Appendix II A
Specification of the Content of the Learners’ Entry Behaviour Pre-Requisite Skills...
APPENDIX - II.A
SPECIFICATION OF THE CONTENT OF THE LEARNERS' ENTRY BEHAVIOUR
PRE-REQUISITE SKILLS:

1. The Continents of the World

A continent is a large landmass having many different countries with different races, speaking different languages.

The five continents of the world are:

- Asia
- North and South America
- Africa
- Australia and New Zealand
- Europe

Continents of the World

North and South America  Australia and New Zealand  Africa  Asia  Europe

1.1 Population of the World

The total population of the world has crossed 5500 million in July 1992. More than 90 percent of the world's total population live in the Northern Hemisphere. The continent of Asia including Russia alone has more than two-thirds of the world's total population. The countries of China, India, Russia, USA, Indonesia, Brazil, Nigeria, Bangladesh and Pakistan are top ten nations in order of merit having more than 100 million people.

India alone has got 844,302,688 people according to 1991 population census. The state of Uttar Pradesh is the most populous state in India with 139, 112,287 people.

2. The Indian Sub-Continent

The relief map of Asia brings home the distinctive identity of the Indian sub-continent from the rest of Asia. India is a country with in the continent of Asia and Asia is the biggest continent in the world.

3. Countries that Form the Indian Sub-Continent

The countries that form the Indian sub-continent today are:

- Pakistan in the (N.W.)
- India (at the core)
- Nepal in the (N)
- Bhutan (N.E.)
- Bangladesh (E) and
- The Island states of Sri-Lanka and the Maldives which are the southern neighbours of India in the Indian Ocean. India is joined to Sri-Lanka by a bridge called Adam's Bride.

3.1 The States and Union Territories of India

India has got a total of twenty seven states with five Union Territories. Out of these states, Kerala State has the highest literacy rate in the whole country. Delhi is the seat of the Central Government and is the Capital City of India.

Andaman and Nicobar Islands is the Union Territory in India which is engulfed by the Bay of Bengal.
3.2 India and her Neighbours

India is a large country being surrounded by two great seas on both sides. States in India which borders China, are:
- Arunachal Pradesh (A.P.)
- Sikkim
- Uttar Pradesh
- Himachal Pradesh and
- Jammu and Kashmir

3.3 The Coastal States of India which Boarders the Arabian Sea are:
- Kerala
- Karnataka
- Goa
- Maharashtra and
- Gujarat

3.4 The Coastal States of India that Borders the Bay of Bengal are:
- Tamil Nadu
- Andhra Pradesh
- Orissa
- West Bengal
- Assam
- Meghalaya

4. The Himalaya Mountains:

A sea called "Tethys" Sea occupied the area where the Great Himalaya Mountains stands today together with the Northern Plains of India. It was an elongated and shallow sea sandwiched between the two giant landmasses called the Angaraland in the North and the "Gondwanaland" in the south.

For millions of years, denudation of these two landmasses resulted in the deposition of silt into the Tethys Sea. The two giant landmasses were slowly but steadily heading towards each other. This lateral compression force acting from two opposite directions made the sea not only Shrink further but also buckle up forming a chain of Islands to begin with over millions of years into the present day mighty fold mountains of the great Himalayas today. The mighty Himalaya along with its extensions act as an effective climate divide to the Indian sub-continent. Rivers like the Ganga and Brahmaputra originate from the Great Himalayas.

4.1 Physiographic Divisions of India

The collision between the two ancient landmasses Angaraland and Gondwanaland resulted in the formation of a well-integrated Indian sub-continent consisting of three physiographic divisions.
- The Great Mountain wall of the North.
- The Northern Plains and
- The Great Peninsular Plateau.

4.2 Mountains of the Himalayas

Mountains of the Great Himalayas are Mt. Everest, the Pamir Knot, sometimes known as the roof of the world. From this Knot runs several mountains like the Kunlun, which moves eastwards into Tibet, the Kara Koram which enters into Kashmir including the plateau of Aksal Chin, the Hindu Kush and Ladakh and Zaska ranges.
5 Factors that Govern Climatic Conditions of India

The factors and phenomena that govern the climatic conditions of India go beyond the following:
- Relief
- Surface winds
- Air circulation
- Situation, position and size and
- Land Configuration

5.1 Climate

The climate of India is quite diverse. While in summer, the mercury occasionally touches 55°C in the western deserts and drops down to as low as -45°C in winter around Leh. It is true that the determinants of India's climate go beyond man made political boundaries. The Monsoon winds provide a very strong climate in India leading to almost all-climatic unity to the whole country. In India, cold weather seasons are experienced during the months of December, January and February while hot weather comes in the months of May, June and July.

6. Rivers of India: (The Ganga and Narmada Rivers)

Differences between Ganga and Narmada Rivers

<table>
<thead>
<tr>
<th>Ganga River</th>
<th>Narmada River</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is deltaic</td>
<td>1. Is an estuary</td>
</tr>
<tr>
<td>2. Has many mouths as it enters the seashore.</td>
<td>2. Has only one inlet at the entrance in the sea</td>
</tr>
<tr>
<td>4. Long and meandering.</td>
<td>4. Short, deep, and steep.</td>
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<tr>
<td>5. Have many tributaries.</td>
<td>5. Have no tributaries.</td>
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<tr>
<td>6. Source comes from the Great Himalaya</td>
<td>6. Source comes from the Peninsular Plateau of India.</td>
</tr>
</tbody>
</table>
Appendix II B
Entry Behaviour
Test Items...
APPENDIX – II
ENTRY BEHAVIOUR TEST

Student’s Name: ..............................................................
Grade: IXth Time: 1 Hr. Date: ..................... School ....................
Roll No:..............................................................

Important Instructions to Students:

Kindly read the instructions carefully and write your answers on the spaces provided. Do not make guesswork at all. You have one hour to do and complete this test. You are advised not to spend too much time in one question or on questions, which you might find a bit difficult.

There are thirty questions in all. Some are divided into sub-questions which require more than one answer type. In front of each question is the mark(s) award shown. You will be tested frequently in future. You are requested to keep a good clean record of all the test(s) done in future as well as this one. Each future test will be based on the unit(s) just completed which in turn will be linked to the in coming unit.

Please, fill in the blank spaces provided by writing the right answer to the questions that follow. Some questions involve deep critical thinking i.e. (analysing, discriminating, and proper reasoning)

SECTION A

1. The name of legendary sea sandwiched between Angaraland and Gondwanaland in the area now occupied by the Himalaya ranges was called ................ (1 mark)

2. Name the Union Territory Island in India which is engulfed by the Bay of Bengal ................................................................................................................ (1 mark)

3. Write the major characteristics between a delta and an estuary

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<th>A Delta</th>
<th>An Estuary</th>
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(5 Marks)

4. Differentiate between Ganga and Narmada rivers.

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<th>Ganga</th>
<th>Sr.No.</th>
<th>Narmada</th>
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(5 Marks)

5. Without seeking help from anywhere, name five states in India having common boarders with China. ————, ————, ————, ————, ————. (5 Marks).

6. Without referring to the text, name five coastal towns in India neighbouring the Arabian Sea ————, ————, ————, ————, ————. (5 Marks).
7. By completing the blank spaces provided, name the three months in India which cold weather seasons are being experienced most: ________, ________, ________.

8. India belongs to ____________________________ continent.

9. Write from the blank spaces provided names of five continents of the world as was taught to you: ________, ________, ________, ________, ________.

10. Write the name of the seat of Central Government of Indian Union: ________.

11. The biggest continent of the world is: ________.

12. Adam's Bridge joins India with a country called: ________.

13. Which continent in the world has more than two-thirds of the world's total population? ________.

SECTION B
MULTIPLE CHOICE TYPE

Four options have been given for statement only one is correct. Tickmark the correct answer. Take your time and think carefully before making your choice.

14. Which one of the given statements below best describe the climatic conditions of India:
   a) The climate of India is quite diverse. While in summer, the mercury occasionally touches 55°C in the Western deserts and drops down to as low as -45°C in winter around Leh. It is therefore true to say that the determinants of India's climate go beyond Man made Political boundaries.
   b) The climate of India is not quite diverse because while in summer, the mercury occasionally touches 55°C in the western deserts and drops down to as low as -45°C in winter around Leh. It is therefore not true to suggest that the determinants of India's climate go beyond man made political boundaries.
   c) Many of the factors and phenomena that govern India's climatic conditions like situation, position, size relief, surface winds and air circulation do not actually go beyond its four walls.
   d) In India cold weather seasons are experienced in the months of May, June and July only.

