INSTRUCTIONAL UNIT – I

Topic: Our Environment - Components and Processes (Part I)

Instructional Objectives

After the instructions are over students have studied the enrichment and/or remedial material, they in their own words will be able to:

1.1 Give a general view about environment.
1.2 Write the importance of environment for human beings.
1.3 List two major types of environment.
1.4 Write the definition of atmosphere.
1.5 Write the composition of atmosphere with the help of diagram.
1.6 Write four layers of atmosphere with the help of diagram and their various characteristics.
1.7 Draw and elaborate the hydrological cycle.
1.8 Write about the hydrosphere.
1.9 Write how are oceans important to us.
1.10 Distinguish between condensation and evaporation.
1.11 Explain how clouds are formed in accordance to the teacher taught in the class.

Prerequisite Knowledge of Students

It is required the students should fulfill the conditions of entry behaviour test given in Appendix B.

Instructional Aids

- Coloured chalks and chalkboard
- Chart 1A: Composition of atmosphere
- Chart 1B: Hydrological cycle
- Chart 1C: Structure of the atmosphere

Content Sequence

Our environment components and processes (Part I)
i) Definition of environment.
ii) Elements of environment.
iii) Composition of atmosphere.
iv) Structure of atmosphere.
v) Hydrosphere.

Instructional Programme

Teacher announces the topic saying, “Today, we will learn about our Environment.”

Content Sequence – 1

Teacher says, “First of all we will learn about the literal meaning of environment. Students note down the topic.

Teacher says “Environment literally means the surroundings of an object.”

Teacher asks the students, “Do we live in isolation?”

Students respond

Teacher says, No, human beings do not live in isolation, they interact with their surroundings.

Thus, we must study the environment of all forms of life on the earth.”

Students note it down in their notebooks.

Content Sequence – 2

Teacher announces, “Let us now learn about various elements of environment.”

Students note down the topic.

Teacher says, “The earth is a unique planet as it supports various forms of life. This is only possible because of optimum distance from the sun, making the temperature on the earth neither too high nor low.”

Teacher asks the students, “Which thing is very essential for human beings to live?”

Students respond

Teacher says, “The earth is surrounded by air which contains oxygen essential for all forms of life on this earth. Air also moderates the temperature. This temperature variations enable water to be present on the earth. Water favored life, thus earth is unique in bearing life – biosphere.”

Teacher further explains that there are two types of environment on which all types of life depends on. These are

a) Physical environment
b) Biological environment

Teacher asks students to distinguish between physical and biological environment.
Students respond differently.
Teacher announces, the physical environment comprises the land, water and air while biological environment includes the plants, animals and organisms.
Both physical and biological environment interact with one another. The physical and biological elements in the environment are dynamic in nature. Changes take place in the physical environment causing extinction of certain species and evolution of new while some changes are due to natural processes others are caused by human activities.”

Content Sequence – 3

Teacher puts forward the next objective before the students saying, “Now, we will study about our atmosphere”
Students note down the topic.
Teacher says, “The air envelope that surrounds the earth is called the atmosphere. Students note down
Teacher further explains, “Of the total mass of the atmosphere 99%is with in a height of 32 Km from the earth’s surface. Most atmospheric changes occur within this layer.
Students note it down in their notebooks.

Content Sequence—4

Teacher announces, “Let us now learn about the composition of atmosphere.” Students note down the topic.
Teacher explains with the help of chart, “The atmosphere is made up of a mixture of gases. An average sample of pure day air consists of nitrogen (78%), oxygen (21%) and argon (0.9%), other gases such as carbon dioxide, hydrogen, helium and ozone are present in minute quantities.”

Composition of Atmosphere

Students draw diagram in their copies.
Teacher further says, “The lower layers also contain water vapour which may not exceed 3-4%. Apart from these gases, solid particles like dust, carbon, salt, pollen grains etc. are also found in the lower layers of the atmosphere.”

Content Sequence – 5

Teacher now puts forward the next objective before the students saying, “Let us now study about structure of atmosphere.”
Students note down the topic.
Teacher begins by saying, “Our atmosphere is generally divided in four layers. The lowest layer is troposphere. In this layer, the temperature of air decreases with height at average rate of 1°C for 165 meters. The troposphere extends upto
Appendices

a height of 18 Kms at the equator and about 8 kms along the poles. The upper limit of the troposphere is called the tropopause.”

Teacher asks the students, “What type of weather phenomena you find take place on this earth?”

Students respond and give various weather phenomena.

Teacher further explains that these all weather phenomena take place in this layer.

Teacher then explain about next layer of atmosphere by saying, “Above the troposphere is another layer called the stratosphere. The thickness of this layer is about 40—45 kms. The temperature is constant and then increases with height. It is ideal for flying conditions as there are no weather phenomena in this layer. The ozone in this layer absorbs harmful ultra-violet radiations from the sun.”

Teacher show these two layers on the model and clearly show and explain how these layers exist in our atmosphere.

Teacher further explains, “Third layer of our atmosphere is mesosphere which extends above the stratosphere.

The fourth layer is called the thermosphere. Its lowest part, called the ionosphere which contains electrically charged particles called ions. These particles reflect radio waves back to the earth’s surface and enable wireless communication. The upper portion of this layer is called the exosphere. There is no distinct upper limit to the exosphere and gives way to inter–planetary space.

Teacher show whole model to the students and explain all the four layers of atmosphere then teacher says, "The atmosphere is important as it protects the earth from ultra–violet radiation and extremes of temperature. All weather phenomena takes place in the atmosphere.

Students draw diagram of four layers of atmosphere and note down in the note books.

Content Sequence – 6

Teacher announces, “Now, we will learn about Hydrosphere.”

Students note down the topic.

Teacher says, “Water covers 71% of the total surface of earth. Water occurs in the form of ice–sheets in polar regions and on high mountains. Water is also found as underground water. Water as water vapour is found in the atmosphere. Of the total volume of water available, 97%is in the vast oceans, 2% is stored in the form of ice–sheets and less than 1% is available as fresh water.”

Teacher asks, “How water vapours are formed?”

Students respond and give various examples.

Teacher further says, “When the surface water is heated, evaporation takes
place and water vapour is added to the atmosphere.”
Teacher asks, “How rainfall occurs?”
Students respond
Teacher by listening students response says, “When water vapour in the atmosphere gets cooled it leads to condensation of water into tiny droplets which form clouds. Clouds cause precipitation of water in the form of rainfall or snowfall. Rainfall leads to run-off in the form of river which flow to the oceans. Water is consumed by plants and animals in the biosphere. Water, is temporarily stored as underground water in lakes, ice-sheets etc. The circulation of water is called the hydrological cycle.
Students note it down in their note books.
Teacher asks, “How tides are formed?”
Students respond.
Teacher further explains, “Water circulates both horizontally and vertically in oceans. It moves by wind in the form of waves and currents. When water moves due to the gravitational pull of the moon it is called tides.
Teacher asks, “How oceans are import for us?”
Students give various reasons.
Teacher accept their responses and says, “Yes, Oceans serve as transport links between land masses. They also influence the climate conditions of the coastal regions. Oceans also have plant and animal life which provide large reserves of food for man. Valuable oil is also found in off-shore regions. Valuable mineral deposits are also found on ocean floors.

