Stock and reserve resources* - That part of the actual resource that can be potentially developed profitably with the available technology is called a reserve.

With respect to renewability, natural resources can be categorized as follows:

- *Renewable resources*: are ones that can be replenished or reproduced easily. Some of them, like sunlight, air, wind, etc., are continuously available and their quantity is not affected by human consumption. Many renewable resources can be depleted by human use, but may also be replenished, thus maintaining the flow. Some of these,

like agricultural crops, take a short time for renewal; others, like water, take comparatively a longer time, while still others, like forests, take even longer.

- *Non-renewable resources*: are formed over very long geological periods. Minerals and fossil fuels are included in this category. Since the process of their formation is extremely slow, they cannot be replenished once they get depleted. Of these, the metallic minerals can be re-used by recycling them. But coal and petroleum cannot be recycled.

On the basis of availability, natural resources can be categorized as:

- *Inexhaustible natural resources*: those resources which are present in unlimited quantity in nature and are not likely to be exhausted easily by human activity are inexhaustible natural resources. E.g.- sunlight, air, etc.
- *Exhaustible natural resources*: the amounts of these resources are limited. They can be exhausted by human activities in the long run. E.g.- coal, petroleum, natural gas, etc.

Natural Vegetation

The term natural vegetation refers to any form of vegetation that grows in a certain geographical area under the natural conditions of the place, without any human interference. The physical conditions of a place such as climate and topography influence the kind of natural vegetation that covers a certain environment.

The natural vegetation in an area serves many purposes and provides many advantages. Among others, the following are the most important ones. They serve as:

- **Source of energy**: many natural vegetations can be used as a source of energy.
- **Habitat for wild animals**: the varied vegetations are homes for different species of wild animals.
- **Sources of food and medicinal plants**: natural vegetation possesses different species of plants that have food and medicinal values. The roots, fruits, leaves, stems, flowers, barks and seeds of the wild plants provide food and traditional medicine.
- **Scientific and educational sites**: natural vegetations have scientific and educational significance. Scientifically, they are used to make different scientific researches that are significant to improve the welfare of people and the environment. Educationally,

the forests, grasslands and desert vegetation regions provide a suitable environment for visits to support educational lessons with the actual reality.

- A natural means for the balance of nature: the vegetation cover that develops in a certain place plays a significant role in regulating micro-climatic conditions and maintaining the balance of nature. Vegetations are part of the hydrological system and atmospheric cycle. As a result, they help to regulate local climates by circulating water through transpiration and maintaining balance between the concentration of oxygen and carbon dioxide in the atmosphere. The roots and fallen plant parts, such as leaves, are also important in controlling soil erosion and maintaining soil fertility.
- Recreational sites: vegetated areas are very important places for recreation and refreshment. Many people like visiting places that are green and rich in wildlife. Tourists usually visit areas that are endowed with wildlife. This in turn helps states to generate money from tourism.
- Sources of industrial raw materials: different wild plants serve as sources of industrial inputs. Lumbers, gums, fruits, leaves, and other forest products are very important raw materials for various industries. Medical herbs are also used as inputs for industries that produce medicines.

Wild Animals

The term ‘wild animal’ refers to any of the species of animals that are not domesticated. They are untamed animals that do not get too close to humans. These animals are important for many reasons. Among the most common importance of wild animals, some are the following.

- Source of income: wild animals can generate huge sum of money through tourism. As we know, people spend money when they visit different places in different ways. In addition, states can get money through poaching (legal hunting) and the selling of body parts of and live animals.
- Source of industrial raw materials: wild animals are good sources of raw materials for different industries. The fur, skin and excretion of various wild animals are used as raw materials for industries that produce different kinds of goods. For example, crocodile skin is used to produce expensive shoes, belts and hand bags. Similarly, the excreta of some animals are used to produce chemicals and perfume.
- Scientific and educational uses: different species of wild animals are used for scientific and educational purposes. They are used to conduct research on various

issues. For instance, some wild animals, such as rats, apes and rabbits, are used to make medical experiments.

- **Maintaining the balance of nature:** wild animals are dependent on the natural vegetation and on other animals for their subsistence. Herbivorous animals for example, feed on vegetation and control the amount of vegetation cover in an area. Similarly, carnivorous animals feed on the herbivores and other animals, thereby controlling the number of animals that feed on plants. This interdependence among the animals and the environment helps to maintain balance in nature.
- **Aesthetic value:** wild animals are good forces of attraction. They add beauty to the natural environment and serve as tourist attractions. Many people visit places that are rich in wild animals for purposes that include refreshment.
- **Source of animal protein:** in many places there are many people who depend on wild animals for their protein needs. The people hunt the animals and use the meat as food.

Minerals

A mineral is a combination of elements. It is an organic chemical element or compound found naturally in the crust of the earth. It is grouped as one set of the non-renewable natural resources.

Soils

Soil is a mixture of mineral and organic constituents that are in solid, gaseous and aqueous states.

Soil has various uses. For example, plants depend on soil for nutrients, water supply and support. Soil is also vital for human beings and other animals in several ways. We obtain food for our life directly or indirectly from soil. Other animals too, bigger or smaller, depend on soil for their survival.

4. Teaching-learning Process

4.1 Suggested Teaching Aids

- Diagrams that show different wild animals.
- Pictures that show vegetation distribution.
- Photographs that show different types of soil.

- Physical map of the world.
- Maps that show mineral distribution.
- Film that shows Ethiopian wild animals and natural vegetation.

4.2 Suggested Teaching Methods

- Brainstorming by asking different question.
- Explanation about the two types of natural resources.
- Small group discussions so that students discuss the ecological and economic importance of natural vegetation.
- Small group discussions about the economic and other use of wild animals and minerals.
- Explanation about the importance of soil in reaction to agriculture, construction, and ecological balance.

4.3 Pre-lesson Preparation

- Read relevant source materials related to the different resource types.
- Collect diagrams, pictures, photographs, and physical maps of the world that show natural vegetation, wild animals, minerals and soils.
- Make all the materials you have collected ready for class use.

4.4 Presentation of the Lesson

a) Introduction of the lesson

Begin the lesson with brainstorming questions. The following questions might serve this purpose:

- What are natural resources?
- What are the two types of natural resources?
- What do we mean when we say renewable and non- renewable natural resources?

- List the importance of natural vegetation.
- In Ethiopia, which types of trees are economically important?
- What are the economic importances of wild animals?
- List the importances of minerals.
- What are the importances of soil?

b) Body of the lesson

- Let students be arranged into groups and discuss the concept of natural resources and classify natural resources into renewable and non-renewable resources.
- Divide students into groups and let them discuss the relationships that exist among soil, vegetation and wildlife.
- Let the students explain the importance of natural vegetation, wild animals, minerals and soils.
- Let the students write reports on the economic importance of bamboo, eucalyptus and indigenous trees of Ethiopia.
- Let students discuss the following points in pairs:
 - The importance of wild animals and minerals.
 - The economic and other uses of wild animals and minerals.
 - Let the students explain the importance of soil in relation to agriculture, construction, and ecological balance.

c) Stabilization

Stabilize the lesson with a review of key ideas and concepts such as:

- Considering renewability, natural resources can be categorized renewable and non-renewable resources.

4.5 Evaluation and Follow up

a) Evaluation

Ask students questions like the following:

- What is a natural resource?
- List renewable natural resources.
- List non-renewable natural resources.
- What are the indirect uses of natural vegetation?
- In what ways are of wild animals and minerals economically important?
- How is soil used for construction?

b) Follow up

- Let students make a list of examples of renewable and non-renewable natural resources.
- Let students make a list ways in which natural vegetation, wild animals, minerals and soil.
- Let the students identify the difference between renewable and non-renewable natural resources.
- Help the students do the activities given at the end of the lesson in their textbooks.

c) Additional activities

1. Write the direct uses of natural vegetation.
2. What are the economic importance of mineral resources?
3. What are importance of wild animals?
4. What is the difference between natural resources and economic activities?

4.6 Answer for Activities

Activity 3.18

1. Natural resources are resources that occur naturally without the intervention of human kind.
2. People use natural resources in order to survive and meet other needs. People use natural resources as source of food, energy, industrial raw materials, sources of constructional materials, source of income, etc.
3. Unwise and over use of resources exposes the environment for degradation. As resources are over used, the quality of the environment declines.
4. Human activities have great impacts on the natural environment. For example, forestry may result in deforestation, unless it is wisely managed.

Activity 3.19

- Renewable resources: are types of resources that can be replaced as they are used. Example, forests, water, soil, plant and animal life.
- Non-renewable resources: are resources which exist in a fixed amount. Example, coal, petroleum, gold, copper, etc.