15. By tick marking, select the statements, which best describe the influence of the mighty Himalayas on the climatic conditions of India:
   a) The Himalayas are young Fold Mountains with three distinct mountain ranges running parallel to each other. The northern most range mountain where Mount Everest is situated is the loftiest of them all.
   b) The middle or lesser Himalaya called the Himachal are found to the southern part of the Great Himalayas. All the important towns like Dalhousie, Dharamsala, Shimla, Musourie, Nanital, and Darjeeling belong to this range.
   d) The might Himalayas a long with its extensions acts as an effective climatic divided. Its towering mountain chains provide an invincible shield by protecting the Indian subcontinent from the cold and chilly winds originating from and near the Arctic Circle. Thus, the Great Himalayas is responsible for giving the whole of northern India a Tropical climate with relatively high temperatures almost throughout the year with predominantly dry winds.

16. Which one of the following is the most populous state in India?
   a) Bihar  b) Madhya Pradesh  c) Uttar Pradesh  d) Maharashtra.

17. Which one of the following countries is the most populous in the world?
   a) China, India, USA and Indonesia.
   b) North and South America, Australia and New Zealand.
   c) India, Nigeria, Asia, China.
   d) Indonesia, Australia and New Zealand.
18. Which one of the following mountains given below is not found in the continent of Asia?
   a) Mt. Everest  b) Mt. Kunchun  c) Mt. Hindu Kush  d) Mt. Kilimanjaro  (1 Mark)

19. From the list given below, identify countries in the world which are bigger than India in size.
   a) Africa, Russia, China, and Japan.
   b) Brazil, USA, China, Canada, Russia, and Australia.
   c) North and South America, Australia, and Africa  (1 Mark)

20. Which one of the choices below best depict the physiographic divisions of India?
   a) The Ganga Basin, the Indus Basin, and the Brahmaputra Valley.
   b) The Chotanagpur plateau, the Deccan plateau, and the Coastal plains.
   c) The Great mountain wall of the north, the Northern plains, and the Great peninsular plateau.
   d) The Nilgiri, the Anamalai, and the Candamon hills  (1 Mark)

21. Identify by tick-marking countries that form the Indian sub continent from the list given below.
   a) India, Pakistan, Chandigarh, Haryana, Bhutan and Nepal.
   b) India, Bhutan, Europe, Punjab, China and Afghanistan.
   c) Kerala, Pakistan, Jammu and Kashmir, Himachata Pradesh and Sikkim.
   d) India, Pakistan, Bhutan, Nepal, Bangladesh, The Islands of Sri Lanka and the Maldives  (1 Mark).

22. Identify from the list given below, countries that form India’s neighbours as you were taught.
   a) Bangladesh, Bhutan, Nepal, Pakistan, China, The Island of Sri Lanka and the Maldives and Myammar (Burma).
   b) Afghanistan, Kirghistan, Myammar, China.
   c) Assam, Meghalaya, China, Bhutan, Tamil Nadu.
   d) Bhutan, Afghanistan, Kazakhstan, Nepal, Pakistan, China  (1 Mark)

23. Identify from the choices given below one Mountain which was not formed by Volcanic activities.
   a) Mountain Everest  b) Mount Kilimanjaro  c) Mount Etna  d) Meru in Tanzania  (1 Mark)

24. Without referring to the text, identify from the choices given below, one state in India having the highest literacy rate.
   a) Uttar Pradesh  b) Madhya Pradesh  c) Maharashtra  d) Kerala  (1 Mark)

25. Discriminate from the choices given one statement which best describe the effects of the Monsoon winds on the Climatic conditions of India.
   a) Upon crossing the equator in he Indian Ocean, the dry Monsoon winds are quickly replaced by the Moisture Sea bearing winds. In the Indian sub-continent, the Monsoon wind are greatly influenced by the Great Himalaya ranges which bring the whole of the Indian sub-continent under the Sway of these moisture loaded equatorial winds for a season ranging between two to five months. The Monsoon winds therefore accounts to nearly 75 to 90 percent of the total annual rainfall being experienced from the months of June to September in this region alone.
   b) The shifting of the Monsoon winds across the Equator is known as the Southern Oscillation. The extent of shifting across the equator and the intensity of winds affects the Monsoon, thereby making it unable to drop its load within the Monsoon Asia.
   c) The Climatic conditions of India cannot be described interms of an annual cycle of seasons like the Monsoon winds. This is because four main cycles i.e. cold weather season, hot weather, advancing Monsoon and Retreating Monsoon may be distinguished quite easily.
d) From the description given in a, b, c above, it is not possible to arrive at the correct answer which describe the effects of the Monsoon winds on the climate conditions of India.
(1 Mark)

26. Identify from the choices, the states in India described as the granary of both hematite and magnetite iron ores.
   a) Bihar (Keonjhar) and Orissa (Bonai and Nayurphan) and Madhya Pradesh (Durg and Bastar)
   b) Andhra Pradesh, Kerala and Meghalaya.
   c) Goa, Paradip and Calcutta.
   d) Bihar (Singhbhum), Andhra Pradesh (Nizamabad and Visakhapatnam) and Punjab.
(1 Mark)

27. From the list given below, which one of them best illustrate all the five continents of the world.
   a) Asia, Europe, USA, Australia and Tasmania
   b) Africa, Asia, Europe, North and South America and Australia and New Zealand.
   c) Africa, Asia, Brazil, Russia and Europe
   d) Asia, Europe, Haryana, Maharashtra and Madhya Pradesh.
(1 Mark)

28. Which one of the countries named below do not form part of the Indian sub-continent.
   a) China, Myanmar (Burma) and Afghanistan.
   b) Sri Lanka and Maldives Islands.
   c) Andaman and Nicobar Islands.
   d) Nepal and Bhutan.
(1 Mark)

29. Identify from the choices given below, statements which best describe the meaning of a continent.
   a) It is a small country like Bhutan and Sri Lanka but with different ethnic groups speaking different languages.
   b) It is a single country like India with a wide diversity of culture and people speaking different languages.
   c) It is a large land mass having many different countries with different races, speaking different languages.
   d) It is a small minute land with many different countries crowded together. Its people also speak different languages because they don’t understand one another due to size caused by the crowd.
(1 Mark)

30. What is the name of a place in India which receives the highest amount of rainfall in whole world called.
   a) Khasi Hills, Cherra Punji and Mawsynram in Meghalaya State.
   b) Jodhpur, Jaipur and Punjab.
   c) Rann of Kachchh and Dehra Dun.
(1 Mark)
Appendix II C
Scoring Key for Entry Behaviour Test Items...
APPENDIX – II C

(ANSWER SHEET) FOR ENTRY BEHAVIOUR TEST

♦ Students Name : ______________________
♦ IX Grade : _____________________________
♦ School : _____________________________
♦ Section : ____________________________
♦ Date : _____________________________
♦ Time : _____________________________

SECTION A

Q.No.1_______________________________________

Q.No.2

Q.No.3

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<th>S.No.</th>
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Q.No.4

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<th>S.No.</th>
<th>Ganga</th>
<th>S.No.</th>
<th>Narmada</th>
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Q.No.6

Q.No.7

Q.No.8

Q.No.9

Q.No.10

Q.No.11

Q.No.12

Q.No.13
SECTION B
CIRCLE THE RIGHT LETTER ONLY

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Appendix II D
ML-Instructional Packages

* ML-GEN (Appendix II D)
* ML-ANAL (Appendix II D1)
Appendix II D
Instructional Packages
(ML-GEN Group)
INSTRUCTIONAL PACKAGES
(GENERALIZATION AS ADVANCE ORGANIZER)

INSTRUCTIONAL EVENTS FOR UNIT I (PART I)
Topic: The Biosphere I.
Focus: Common for both types of advance organizers
(Generalization and Analogy)

The primary focus of this unit will be to help students related and integrated Biosphere into their cognitive structure with the help of its defining attributes (Chart. 1.1), and Hierarchies linking an insect's body with Biosphere (Chart. 1.6).