Unit Criterion Tests
1) Give definition of the term “Environment”.

2) Name three features which make earth, a unique planet :
   a) ____________
   b) ____________
   c) ____________

3) Name two major types of ‘Environment’
   a) ____________
   b) ____________

4) Define Atmosphere

5) Draw diagram showing composition of Atmosphere.
6) Enlist various layers of Atmosphere
   a) ________________
   b) _________________
   c) ________________
   d) ________________

7) Write characteristics of each layer of atmosphere
   a) ____________________________________________
   b) ____________________________________________
   c) ____________________________________________
   d) ____________________________________________

8) Define the term “Hydrological Cycle.”
   ____________________________________________

9) How are oceans important to us?
   ____________________________________________

10) Water circulates in two directions
    a) ________________
    b) ________________

11) Define ‘Tides’
    ____________________________________________

12) Distinguish the terms “Evaporation” and “Condensation”.

<table>
<thead>
<tr>
<th>Evaporation</th>
<th>Condensation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13) How clouds are formed? Explain
    ____________________________________________

Remedial Instructions / Feedback Correctives Used

Investigator herself repeat the unit material again in an easier manner. Secondly, class monitors will be selected on the basis of their performance on the unit criterion test. These monitors will help the other students to achieve the mastery criterion.
INSTRUCTIONAL UNIT II

Topic: Our Environment–Components and Processes (Part II)

Instructional Objectives

After the instructions are over students have studied the enrichment and/or remedial material, they in their own words will be able to:

2.1 Write definition of Lithosphere and explain composition of Lithosphere.
2.2 Define rock and composition of rocks by writing.
2.3 Explain various type of rocks i.e. Igneous, Sedimentary, metamorphic.
2.4 Write definition of biosphere.
2.5 Explain relationship between man and environment.
2.6 Explain significance of Lithosphere to humans.
2.7 Explain the role of biosphere in the environment.
2.8 Distinguish between Sial and Sima.

Prerequisite Knowledge of Students

It is required that students should fulfil the condition of unit–criterion test of Lesson No.–1.

Instructional Aids

• Chart 2A: Types of Spheres i.e. Lithosphere, Atmosphere, Biosphere and Hydrosphere

Content Sequence

Our environment – components and processes (Part II)

i) Lithosphere.
ii) Rock Types.
iii) Biosphere.

Instructional Programme

Teacher announces the topic saying, “Today, we will learn about Lithosphere, Rock types and Biosphere.”

Content Sequence – 1

Teacher says, “First of all we will learn about the word Lithosphere”

Students note down the topic.

To begin with the teacher explains that the word Lithosphere refers to the solid layers of rock material on the earth’s surface both on the continents and ocean floors.

Teacher then asks the students, “The crust is thicker in the continents or on the
ocean floor?”
Students start thinking and then they respond.
Teacher writes on the Blackboard: The crust is thicker in the continents than on the ocean floors. The crustal layer is of lighter density than the interior layers because the interior layers consists of metals.
Students note it down in their notebooks.

Content Sequence – 2

Teacher announces, “Let us now learn about various type of Rocks and how they are made up of?”
Students note down the topic.
Teacher further explains that the crust of the earth consists of various types of rocks and these rocks are made up of minerals like silicate.
Teacher says, “Name few type of rocks you know.”
Students respond.
Teacher accept their answers and writes on the blackboard: There are three types of rocks.

a) Igneous rocks
b) Sedimentary rocks
c) Metamorphic rocks

Teacher asks, “How Igneous rocks are formed?”
Students respond.
Teacher explains that these rocks are formed by gradual cooling of molten rocks called magma which gets erupted by volcanoes.
Teacher asks, “What do you understand by sediments?”
Students respond.
Teacher further explains that sediments may consist of particles of gravel, sand, silt or clay and when these sediments are deposited on the floor of seas and lakes then sedimentary rocks are formed. These rocks are also known as stratified rocks as they occur in the form of layers of sediments.
Teacher asks students, “When pre-existing igneous or sedimentary rocks change their form, what name we gave to that type of rocks?”
Students respond then teacher explains that when igneous or sedimentary rocks are subjected to extreme heat or pressure or both then new minerals are formed and metamorphic rocks are formed.
Teacher gives few types of rocks i.e. Basalt, Granite, limestone, Sandstone, Marble and Quartzite and asks students to classify these rock types into major three types of rocks i.e. Igneous, Sedimentary, metamorphic rocks and tries to
develop decision making skill in students.

Students critically thinks about all type of rocks and try to classify these rocks types.

Teacher further explains that the pattern of landuse in a region depends on the nature of landforms, besides economic and cultural factors and concludes that an understanding of the processes at work in shaping the landforms in a region is essential for planning proper use of land.

Students note down.

Content Sequence – 3

Teacher announces, “Next we will study about, “The Biosphere”.

Students note down the topic.

Teacher begins by saying, “Biosphere is unique to the earth. Organisms in the biosphere are mostly found in contact zones between the atmosphere Lithosphere and Hydrosphere.

The teacher asks students, “From where do we get energy?”

Students respond

Teacher accept their response and says, Yes! The biological process depends on sunlight for their energy. The energy from the sun enables conversion of inorganic materials into organic matter.

Students note down.

Teacher says, “Each organism in the biosphere has certain limiting physical conditions for its survival and growth. Thus we may say that the types of plants and animals found in a region are related to the prevailing physical environment.

Teacher asks, “In ecology which type of study we made?”

Students respond

Teacher says, “A study of inter-relationships between the various life forms and their environment is the major concern of the science of ecology.

Students note down.

Content Sequence–4

Teacher now puts forward the next objective before the student saying, “Let us now learn about relation between human beings and environment.

Students note down the topic.

Teacher says, “Human beings are part of the biosphere. Human beings like any other living thing are entirely dependent on their environment. Human activities were aimed at satisfying their increasing needs from the environment. With rapid increase in population it has lead to an adverse effect on the biological and physical environment.

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Teacher asks the students, “Why it is very necessary to protect our environment.

Students respond

Teacher says, “Due to interference of human beings in environmental processes, Environmental pollution has taken place on a large scale in industrial and urban areas. These environmental changes pose a threat to the survival of humans on the earth. There is an urgent need for protecting the environment from which humans derive their food and other resources”.

Students note it down.

Teacher pays individual attention to the individual learners and provides corrective feedback to them whenever required.