Activity 3.20

1. Bamboo, Tikur inchet, Tid, Zigba, Kerero, Koso tree, Weira sholla, Warka, Wanza, Birbira, Yehabesha Tid, Lole, Wuiikufa, Kitikita, Bisana, Amibese, etc.
2. for making fences, water pipe, basketry, mats, and other decorative material.

Answer for Additional Activities

1. Source of energy, source of industrial raw material, source of construction materials and source of food
2. As raw material for a variety of manufacturing establishments, as a source of energy that is used to run machinery used for making fertilizers, as materials in building construction and for aesthetic and ornamental purposes.
3. Source of food, source of industrial raw materials, scientific and educational purpose, maintaining the balance of nature, add beauty of the environment and source of individual and national income.
4. Economic activity is the production, distribution, and exchange of goods and services. Whereas natural resources occur naturally within environments and people use all these resources to improve their lives.
 - Economic activity directly depends on natural resources

Answer for Exercises**Exercise 3.3****Part I**

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

Part II

6. A 7. B 8. D 9. B 10. D

Answer Key Review Exercise**Part I**

1. C 2. A 3. C 4. C 5. A 6. C 7. D 8. A

Part II

9. It is an activity that focuses directly on the extraction of resources from the environment.
10. It is an activity that includes manufacturing which is a process that turns raw materials into something finished or semi-finished product with added values.
11. Mining is a primary economic activity concerned with the extraction of mineral bearing substances from the earth's crust.
12. Refers to the purpose for which humans exploit, the land and its resources.
13. Population data refers to population information, such as number, age, marital status, birth and deaths, occupation, religion, educational status, and other characteristics of the human population.

Check List

Check the student’s performance according to the given competencies referring the questions under the check list for every unit. Put a tick (✓) mark against each task weather they are able to perform in the competencies of each unit. The students are expected to respond saying Yes or No. then, you can make your own evaluation whether the competencies are met or not.

Can you:

	Yes	No
1. define the concept of human population? -----		
2. discuss facts about human population? -----		
3. distinguish sources of population data? -----		
4. identify the densely and sparsely populated areas of the world; and? ----		
5. discuss the settlement patterns of world population -----		
6. list the five types of economic activities? -----		
7. explain the major characteristics of economic activities? -----		
8. examine how economic activities modify and transform resources? -----		
9. describe concept and meaning of land use? -----		
10. identify land use system in Ethiopia? -----		
11. differentiate driving forces that change land use systems? -----		
12. differentiate rural land use from that of urban land use? -----		
13. define the concept of natural resources? -----		
14. classify natural resources into renewable and non-renewable? -----		
15. state the direct and indirect uses of natural vegetation? -----		
16. identify Ethiopia’s common woods used for construction purposes? ----		
17. select Ethiopia’s woods potentially significant for furniture and other purposes? -----		
18. recognize the economic significance of wild animals? -----		
19. appreciate the varied uses of minerals resources? -----		
20. express the importance of soil? -----		

Unit Assessment

Students' performance has to be assessed continuously over the whole unit. The assessment will be made by comparing students' performance with the specified level of competencies. Besides, the teacher has to recognize the level of performance of each student and provide assistance accordingly.

Thus

A student at a minimum requirement level will be able to define the concept and discuss facts on human population; distinguish sources of population data; identify settlement patterns of the world and state the reasons for their variation; list the five types of economic activities and explain their major characteristics; and examine how economic activities modify and transform resource. Moreover, they can define the concept of natural resources, classify natural resources into renewable and non-renewable resources; recognize the economic significance of resources for sustainable development.

A student at a minimum requirement level will be able to defend how and why we better practice the use of natural resources wisely; and interrelate rate of population growth with economic development using the conditions of sample countries.

Unit 4

PUBLIC AND POLICY RELATED ISSUES IN ETHIOPIA

Total Periods Allotted: 6

1. Introduction

In this unit you are going to deal with HIV/AIDS, environmental policy, and economic policy of Ethiopia. Each topic is presented by giving concise and clear explanation. To deal with these contents, group discussion, presentation, explanation, demonstration, practical activities, observation, and explanation are suggested as major methodologies.

The start-up questions and activities are given in each sub-unit to encourage students. Summaries and exercises are also designed to explore the key concepts in more detail.

2. Unit Outcomes

At the end of this unit, the students will be able to:

- *Realize the prevalence and impacts of HIV/AIDS;*
- *Accept and participate in the implementation of environmental policies in Ethiopia;*
- *Realize the economic policy of Ethiopia.*

3. Main Contents

4.1 HIV/AIDS

4.2 ENVIRONMENTAL POLICY

4.3 ECONOMIC POLICY

4.1 HIV/AIDS

Periods Allotted: 2

1. Competencies

At the end of this lesson, the students will be able to:

- ✚ Analyze the global prevalence of HIV/AIDS;
- ✚ Explain the prevalence of HIV/AIDS in Ethiopia;
- ✚ Reflect impacts of HIV/AIDS in Ethiopia;
- ✚ Decide to join the school Anti- HIV/AIDS club to the alleviation of HIV/AIDS problems in Ethiopia.

2. Overview

HIV (Human Immunodeficiency Virus) that causes Acquired Immuno Deficiency Syndrome (AIDS) can be transmitted through infected blood, semen, vaginal secretions, breast milk, and during pregnancy or delivery. HIV destroys certain white blood cells called CD4+ T cells. These cells are critical to the normal function of the human immune system, which defends the body against illnesses. When HIV weakens the immune system, a person is more susceptible to developing a variety of cancers and becoming infected with viruses, bacterias and parasites. The disease has four stages: primary or acute HIV infection, asymptomatic, symptomatic, and advanced HIV disease (AIDS).

A person who tests positive for HIV is considered to have developed to AIDS when a laboratory test shows that his or her immune system is severely weakened by a virus that might not affect a person with a normal immune system but that takes advantage of damaged immune systems. People who have not had one of these opportunistic infections, but whose immune system is severely damaged, are also considered to have been affected by AIDS disease.

HIV/AIDS is one of the most devastating health and development crises of our time. Since the first clinical evidence of AIDS was reported over two decades ago, the disease has spread too much over the world. Still spreading, the pandemic is reversing development endeavors, robbing millions of their health and lives, widening the gap between rich and poor, and endangering social and economic security.

All persons should take extreme care in order to protect themselves from HIV/AIDS. To reduce the fatal impact of HIV/AIDS, people have to change their behavior in their sexual relationship. Especially young boys and girls, who are the most productive section of the society, should refrain from having sexual relationships before being engaged in a tested marriage. People who, otherwise, enter into sexual relationship should use condoms.

In addition, the fight against HIV/AIDS calls for the victims to be given due respect as persons; their human rights should be observed, and their legal rights protected. They must not be stigmatized and discriminated simply because they are HIV-positive. Correspondingly, people who are HIV-positive should have also normal, legal and human responsibilities in taking care not to transmit the virus to any individual. It is only through this mutual cooperation anywhere in the world that humanity can be saved from the expansion of this deadly disease and the total annihilation as a result.

During 2008, some 2.7 million people became infected with the human immunodeficiency virus (HIV), which causes AIDS. The year also saw 2 million deaths from AIDS a high global total, despite antiretroviral (ARV) therapy, which reduced AIDS-related deaths among those who received it. The number of deaths probably peaked around 2004, and has since declined only slightly.

Around half of the people who acquire HIV become infected before they turn 25, and AIDS is the second most common cause of death among 20-24 year olds. By the end of 2007, the epidemic had left behind 15 million AIDS orphans, defined as those aged under 18, who have lost one or both parents to AIDS. These orphans are vulnerable to poverty, exploitation, and to becoming infected with HIV. They are often forced to leave the education system and find work, and sometimes to care for their younger siblings or head a family. In 2008, around 430,000 children aged 14 or younger became infected with HIV. More than 90 percent of newly infected children are babies born to women with HIV. They acquire the virus during pregnancy, labour or delivery, or through their mother's breast milk. Over nine-tenths of such transmissions occur in sub-Saharan Africa.

This is true also in Ethiopia. There are about 1.2 million people living with HIV/AIDS in the country. Out of these 90,311 are pregnant women and 79,871 are children. The number of orphaned children due to AIDS is estimated at 804,184. The number of deaths due to AIDS in 2010 is estimated at 28,073.

HIV/ AIDS affects societies to a large extent. Here are some of the impacts of it:

- Families with reduced income are common.
- A great number of parentless children will join street life.
- There are times when grandparents are forced to look after children who lost their parents.
- Social crises will be abundant.