Encourage students define the term biosphere with the help of its defining attributes.

At the end of instructions, students will have studied the enrichment and/or remedial material and will be able to:
♦ Define the term biosphere in their own words.
♦ Complete the incomplete statements regarding the three components of Biosphere.
♦ Name by completing the blank spaces provided, three examples of living organisms found in the lithosphere.
♦ Write from the incomplete statements, two examples of living organisms found in the atmosphere.
♦ Complete the sentence by naming at least three living organisms found in the hydrosphere.
♦ Choose correctly out of the four choices, the one which gives the best defining attributes of Biosphere.
♦ Draw correctly a hierarchical outline of Biosphere.

PRE-REQUISITE KNOWLEDGE OF THE LEARNERS:
Note: It is required that students fulfill the conditions of the entry behaviour test items before proceeding on to Unit 1.

Instructional Aids:
♦ Chart 1.0: Hierarchical outline showing expanded and elaborated Hierarchy of Biosphere.
♦ Chart 1.1: Defining attributes of Biosphere.
Teacher presents seven objectives of unit I and proceeds to present advance organizer.

**Chart 1.2**: Examples of components that form Biosphere.

**Chart 1.3**: Examples of living organisms found in the components.

**Chart 1.4**: Extended and elaborated hierarchy linking an insect's body with biosphere.

**Chart 1.5**: Definition of Biosphere.

**Chart 1.6**: Hierarchical outline showing Biosphere, its components, examples and similarities and differences between an insect and biosphere.

**Chart 1.7**: Extended and elaborated hierarchy linking an insect's body with biosphere.

**Chart 1.8**: Definition of Biosphere.

**Components of Biosphere**

- Living organisms found in the Lithosphere.
- Living organisms found in the Hydrosphere.
- Living organisms found in the Atmosphere.

**Defining attributes of Biosphere**

- Hierarchical representation of Biosphere.

Detailed instructional events are stated in the syntax of the Advance Organizer Model (Generalization and Analogizing).

**SYNTAX (GENERALIZATION):**

**Phase I: Clarify Objectives of the Lesson:**

Teacher presents seven objectives of unit I and proceeds to present advance organizer.

**Geography is the study of man and his environment to be viewed as a complete picture of a narrow common zone of contact where the earth (Lithosphere), air (Atmosphere) and water (Hydrosphere) meet. The narrow common zone of contact where these three spheres meet is termed as Biosphere.**

---

**Instructional Programme and Sequencing Learning Events:**

- Instructional Aids:
  - Chalkboard, ruler, pointer, duster.
  - Lecture and discussions.
- Other Instructional Aids:
  - Chalkof (assorted colours)
- Content Sequence:

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All the three spheres are components of Biosphere. Life is possible in all three components of the Biosphere.

Identify defining attributes:

- Hierarchical outlines Expanded and Elaborated Hierarchy of Biosphere (Chart 1.0)
- Chart 1.0 BIOSPHERE (Meeting Place)
  - The Earth (Lithosphere) Face of the land where we find elements of the physical and Biological environments
  - Air (Atmosphere) where we find elements of the Terrestrial environment
  - Water (Hydrosphere) where we find elements of the aquatic environment

Chart 1.1 DEFINING ATTRIBUTES OF BIOSPHERE

- Biosphere is a narrow common zone of contact
- Encompasses three spheres Lithosphere, atmosphere, Hydrosphere
- Situated at the Central focal point where all the three spheres meet at a uniform ground or zone of Contact
- Life is possible in all three components of the Biosphere
- All the three spheres are components of Biosphere
EXAMPLES OF COMPONENTS THAT FORM BIOSPHERE

- Lithosphere (earth) → is a Component
- Atmosphere (air) → is a Component
- Hydrosphere (water) → is a Component

EXAMPLES OF LIVING ORGANISMS FOUND IN THE COMPONENTS

- Lithosphere
  - Plants
  - Animals
  - Micro-organisms
  - Birds
- Atmosphere
  - Micro-organisms
  - All aquatic animals like fish, whales, hippos, seals etc.
- Hydrosphere
  - All aquatic plants like spirogyra, water lilies, planktons etc.
  - Micro-organisms
Present differentiation of concepts in the lesson progressively i.e. Expanded and elaborated Hierarchy of Biosphere (Chart 1.0)
- Defining attributes of Biosphere (Chart 1.1)
- Examples of components that form Biosphere (Chart 1.2) and
- Examples of living organisms found in the components (Chart 1.3)

Present the differentiated Hierarchy sequentially by adding elements being discussed during the lesson in the hierarchies.

By constantly referring to the learning hierarchies, attributes, examples and advance organizer earlier presented

All learning tasks to be tackled sequentially throughout the lesson

Extend students in the lesson a lot and keep on checking their understanding abilities throughout the lesson-session.

Extended and elaborated Hierarchy Linking an insect's Body with Biosphere.
EXTENDED AND ELABORATED HIERARCHY LINKING AN INSECT'S BODY WITH BIOSPHERE

AN INSECT'S BODY-BIOSPHERE

Head (Feelers, Compound Eyes, Brain)

\[ \text{is a} \]
\[ \text{Component} \]

Lithosphere

\[ \text{is a} \]
\[ \text{Component} \]

Thorax (wings, like air, most insects fly with it)

\[ \text{is a} \]
\[ \text{Component} \]

Atmosphere

\[ \text{is a} \]
\[ \text{Component} \]

Hydrosphere

\[ \text{is a} \]
\[ \text{Component} \]

Abdomen watery (like Hydrosphere, Carry food)

\[ \text{is a} \]
\[ \text{Component} \]
## Chart 1.5
### SIMILARITIES AND DIFFERENCES BETWEEN AN INSECT AND BIOSPHERE

<table>
<thead>
<tr>
<th>Insect's Body</th>
<th>Biosphere</th>
</tr>
</thead>
<tbody>
<tr>
<td>♦ The head, thorax and abdomen are components of an insect</td>
<td>♦ The Lithosphere atmosphere, and hydrosphere are components of Biosphere</td>
</tr>
<tr>
<td>♦ The three body parts or components meet at a narrow common zone of contact which is the insect itself</td>
<td>♦ The three spheres or components or parts meet at a narrow common zone of contact which is the Biosphere itself</td>
</tr>
<tr>
<td>♦ The thorax may be compared to the atmosphere in the Biosphere for it has wings which enable an insect to fly in the space (atmosphere)</td>
<td>♦ The space (atmosphere) may be compared to an insect's wings for insects fly in it</td>
</tr>
<tr>
<td>♦ Has three components, Head, thorax and abdomen</td>
<td>♦ Has three components, Lithosphere, Atmosphere and Hydrosphere</td>
</tr>
<tr>
<td>♦ An insects cannot live without its components</td>
<td>♦ No Biosphere can exist without its components</td>
</tr>
</tbody>
</table>

### Differences

<table>
<thead>
<tr>
<th>Differences</th>
<th>Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>♦ Is a living organism found in the Biosphere</td>
<td>♦ All living non-living organisms are found in the biosphere</td>
</tr>
<tr>
<td>♦ Insects are found in the Biosphere</td>
<td>♦ Biosphere cannot be found in Insects</td>
</tr>
<tr>
<td>♦ An insect is part of Biosphere</td>
<td>♦ Biosphere is not part of an Insect</td>
</tr>
</tbody>
</table>
Chart 1.6
EXTENDED AND ELABORATED HIERARCHIES LINKING AN INSECT'S BODY WITH BIOSPHERE

(AN INSECT'S BODY)

\[ \downarrow \]

- Head (Part of an Insect's Body) is a Component
- Thorax (Part of an Insect's Body) is a Component
- Abdomen (Part of an Insect's Body) is a Component

( BIOSPHERE )

\[ \downarrow \]

- Lithosphere (Like an Insect's Head) is a Component
- Atmosphere (Like an Insect's wings) is a Component
- Hydrosphere (Like water in the abdomen of an insect) is a Component

[point of integrative reconciliation takes place here or there]
Appendix-D

**CHART 1.7**

**DEFINITION OF BIOSPHERE**

- Is a narrow common zone of contact where the earth (Lithosphere), Air (atmosphere), and Water (Hydrosphere) meet.