Unit Criterion Tests

1) Give definition of the term “Lithosphere”.

2) Explain composition of Lithosphere

3) Explain the term “Rock”.

4) Enlist types of Rocks
   a) _______________
   b) _______________
   c) _______________

5) How Igneous rocks are formed?

6) Give two examples of Igneous Rocks
   a) _______________
   b) _______________

7) Define “Sedimentary Rocks”.

8) Write two examples of Sedimentary Rocks
   a) _______________
   b) _______________

9) Define “Metamorphic Rocks”.

(appendices (xxxvi))
10) Give two examples of Metamorphic Rocks
   a) ______________ 
   b) ______________ 

11) The biological process for energy depends on ______________
12) All organisms in the biosphere interact with :-
   a) ______________ 
   b) ______________ 

13) Define “Ecology”

14) Which type of Environmental changes pose a threat to the survival of humans on this earth :-
   a) ______________
   b) ______________

15) Write two reasons for protecting our Environment :-
   a) ______________ 
   b) ______________

Remedial Instructions / Feedback Correctives Used

Class monitors will help those students who have not achieved the selected mastery criterion. Again unit criterion test will be administered and this time teacher will explain the material by using charts.

INSTRUCTIONAL UNIT III

Topic : Realms of Water – I

Instructional Objectives

After the instructions are over students have studied the enrichment and/or remedial material, they in their own words will be able to :-

3.1 Explain the significance of water in oceans.
3.2 Define the term 'Salinity of Water'.
3.3 Write difference between continental shelf and continental shell and continental slope.
3.4 Explain with the help of diagram “Submarine relief”.
3.5 Distinguish between relative humidity and absolute humidity.
3.6 Explain how clouds are formed.
3.7 Describe precipitation and its various forms.
3.8 Explain state of saturation.

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Prerequisite Knowledge of Students

It is required that students should fulfil the condition of unit-criterion test of Lesson No.—2.

Instructional Aids

- Chart 3A : Submarine relief
- Chart 3B : Forms of precipitation

Content Sequence

i) Realms of water.
ii) Ocean floor.
iii) Continental slope.
iv) Water in the air.
v) Condensation.
vi) Precipitation.
vii) Forms of Precipitation

Instructional Programme

Teacher announces the topic saying, “Today, we will learn about Realms of Water” in which we will study about sub-marine relief, humidity and forms of precipitation.

Content Sequence – 1

Teacher says, “First of all we will learn about Oceans and its various characteristics.”

Students note down the topic.

To begin with the teacher explains about the salinity of ocean water and about how this salinity of ocean water is very important for us?

Students note it down in their notebooks.

Content Sequence – 2

Teacher puts forward the next objective before the students saying, “Now, we will study about Ocean floor or Features below the Ocean.”

Students note down the topic.

Teacher draws the diagram on the chalkboard and explain all features one by one.

Students draw diagram in their notebooks.

Teacher asks students that, “Can you see an Ocean?”

Students respond.
Teacher asks “Is ocean floor is a levelled surface.”
Students respond and teacher confirms their responses.
Teacher explains about continental shelf and asks the students, “From which part of ocean we get maximum fishes and petroleum reserves.”
Students responds.
Teacher further explains about another sub–marine features like continental slope, Trench, Ridge, Islands, Abyssal plain etc.
Students note it down in their notebooks.
Teacher asks students, “Which sub–marine relief features are the result of tectonic forces?”
Students respond and teacher confirm their responses.
Students note it down. Feedback is provided whenever needed.

Content Sequence – 3

Teacher puts forward the next objective before the students saying, “Now, we will study about Presence of Water in the Air”.
Students note down the topic.
Teacher asks students, “Is Water is present in the air?”
Students thinks and then respond.
Teacher further asks, “With which process water is added to the atmosphere?”
Students respond and teacher clearly explains about Evaporation by activity method or by drawing diagram.
Students note it down in their notebooks.
Teacher says, “There is an upper limit beyond which water vapour cannot be added to the atmosphere and this upper limit is called the state of saturation”. Teacher explains this concept with the help of activity method.
Students note down.
Teacher asks the students, “Which type of air holds more water vapour?”
Students critically thinks and then respond.
Teacher further explains about Humidity and its various types. Students note it down in their copies. Feedback is provided.

Content Sequence–4

Teacher announces, “Next we will learn about Condensation and Precipitation”.
Students note down the topic.
Teacher begins by saying, “Condensation is the conversion of water vapour into droplets of water of crystals of ice.

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Teacher asks, “How clouds are formed?
Students thinks and respond.
Teacher further says, “Clouds can be classified on the basis of their height.”
Students note it down.
Teacher further explains, “Precipitation is the process by which condensed water from the clouds falls through the atmosphere and reaches the earth’s surface.”
Students note it down the definition.
Teacher asks, “Name most common form of precipitation”.
Students respond
Teacher further explains about other forms of precipitation i.e. drizzle, Sleet, hail etc. in detail.
Students note it down in their notebook.

Unit Criterion Tests
1) What factors are responsible for reducing extremes of temperature

2) Define the term “Salinity of Water”.

3) Why there is more salinity in Tropical Regions.

4) Which property of ocean provides ideal condition for different life forms

5) Draw a diagram showing various features of ‘Sub-marine Relief’.

6) Differentiate between Absolute Humidity and Relative Humidity.

<table>
<thead>
<tr>
<th>Absolute Humidity</th>
<th>Relative Humidity</th>
</tr>
</thead>
</table>

7) What is “State of Saturation”

8) Define the term “Precipitation”.
9) Write various forms of precipitation.
   a. _______________
   b. _______________
   c. _______________
   d. _______________
   e. _______________

Remedial Instructions / Feedback Correctives Used
   Doubts of the students will be cleared by the teacher by using charts. Second attempt will be made by class monitors.

INSTRUCTIONAL UNIT IV
Topic: Realms of Water – II

Instructional Objectives
   After the instructions are over students have studied the enrichment and/or remedial material, they in their own words will be able to:
   4.1. Explain water table with the help of diagram.
   4.2. Distinguish between Permeable rocks and Impermeable rocks.
   4.3. Give brief account of "hydrological cycle" by writing.
   4.4. Describe the role of water in the biosphere.
   4.5. Discuss the importance of underground water and its occurrence.
   4.6. Explain with the help of diagram how springs formed.

Prerequisite Knowledge of Students
   It is required that students should fulfil the condition of unit–criterion test of Lesson No.–3.

Instructional Aids
   • Chart 4A : Formation of Springs
   • Chart 4B : Water Balance
   • Chart 4C : Water Cycle

Content Sequence
   i) Water on Land.
   ii) Underground Water.
   iii) Water in the Biosphere.
   iv) Hydrological Cycle.
   v) Global Water Balance.
Instructional Programme

Teacher announces the topic saying, “Today, we will learn about Realms of Water” under this we will study about water on land, underground water, water in the Biosphere, Hydrological Cycle and Global Water Balance.