The problems that arise as a result of the expansion of HIV/AIDS at a national level are very complicated and vast in nature:

- Students and teachers are at stake.

- students may lose their interest in education,
- parents may fail to send their children to school,
- schools may be closed,
- the country may be forced to change its education programs and even its curriculum,
- quality of education may be affected.
- HIV/AIDS affects the national economy.
 - It imposes economic pressure on the educational, agricultural, industrial, commercial, etc. sectors, because:
 - It attacks mainly the productive forces.
 - Production decreases in all sectors.
 - As a result transaction or commerce gets weaker and weaker from time to time.
 - Financial institutions like banks and insurance organizations will register poor performance.
 - Factories may run short of trained human-power and farm plots may be left fallow because of the death of farmers.
 - Old people may become helpless from time to time.
 - Generally, people negative in HIV/AIDS may become busy handling people with HIV/AIDS.

Finally, it is very important and high time for individuals, societies, nations and governments at large to note that they can save humanity from total devastation only when they make a well coordinated effort and open a common front against HIV/AIDS.

4. Teaching-learning Processes

4.1 Suggested Teaching Aids

- Photographs that show HIV/AIDS patient.
- Diagram that shows the trend of HIV/AIDS in Ethiopia.

4.2 Suggested Teaching Methods

- Asking questions as a brainstorming activity.
- Discussion about the magnitude and impact of HIV/AIDS on the productive forces.
- Discussion about how to mitigate the impact of HIV/AIDS.
- Encouraging the students to participate in Anti HIV/AIDS clubs.

4.3 Pre-lesson Preparation

- Collect photographs that shows HIV patient and refers different books related to the topic.
- If possible, arrange HIV patient as a guest speaker.

4.4 Presentation of the Lesson

a) Introduction of the lesson

You may start the lesson by asking questions like the following:

- What is HIV/AIDS?
- What should be done in order to overcome HIV/AIDS pandemic?
- What are the major means of transmission of HIV/AIDS?

b) Body of the lesson

- Let students explain/define the meaning of HIV/AIDS.
- Explain the ways by which HIV/AIDS is transmitted and the means to prevent the expansion of HIV/AIDS.
- Discuss the current prevalence rate of HIV/AIDS in the world and Ethiopia.

c) Stabilization

Stabilize the lesson with a review of key ideas and concepts such as

- During 2008, some 2.7 million people in the worlds became infected with the human immunodeficiency virus (HIV), which causes AIDS.
- The area in Africa, south of the Sahara Desert known as sub- Saharan Africa, is by far the worst affected in the world by AIDS epidemic.
- Women, young commercial sex workers, the rural population and orphans and children in general are the most vulnerable groups in Ethiopia.

4.6 Evaluation and Follow up

a) Evaluation

Ask questions like the following:

- Can you explain the status of HIV/AIDS in the world?
- What is the status of HIV/AIDS in Ethiopia?
- Can you explain how the HIV/AIDS pandemic affects individuals, families and the society at large?

b) Follow up

Form groups to discuss the magnitude and the impact of HIV/AIDS on the productive force and try to gather cases of people living with HIV/AIDS. In addition let them discuss how to mitigate the impact of HIV/AIDS.

c) Additional activities

1. Write the most common way of HIV/AIDS infection?
2. What are the social impacts of HIV/AIDS?
3. Write at least three demographic impacts of HIV/AIDS.

4.6 Answer for Activities**Activity 4.1**

1. No
2. It is in a decreasing state
3. AIDS has a large social, psychological, demographic, and economic impact on both the individual and societies.
 - Painful stress, disability and death that AIDS causes to the individual patterns.
 - The family, social and economic problems that follow are many and varied. Such problems include divorce, family disintegration, orphaned children, etc.
4. By joining the school anti HIV/AIDS club to alleviate the prevalence of HIV/AIDS in Ethiopia; design a strategy to combat the prevalence of HIV/AIDS in the school community.

Activity 4.2

1. Give students freedom to assess and discuss the issues in their perspective.
2. Give students freedom to assess and discuss the issue in their perspective.

Answer for Additional Activities

1.
 - Unsafe or unprotected sexual intercourse
 - Shared use of items such as needle, blades and other sharp objects.
 - Transfusion of infected blood.
 - Unsafe delivery and breast feeding.
2. Divorce, family breakup, orphan hood, stigma, discrimination, and school dropout.
3. Increase mortality, structural shift and shortens life expectancy.

Answer for Exercises

Exercise 4.1

Part I

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

Part II

5. C 6. D 7. D 8. C 9. D 10. D

4.2 ENVIRONMENTAL POLICY

Periods Allotted: 2

1. Competencies

By the end of this lesson, the students will be able to:

- ✚ *adhere to the implementation of Ethiopian environmental policy.*

2. Contents

- Environmental Policy

3. Overview

Environmental policies are guidelines formulated for wise use of resources. The guidelines help us to form systematic conservation techniques in order to minimize waste of resources. Most solutions for major conservation problems are, therefore, derived from environmental policies. The main goal of these policies is the protection of the environment from degradation and depletion for sustainable utilization of the resources contained in it.

Ethiopia has established a macroeconomic policy and strategies framework. Sectoral development policies and strategies have been formulated. Environmental sustainability is recognized in the national economic policy and strategy as a key prerequisite for lasting success. Accordingly the country has formulated an environmental policy.

The overall policy goal is to improve and enhance the health and quality of life of all Ethiopians and to promote sustainable social and economic development through the sound management and use of natural, human-made and cultural resources, and the environment as a whole. In other words, the age is to meet the needs of the present generation without compromising the ability of the future generations to meet their own needs.

Specific Policy Objectives

The Policy seeks to:

- Ensure that essential ecological processes and life support systems are sustained, biological diversity is preserved and renewable natural resources are used in such a way that their regenerative and productive capabilities are maintained and where possible enhanced so that the satisfaction of the needs of future generations is not compromised; where this capability is already impaired to seek through appropriate interventions a restoration of that capability.
- Ensure that the benefits from the exploitation of non-renewable resources are extended as far into the future as can be managed, and minimize the negative impacts of their exploitation on the use and management of other natural resources and the environment.
- Identify and develop natural resources that are currently underutilized by finding new technologies, and/or intensifying existing uses which are not widely applied.
- Incorporate the full economic, social and environmental costs and benefits of natural resource development into the planning, implementation and accounting processes by a comprehensive valuation of the environment and the services it provides, and by considering the social and environmental costs and benefits which cannot currently be measured in monetary terms.
- Improve the environment of human settlements to satisfy the physical, social, economic, cultural and other needs of their inhabitants on a sustainable basis.
- Prevent the pollution of land, air and water in the most cost-effective way so that the cost of effective preventive intervention would not exceed the benefits.
- Conserve, develop, sustainably manage and support Ethiopia's rich and diverse cultural heritage.
- Ensure the empowerment and participation of the people and their organizations at all levels in environmental management activities; and raise public awareness and promote understanding of the essential linkages between environment and development.

4. Teaching-learning Processes

4.1 Suggested Teaching Aids

- Documents of Environmental Policy of Ethiopia
- Physical map of Ethiopia

4.2 Suggested Teaching Methods

- Make a discussion on the content of the environmental policy of Ethiopia.
- Inviting a guest speaker.
- Initiating the students to participate in the implementation of the policy.

4.3 Pre-lesson Preparation

- Read relevant source materials related to contents to be covered.
- Collect suggested teaching aids and display them in the classroom.
- Identify the most acute environmental problems of Ethiopia.
- Consult relevant documents on environmental policy of Ethiopia.
- If possible, invite a guest speaker, i.e. environmentalist.

4.4 Presentation of the lesson

a) Introduction of the lesson

Ask students questions like the following:

- What is environmental policy?
- What is the importance of environmental policy?

b) Body of the lesson

- Begin the lesson by asking students to define environment policy. Based on students' definition explain what an environmental policy is?
- Let students bring the environmental policy of Ethiopia and discuss on the content of the policy.
- Explain the role of people in maintaining the well-being of their environment so that life becomes sustainable.

c) Stabilization

You may stabilize the lesson by reviewing the key ideas and concept of the lesson such as:

- Environmental policies are guidelines formulated for a wise use of the resources.
- Countries of the world do not have similar environmental problems. The policies also differ among countries.

4.5 Evaluation and Follow up

a) Evaluation

You can ask students questions like the following in order to check their understanding of this particular lesson.

- Mention some examples of points in the environmental policy of Ethiopia.
- Do you think that people including students and teachers should be involved both in the formulation and implementation of such policies? Why?

b) Follow up

- Arrange the class into different groups and assign different topics for each, and then they should present the content of each topic for the class. Finally, try to invite a guest who is aware of and practitioner of environment and arrange a discussion forum.

c) Additional activities

1. What is the major importance of environmental policy?
2. Write at least two specific objectives of the environmental policy of Ethiopia.