(Chart 1.8)

**HIERARCHICAL OUTLINE**

**BIOSPHERE: ITS COMPONENTS, EXAMPLES AND EXAMPLES OF LIVING ORGANISMS FOUND IN THE COMPONENTS**

**BIOSPHERE**

**(Meeting Place)**

- The earth (Lithosphere) face of the land where we find elements of the physical and Biological environments
  - is a Component
    - Examples of Living Organisms
      - Man and his family
      - Animals
      - Plants
      - Micro-Organisms
  - Birds
  - All aquatic Animals like fish, whale, Hippos, seals

- The Air (Atmosphere) face of the land where we find elements of the Terrestrial environments
  - is a Component
    - Examples of Living Organisms
      - Micro-Organisms

- Water (Hydrosphere) where we find elements of the Aquatic environments
  - is a Component
    - Examples of Living Organisms

**Examples of Living Organisms**

- Water (Hydrosphere) where we find elements of the Aquatic environments
  - All aquatic plants like whales, water lilies, spirogyra planktons etc.
DEFINING ATTRIBUTES OF BIOSPHERE

Biosphere is a narrow common zone of contact

Encompasses three spheres: lithosphere, atmosphere, hydrosphere

Situated at the Central focal point where all the three spheres meet at a uniform common ground or zone of contact

Life is possible in all three components of Biosphere

All three spheres are components of the Biosphere

Clarify:

> Students describe how different parts of an insect’s body relate to Biosphere
> Apply the idea of Biosphere to new problems and examples i.e. Human body-Head, chest, and lower limbs are components of a human being.
> Prompt for more examples relevant to the learning task and the organizer.
> Common steps for both types of organizers (Generalization and Analogy)

Awareness of the learner’s relevant knowledge and experience:

Social system reflects upon the kind of teacher-taught interactional patterns in the class with very specified roles of the teacher and students.

Teacher’s role:

> Retain control of the intellectual structure as students continually relate the learning tasks to the organizers earlier presented.
> Helps students differentiate new learning tasks from previously learned tasks,
> Encourage more interactive learning situations especially in Phase III of the lesson and;
> Encourage students to initiate more questions and comments
> Students are encouraged to initiate their own questions in response to their own drives of meaning;

Principles of reaction:

Appendix-D
Student's Role

Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge.

Students are helped to use critical approaches to knowledge by making differentiated and reconciliation of new learning tasks relevant to the student's cognitive structure (as in Phase III of the syntax of the model) and;

Teacher clarifies the learner's reaction to new learning tasks

SUPPORT SYSTEM:

In Phase II, proper caution is taken in the organization of instructional material. This is because, a well organized material is the critical support requirement of the model and;

That; the effectiveness of advance organizers depend on an integral and appropriate relationship between the conceptual organizer and the content.

Well-formed and synchronized structural hierarchies of content and transparencies of Over Head Projector (OHP) will form the support system during instruction.

POST-ASSESSMENT:
FORMATIVE EVALUATION:

For the purpose of ascertaining unit-wise individual's status achievement, formative evaluation will be adopted at the end of each Unit. Corrective feedback will follow remediation and enrichment procedures as stated below.

Teacher will use tutorials for those students who may lack knowledge essential for the programme or unit.

Hierarchical outline of Biosphere, its examples, and examples of living organisms found in the components will form part of remediation package (Chart 1.8)

Extended and elaborated Hierarchies linking an insect's body with biosphere Chart 1.6) and similarities and differences between an insect and Biosphere (Chart 1.5) will be an alternative source of remediation package.

This will be administered at the end of the experiment to grade students according to their achievement of the course intentions;

Summative evaluation will be final and grades assigned will reflect students' achievement throughout their scholastic career during this course.
INSTRUCTIONAL PACKAGES
(GENERALIZATION AS ADVANCE ORGANIZER)

INSTRUCTIONAL EVENT FOR UNIT I PART II

Topic: Biosphere II (Mathematical Explanations)
Focus: Common for both types of advance organizers
(Generalization and Analogy)

The Primary focus of this unit will be to help students relate and integrate Biosphere into their cognitive structure through mathematical explanations.
Emphasize on the position of Biosphere in terms of figures 2, 24 and 72 respectively.
At the end of instructions, students will have studied the enrichment and/or remedial material and will be able to:

- Find out the GCD of set ABODE (4, 6, 8, 12, 18).
- Find out the LCM of set ABODE (4, 6, 8, 12, 18).
- Find out the GCD of set FGH (4, 6, 8).
- Find out the LCM of set FGH (4, 6, 8).
- Find out the GCD of set IJK (6, 8, 12).
- Find out the LCM of set IJK (6, 8, 12).
- Find out the GCD of set LMN (8, 12, 18).
- Find out the LCM of set LMN (8, 12, 18).
- Relate 2, 24, and 72 with Biosphere.
- State at least two attributes of Mathematical explanations of Biosphere in relation to a Venn diagram of Biosphere.
- Explain why 2 is most suitable than 24; and 72 in the explanation of Biosphere.

PRE-REQUISITE KNOWLEDGE OF THE STUDENTS:

Note: It is required that students fulfil conditions of unit I test items before proceeding on to the next lesson.
INSTRUCTIONAL AIDS:
- Transparency: Showing Generalization II.
- Chart 1.1(a): Showing Attributes, similarities, relationships, and differences of GCDS, and LCMS in relation to Biosphere.
- Chart 1.2(b): Hierarchy showing analysis of concepts (Lithosphere, Atmosphere and Hydrosphere, 2, 24 and 72.
- Chart 1.3(c): Some examples of division of sets ABCDE (4,6,8,12,18)
- Chart 1.4(d): Some Examples of division of sets FGH (4,6,8)
- Chart 1.5(e): Some examples of division of sets UK (6,8,12)
- Chart 1.6(f): Some examples of Division of sets LMN (8,12,18)
- Chart 1.7(i-iv): Expanded and elaborated Hierarchies of sets and Venn Diagram Representations (Analyses of concepts).
- Chart 1.8(a): Interrelationships showing positions of 2; 24; and 72 in Venn-Diagram in relation to Biosphere.

OTHER INSTRUCTIONAL PACKAGES/LEARNING TASKS:
- Chalks (assorted colours)
- Chalkboard, dusters, rulers
- Lecture and discussion

CONTENT SEQUENCE:
- Finding GCD of sets ABCDE (4,6,8,12,18)
- Finding LCM of sets ABCDE (4,6,8,12,18)
- Finding GCD of sets FGH (4,6,8)
- Finding LCM of sets FGH (4,6,8)
- Finding GCD of sets UK (6,8,12)
- Finding of LCM of sets LMN (8,12,18)
- Finding of GCD of sets LMN (8,12,18)
- Relate 2; 24; and 72; with Biosphere
- Attributes of mathematical explanations of Biosphere.
- Suitability of 2 over 24 and 72 in the mathematical explanation of biosphere.

INSTRUCTIONAL PROGRAMME AND SEQUENCING LEARNING EVENTS:
- Refer to the syntax of this lesson

POST ASSESSMENT (FORMATIVE EVALUATION):
- For the purpose of ascertaining unit wise individual's status achievement; formative evaluation will be adopted at the end of each unit. Corrective feedback will follow the remediation and/or Enrichment procedures stated below.
PRESCRIPTION:
Teacher will use tutorial for those students who may lack knowledge essential for the programme or unit.
Hierarchies showing analysis of concepts with the help of Venn Diagrams (Chart 1.2); attributes / similarities / relationships and differences of GCDs and LCMs in relation to Biosphere (Chart 1.1(a)) will also form part of remediation packages.
Hierarchies and attributes from Chart 1.8(a) will form an alternative source of remediation.

REMEDIATION:

ENRICHMENT:
Some topics relevant to the IX grade students studies (Geography) will be assigned to those students who have achieved mastery faster than others. [Oxford children's encyclopaedia AB to ZU Vol. 1-9 (1996) and the Oxford Children's Reference Library (2) Exploring the World (1966)].
Teacher will guide students through the enrichment material.