Content Sequence – 1

Teacher says, “First of all we will learn about the Water on Land.”

Students note down the topic.

To begin with the teacher says, “Precipitation results in water falling on the land surface as well as in oceans. Water falling on the land runs down the slope of the land in the form of streams and rivers. Water may get stored on the land in the form of ice sheets.”

Students. Listen very carefully.

Teacher asks, “What factors are responsible for the quantity of surface water in a region?”

Students tries to give responses.

Teacher explains the correct response and students note it down.

Content Sequence – 2

Teacher announces, “Let us now learn about the underground water.”

Students note down the topic.

Teacher explains, “A part of rainfall which falls down on the land surface seeps below the surface through soil, layers or spaces in the rocks. This water is called underground water.”

Students note it down.

Teacher asks, “What are two types of rocks in terms of seepage of water?”

Students respond.

Teacher explains about zone of saturation and water table by doing activity in the class with the help of a glass full of water.

Students very keenly observe whole process.

Teacher further asks students, “Is Underground water is subject to Evaporation?”

Students critically thinks and then responds.

Teacher asks, “In which form underground water may reappear on the surface of earth?”

Students respond. Teacher announces. In the form of Springs we get underground water on the surface. These springs may be hot or cold spring. Teacher will show a chart showing formation of springs and explain how springs form.
Students note it down and give few examples. Feedback is provided whenever needed.

**Content Sequence – 3**

Teacher puts forward the next objective before the students saying, “Now, we will study about Water in the Biosphere”.

Students note down the topic.

Teacher explains, “Water plays an important role in sustaining various forms of life on the earth. Plants absorb nutrients from soil moisture and ground water. Excess water gets added to the atmosphere in the form of water vapour which escapes through the pore spaces in the leaves. This release of water vapour from the leaves known as transpiration.

Teacher asks students, “Which forest regions have this process in large amount?”

Students respond and teacher accepts their responses.

Teacher further explains that animals also need water for their sustenance and growth.

Teacher encourages students to think and give response of how water is important constituent for animals and human beings?

Students give various reasons and teacher accept their responses.

**Content Sequence – 4**

Teacher announces, “Let us now learn about Hydrological Cycle”.

Students note down the topic.

Teacher explain water cycle with the help of chart showing diagram of hydrological cycle.”

Students also draw the diagram and take keen interest in the topic.”

Teacher further says that the total quantity of water available in hydrosphere, atmosphere and Lithosphere remains constant though the quantity available in each one of these realms may vary from place to place and according to seasons. This is known as Global Water balance and put forth the next objective.

Students note it down the next topic in the notebook.

Teacher again take help of a chart to explain water balance.

Students also draw that diagram on their notebooks.

Teacher further explains that oceans contain 97% of all water available on the earth. Fresh water forms the remaining 3% out of this 3% ice sheets and glaciers store 3/4th of all fresh water available. Lakes and rivers may carry only very small quantities as compared to ground water storage.

Students note it down, the quantity in their notebooks.
Teacher again says that there is excess of evaporation over precipitation in the ocean. This is compensated by run-off from the land. Any change in the pattern of circulation of water causes changes in the quantity of water available on the land, in the soil layer and as underground water. Though abundant water may be available in the oceans and in the atmosphere the quantity available for use by man is determined by precipitation. On the land, and water stored on the land and below it.

Students listen carefully and note important points in the notebooks.

Unit Criterion Tests

1) Of the total water available on the surface of the land, how much water is in the form of ice-sheets?

2) The quantity of surface water in a region depends on:
   a) __________________
   b) __________________

3) Define “Underground Water”.

4) Explain Permeable and Impermeable rocks.

5) Draw diagram of water table.

6) Write definition of “Zone of Saturation”.

7) How springs are formed?

8) Define the term “Transpiration”.

9) Name physical processes involved in the hydrological cycle:
   a) __________________
   b) __________________
   c) __________________

10) Name the region where there is excess of evaporation on this earth over precipitation:

(xliv)
Remedial Instructions / Feedback Correctives Used

Students are allowed to move to next lesson after mastering the content of the present lesson. Class monitors will help other students to master the content. Then afterwards if needed then teacher will explain the material by using charts etc.

INSTRUCTIONAL UNIT V

Topic : The Air Around Us – I

Instructional Objectives

After the instructions are over students have studied the enrichment and/or remedial material, they in their own words will be able to:

5.1 Define electro–magnetic radiation.
5.2 Distinguish between insolation and terrestrial radiation.
5.3 Explain role of ozone layer in the atmosphere.
5.4 Explain greenhouse effect.
5.5 Examine the effect of altitude on temperature.
5.6 Locate Tropic of Cancer, Tropic of Capricorn, Artic Circle and Antarctic Circle on the map.

Prerequisite Knowledge of Students

It is required that students should fulfil the condition of unit–criterion test of Lesson No.—4.

Instructional Aids

• Chart 5A : Insolation heat balance
• Chart 5B : Temperature Zones

Content Sequence

i) The air around us
ii) Insolation heat balance
iii) Latitudinal Zones

Instructional Programme

Teacher announces the topic saying, “Today, we will learn about The Air Around Us” under this, we will study about Insolation heat balance, glasshouse, Latitudinal Zones, Temperate Zones, etc.

Content Sequence – 1

Teacher says, The atmosphere is the most dynamic out of all the physical elements. The sun emits a form of energy known as electro–magnetic radiation.
Students listens and note it down in the notebook.

Teacher asks, “Is the amount of energy radiated by the sun varies in the atmosphere?”

Students critically thinks and give response.

Teacher said or confirm their response and said, “The amount of energy radiated by the sun has remained almost constant.”

Teacher further asks, “What do you mean by insolation.”

Students responds.

Teacher says, “Insolation refers to incoming solar radiation. It is in the form of short waves. The sun radiates nearly half of its energy at wavelengths of visible light. As the insolation enters the atmosphere, a part of it is reflected, another part is absorbed and the remaining reaches the earth’s surface. About 35% of insolation is lost by reflection.

Teacher again asks the students “Why Ozone layer is very important for us?”

Students critically thinks about the answer then give responses.

Teacher confirm the response and tries to reduce their stress and said Ozone present in the upper layers of the atmosphere absorbs ultraviolet radiation and protects the earth’s surface from its harmful effects.

Teacher further asks, “Is there any gain or loss of insolation?”

Students critically thinks and decide immediately and respond.

Teacher explains with the help of diagram of the 100 units of insolation entering the atmosphere 35 units are reflected, 17 units are radiated by the earth’s surface and 48 units are radiated by the atmosphere. Thus there is no loss no gain.”

Teacher asks, “How our atmosphere works as a glasshouse?”

Students responds.