4.6 Answers for Activities

Activity 4.3

1. Chemical that farmers use may increase the productivity of their crops but some also damage the land. Pesticides or chemical that kill insects, can pollute rivers and ground water.
2. Environmental pollution from human activities occurs in industries, automobiles, thermal power station, domestic combustion, etc. on the other hand pollution resulting from natural events includes gases coming out from volcanoes, dust particles, water, smoke, etc.
3. By reduction of pollutant inputs: this includes the reduction of garbage disposed into rivers, lakes and oceans.
 - Removal of pollutants by purification: by using appropriate methods salt and other substances can be removed by the process of purification used for purifying water from sewage.
 - By use of chemicals: this include the addition of chlorine in public water. This chemical is used to clean water from bacteria.
4. Industries that burn fossil fuels are the main source of air pollution. Factories can pollute the environment through thermal pollution, chemical pollution, air pollution and noise pollution.

Activity 4.4

1. Promote development that is sustainable and optimize resource use and management opportunities.
2. Yes, because communities, families, teachers and students are the immediate users of natural resources in their surroundings. Thus, the active participation of people, communities, families and individuals – in resources management and protection is very crucial if sustainable development is to be attained.

Activity 4.5

1. Environmental rehabilitation is a community effort to be successful and sustained, it has to involve the target population. Environmental rehabilitation without the people behind it is a worthless effort.
2. Yes, they dispose their waste inside water bodies. They are wrong because they pollute the rivers water.
3. Yes, if the people misuses forests, wildlife, and soil, they will be smaller and smaller. This lead to environmental degradation.
4. Gives students freedom to discuss the issue in their perspective.

Answer for Additional Activities

1. It helps to minimize misuse of resources
2. Endure that environmental concerns are explicitly addressed and incorporated into the decision-making process.
Protect eh productivity and capacity of natural systems and ecological processes which maintain their function .

Answers for Exercises**Exercise 4.2****Part I**

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

Part II

5. D 6. D 7. D 8. D 9. B 10. C

4.3 ECONOMIC POLICY

Periods Allotted: 2

1. Competences

At the end of this lesson, the students will be able to:

- ✚ Realize the contribution of economic policy of Ethiopia for development.

2. Content

- Economic policy of Ethiopia

3. Overview

Achieving Ethiopia's sustainable growth rate will involve enhanced implementation of sound policies and strategies by minimizing downward deviations (or shocks that brings about it).

Ethiopia's strategy has to be based on its most abundant resource: labor, on exploiting the opportunities created by relatively low wage rates, and the idiosyncrasies of climate that create comparative advantages (for example in flowers and spices). However, there is also an acute shortage of capital with which this labor can work.

Based on the new economic policy, the Ethiopian government formulated a long-term economic development strategy known as, Agriculture-Led Industrialization, which is devised towards the renovation of the backward economic structure. It is a two-sided strategy, integrating:

- on one side, the external sector (export-led part) and
- on the other, the internal sector which explains the forward and the backward relationship between agriculture and industry.

In other words, agriculture will provide commodities for exports, domestic food supply, and industrial inputs and will enlarge the market for domestic manufactures. The mining sector is anticipated to give momentum to the development of the export sector.

4. Teaching-learning Process

4.1 Suggested Teaching Aids

- Ethiopia's economic policy document.
- Plan for Accelerated and Sustained Development to End Poverty (PASDE).

4.2 Suggested Teaching Methods

- Discussion based on the previous knowledge of students about the economy policy of Ethiopia.
- Explanation about the newly introduced economic policy of Ethiopia.
- Arrange small group discussions so that students discuss the contribution of Ethiopia economic policy to development.
- Group activity and report writing.

4.3 Pre-lesson Preparation

- Get the materials suggested as teaching aids ready.
- Collect relevant literature on the issue.
- Prepare different activities.
- Consult relevant documents on the economic policy of Ethiopia.

4.4 Presentation of the Lesson

a) Introduction of the lesson

Brainstorm students on the economy and economic policy of Ethiopia by way of asking the following questions or other similar questions.

1. What does economic policy mean?
2. Does Ethiopia have an economic policy?

b) Body of the lesson

- Continue the lesson by first giving the definition of economic policy.
- Explain the importance of an economic policy for economic development.
- Discuss briefly objectives and strategies of the national economic policy of Ethiopia.

c) Stabilization

Stabilize the lesson with a review of key ideas and concepts such as:

- Economic policy refers to the action that governments take in the economic field.
- Macroeconomic stabilization policy, trade policy, policies designed to create economic growth, policies related to development economics and industrial policy are the types of economic policy

- Agricultural – Development - Led Industrialization is a two – sided strategy, integrating
 1. The external sector (export – led part) and
 2. The internal sector which explains the forward and the backward – relationship between agriculture and industry.

4.5 Evaluation and Follow up

a) Evaluation

Ask the following questions:

- Briefly discuss the significance of the economic policy.
- What is the factor that hinders the implementation of the economic policy of Ethiopia? Is there only a single factor?

b) Follow up

Arrange a group discussion so that students exchange ideas on the contribution of our economic policy for development.

c) Additional activities

1. Write at least two types of economic policy.
2. What factors influence the economic policy of Ethiopia?

Answer for Additional Activities

1. Macroeconomic stabilization policy and trade policy.
2. International institutions as well as political ideology.

Answer for Exercises

Exercise 4.3

Part I

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

Part II

5. B 6. C 7. C

Review Exercise on Unit 4

Part I

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

Part II

6. A 7. D 8. B 9. D 10. D
 11. D 12. C 13. C 14. A 15. B

Unit Assessment

Students' performance has to be assessed continuously over the whole unit. The assessment will be made by comparing students' performance with the specified level of competencies. Besides, the teacher has to recognize the level of performance of each student and provide assistance accordingly.

Thus

A student at a minimum requirement level will be able to analyze the global prevalence and explain the prevalence of HIV/AIDS in Ethiopia and reflect its impact; adhere to the implementation of Ethiopia's environmental policy; and realize the contribution of economic policy of Ethiopia for development.

In addition, a student working above the minimum requirement level and considered as higher achiever should be able to decide to join the school anti HIV/AIDS club to alleviate the prevalence of HIV/AIDS in Ethiopia; design a strategy to combat the prevalence of HIV/AIDS in the school community; formulate mechanisms to implement the Ethiopian environmental policy at school level; and argue how the economic policy of Ethiopia brings the desired socio-economic changes and development for the country.

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Minimum Learning competencies for Secondary Education First Cycle

Grade 9 Geography

<i>Theme</i>	<i>Competencies</i>
	<i>Grade 9</i>
I. The concept of Geography	<ul style="list-style-type: none"> • Value the concept of Geography • Write the meaning of Geography • Argue that geography is a science • Determine the scope of geography and classify its branches
II. Map Reading	<ul style="list-style-type: none"> • Explain the meaning of map • Compare the historical development of map between the earlier and the present time maps • Recognize the basic uses of maps and calculate field distance and areas of irregular shapes • Demonstrate classifying map on purpose and scale • Use marginal information to interpret maps • Construct and interpret statistical diagrams based on simple line graph, simple bar graph and pie chart.
III. Physical Environment	<ul style="list-style-type: none"> • Analyze the internal and external forces that change the surface of the earth and relate with the resulting landforms • Realize the origin, composition and the layers of the earth's atmosphere • Relate the association between the elements and controls of climate • Develop the skill of measuring, recording and constructing temperature and rainfall graphs. • Know the physical and human characteristics of places, and use this knowledge to define and study regions and their patterns of change. • Examine the factors that affect the distribution and characteristics of ecosystem.

<i>Theme</i>	<i>Competencies</i>
	<i>Grade 9</i>
	<ul style="list-style-type: none"> •
IV. Human and economic aspects	<ul style="list-style-type: none"> • Describe the demographic concept of population and the concept of economic activities. • Compare and contrast sources of population data • State reasons for variation in population distribution and settlement • Analyze the effects of economic activities in modifying and transforming resources. • Realize the importance of natural resources for sustainable economic development • Describe how changes in transport technology and communication affect the location and patterns of economic activities. • Discuss land use patterns of Ethiopia
V. Public and policy related issues	<ul style="list-style-type: none"> • Analyze how HIV/AIDS affects the socio-economic development of a country. • Identify and evaluate alternative practices to respond to constraints found in varied environments • Reflect the importance of environmental policy of Ethiopia for wise utilization of resources.