SYNTAX:

PHASE I: Clarify objectives of the Lesson:
Teacher presents all the eleven objectives of unit I Part II and presents the advance organizer. (Chart 1.0 (a))

Generalization II:
Find the G.C.D. and L.C.M. of the following sets:
- Sets ABCDE (4,6,8,12,18)
- Sets FGH (4,6,8)
- Sets IJK (6,8,12)
- Sets LMN (8,12,18)

Identify Defining attributes:
Attributes/similarities/Relationships/ and Differences of GCDs and LCM in relation to Biosphere:
- In all the sets, 24 and 72 are found to be the GCD.
- In all the sets, 2 is found to be the LCM.
- 24 and 72 has appeared twice in all the sets i.e. in FGH (4,6,8); IJK (6,8,12); and sets ABCDE (4,6,8,12,18); and LMN (8,12,18) respectively.
- In the previous Lesson (Chart 1.0); Biosphere was situated at the central focal point where all of its components the Lithosphere (Earth); Atmosphere (Air) and Hydrosphere (Water) meet. Hence, a narrow common ground or zone of contact where all the three spheres and/or components meet.
- All the components of the sets are divisors of the whole set.
These components of the sets converge at a particular point which form their zone of contact where 2, 24, and 72 meet. Thus, 2, 24 and 72 are narrow zones of contact where all the sets meet. Hence, the Biosphere (see Venn Diagram Chart 1.2 (b) below).

(Chart 1.2)
HIERARCHY SHOWING ANALYSIS OF CONCEPTS (LITHOSPHERE, ATMOSPHERE, HYDROSHERE 2,24 AND 72 TO FORM BIOSPHERE)

All the divisors 2; 24 and 72 may be substituted as follows: 2 for the Earth (Lithosphere); 24 for Atmosphere (Air) and 72 for Hydrosphere (Water) to form the Biosphere where they all meet at a narrow common zone of contact (Chart 1.3(c)).

Some Examples of the Divisors of Sets ABODE (4, 6, 8, 12, 18)
♦ (2, 3, 4, 6 and 9)
♦ But our concern is limited to the greatest common divisors and the least Common Multiples Only

Give Examples:

(Chart 1.4 (d))
SOME EXAMPLES OF THE DIVISORS OF SETS FGH (4, 6, 8)
♦ [2, 3, 4]
♦ Our concern is restricted to the Greatest common divisors and the least common multiples only.
Chart 1.5 (e)

**SOME EXAMPLES OF THE DIVISORS OF SETS IJK (6,8,12)**

- [2,3,4]
- We are limited to the GCD and LCM of the sets.

Chart 1.6 (f)

**SOME EXAMPLES OF THE DIVISORS OF SETS LMN (8,12,18)**

- [2,3,4,6,9]
- But we are restricted to the GCDs and LCM only.

Repeat:

- Refer to advance organizer
  - Attributes/similarities/relationships and differences of GCDs and LCMs in relation to Biosphere (Chart 1.1) (a).
  - Hierarchy showing analysis of concepts Lithosphere, Atmosphere, Hydrosphere 2; 24 and 72 to form Biosphere (Chart 1.2) (b) as defined in the attribute (Chart 1.2) (b).
  - Some examples of the Divisions of sets ABCDE (4,6,8,12,18) (Chart 1.3) (c).
  - Some examples of Divisors of sets FGH (4,6,8) (Chart 1.4) (d).
  - Some examples of Divisors of sets IJK (6,8,12). (Chart 1.5) (e).
  - Some examples of Divisors of sets LMN (8,12,18). (Chart 1.6) (f).

Awareness of the students' relevant knowledge and experience:

- Prompt for more examples relevant to this learning task and the organizer.

Part II: Present Material:

- Present defining attributes, similarities, relationships and differences of GCDs and LCMs in relation to Biosphere (Chart 1.1) (a).
- Some examples of the Divisions of sets ABCDE (4,6,8,12,18) (Chart 1.3) (b).
- Some examples of Divisors of sets FGH (4,6,8) (Chart 1.4) (d).
- Some examples of Divisors of sets IJK (6,8,12). (Chart 1.5) (e).
- Some examples of Divisors of sets LMN (8,12,18). (Chart 1.6) (f).
- Present the differentiated hierarchies sequentially by adding elements being discussed during the lesson in the hierarchies.

Maintain attention:

- By constantly referring to the hierarchies, attributes, examples and generalization earlier presented.

Make Organization explicit

- All learning tasks to be tackled sequentially throughout the lesson.
Logical order

Phase III: Strengthening of Cognitive Organisation:
Revise Principle of Integrative reorganisation:

➢ Involve students in the lesson a lot and keep on checking their understanding abilities throughout the lesson – session.
➢ Chart 1.7 (i) (Revisited)
➢ Finding the GCD and LCM of the sets to show their relationship with Biosphere (Chart 1.7 (i))

(Chart 1.7 (i))
EXPANDED AND ELABORATED HIERARCHIES

♦ Sets ABCDE (4,6,8,12,18) =

\[
\begin{array}{c|c}
2 & 4,6,8,12,18 \text{ (Common factor)} \\
2 & 2,3,4,6,9 \text{ (Not common factor)} \\
2 & 1,3,2,3,9 \text{ (Not common factor)} \\
2 & 1,3,1,3,9 \text{ (Not common factor)} \\
3 & 1,1,1,1,1 \text{ (Not common factor)} \\
\end{array}
\]

GCD = $2^3 \times 3^2 = 72$
LCM = 2

Venn Diagram Representation
(Analysis of Concepts)

[Diagram showing Venn diagrams with sets A, B, C, D, and E, illustrating the relationships between the sets with numbers 4, 6, 72, 12, 16, and 8]

vi
EXPANDED AND ELABORATED HIERARCHIES

Sets FGH (4,6,8,12,18) =

<table>
<thead>
<tr>
<th>Prime Factors</th>
<th>Common Factor</th>
<th>Not Common Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>4,6,8</td>
<td>(Common factor)</td>
</tr>
<tr>
<td>2</td>
<td>2,3,4</td>
<td>(Not common factor)</td>
</tr>
<tr>
<td>2</td>
<td>1,2,2</td>
<td>(Not common factor)</td>
</tr>
<tr>
<td>3</td>
<td>1,3,1</td>
<td>(Not common factor)</td>
</tr>
</tbody>
</table>

GCD = $2^2 \times 3$

LCM = 24

VENN Diagram representation:
(Analysis of Concepts)

(Chart 1.7 iii)
EXPANDED AND ELABORATED HIERARCHIES

Sets IJK \{6,8,12\} =

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>3</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6,8,12 (Common factor)</td>
<td>3,4,6 (Not common factor)</td>
<td>3,2,3 (Not common factor)</td>
<td>3,1,3 (Not common factor)</td>
</tr>
<tr>
<td>GCD</td>
<td>2^2 \times 3</td>
<td>= 24</td>
<td>1,1,1</td>
<td></td>
</tr>
<tr>
<td>LCM</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

VENN Diagram representation
(Analysis of Concepts)
EXPANDED AND ELABORATED HIERARCHIES

Sets LMN [8,12,18] =

<table>
<thead>
<tr>
<th></th>
<th>8,12,18</th>
<th>(Common factor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>8,12,18</td>
<td>(Common factor)</td>
</tr>
<tr>
<td>2</td>
<td>4,6,9</td>
<td>(Not common factor)</td>
</tr>
<tr>
<td>2</td>
<td>2,3,9</td>
<td>(Not common factor)</td>
</tr>
<tr>
<td>3</td>
<td>1,3,9</td>
<td>(Not common factor)</td>
</tr>
<tr>
<td>3</td>
<td>1,1,3</td>
<td>(Not common factor)</td>
</tr>
</tbody>
</table>

GCD = 2^3 x 3^3
= 72

LCM = 2

VENN Diagram representation
(Analysis of Concepts)
Chart 1.8 (a)
INTERRELATIONSHIPS SHOWING POSITION OF 2;24 AND 72 IN VENN DIAGRAMS IN RELATION TO BIOSPHERE

(i) SET A
SET B
SET C
SET D
SET E
SET F
SET G
SET H
SET I
SET J
SET K
SET L
SET M
SET N

(iii) SET I

(iv) SET L

(v) SET M

Appendix-D
Retain control of the intellectual structure - students continually relate the learning tasks to the organiser earlier presented;

Helps students differentiate new learning tasks from previously learned tasks;

Encourage more interactive learning situations especially in phase III of the lesson and;

Encourage students to initiate more questions and comments.