Teacher explains “Glasshouse is warmer from inside than outside because glass permits radiation to get in but does not allow radiation to escape out immediately. The atmosphere surrounding the earth also acts like a greenhouse by permitting insolation to pass through and absorbing terrestrial radiation. This known as greenhouse effect of the atmosphere. The atmosphere acts like a blanket keeping the earth warm.

Feedback is given whenever needed.

Content Sequence – 2

Teacher announces, “Let us now learn about Latitudinal Zones”.

Students note down the topic.

Teacher explain the location of tropical zone, temperate zone and polar zones with the help of map of world.
Students also draw these zones on the world map.

Teacher asked what type of sun rays exists near the tropical zone?

Students respond and teacher confirms their responses.

Teacher further says, “As the axis of the earth is inclined at 23½ from the vertical all places at which the sun’s rays are vertical on any day lie between the Tropic of Cancer (23½°N) and the Tropic of Capricorn (23½°S). This is called the Tropical zone. In this zone the sun’s rays are vertically overhead during a part of the year. This zone receives maximum insolation.

Students note it down in the notebook.

Teacher now explains about the temperate zones that this zone includes all the regions between the Tropic of Cancer and Artic Circle (23½°N to 66½°N) and the Tropic of Capricorn and the Antarctic Circle (23½°S to 66½°S). In these zones, the sun’s rays are never vertical during the year.

Students note down.

Teacher further explains with the help of globe that Polar zones are the zones surrounding the Poles and extending upto the Artic circle in the Northern Hemisphere and up to the Antarctic circle in the Southern Hemisphere. In these zones, while the sun’s rays are not received during the long winter, the duration of sunlight may be more than 20 hours during summer. As the longer duration of sunlight does not compensate for the low angle of incidence, temperature is quite low even in Summer.

Students note down the topic.

**Unit Criterion Tests**

1) Explain the term “Insolation.”

2) Which gas protect us from ultra-violet radiation of sun?

3) Define the term “Terrestrial Radiation.”

4) Explain why Glasshouse is warmer from inside than outside?

5) Give meaning of “Greenhouse Effect”


7) Which zone receives maximum insolation
Appendices
8) Locate Tropical Zone, Temperate Zone and Polar Zone on the map (A map will be provided).

9) Which areas have very less amount of temperature.

Remedial Instructions / Feedback Correctives Used
First mode of correction will be the teacher herself and second will be class monitors.

INSTRUCTIONAL UNIT VI
Topic: The Air Around Us – II
Instructional Objectives
After the instructions are over students have studied the enrichment and/or remedial material, they in their own words will be able to:
6.1 Discuss the heat balance indicating latitudinal variations.
6.2 What causes changes in the angle of incidence of the sun’s rays during different seasons.
6.3 Distinguish between diurnal range and annual range of temperature.
6.4 Explain diurnal and seasonal cycle of temperature.

Prerequisite Knowledge of Students
It is required that students should fulfil the condition of unit–criterion test of Lesson No.—5.

Instructional Aids
- Chart 6A : Incidence of the Sun’s rays.
- Chart 6B : Vertical and inclined Sun rays.

Content Sequence
i) Latitudinal heat balance
ii) Diurnal and seasonal cycles.

Instructional Programme
Teacher announces the topic saying, “Today, we will learn about Latitudinal Heat Balance.”

Content Sequence – 1
Teacher says, “There is no net gain or loss of energy though transfer of energy takes place between the earth and the atmosphere. Today we will study about latitudinal heat balance.

(xlviii)
Students not down the topic and listens carefully.
Teacher with the help of diagram explains about incidence of the sun’s rays and said the spherical shape of the earth introduces changes in the horizontal distribution of insolation between latitudinal zones.
Students listens attentively.
Teacher further explains that the differential heating of the earth and its atmosphere is responsible for circulation in the atmosphere and oceans such a circulation of air and water maintains heat balance.
Students note down.
Teacher asks students to name various factors important in heating and cooling of the atmosphere.
Students tries to respond teacher help them to give correct response and explain all these factors one by one. Like nature of earth’s surface, Summer and Winter seasons and prevailing winds etc.
Students note it down in their notebooks.
Teacher gives corrective feedback whenever needed.

Content Sequence – 2

Teacher says, “The temperature of the atmosphere at any place at a given time depends on the balance between the incoming and outgoing radiation. Now we will study about diurnal and annual range of temperature.
Students listens and note down the topic.
Teacher asks students at what time in a day we record maximum temperature?
Students responds.
Teacher further explains although sun rays are vertical at 12.00 noon but temperature shows a gradual increase from sunrise to about 3.00 pm, when the maximum temperature is recorded. This is the period when incoming radiation is more than the outgoing radiation.
Students listens carefully.
Teacher further explains that temperature decreases in the evening and night and reaches a minimum before sunrise.
Teacher then concludes by saying that the difference in temperature between maximum in a day and minimum during the night is known as diurnal range of temperature and it is greater at places in the interior of continent than those along the coasts.
Students listens and note down in the notebook.
Teacher asks students, “What are the factors responsible for the seasonal differences in temperature?
Students responds and teacher confirm their response and says, “Angle of
incidence of the sun’s rays and duration of sunlight are those two factors responsible for seasonal differences in temperature.

Teacher further says that the variation between summer and winter is known as annual range of temperature and it is greater in the interior of continents in middle latitudes.

Students listens and note it down the facts in the notebooks.

Teacher also gives corrective feedback whenever necessary.

**Unit Criterion Tests**

1. What introduces changes in the horizontal distribution of insolation between latitudinal zones?

2. Transfer of heat energy takes place by ________________

3. Atmosphere gets heated from _____________ radiation.

4. Which factor plays an important role in the heating and cooling of the atmosphere?

5. Earth surface is a _____ conductor of heat but _____ radiator of heat.

6. In Summer, Land masses are _______ than the oceans and ________ than the oceans in winter.

7. Explain how warm or cold ocean currents affect the temperature of adjoining regions?

8. At which rate temperature decreases with height.

9. Distinguish between Diurnal and Annual range of temperature.

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<thead>
<tr>
<th>Diurnal range of temperature</th>
<th>Annual range of temperature</th>
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10. Explain how seasonal difference in temperature occurs?

11. Write about daily range of temperature in interior of continents and along the coast.
Remedial Instructions / Feedback Correctives Used

Class monitors will help those students who have not mastered the material of the present unit. Afterwards, unit criterion test will be administered. This time, the left students will be taught through visual aids by the teacher.

INSTRUCTIONAL UNIT VII

Topic : The Air Around Us – III

Instructional Objectives

After the instructions are over students have studied the enrichment and/or remedial material, they in their own words will be able to :

7.1 Name the major pressure belts.
7.2 Distinguish between Cyclones and anti-cyclones.
7.3 Explain how the distribution of precipitation is related to the direction of winds.
7.4 Explain Land and Sea breeze.
7.5 Explain Cyclonic Rainfall with diagram and Orographical and Convectional Rainfall.