Federal Democratic Republic
of Ethiopia

Ministry of Education **For**

Grade 9

Geography Syllabus

Introduction

The purposes of first cycle secondary education are bridging general education to preparatory of higher education and to technical vocational education and training (TVET), and preparing learners to the world of work. This level is also the highest level of general education under the Ethiopian educational structure.

Geography, as component of general education, contributes to the realization of the above purposes. The unique nature of the subject geography helps learners form bases for the understandings, the interrelationship and interaction of phenomena in the society and the world. This condition plays important role in enabling learners to see their future choice of education carrier/training in the context of the well being of the individual and people in their respective as well as world society. It also enhance the presence of informed participation in relation to keeping local and global environment healthy for the sake of future generation. Within the framework of the above understandings, geography has been one of the subjects given in our schools.

Currently, quality has become an issue in our education system. Research and learning assessment reports (like national learning assessment and joint review mission of MoE) indicated us that the performance of learners was below what is expected. Besides, need assessment reports made in relation to the realization of geography curriculum has shown us the need for reviewing our curriculum. As a whole, all these reports forced us to revise our geography curriculum in line of competency based approach which is defined in our new curriculum frame work.

Thus, the present geography curriculum has been made suitable for the realization of active learning methods and out come based learning. The curriculum is also revisited to make it competent to the international standard. Moreover, it gives greater opportunity to teachers than the previous curriculum so that they can add their professional input and implement in a flexible way. The material is prepared by team of experts and teachers coming from MoE and regions.

For clarity purposes, this curriculum is made to contain:

- Profile of geography students at the end of grade ten which shows the contribution of attending geography lesson in realizing the expected general profile of learners at the end of the cycle ;
- Minimum learning competencies for geography education of the cycle;
- Content flow chart of the cycle;
- Grade level learning outcomes of each grade 9 ;
- The respective grade syllabuses.

Besides, the competencies and content flow chart are organized around five themes – The concept of geography, map reading, physical environment, human & economic aspects, and public and policy related issues. Using these themes, the syllabuses of grade 9 and 10 have been arranged in four units.

Thirty four weeks are assigned in a year to cover the lesson of each grade with two periods per week. The content load is minimized to be balanced with the allotted time.

Profile of Geography students at the end of Secondary School First cycle 9

- Students have general knowledge of geography that enable them to understand their natural and social environment
- Students are active participant in Social and cultural development of their country and Environmental protection
- Students play healthy role in the interaction between human and natural environments
- Students communicate with people using maps
- Students can live with people of diverse background by appreciating multiculturalism and value livelihood diversity
- Students can contribute their part in the effort of sustainable development of their country and the world
- Students utilize their geographical knowledge to connect social & natural phenomenon
- Students can be capable to continue technical training and prepare for further academic carrier using their geographical knowledge as a base.

First Cycle Secondary Education 9 Learning outcomes for Geography

After students study geography, at the end of first cycle secondary education the expected learning outcomes are that students will be able to:

- Develop a basic understanding of the geologic history of the earth in general and Ethiopia in particular;
- Analyze factors and processes of landform formation
- Comprehend the elements of weather and climate and the mechanisms that create discernible climate pattern in Ethiopia and the world at large.
- Relate major types of natural resources and associated problems and there by develop a set of values and feelings of concern for the resources and the motivation for actively participating in their protection;
- Realize some basic concepts, major theories as well as the impact of population growth on socio-economic development and the environment and measures taken to harmonize them in Ethiopia and the world;
- Appreciate major types of economic activities practiced in Ethiopia and the world at large, factors affecting their distribution as well as their levels of development;
- Acquire basic skills in understanding, reading, using and interpreting maps;
- Know the distribution and types of natural regions of the world and appreciate the unique feature of Ethiopia.

First Cycle Secondary Education 9 Learning outcomes for Geography

Grade level learning outcomes for grade 9 geography

After completing grade nine geography lesson, the students will be able:

1. To develop understanding and acquire knowledge of:

- The term geography, the development of geography as a discipline and the branches of geography
- Meaning of map, basic uses of map,
- Some of the marginal information given on maps as well as
- Conventional signs and symbols used to represent different features on maps
- The resulting landforms formed by each internal and external forces
- The meaning of weathering, its types and landforms resulted from chemical weathering
- Types and characteristics of agents of erosion and associated landscapes with it.
- The process of deposition and its associated landforms
- The meaning, origin, composition and layer of the earth's atmosphere
- Weather and climate and the concept of temperature
- Formation and types of rainfall as well as types of wind
- The concept of region and regional study
- Major characteristics of tropical zone
- Sub-regions of tropical zone; the characteristics of equatorial rain forest and hot desert regions
- Major characteristics of temperate zone and its sub-regions
- The general characteristics of the Mediterranean and the coniferous regions, and
- The term ecosystem, its components and interdependence
- The concept and facts about human population
- Sources of population data, densely and sparsely populated areas of the world
- Settlement patterns of population
- The five types of economic activities and their major characteristics
- The concept of land use
- The concept of natural resources
- Classification of natural resources as renewable & non-renewable
- Direct and indirect use of natural vegetation
- The economic significance of wild animals
- The importance of soil

2. To develop skills and abilities of:

- Determining the scope of geography
- Categorizing maps based on scale and purpose
- Converting and calculating scale of the map
- Constructing statistical diagrams
- Using simple line graph, simple bar graph and pie chart bases on the data provided.
- Appraising the variation of temperature
- Demonstrating how to measure and record temperature data
- Computing and interpreting temperature laps rate and data
- Practicing measuring and recording of rainfall
- Demonstrating the temperature zones of the world

3. To develop the habits and attitude of :

- Appreciation to the historical development of map
- Discrimination of the impact of relief on climate over the influence of latitude in Ethiopia
- Recognition of the major characteristics of frigid zone, its sub regions, tundra and polar ice caps
- Identification and demonstration of the interdependence in the ecosystem
- Appreciation for the varied uses of minerals
- Realization of the prevalence and impact of HIV/AIDS
- Accept and participate in the implementation of Ethiopian environment policy
- Realization of the elements of Ethiopian economic policy for development

Unit One: The concept of geography and map reading (12 Periods)

Unit Out comes: students will be able to:

- Recognize the concept, scope and branches of geography
- Express the meaning, historical development, uses and types of map
- Compute field distance & areas of irregular shaped figures, construct and interpret statistical diagrams.

Competencies	Main Contents	Suggested activities
<p><i>Students will be able to:</i></p> <ul style="list-style-type: none"> • Define the term Geography • Describe the development of geography as a discipline • Determine the scope of geography • Identify the branches of geography • Identify the characteristics that make the subject of geography science • Explain the meaning of map • Appreciate the historical development of map • State the basic uses of map 	<p>1.The concept of geography and map reading</p> <p>1.1 Introduction to the concept of Geography (4 Periods)</p> <ul style="list-style-type: none"> • Meaning of geography • Scope of geography • Branches of geography • What makes geography science <p>1.2 Introduction to the concept of map reading (8 Periods)</p> <ul style="list-style-type: none"> • Meaning of map • Historical development of map <ul style="list-style-type: none"> – Traditional – Modern • Uses of map • Classification of map <ul style="list-style-type: none"> ➤ By function 	<ul style="list-style-type: none"> • Ask the learners what they know about the subject geography and help them to arrive at a correct definition and then determine the scope and branches of geography. • Arrange small group discussion so that students discuss on what makes an academic subject science and equate it to prove that geography is science. Small groups' discussion results have to be reported to the whole class in order to arrive at the desired points through whole class discussion. • Review the meaning of map and discuss its historical development. Organize students into small groups to discuss the uses of map, its classification as well as marginal information. • Provide students with various kinds of maps which can be general and specific purpose maps; other maps of various scale sizes so that they can categorize the maps by function and size of scales.

<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested activities</i>
<ul style="list-style-type: none"> • Categorize maps based on purpose and scale • Distinguish conventional signs and symbols used to represent different features on maps. • Identify some of the marginal information given on maps • Calculate scale of the map • Convert linear scale to areal scale • Calculate the areas of regular and irregular shaped figures by referring to the scale of the map. • Construct statistical diagrams using simple line graph, bar graph and pie chart based on the provided data 	<ul style="list-style-type: none"> – General – Specific ➤ By scale <ul style="list-style-type: none"> – Large scale map – Medium – Small • Marginal information <ul style="list-style-type: none"> – Conventional signs and symbols – Scale of map – Grid reference – Magnetic declination • How to find scale of the map • The relationship between linear and areal scales • Measurement of regular and Irregular shaped areas • Statistical diagrams <ul style="list-style-type: none"> – Simple line graph – Simple bar graph – Pie chart 	<p>Provide students with a topo-sheet produced by Ethiopian mapping agency so that students get all the necessary conventional signs and symbols and be able differentiate each.</p> <ul style="list-style-type: none"> • Demonstrate the ways of finding scale of a map and then let students practice how to find the scale of a map. (Using degree values of latitude using ruler measurement) • Let students review the scale of a map in small groups and then practice conversion of linear scales into areal scales • Students have to be allowed to measure regular shaped areas using the formula they have learnt in their geometry class by using the scale of the map given to find real/ground area. Besides, the teacher should also encourage students to find the ground of irregular shaped areas represented on maps using square methods. • Provide given data of population, production, climate then organize students to represent the data using simple line graph, simple bar graph and pie chart.