SOCIALS SYSTEM:
Social system reflects upon the kind of teachers - taught interrelational patterns in the class with very specified roles of the teacher and students.

Teacher’s Role:
- Retain control of the intellectual structure - students continually relate the learning tasks to the organiser earlier presented;
- Helps students differentiate new learning tasks from previously learned tasks;
- Encourage more interactive learning situations especially in phase III of the lesson and;
- Encourage students to initiate more questions and comments.

PRINCIPLES OF RELATION:
Students Role:
- Students are encouraged to initiate their own questions in responses to their own drives of meaning;
- Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge;
- Students are helped to use critical approach to knowledge by making differentiated and reconciliation of new learning tasks relevant to the students cognitive structure (as in Phase III of the syntax of the model, and
- The teacher clarifies the learners' reaction to new learning tasks.

SUPPORT SYSTEM:
- In Phase II, proper caution is taken in the organization of instructional material. This is because, a well organised material is the critical support requirement of the model and;
- That the effectiveness of advance organizer depends on an integral and appropriate relationship between the conceptual organizer and the content;
- Well formed and structural hierarchies of contents and transparencies of over Head Projector (OHP) will form support system during instruction.

SUMMATIVE EVALUATION:
- This will be administered at the end of the experiment to grade students according to their achievement of the course intensions;
- Summative evaluation will be final and grades assigned will reflect students' achievement throughout their scholastic career during this course.

Promote Active reception Learning:
- Interactive discussion. More discussions on how mathematical illustrations were used to explain the Biosphere.

Clarify:
- The relationships between 2;24 and 72 with Biosphere and why 2 is the most acceptable least common multiple that may be substitute to Biosphere.

(Common steps for both types of the – organizers generalization and analogy)

Social system reflects upon the kind of teachers - taught interrelational patterns in the class with very specified roles of the teacher and students.

Teacher’s Role:
- Retain control of the intellectual structure - students continually relate the learning tasks to the organiser earlier presented;
- Helps students differentiate new learning tasks from previously learned tasks;
- Encourage more interactive learning situations especially in phase III of the lesson and;
- Encourage students to initiate more questions and comments.

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- That the effectiveness of advance organizer depends on an integral and appropriate relationship between the conceptual organizer and the content;
- Well formed and structural hierarchies of contents and transparencies of over Head Projector (OHP) will form support system during instruction.

SUMMATIVE EVALUATION:
- This will be administered at the end of the experiment to grade students according to their achievement of the course intensions;
- Summative evaluation will be final and grades assigned will reflect students’ achievement throughout their scholastic career during this course.
INSTRUCTIONAL EVENTS FOR UNIT II
Topic: Composition of our environment
Focus: Common for both types of advance organizers (Generalization and Analogy).

- The main focus of this unit will be to help students acquire knowledge on the relationship between the physical and Biological environments and
- Relate the knowledge acquired into their own day-to-day life in relations to man's existence in the environment.
- Major focus will be based on the examples of things/organisms that man interact with for his own existence and/or survival in the environment where he lives (Face of the land).

INSTRUCTIONAL OBJECTIVES:

- At the end of instructions, students will have studied the enrichment and/or remedial material and will be able to:
  - Identify the two environments which our earth (Lithosphere) is composed of.
  - List down three major elements of the Physical environment.
  - List down three major elements of the Biological environment.
  - Match list A with List B, interdependency between the physical and Biological environments.
  - Describe how man's existence on earth depends upon the Biosphere

PRE-REQUISITE KNOWLEDGE OF THE STUDENTS:

NOTE: It is required that students fulfil conditions of Unit 1 Test items before proceeding on to the next lesson.

INSTRUCTIONAL AIDS:

- Chart 2.0: Structural outline showing our environment.
- Chart 2.1: Progressive differentiation of our environment showing elements of the physical and Biological Environment.
- Chart 2.2: Expanded and Elaborated Hierarchy showing examples of components found in the physical environment.
- Chart 2.3: Expanded and Elaborated hierarchy showing examples of components found in the Biological environment.
Teacher will use tutorial for those students who may lack knowledge essential for the programme and/or unit.

Extended and Elaborated Hierarchies showing the entire spectrum of our environment will form part of remediation package (Chart 2.4).

Defining attributes, similarities and differences will also form part of the package.

For the purpose of ascertaining unit wise individual's status achievement; formative evaluation will be adopted at the end of each Unit. Corrective feedback will follow the remediation and/or enrichment procedures stated below.

♦  Chalks (Assorted colours)
♦  Chalkboard, Dusters, rulers, pointers.
♦  Lectures and Discussion.

♦  Refer to the syntax of the Lesson.

♦  Teacher will use tutorial for those students who may lack knowledge essential for the programme and/or unit;
♦  Extended and Elaborated Hierarchies showing the entire spectrum of our environment will form part of remediation package (Chart 2.4)
♦  Defining attributes, similarities and differences will also form part of the package.

♦  Oxford children's encyclopaedia AB to ZUV vols. 1 to 9 (1996) and the Oxford children's reference Library (2) Exploring the World (1966), will be used as enrichment packages for those students who achieved mastery faster.
♦  Teacher will guide students through the enrichment material.
Teacher presents all the five objectives of unit 2 and presents the advance organizer.

Our environment called the earth (Lithosphere) is composed of two types of environments. The Physical environment and the Biological environment.

(Chart 2.0)
STRUCTURAL OUTLINE
Our Environment

(The Earth-Lithosphere)

The Physical Environment  The Biological Environment

(Chart 2.1)
PROGRESSIVE DIFFERENTIATION OF OUR ENVIRONMENT SHOWING ELEMENTS OF PHYSICAL AND BIOLOGICAL ENVIRONMENTS

(Chart 2.1)
OUR ENVIRONMENT
(THE EARTH-LITHOSPHERE)

Physical Environment  Biological Environment

Elements of Physical Environment  Elements of Biological Environment

Land  Air  Water  Plants  Animals  Micro-organisms
Give Examples:

> Chart 2.2
EXPANDED AND ELABORATED HIERARCHY
Examples of Components found in the Physical Environment

**Physical Environment**

- **Elements**
  - **Land** (Components)
  - **Air** (Components)
  - **Water** (Components)

  - **Organic matter**
  - **Inorganic matter**
  - **Oxygen**
  - **Hydrogen**
  - **Carbon dioxide**
  - **Rear Gases**
  - **Oxygen**
  - **Impure Other solutions**
  - **Pure Hydrogen**

> Chart 2.2 (ii)
EXPANDED AND ELABORATED HIERARCHY
Components found in the Biological Environment

**Biological Environment**

- **Elements**
  - **Plants** (Components)
  - **Animals** (Components)
  - **Microorganisms** (Components)

  - **Mangoes**
  - **Grass**
  - **Maize**
  - **Dogs**
  - **Cats**
  - **Fly**
  - **Cattle insects**
  - **Wild Animals**
  - **Bacteria**
  - **Virus**
  - **Parasites**
Repeat:
- Refer to advance organiser
- Structural outline of our environment the earth (Lithosphere) Chart 2.0

> Progressive differentiation of our environment showing elements of physical and Biological environment (Chart 2.1).
> Expanded and Elaborated hierarchy showing examples of components found in the physical environment (Chart 2.2).
> Expanded and elaborated hierarchy showing examples of components found in the Biological environment (Chart 2.3).

Awareness of the learner's relevant knowledge and experience:
> Prompt for more essential features, of the learning tasks and provide more examples relevant to the organizer.

PHASE II: Present Material:
- Present differentiation of concepts in the Lesson progressively so that students can see how ideas relate to each other i.e.
  - Structural outline our Environment the earth or Lithosphere (Chart 2.0).
  - Progressive differentiation of our environment showing elements of physical and Biological environments (Chart 2.1).
  - Extended and Elaborated Hierarchy: Examples of components found in the Physical Environment (Chart 2.2).
  - Extended and Elaborated Hierarchy: Examples of components found in the Biological Environment (Chart 2.3).
  - Present differentiated hierarchies sequentially by adding elements being discussed during the lesson to hierarchies.

Maintain attention:
> By constantly referring to the learning hierarchies, attributes; examples; and generalization earlier presented.