Prerequisite Knowledge of Students

It is required that students should fulfil the condition of unit–criterion test of Lesson No.—6.

Instructional Aids

• Chart 7A : Major pressure and wind belts.
• Chart 7B : Types of rainfall.

Content Sequence

i) Pressure and Winds.
ii) Distribution of Precipitation.

Instructional Programme

Teacher announces the topic saying, Today, we will learn about Pressure and Winds in which we study about pressure and wind belts, distribution of precipitation.

Content Sequence – 1

Teacher says, “First of all we will learn about pressure and winds”.

Students note down the topic. To begin with the teacher explains about atmospheric pressure and various pressure belts i.e. equatorial low pressure belt, sub-tropical, high, sub-polar low and polar high pressure belts.

Students note down in the note book and fill on the map.
Teacher asks what is the direction or flow of water?
Students responds.
Teacher says similarly winds also blow from high pressure belts to those of low pressure.
Students note down.
Teacher explains major planetary winds one by one i.e. trade winds the westerlies and the Polar easterlies with the help of diagram. Students note down in the notebook.
Teacher further asks the causes of migration of major pressure belts.
Students responded.
Teacher says this migration of pressure belts occurs poleward during summer and equatorward during winter. This also causes migration of planetary winds.
Students noted down.
To develop critical thinking in students teacher asks the students to explain direction of winds in both hemispheres.
Students responds and teacher confirms their responses by saying that in northern hemisphere wind blow in an anti-clockwise direction around a low pressure centre and clockwise around a high pressure centre.
Teacher creates a stressful situation for students by asking cyclones and anti-cyclones and teacher tries to develop stress coping skill by reason out the questions of students that like water flows from high area to low areas similarly when winds blow from outside of high pressure to inward of low pressure is known as cyclones and vice-a-versa is known as anti-cyclones.
Students tries to release themselves from stressful situation and write it down in their note books.
Teacher further explains about Land and Sea breezes with the help of diagram.
Students note it down in the copy.
Proper feedback is given whenever needed.

Content Sequence – 2

Teacher announces “Let us now learn about distribution of precipitation.”
Students note down the topic.
Teacher starts by saying that the distribution of precipitation is related to the direction of winds with reference to the distribution of continents and oceans.
Teacher further explains why onshore winds give large quantities of rainfall in comparison to off-shore winds.
Students note it down in the notebook.
Teacher further explain various areas/regions of high, moderate and low
Appendices

rainfall and shore these regions on the map of world.
Students note down and locate these regions on their maps.

Unit Criterion Tests

1. What causes differences in atmospheric pressure:
   a) _____________________
   b) _____________________

2. Name two hemispheres
   a) _____________________
   b) _____________________

3. Which type of pressure belts existed in
   Equatorial Region ___________________
   Sub–Tropical Region ___________________
   Sub–Polar Region ___________________

4. Major Planetary winds are:
   a) _____________________
   b) _____________________
   c) _____________________

5. Which type of migration exists during summer and winter season in major pressure belts?

6. In Northern Hemisphere wind blow in an anti–clockwise direction around a ___________________ and clockwise around a ___________________.

7. Explain the terms “Cyclones” and “Anti–Cyclones”
   Cyclones _________________________________
   Anti–Cyclones _________________________________

8. Distinguish between ‘Land Breeze’ and ‘Sea Breeze’.

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<tr>
<th>Diurnal range of temperature</th>
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9. What causes precipitation?

10. Name Regions of high rainfall and also locate these areas on map.
    a) _____________________

     (liii)
11. Which regions have very less rainfall? Locate these areas on map.

Remedial Instructions / Feedback Correctives Used
First mode of correction will be explanation by teacher with charts and secondly, class monitors.

INSTRUCTIONAL UNIT VIII
Topic: The Air Around Us – IV

Instructional Objectives
After the instructions are over students have studied the enrichment and/or remedial material, they in their own words will be able to:

8.1 Describe the distribution of rainfall on the earth
8.2 Distinguish between Weather and Climate
8.3 Give an account of the factors affecting climate.
8.4 Enlist various elements of Weather and Climate.
8.5 Write how climate of a region affects man directly or indirectly?

Prerequisite Knowledge of Students
It is required that students should fulfil the condition of unit–criterion test of Lesson No.—7.

Instructional Aids
- Chart 8A: Factors affecting climate.

Content Sequence
ii) Seasonal distribution of rainfall.
iii) Weather and Climate.
iv) Elements of Weather and Climate.
v) Factors affecting climate.
vii) Relief Features.
viii) Climate and Humans

Instructional Programme
Teacher announces the topic saying, Today, we will learn about seasonal distribution of rainfall, weather and climate, factors affecting climate.”
Appendices

Content Sequence – 1

Teacher says, “There is difference in distribution of rainfall according to season also. In the equatorial region convectional rainfall occurs throughout the year. But most parts of the World rainfall is mostly limited to the summer season only accept the Mediterranean region because this region gets rainfall from cyclones and depressions in the westerly wind belt in winter as the area is located in the western margins of continents.

Students listen all the information attentively and note down in the note book.

Teacher further says that apart from seasonal variations there are also annual variations in distribution of rainfall. Teacher asks the students about reason of this variation in distribution of rainfall. Students responds.

Teacher confirm their response by saying that these variations are due to changes in the pattern of circulation in the atmosphere which cause changes in the direction and intensity of surface winds over land masses. Students note it down. Appropriate feedback also be provided by teacher.

Content Sequence – 2

Teacher announces, “Let us now learn about weather and climate.

Students note down the topic.

Teacher says, “Weather is a composite picture of various elements at a particular time at a place whereas climate refers to the general features based on average values of several elements of weather.

Students note down these definitions in their note book.

While explaining about various elements of weather and climate teacher explains that the atmospheric condition at any place is a combination of several elements like temperature, pressure, winds, humidity, precipitation, sunshine and cloudiness etc. and be measured by using a variety of instruments at the meterological observatory.

With the help of these observations weather maps are prepared which also help in forecasting weather conditions.

Students note it down in the notebook.

Content Sequence – 3

Teacher says, “Now we will learn about various factors affecting climate.”

Students note down the topic.

Teacher take all the factors one by one and use world map to explain factors and to show examples.

Teacher take first factor i.e. Latitude of a place and explain it by saying that the amount of insolation is maximum at the equator and decreases to a minimum at the poles. The moisture content of the atmosphere decreases from the equator towards the poles. The distribution of precipitation also shows a general decline
from the equator to the poles.

Students note down in the notebook.

Teacher further says that next factor is Land and Sea contrasts. When winds blow from land to sea there is less rainfall and when winds blow from sea to land, air has moisture and it results in rainfall.