Assessment

Students' performance has to be assessed continuously over the whole unit. The assessment will be made by comparing students' performance with the specified level of competencies. Besides, the teacher has to recognize the level of performance of each student and provide assistance accordingly. Thus:

A student at a minimum requirement level will be able to define geography; describe the development, determine the scope and identify the branches of geography, explain the meaning, appreciate the historical development, state the basic uses of maps, identify some of the marginal information, distinguish conventional signs and symbols on maps and categorize maps based on scale and purpose; convert linear scale to areal scale; calculate scale of map and areas of regular/irregular shaped areas from a map and construct simple statistical diagrams.

In addition, a student working above the minimum requirement level and considered as higher achiever should be able to evaluate varied definitions of geography, state the fundamental differences of maps that are classified based on scales, design her/his own signs and symbols to convey information on maps, calculate scale of maps based on given degree distance information, and evaluate the relationships and differences of two kinds of information presented on maps using simple statistical diagrams.

Students working below a minimum requirement level will require extra help if they are to catch up with the rest of the class.

Students reaching at the minimum requirement level but achieve a little bit higher should be supported so that they attain the higher achiever competencies. Students who fulfill the higher achievers competencies also need a special support to continue and achieve more.

Unit Two: Physical environment of the world and Ethiopia (34 periods)

Unit Out comes: The students will be able to:

- Analyze the internal and external forces that change the surface of the earth and relate them with the resulting landforms
- Appreciate the origin, composition and the layers of earth’s atmosphere, analyze the association between the elements and controls of climate and interpret climatic data
- Realize the concept of region, distinguish different temperature zones of the earth and describe Ethiopia as a tropical mountainous country
- Assess the concept, components, interdependence and the factors that affect the distribution and features of ecosystem

<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested activities</i>
<p><i>Students will be able to:</i></p> <ul style="list-style-type: none"> • List down the landforms formed by each internal force • Describe the process of each internal force. • Relate some major landforms with their respective internal force. • Explain effects of earth quakes on infrastructure like buildings, dams, roads <ul style="list-style-type: none"> • State the meaning of weathering • Distinguish the types of weathering • Identify land features 	<p>2. Physical environment of the world and Ethiopia</p> <p>2.1 Forces that changes the surface of the earth.</p> <p>2.1.1 Internal forces (4 periods)</p> <ul style="list-style-type: none"> • Folding • Faulting • Volcanism • Earthquake <p>2.1.2 External forces (4 periods)</p> <ul style="list-style-type: none"> • Weathering (definition) • Types(physical and chemical including leaching) 	<ul style="list-style-type: none"> • Brain storming: Ask students what they remember about internal forces from their grade eight social studies. • Help students to discuss the processes through which folding, faulting, volcanism and earth quake can happen using diagrammatic animated film expression. • Let students discuss about the internal forces in small groups and then demonstrate the internal movement by using different figures and show the resulting lands forms on world map. • Besides, students has to be encouraged to present effects of earth quake and volcanism on infrastructural like buildings (built uproars), dams, roads and etc. using examples. <ul style="list-style-type: none"> • Assist students to recall what they know about the external forces • Then, let students speak out about what happens to soil

<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested activities</i>
<p>resulted from chemical weathering (stalactite, stalagmite, pillar etc.)</p> <ul style="list-style-type: none"> • Explain the types & characteristics of agents of erosion • Relate types of erosions • State the effects of erosion with various landscapes on human activities • Explain the process of deposition • Recognize erosion deposited soils and landforms. 	<ul style="list-style-type: none"> • Erosion <ul style="list-style-type: none"> – Agents: wind and water – Types: sheet and gully • Deposition • Agents: wind and water • Land forms created by wind and water deposition. 	<p>when it interacts with water, varied temperature conditions, and plant roots. Facilitate conditions through animated films, diagrams, color pictures or other ways that enable them explain the meaning of weathering. Students have to classify conditions of weathering as physical and chemical.</p> <ul style="list-style-type: none"> • Take them to the field to observe the effects of erosion, in their surroundings, so that they can distinguish landforms associated with different agents of erosion. Besides, present short case studies that show sheet and gully erosions caused by wind & water. Substantiate this presentation with interesting cases until students able to explain landforms created by wind & water deposition.
<ul style="list-style-type: none"> • Explain the meaning of atmosphere • Discuss the composition and layers of earth's atmosphere 	<p>2.2 Weather and climate 2.2.1 Earth & atmosphere <i>(2 periods)</i></p> <ul style="list-style-type: none"> • Definition of atmosphere • Composition • Structure/layer 	<ul style="list-style-type: none"> • Brainstorm: <ul style="list-style-type: none"> – Let students describe the fate of human life in the absence of air, and explain the importance of atmosphere based on their science/biology lesson. – Help students define atmosphere correctly in small group discussion. Supplement this activity with some kind of fascinating presentation. At the same time, make students identify the layers and composition of atmosphere.
<ul style="list-style-type: none"> • Explain the terms of weather and climate 	<p>2.2.2 Weather and climate <i>(6 periods)</i></p>	

<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested activities</i>
<ul style="list-style-type: none"> • Express the concept of temperature • Appraise the variation of temperature • Compute normal temperature lapse rate • Interpret temperature data • Explain the formation of rain • Discuss the types of rainfall • Relate the varied slopes of roofs of houses (buildings) of various climatic regions with their respective types of rainfall • Explain what cloud is • Describe types of cloud • Predict the impact of cloud cover on temperature • Differentiate types of winds <ul style="list-style-type: none"> – Local – Monsoon(seasonal) – Planetary winds Including (cyclones and anticyclones) • Relate direction and deflection of winds to earth’s rotation • Interpret wind speed and direction from wind gradient map • Explain how conditions of wind affect structure of buildings and crop production. • Identify types of atmospheric pressure • Relate atmospheric pressure with temperature and altitude 	<ul style="list-style-type: none"> • Elements <ul style="list-style-type: none"> –Temperature – Rainfall – Clouds – Types of clouds – Winds – Air pressure • Controls <ul style="list-style-type: none"> – Latitude 	<ul style="list-style-type: none"> • Consider a hypothetical air flight that took place from Addis Ababa in a cloudy day to Mali desert area. Now, let students attempt to express weather and climate based on the above statement. • Arrange a group discussion, so that they can identify the major elements of weather and climate by relating with the effects of climatic controls that cause spatial and temporal variation in the distribution of the elements of weather and climate. • Help students discuss the effects of the varied conditions in the elements of weather and climate on human activities and human made materials • Let students form small groups to discuss and present about slopes of roofs of buildings in a temperate region and compare it with that of our common slopes of roofs. In their discussion they have to consider the type of rain of those areas and recite the probable reason why the slopes of roofs of buildings in the respective areas are made in that way. • Arrange group presentation dealing with the effects of wind on buildings and plantation so that they can

<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested activities</i>
<ul style="list-style-type: none"> • Demonstrate how to measure and records temperature data • Practice measuring and recordings of rainfall • Develop the skills of measuring and recording atmospheric pressure • Demonstrate the pressure belts of the world • Analyze the position of the sun at various latitudes at noon time of Dec.22/June 21 • Examine the impact of latitude on temperature • Justify the effect of altitude on the characteristics of temperature, rainfall and air pressure • Compare and contrast the condition of rainfall and temperature between places of coastal and interior areas • Express the meaning and types of ocean current • Identify the impacts of ocean currents • Recognize the effects of ocean currents on temperature & rainfall on land surfaces • Discuss the type & location of pressure belts of the world • State seasonal movements 	<ul style="list-style-type: none"> – Altitude – Distance from the sea – Cloud cover – Ocean current – Planetary winds and pressure belts • Measuring and recording Elements of Weather and climate • Low and high pressures • Pressure belts belts and areas • Latitude, overhead of sun and temperature • The relationship between altitude, temperature, rainfall and air pressure • Rainfall and temperature difference between coastal and interior places • Cold and warm ocean currents • Major pressure belts of the world 	<p>describe the various mechanisms of breaking wind power.</p> <ul style="list-style-type: none"> • Motivate learners to identity types of atmospheric pressure. Then, supply learners with varied information of altitude, and its corresponding temperature and the related atmospheric pressure so that they can relate atmospheric pressure with a given altitude and temperature conditions. • Facilitate conditions that enable students measure, record, and compute temperature and rainfall data based on climatic information of a given area. Then identify the differences among local, monsoon,