Make organization Explicit:
> All learning tasks to be tackled sequentially throughout the lesson.
Logical Order:

PHASE III: Strengthening of Cognitive Organization:
Revise Principle of Integrative reconciliation:

- Involve students in the lesson a lot and keep on checking their understanding abilities throughout the Lesson – Session.

Chart 2.4 (i)
INTERDEPENDENCY BETWEEN PHYSICAL AND BIOLOGICAL ENVIRONMENTS

- Both these two environments of the earth interact with each other by exchanging matter and energy.
- Plants get their food from Soil.
- Both Plants and animals once dead get decayed with the help of micro-organisms (Detritus feeders)
- The decomposed organic and inorganic matter turn into soil thereby replenishing it.
- Matter and energy is exchanged between the physical and Biological environments.

Chart 2.4 (ii)
HIERARCHICAL OUTLINE SHOWING INTERRELATIONSHIP BETWEEN PHYSICAL AND BIOLOGICAL ENVIRONMENTS OF THE EARTH
Chart 2.4 (ii)
OUR ENVIRONMENT
(The Earth Lithosphere)

Physical environment

Biological environment

Elements of Physical Environment

Elements of Biological Environment

Land
Water
Air
Plants
Micro-organisms
Animals

(They all need one another)
(Point of Integrative Reconciliation Takes Place Here or There)
Retain control of the intellectual structure as students continually relate the learning tasks to the organizer earlier presented.

Helps students differentiate new learning tasks from previously learned tasks; and

Encourage students to initiate more questions and comments.

Social system reflects upon the kind of teacher taught interrelational patterns in the class with very specified roles of the teacher and students.

Teacher Role:

- Retain control of the intellectual structure as students continually relate the learning tasks to the organizer earlier presented.
- Helps students differentiate new learning tasks from previously learned tasks; and
- Encourage students to initiate more questions and comments.

Appendix-D

Chart 2.5

MAN'S DEPENDENCY ON BIOSPHERE

<table>
<thead>
<tr>
<th>MAN</th>
<th>BIOSPHERE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man needs raw material to satisfy his human wants.</td>
<td>Has a variety of Raw material which man utilizes to meet his own wants.</td>
</tr>
<tr>
<td>Man needs food for his survival</td>
<td>Has abundance of food supply.</td>
</tr>
<tr>
<td>Man exploits this co-existence in the Biosphere positively or negatively for his own good and existence in the environment</td>
<td>Both living and non-living organisms in the Biosphere co-exist together in mutual interdependency.</td>
</tr>
</tbody>
</table>

Promote active reception leaving:

- Interactive discussions:
  - Elaborate more on man's dependency in the Biosphere (Chart 2.5 and 2.4) and relate this to the organizer earlier presented in Generalization I & III in readiness for the next lesson.
  - Students to provide summaries of the major attributes Man's dependency on Biosphere (Chart 2.5); Interdependency between physical and Biological environments (Chart 2.4 (i); and extended and Elaborated hierarchies showing examples of components found in both Physical and Biological environments (Chart 2.2) and (Chart 2.3) respectively.

Clarify:

SOCIAL SYSTEM:

- Common Steps for both Types of the Organizers. (Generalization and Analogy)

Social system reflects upon the kind of teacher taught interrelational patterns in the class with very specified roles of the teacher and students.

- Man needs raw material to satisfy his human wants.
- Man needs food for his survival.
- Man exploits this co-existence in the Biosphere positively or negatively for his own good and existence in the environment.
- Has a variety of Raw material which man utilizes to meet his own wants.
- Has abundance of food supply.
- Both living and non-living organisms in the Biosphere co-exist together in mutual interdependency.

Chart 2.5

MAN'S DEPENDENCY ON BIOSPHERE

<table>
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</tr>
</tbody>
</table>
This will be administered at the end of the experiment to grade students according to their enrichment of the course intensions. Summative evaluation will be final and grades assigned will effect students achievement throughout their scholastic career during this course.

Principles of Reaction:
Students Role:

- Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge.
- Initiate their own questions in response to their own drives of meaning.
- Students are helped to use critical approach to knowledge by making differentiated and reconciliation of new learning tasks relevant to students cognitive structure as Phase III of the model and
- Teacher clarifies the learners' reaction to new learning tasks.

Support System:

- In phase II, proper caution is taken in the organisation of instructional material. This is because, a well organised material is the critical support requirement of the Model and
- Well formed and synchronized structural hierarchies of content and transparencies of over. Head projector (OHP) will form the support system during instructions.

Summative Evaluation:

- This will be administered at the end of the experiment to grade students according to their enrichment of the course intensions.
- Summative evaluation will be final and grades assigned will effect students achievement throughout their scholastic career during this course.
INSTRUCTIONAL EVENTS FOR UNIT III

Topic : FACE OF THE LAND:
Focus: Common for two types of advance organizers (Generalization and Analogy).

INSTRUCTIONAL OBJECTIVES:

➢ The main focus of this unit will be to help students identify major forces that operate on the face of the earth (Lithosphere) and the resulting landforms due to the action of these forces on the face of the earth.

➢ All the end of instructions, students will have studied the enrichment and/or remedial material and will be able to :-
  ♦ Name at least three landforms found on the face of the land.
  ♦ Identify the characteristically variations of land forms
  ♦ Identify two types natural processes of the earth whose action on the face of the land causes land forms.
  ♦ Differentiate between sudden and gradual changes which occur during landform.
  ♦ Identify three land forms due to that takes place on sudden changes the faces of the land.
  ♦ Identify at least six land forms due to gradual changes of land forms.

PREREQUISITE KNOWLEDGE OF THE LEARNERS:
NOTE: It is required that students fulfil conditions of unit II test items before proceeding to unit III.

INSTRUCTIONAL AIDS:

◆ Chart 3.0 : Defining attributes of different types of land forms found in the face of the land.
◆ Chart 3.1 : Characteristics of variations of land forms.
◆ Chart 3.2 : Examples of different land forms on the face of the land.
◆ Chart 3.3 : Hierarchy showing types of natural processes of the earth whose actions on the face of the land causes land forms.
◆ Chart 3.4 : Attributes of External Processes.
◆ Chart 3.5 : Attributes of Internal Processes.
Chart 3.6: Hierarchy Comparing the characteristics of Human Head to the face of the land.

Chart 3.7: Extended and Elaborated Hierarchy showing changes causing landforms on the face of the land and Resulting examples of landforms.

Other Instructional Aids:
- Chalks (assorted colours).
- Chalkboard, dusters, rulers, pointers.
- Lectures, discussions.

Content Sequence:
- Landforms found on the face of the land.
- Characteristics variations of landforms
- Natural processes of the earth causing landforms.
- Sudden and gradual changes causing landforms.
- Factors causing sudden changes on the face of the land.
- Factors causing gradual changes on the face of the land.

Instructional Programme and Sequencing

Learning Units

Post-Assessment:
(Formative Evaluation): For the purpose of ascertaining unit wise individuals status achievement; formative evaluation will be adapted at the end of each unit. Corrective feedback will follow the remediation and/or enrichment procedures stated below.

Prescription: Remediation:
- Teacher will use tutorial for those students who may lack knowledge essential for the programme and/or unit.
- Hierarchical outlines of the face of the land (Chart 3.0) will form another alternative source of information
- Hierarchies comparing characteristics of human head to the face of the land (Chart 3.6) will also form part of alternative source of remediation

Enrichment:
- Some topics relevant to IX grade Social Studies (Geography) will be assigned to those students who have achieved mastery faster than others. (Oxford Children's Encyclopaedia AB to ZU Vols. 1 to 9 (1996) and the Oxford Children's Reference Library (2) Exploring the World, (1966).
Teacher will guide students through the enrichment material.

Teacher presents all the six objective of unit III and presents advance organizer.

> Just like the face of a human being, the face of the land called the earth (Lithosphere) is nearly uniform in characteristic height, sphere, appearance, and size. It is always irregular. The sizes, appearances, shapes and heights of mountains, hills, plateaux, valleys, rivers, sand dunes, rivers, seas and plains as major components of land forms are never the same on the face of the land.