Teacher says Relief features also an important factor. On the windward side of mountain ranges there is considerable rainfall white on the leeward side there is no rainfall and thus it is known as the rain shadow region.

Students listen and note down.

Teacher explains another factor affecting climate by saying that Ocean currents also plays important role in affecting the climate of that particular area.

Teacher concludes by saying, “Climate of a region affects man directly and indirectly e.g. like according to temperature man wears the appropriate clothes, accordingly he built his houses etc. The natural vegetation and the crops grown also related to the climate.

Students listen carefully and note down main points.

Teacher also gives feedback corrective wherever necessary.

Unit Criterion Tests

1. In which regions convectional rainfall occurs throughout the year.
   a) ____________________
   b) ____________________

2. Which region gets rainfall only in winter season?

3. Distinguish the terms ‘Weather’ and ‘Climate’

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<tr>
<th>Weather</th>
<th>Climate</th>
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4. Name elements of weather and climate.
   a) ____________________
   b) ____________________
   c) ____________________
   d) ____________________
   e) ____________________
5. Which type of map helps in understanding weather conditions over a large area and helps in forecasting weather conditions?

6. Write some factors on which climate of a place depends on:
   a) __________________
   b) __________________
   c) __________________
   d) __________________

7. Which weather elements decreases from the equator towards the poles.
   a) __________________
   b) __________________
   c) .................. .............

8. On which side of mountain there is large amount of rainfall occurs?

9. Which side of mountain gets no rainfall?

Remedial Instructions / Feedback Correctives Used

Class monitors will help those students who have not mastered the content. Again unit criterion test will be administered to check the weakness of the students. Second mode of correction will be explanation through charts.

INSTRUCTIONAL UNIT IX

Topic : The Biosphere – I

Instructional Objectives

After the instructions are over students have studied the enrichment and/or remedial material, they in their own words will be able to:

9.1 Describe the distribution of biosphere.
9.2 Define ecosystem
9.3 Write the significance of photosynthesis.
9.4 Describe ecological efficiency.
9.5 Distinguish between Producers and Consumers.
9.6 Distinguish between Food Chain and Food Web.
9.7 Explain components of ecosystem.
9.8 Discuss the movement of energy and mineral matter in an ecosystem with diagram.
Appendices

9.9 Explain producers and consumers with examples.

Prerequisite Knowledge of Students

It is required that students should fulfil the condition of unit–criterion test of Lesson No.–8.

Instructional Aids

• Chart 9A : Cycle of Energy and nutrients flow in ecosystem.

Content Sequence

i) Ecosystem.

ii) Components of Ecosystem.

iii) Energy and mineral movement.

Instructional Programme

Teacher announces the topic saying, “Today, we will learn about Biosphere”.

Content Sequence – 1

Teacher says, First of all we will learn about Ecosystem and its components.

Students note down the topic.

To begin with teacher says Earth is unique in having a biosphere. Plants, animals and other organisms together with the physical environment with which they interact constitute the ecological system or ecosystem.

Students listen carefully.

Teacher asks what do you mean by Ecology?

Students responds and teacher explain them that Ecology is the science which deals with interrelationship between the various organisms living in an area and also their relationship with the physical environment.

Students listen carefully.

Teacher further says lets study about various components of Ecosystem.

Students note down the sub–topic.

Teacher starts by saying that an ecosystem consists of both living and non–living components. Teacher asks the students to name some living and non–living components. Students critically thinks and try to decide the correct ones and responds. To release the stress of the students teacher confirms and corrects their responses and says – The non–living components of the ecosystem consist of chemical substances found in the soil, water and atmosphere. Few non–living elements of the climate are temperature, rainfall duration of sunlight, winds, nature of soil, slope of the land, composition of water bodies etc. and living components are further divided into two groups i.e. the producers and the consumers.

Appendices
Teacher asks what do you mean by Producers and Consumers?

Students responds

Teacher says, The producers are organisms which produce their own food from the physical environment, whereas consumers are organisms which depend on other organisms for their food.

Teacher further explains that consumers are further sub-divided into four categories i.e. herbivore, carnivore, omnivore and decomposers.

Teacher asks students to differentiate these four sub-types.

Students responds.

Teacher give appropriate feedback to the students.

Content Sequence – 2

Teacher announces, “Let us now learn about food chain and food web”.

Students note down the topic.

Teacher further explains that all organism including humans need food which provides energy for growth, maintenance and reproduction.

Students listen very attentively.

Teacher explains with example that in a grassland, grass is eaten by rabbits and rabbits are eaten by foxes. This is a simple food chain. When this food chain becomes more complex such complicated network of food chain is called a food web.

Students note down in the notebook but they become stressed and to release or reduce their this state of stress teacher explains that each group of organism occupies a trophic level. In this trophic level all green plants and producers occupy first level and all herbivores occupy second level, carnivores at the third level. The trophic levels may be represented in the form of a pyramid called ecological pyramid.

Students note down.

Teacher explains about ecological efficiency by saying that the percentage of energy transferred from one trophic level to another is called ecological efficiency. When ecological efficiency is low, the capacity of ecosystem to support organisms at the higher trophic level is limited.

Students listen attentively and note down the main points.

Teacher further with the help of diagram showing cycle of energy and nutrients flow in ecosystem explains that the sun provides radiant energy for the producers to manufacture food. The energy is transferred from producers to herbivores and then to the carnivores and decomposers. The ecological system maintains its stability by continuous input of energy from the sun and the cyclic movement of nutrients through the system. Decomposers play an important role in maintaining the supply of mineral nutrients. 

(lix)
Appendices

Students note down in the note book.
Teacher also provide corrective feedback wherever necessary.

Unit Criterion Tests

1. Define the term ‘Biosphere

2. Explain the term ‘Ecosystem’.

3. Write two components of Ecosystem.
   a) ___________________
   b) _________________

4. What brings variations in the types of plants and animals found in different land masses ?

5. The non–living components of the ecosystem consists of :
   a) ___________________
   b) _________________

6. The biotic components are broadly divided into :–
   a) ___________________
   b) _________________

7. Explain the terms “Producers” and “Consumers”

8. Name the thing present in the leaves of plants which make photosynthesis possible.

9. Name the primary producers present in the ocean. __________

10. Distinguish between the terms ‘Herbivores’, ‘Carnivores’ and ‘Omnivores’.

11. Define “Food Chain”.

12. Complicated network of food chain called__________________

13. Explain the term “Decomposers”.

14. Distinguish the terms “Tropic Level”, “Ecological Pyramid” and “Ecological Efficiency”.

Remedial Instructions / Feedback Correctives Used

The explanation by teacher herself through visual aids and examples will be first mode of correction and class monitors will be second mode of correction.
INSTRUCTIONAL UNIT X

Topic : The Biosphere – II

Instructional Objectives

After the instructions are over students have studied the enrichment and/or remedial material, they in their own words will be able to:

10.1 Explain major ecosystems of the earth.
10.2 Give an account of ecosystem in estuaries.
10.3 Give an account of the factors which influence the terrestrial ecosystem.
10.4 Distinguish between Evergreen and Deciduous forests.
10.5 Explain with example about grasslands and desert vegetation.