<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested activities</i>
<p>of pressure belts in relation to the apparent movement of the sun</p> <ul style="list-style-type: none"> • Relate movements of planetary winds with pressure belts 	<ul style="list-style-type: none"> • The relationship between planetary winds and pressure belts 	<p>planetary, cyclone and anticyclone winds in relation to its direction and deflection due to earth's rotation. Make a visit to a near by meteorological station to enrich students ability of practicing measuring and recording weather and climatic data.</p> <ul style="list-style-type: none"> • Demonstrate the world pressure belts with their respective wind systems and make students express major pressure belts and winds. <p><u>N.B</u> Be sure that the designed activities have to be reasonable to realize all specific learning competencies stated in this part.</p> <ul style="list-style-type: none"> • Remind learners what they learnt about revolution of the earth in their lower grades to realize that the position of sun in relation to the earth varies seasonally. Then, supply them with globate and let them sate the position of sun at various latitudes of the earth at noon time of Dec22/June 21 This needs to express the angle of sun's rays at particular latitude of the earth. Giving examples and exercise with continues follow up of teacher can enrich the activities • Now, let students investigate the impact of latitude on temperature; and altitude on temperature, rainfall and air pressure so that they can analyze and explain the effects of latitude and altitude on elements of weather and climate. • Let learners speak what they

<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested activities</i>
<ul style="list-style-type: none"> Analyse the concept of region & regional study 	<p>2.3 Natural regions of the earth (14 periods)</p> <ul style="list-style-type: none"> Concept of region 	<p>feel beside river or other water bodies during day and at night time compared to land area far away from water body. Then make them compare and contrast the condition of temperature and rainfall of coastal and interior areas. Learners should reason out why the differences happen.</p> <ul style="list-style-type: none"> Present a world map that shows the direction of cold and warm ocean currents students should be motivated to know what makes an ocean current cold or warm. Then students are facilitated to realize and express the impacts of each type of ocean current on temperature and rainfall characteristics of nearby and surfaces. This has to be strengthened by provides example Help learners realize major pressure belts of the earth with the help of appropriate map. Then discuss the type and location of pressure belts of the world consider the seasonal movement of pressure sets in reaction to apparent movement of the sun. Start the lesson by brainstorming students mention the characters of planetary winds. Then help them to relate the movements of planetary winds with location of pressure belts. Motivate students to mention some of the elements they know to characterize a region administratively and mention

<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested activities</i>
<ul style="list-style-type: none"> • Demonstrate temperature zones of the world • Discuss the major characteristics of tropical zone(location, climate, natural vegetation, wild animals, soils and human activities • Distinguish the major sub regions of tropical zone • State the general characteristics of the equatorial rainforest and hot deserts • Discriminate the impact of altitude on climate over the influence of latitude • Explain the major relief feature of Ethiopia 	<ul style="list-style-type: none"> • Temperature zones and sample regions I. Tropical zone <ul style="list-style-type: none"> Major characteristic of tropical zone <ul style="list-style-type: none"> – Location – Climate – N. vegetation – Human activities – Sub regions A. The Equatorial rain forest region <ul style="list-style-type: none"> • Location • Climate • Vegetation • Human activities B. Tropical desert <ul style="list-style-type: none"> • Location • Climate • Vegetation • Human activities C. Ethiopia a mountainous tropical country in Eastern Africa. <ul style="list-style-type: none"> • Location of Ethiopia • Relief of Ethiopia 	<p>some natural elements found in some region n but absent in the other. Assist students to define a region by extracting relevant information mentioned by them to reach at sounding conclusion.</p> <ul style="list-style-type: none"> • Guide students to enable them know that natural regions can also be formulated on the basis of similarities in natural conditions such as climate and natural vegetation and also to some extent similarities in human activities. • Guide students' discussions by leading students arrive at appropriate concept & definition of region. • Demonstrate temperature zones of the earth based on the Greek's classification and let students sketch the map in their exercise books to show temperature zones of the earth. The activities should enable students describe the three temperature zones and how this zonal division is made. • Let students discuss on the general characteristics of the tropical zone in small groups and then help them to distinguish the sub-regions of the tropical zone by using the world map. In addition, students are expected to make the sample studies of equatorial rainforest region and hot desert region. Assist students to demonstrate the characteristics of sample regions using world map and if possible using films showing characteristics of the region.

<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested activities</i>
<ul style="list-style-type: none"> • Assess the major characteristics of temperate zone (location, climate, soils & human activities) and sub regions. • Describe general characteristics of Mediterranean region • Explain the general characteristics of coniferous forest region • Recognize, the major characteristics of the Frigid zone 	<p>II. Temperate zone</p> <ul style="list-style-type: none"> - Location, - Climate - Natural vegetation - Human activities - Sub-regions <p>A. Mediterranean Region</p> <ul style="list-style-type: none"> - Location - Climate - Vegetation - Human activities <p>B. Coniferous Forest Region</p> <ul style="list-style-type: none"> - Location - Climate - Vegetation - Human activities <p>III. Frigid zone</p> <ul style="list-style-type: none"> - Location - Climate 	<ul style="list-style-type: none"> • Present case studies of two countries: <ol style="list-style-type: none"> 1. Ethiopia : showing its high altitude position and its vertical climatic zonation(especially temperature distribution), and 2. Central African Republic: showing its altitudinal condition with the county's temperature distribution. • Then, assist students to distinguish the reason of varied temperature distribution commonly observed in the two countries. In this process, students' activities have to be geared towards understanding and appreciating the role of Ethiopia's altitude in modifying the latitudinal influence over temperature. Provide them a map illustrating the location and relief of Ethiopia. • Present a world map showing natural regions of the world to students so that learners can locate latitudinal extension of temperate zone and sub-regions of the zone. Then, pose questions as starter to make learners discuss in small groups about the characteristics of temperate zone. Students are expected to express their ideas and convince each other by focusing on Mediterranean and coniferous forest regions. Finally, arrange bridging mechanism to link students' opinion with the desired proper lesson conclusion. • Let students discuss on the general characteristics of the temperate zone in small groups

<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested activities</i>
<ul style="list-style-type: none"> • Define the term ecosystem • Identify the component of ecosystem • Demonstrate interdependence in the ecosystem • Identify what development of transport & communication technology has brought changes in location of economic activities. • Discuss how development in transport & communication technology has brought changes in location of economic activity. 	<ul style="list-style-type: none"> – Vegetation – Human activities <p>2.4 Ecosystem (2 periods)</p> <ul style="list-style-type: none"> – Components • Biotic • Abiotic – Interdependence in the ecosystem <p>2.5 Villagization of the world through distance time Decay (2 periods)</p> <ul style="list-style-type: none"> • Location of economic activities in relation to market in the past & at presents <ul style="list-style-type: none"> – Perishable goods production – Industrial/farming activities – Delivery of services • Location of residence of workers versus offices/factories in the past & at present • Location of industries 	<ul style="list-style-type: none"> • Take Lake Ziway/or Alage area or other place to use as a sample for discussing ecosystem. In this discussion, let students distinguish the components of the sample ecosystem as biotic and a biotic with their interdependence. The interdependence should include the idea of the interrelationship among producers, consumers and decomposers. • Based on the discussion, lead students to arrive at proper definition of ecosystem. Besides, they should identify the components of ecosystem and describe their interdependence. • Start the lesson using students' experience about the topic. Let students discuss, in small groups, and report on the contribution of modern transport and communication technology in connecting distant areas and the World itself. It is wonderful if the report is supplemented with concrete examples. Then help learners to reach at the desired conclusion through whole class discussion

Assessment

Students' performance has to be assessed continuously over the whole unit. The assessment will be made by comparing students' performance with the specified level of competencies. Besides, the teacher has to recognize the level of performance of each student and provide assistance accordingly. Thus

A student at a minimum requirement level will be able to describe the process of internal forces and list down the resulting landforms and relate them with their respective internal force; state the meaning and distinguish the types of weathering as external force; explain effects of earth quake and erosion on human made structures; identify land features resulted by chemical weathering; explain the types and characteristics of agents of erosion and the concept of deposition; relate and recognize types of erosion with various land scapes/deposited soils; explain and discuss the meaning, origin, composition, and layers of earth's atmosphere; explain weather and climate, express the concept and appraise the variation of temperature; Relate various roof structure of buildings with the type of rain fall and wind of the respective areas demonstrate how to measure and record temperature; and discuss the type and location of pressure belts of the world.

Besides; they can be able to explain and discuss the formation the condition of each element of weather and climate with the respecting factor/s of weather and climate; explain the major characteristics of selected sub-regions of each temperature zone of the world and examine the factors for characteristics of ecosystem.

In addition, a student working above the minimum requirement level and considered as higher achiever should be able to interpret temperature data and compute normal temperature lapse rate; interpret wind speed and direction from wind gradient map; assess why and how different types of winds formed in varied parts of the world; predict the phenomena caused by the overhead sun at various latitudes by providing concrete examples. Besides, they can be able to relate climatic data with respective altitude and latitude; assess types of clouds and their major characteristics that exist in different altitudes, compare and contrast varied concepts of region and regional studies; determine the type of sub regions of each zone based on the patterns of soil, climatic, vegetation and human activities; and predict what will happen if the ecosystem is affected at various levels.

Unit Three: Human Population and Economic Activities (16 periods)

Unit Out comes: The students will be able to:

- Analyze the concept of human population & the sources of population data
- Indicate the densely moderately & sparsely populated regions of the world
- Distinguish settlement patterns of world population
- Discuss the major economic activities of the world
- Recognize the importance of natural resources

<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested activities</i>
<p><i>Students will be able to:</i></p> <ul style="list-style-type: none"> • Define the concept of human population • Discuss facts about human population • Distinguish sources of population data • Identify the densely and sparsely populated areas of the world • Discuss the settlement patterns of world population • List the five types of economic activities • Explain the major characteristics of economic activities • Examine how economic activities modify & transform resources • Describe concept & meaning of land use • Identify land use systems in Ethiopia • Differentiate 	<p>3. Human population & economic Activities</p> <p>3.1 Concept and facts about human population (3 periods)</p> <ul style="list-style-type: none"> – Meaning of human population – Sources of population data – Distribution and settlement patterns <p>3.2 Economic activities 3.2.1 Classification (6 periods)</p> <ul style="list-style-type: none"> – Primary – Secondary – Tertiary – Quaternary – Quinary <p>3.2.2 Land use (3 periods)</p> <ul style="list-style-type: none"> – Concept and meaning of land use – Land use in Ethiopia – Driving forces in changing land use – Rural land use versus urban land use 	<ul style="list-style-type: none"> • Let students discuss on the concept of population in small groups and help them to distinguish between population data sources and demonstrate the densely and sparsely populated areas of the world by sketching the world map. • Motivate students to say something about the economy activities of different sectors, then give explanation of the primary, secondary, tertiary, quaternary and quinary. • Divide the class in to six gropes. Three of them are assigned to identify the relation slip among the five types of economic activates, while the other three groups different what makes each type of economic activity different from the others. Groups work results have toll be presented to the whole class so that whole class discussion can be made on the basis of the reports through the teacher’s facilitation. • Let the teacher depict students enlarged land use map of Ethiopia. Using the map, students are asked to tell percentage of each land use by simple mere approximation.

Competencies	Main Contents	Suggested activities
<p>driving forces that change land use system</p> <ul style="list-style-type: none"> • Differentiate rural land use from that of urban land use • Define the concept natural resources • Classify natural resources into renewable and non-renewable • State the direct and indirect uses of natural vegetation • Identify Ethiopia’s common woods used for construction purposes • Select Ethiopia’s woods potentially significant to furniture and other purposes. • Recognize the economic significance of wild animals • Show appreciation for the varied uses of minerals • Express the importance of soil 	<p>3.3 Natural resource 3.3.1 Concept (2 periods) – Types(renewable and non- renewable)</p> <p>3.3.2 Importance of natural resources (2 periods) – Natural vegetation – Wild animals – Minerals – Soil</p>	<ul style="list-style-type: none"> • Arrange students into smaller groups and discuss among themselves the dynamic forces that change the land over space and time and present to whole class. • Let students discuss and differentiate the land use system in rural and urban settings with the help of their teacher. Students have to be made explain the type and condition of land uses in rural and urban areas so that they can differentiate the differences. • Let students discuss the concept of natural resources and facilitate the discussion and assist in identifying natural resources as renewable and non-renewable. At the end, let them explain the importance of natural vegetation, wild animals minerals and soil. • Arrange small group discussions that focus on the ecological and economic importance of natural vegetation with a particular emphasis to Ethiopian’s students should identify economically important Ethiopian’s wood like bamboo, Eucalyptus and other indigenous tress, • Similarly, students have pair discussion about the importance of wild animals and minerals for short period of lime. They are supported to identify and understand the economic and other uses of mild animals and minerals. The result of these pair discussion will be enriched through whole class discussion • Let students explain the importance of soil in reaction to agriculture, construction, and ecological balance keeping. This can be realized through various activities like through presentation using practical examples.

Assessment

Students' performance has to be assessed continuously over the whole unit. The assessment will be made by comparing students' performance with the specified level of competencies. Besides, the teacher has to recognize the level of performance of each student and provide assistance accordingly. Thus

A student at a minimum requirement level will be able to define the concept and discuss facts on human population; distinguish sources of population data; identify settlement patterns of the world and state the reasons for their variation; list the five types of economic activities and explain their major characteristics; and examine how economic activities modify and transform resource. Moreover, they can define the concept of natural resources, classify natural resources into renewable and non-renewable resources; recognize the economic significance of resources for sustainable development.

A student at a minimum requirement level will be able to defend how and why we better practice the use of natural resources wisely; and interrelate rate of population growth with economic development using the conditions of sample countries.

Unit Four: Public & Policy Related Issues in Ethiopia (6 periods)

Unit Out comes: Students will be able to:

- Realize the prevalence and impacts of HIV/AIDS
- Accept and participate in the implementation of environmental policies in Ethiopia
- Realize the economic policy of Ethiopia

<i>Competencies</i>	<i>Main Contents</i>	<i>Suggested activities</i>
<p><i>Students will be able to:</i></p> <ul style="list-style-type: none"> • Analyze the global prevalence of HIV/AIDS • Explain the prevalence of HIV/AIDS in Ethiopia • Reflect the impact of HIV/AIDS in Ethiopia • Decide to join the school anti HIV/AIDS club to alleviate the prevalence of HIV/AIDS in Ethiopia • Adhere to the implementation of Ethiopia environmental policy • Realize the contribution of economic policy of Ethiopia for development 	<p>4. Public and policy related issues in Ethiopia</p> <p>4.1 HIV/AIDS (2 periods)</p> <p>4.2 Environmental policy (2 periods)</p> <p>4.3 Economic policy (2 periods)</p>	<ul style="list-style-type: none"> • Let students discuss the magnitude and the impact of HIV/AIDS on productive force and try to gather cases of people living with HIV/AIDS/PLWHAI. In addition let them discuss how to mitigate the impact of HIV/AIDS and rouse their interest to take part in Anti HIV/AIDS clubs. • Let students bring the environmental policy of Ethiopia and make a discussion program on the content of the policy. Arrange the class in to different groups and assign different topics for each, then they should present the content of each topics for the class. Finally, try to invite a guest who aware of practitioner of environment and arrange a discussion forum for it. Initiate the class to participate for the implementation of the policy. • Start the lesson by motivating students to identify of newly introduced/recently strengthened economic activities and discuss the importance of these activities to development. In the middle, expose students to the elements of economic policy of Ethiopia by relating these elements to those activities by students. Then, arrange group discussions so that students express and realize the contribution of our economic policy to development.

Assessment

Students' performance has to be assessed continuously over the whole unit. The assessment will be made by comparing students' performance with the specified level of competencies. Besides, the teacher has to recognize the level of performance of each student and provide assistance accordingly. Thus

A student at a minimum requirement level will be able to analyze the global prevalence and explain the prevalence of HIV/AIDS in Ethiopia and reflect its impact; adhere to the implementation of Ethiopia's environmental policy; and realize the contribution of economic policy of Ethiopia for development.

In addition, a student working above the minimum requirement level and considered as higher achiever should be able to decide to join the school anti HIV/AIDS club to alleviate the prevalence of HIV/AIDS in Ethiopia; design a strategy to combat the prevalence of HIV/AIDS in the school community; formulate mechanisms to implement the Ethiopian environmental policy at school level; and argue how the economic policy of Ethiopia brings the desired socio-economic changes and development for the country.