Prerequisite Knowledge of Students

It is required that students should fulfil the condition of unit–criterion test of Lesson No.—9.

Instructional Aids

• Chart 10A : Major Ecosystems of the Earth.

Content Sequence

i) Major ecosystems of the earth
ii) Types of forests.

Instructional Programme

Teacher announces the topic saying, Today, we will learn about major ecosystems of the earth.

Content Sequence – 1

Teacher says that the ecosystems may be divided into two major types i.e. Aquatic and terrestrial ecosystem and first of all we will learn about Aquatic ecosystem.

Students note down the topic.

Teacher further says that “Aquatic ecosystems may be divided into three categories i.e. Fresh water ecosystem, Estuarine ecosystem and Marine ecosystem.

Students note it down.

Teacher starts explaining all categories of aquatic ecosystems one by one by giving various examples.

Students listens carefully and note down the main points in the note book.

Teacher gives appropriate feedback whenever needed.
Content Sequence – 2

Teacher announces that, Now we will study about terrestrial ecosystems.
Teacher starts by saying that plants occur in distinct groups of communities in areas having similar climatic conditions. These are called Biomes.
Students note it down.
Teacher asks students to name some climatic conditions necessary for plant growth.
Students responds.
Teacher confirm their responses and says Plants can be classified on the basis of their water requirements like

- Xerophytes – survive in dry region
- Hydrophytes – tolerate excessive moisture
- Mesophytes – need moderate moisture
- Tropophyte – adjust themselves to seasonal variations.

Students note it down.
Teacher then explain about various types of forests i.e. Tropical Evergreen, Mediterranean coniferous, Deciduous Forests, Grasslands, Desert Vegetation and Tundra type of vegetation with the help of examples. Students listen carefully and try to gain knowledge about these types of vegetation side by side. Teacher asks various questions to develop critical thinking, decision making type of skills among the students.

Unit Criterion Tests

1. Write major types of Ecosystem
   a) ____________________
   b) ____________________

2. Aquatic ecosystems can be further divided into :
   a) ____________________
   b) ____________________
   c) ____________________

3. Define the term ‘Biomes’.

4. Explain the terms :-
   a) Xerophytes ____________________
   b) Hydrophytes ____________________
   c) Tropophytes ____________________

5. Which type of vegetation occurs in Tundra Region?

______________________________________
6. Define ‘Grassland’.

7. Write characteristics of Desert type of Vegetation.

8. Define ‘Deciduous Forest’ and ‘Evergreen Forest’.

**Remedial Instructions / Feedback Correctives Used**

Teacher explains the concepts again and encourage pupil participation to clear the content. Secondly, examples and map will be used as feedback corrective.

**INSTRUCTIONAL UNIT XI**

**Topic : Human Impact on Environment**

**Instructional Objectives**

After the instructions are over students have studied the enrichment and/or remedial material, they in their own words will be able to:

11.1 Give examples of how humans have overcome the hazards of natural environment.

11.2 Examine the effect of Industrial Revolution on the Environment.

11.3 Explain the term “Energy Crisis”.

11.4 Describe the impact of humans on the biosphere.

11.5 Explain causes of air pollution.

11.6 Give an account of depletion of resources in recent decades.

11.7 Explain terms – Badland, Gully erosion, Sheet erosion.

11.8 Give examples of water pollution.

11.9 Explain effect of an increase in Carbon dioxide content in the atmosphere.

**Prerequisite Knowledge of Students**

It is required that students should fulfil the condition of unit–criterion test of Lesson No.–10.

**Instructional Aids**

- Chart 11A : Types of Pollution.

**Content Sequence**

i) Human impact on the Environment.

ii) Air Pollution.

iii) Water Pollution.

(lxiii)
iv) Land Degradation.

v) Depletion of Resources.

**Instructional Programme**

Teacher announces the topic saying, Today, we will learn about Human Impact on Environment.

**Content Sequence – 1**

Teacher says, “First of all we will learn about Pollution and its types.

Students note down the topic.

To begin with the teacher explains about impact of human activities on environment and tells students about soil erosion, gully erosion, bandlands, sheet erosion etc. and also explain about ways of reducing these erosions.

Students listens carefully and note down main points.

Teacher asks causes of air pollution to develop critical thinking and decision making skills among students.

Students responds.

**Content Sequence – 2**

Teacher puts forward the next objective before the students saying, “Now we will study about various causes and effects of Air Pollution. Students note down the topic.

Teacher asks students to give some of the causes of air pollution and make a stressful situation for the students. Students thinks critically and decide few genuine causes and responds.

Teacher to reduce their stress give them clues side by side and help them in responding.

Teacher further explains various effects of Air Pollution with the help of students.

Students note down main causes and effects in their note books.

**Content Sequence – 3**

Teacher further says that our next objective is to study about, Water and Land Pollution.

Students note down the topic.

Teacher explains various sources of water pollution by asking questions from students.

Students actively participate in the class and help the teacher in developing the lesson.

Teacher further explains various causes of Land degradation.
Students note down.

Teacher further says that human activities also have impact on our biosphere. Various our activities, increasing population is responsible for extinction of various species of birds, animals, pollution, ecological imbalances.

Students listen all these factors and become little bit stressed.

Teacher to overcome the students from stress give various means to control this ecological imbalance which students can follow in their daily lives.

Teacher explains students that if they are aware of these problems they may preach these facts to population and can help in reducing these problems.

Teacher asks students to take appropriate decisions to make the earth habitable for future generations.

Students critically thinks the problems and decide what they have to do for protecting our environment.

Teacher appreciate their decisions and said that if they need any help from her. She is there always to give them proper guidance.

Unit Criterion Tests

1. How growth of population affects our environment

2. Write two harms of deforestation.
   a) _______________________
   b) _______________________

3. Define the term ‘Soil Erosion’.

4. Write various types of Pollution.
   a) _______________________
   b) _______________________
   c) _______________________
   d) _______________________

5. Distinguish between “Sheet Erosion” and “Gully Erosion”.

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<tr>
<th>Sheet Erosion</th>
<th>Gully Erosion</th>
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6. Describe the concept of “Soil Conversion”.

(lxv)
7. Explain human’s impact on biosphere.

8. What do you understand by the term “Land Degradation”.

Remedial Instructions / Feedback Correctives Used

Class monitors will help those students who have not mastered the content. Again unit criterion test will be administered to check the weakness of the students. Second mode of correction will be explanation through charts and pictures by teacher.