Chart 3.0
DEFINING ATTRIBUTES OF DIFFERENT TYPES OF LANDFORMS FOUND ON THE FACE OF THE LAND

<table>
<thead>
<tr>
<th>Landforms</th>
<th>Defining Attributes</th>
</tr>
</thead>
</table>
| 1. Mountains | ♦ Broad at the base, narrow and thin at the apex.  
♦ Some are covered by snow (the Himalayas) |
| 2. Hills | ♦ Smaller than a mountain with gentle slopes  
♦ Most of them are not covered by snow. |
| 3. Plateaux | ♦ Flat at the top like a table.  
♦ Here undulating steep slopes, rich for agriculture. |
| 4. Valleys | ♦ Are depressions found between two hills or mountains.  
♦ Most valleys are U-shaped or V-shaped and have rivers and lakes on their floors like the Great Rift-Valley of East Africa. |
| 5. Plains | ♦ Are flat landforms. Most plains are rich for agriculture like the Indo-Gangetic Plains. |
| 6. Sand Dunes | ♦ Are found in desert areas.  
♦ Dry and form addies or Barchans  
♦ May run up to hundreds of kilometres in the desert areas. |
### Chart 3.1
**CHARACTERISTIC VARIATION OF LANDFORMS**

- Size
- Shape
- Height
- Appearance

### Chart 3.2
**EXAMPLES OF DIFFERENT LAND FORMS FOUND ON THE FACE OF THE LAND**

- Mountains
- Hills
- Plateaux
- Valleys
- Ravines
- Sand dunes
- Mushroomrocks
- Stalactities
- Stalagmites

---

**Repeat:**
- Refer to advance organizer
- Defining attributes of different landforms found in the face of the land (Chart 3.0)
- Characteristic variations of land forms (Chart 3.1)
- Examples of different land forms found on the face of the land (Chart 3.2)

**Prompt for more essential defining attributes of different landforms found in the face of the land.**
- Students provide more examples relevant to the organizer.

**Present differentiation of concepts in the Lesson progressively so that students can see how ideas relate to each other i.e.**
- Defining attributes of different types of landforms found on the face of the hand (Chart 3.0).
- Characteristic variations of land forms (Chart 4.1).
- Examples of different land forms found on the face of the land (Chart 3.2).

**Present differentiated hierarchies sequentially by adding elements being discussed during the lesson in hierarchies.**
HIERARCHY SHOWING TYPES OF NATURAL PROCESSES OF THE EARTH WHOSE ACTIONS ON THE FACE OF THE LAND CAUSES LAND FORMS

CAUSES OF LAND FORMS

External Processes  Internal Process

Chart 3.4
ATTRIBUTES OF EXTERNAL PROCESSES

- Takes place both in the atmosphere and hydrosphere thereby affecting the face of the land.
- External forces act slowly, by wearing out and tearing down the highlands and soils.
- Carry away the eroded material and deposit them down the low lands far away from their original place.
- Causes gradual changes in the face of the land.

Chart 3.5
ATTRIBUTES OF INTERNAL PROCESSES

- Take place in the interior parts of the earth causing changes on the face of the land.
- Take place suddenly and violently causing loss of life and property.
- Causes sudden changes on the face of the land.
<table>
<thead>
<tr>
<th>Human Face Characteristic</th>
<th>Land Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nose</strong>: Flows like a river drains region, divides like a delta, its cross-section looks like a valley, irregular in shape and appearance. Flow from high lands (head) to low lands (chin).</td>
<td><strong>A river</strong>: Flows like a nose, drains water into the sea, a delta, irregular in shape and appearance. Flows from highlights to low lands.</td>
</tr>
<tr>
<td><strong>Hair</strong>: Like a forest. Protects the head from scorching heat of the sun and wind and is replaceable.</td>
<td><strong>Forest</strong>: Protects the land surface from soil, erosion, heat, of the sun and is an inexhaustible resource.</td>
</tr>
<tr>
<td><strong>Face</strong>: Like deserts and plains, has moisture from the body, no hair which can act like air etc. some scanty hair can be found on some faces.</td>
<td><strong>Desert</strong>: Dry, with very little rainfall and vegetation, lacks water very few structure like the face.</td>
</tr>
<tr>
<td><strong>Mouth</strong>: Like caves found in the limestone regions, teeth looks like stalactites and stalagmites the saliva looks like underground water and spring waters.</td>
<td><strong>Caverns</strong>: Found in the limestone regions, have pendants called stalactites and stalagmites which look like teeth of a human being, hangs upside down and upwards saliva like underground water.</td>
</tr>
<tr>
<td><strong>Ears</strong>: Look like basins, salt lakes and depressions. Some ears are shaped like sand dunes in the desert regions. Curves look like eddies and sweats are salty like salt pans.</td>
<td><strong>Basin</strong>: Looks like earlobes salty and shallow. Eddies look like caverns.</td>
</tr>
<tr>
<td><strong>Chin</strong>: Looks like inselbergs Isolated in a plain, or cliffs and mountain cleffs. Protruding downwards towards the chest.</td>
<td><strong>Inselbergs</strong>: Looks like chin of a human being, isolated in the plains and protruding upwards on the plains.</td>
</tr>
</tbody>
</table>
Interactive discussion session

Students discuss more on expanded and elaborated hierarchy showing changes causing land forms on the face of the land and resulting examples of the land forms (Chart 3.7).
Differentiate new learning tasks and reconcile them with existing knowledge.

Help to use critical approach to knowledge by making differentiated and reconciliation of new learning tasks relevant to the students cognitive structure (as in Phase III) of the syntax of the lesson.

Teacher clarifies the learner's reaction to new learning tasks.

In phase II, proper caution is taken in the organisation of instructional material. This is because, a well organised material is the critical support requirement of the model.

The effectiveness of advance organizers depend on an integral and appropriate relationship between the conceptual organizer and the content and;

Well formed and synchronised structure hierarchies of contents and transparencies of Over Head Projector (OHP) will form part of the support system during instruction.

This will be administered at the end of the experiment to grade students according to their enrichment of the course intensions.

Summative evaluation will be final and grades assigned will effect students achievement throughout their scholastic career during this course.

Appendix-D

Clarify:
• Hierarchy comparing the characteristics of human face/head to the face of the land (Chart 3.6)
• Further the attributes of external and internal processes of landforms (Chart 3.4) and (Chart 3.5).

SOCIAL SYSTEM:
Social system reflects upon the kind of teacher taught interrelational patterns in the class with very specified roles of the teacher and students:

Teachers' Role:
• Retain control of the intellectual structure as students continually relate the learning tasks to the organizer earlier presented;
• Helps students differentiate new learning tasks from previously learned tasks;
• Encourage more interactive learning situation especially in phase III of the lesson and;
• Encourage students to initiate more questions and comments.

PRINCIPLES OF REACTIONS:
• Students are encouraged to initiate their own questions in response to their own drives of meaning.

Students' Role:
• Differentiate new learning tasks and reconcile them with existing knowledge.
• Help to use critical approach to knowledge by making differentiated and reconciliation of new learning tasks relevant to the students cognitive structure (as in Phase III) of the syntax of the lesson.
• Teacher clarifies the learner's reaction to new learning tasks.

SUPPORT SYSTEM
• In phase II, proper caution is taken in the organisation of instructional material. This is because, a well organised material is the critical support requirement of the model.
• The effectiveness of advance organizers depend on an integral and appropriate relationship between the conceptual organizer and the content and;
• Well formed and synchronised structure hierarchies of contents and transparencies of Over Head Projector (OHP) will form part of the support system during instruction.

SUMMATIVE EVALUATION:
• This will be administered at the end of the experiment to grade students according to their enrichment of the course intensions.
• Summative evaluation will be final and grades assigned will effect students achievement throughout their scholastic career during this course.
INSTRUCTIONAL PACKAGES
(GENERALIZATION AS ADVANCE ORGANIZER)

INSTRUCTIONAL EVENTS FOR UNIT IV
Topic: Action of external processes on the face of the land.
Focus: Common for two types of advance organizers (Generalization and Analogy).

The main focus of this unit is to guide students know major agents of external processes and integrate them with the resultant land forms on the face of the land.

At the end of instructions, students will have studied the enrichment and/or remedial material and will be able to:
- Identify from the choices given four major actions of external processes on the face of the land.
- Identify six agents of external processes from list B given below.
- Define the term weathering.
- Identify from the choices given by circling four causes of sudden changes in weather phenomena which help in the breaking down of rocks.
- Identify from the given choices by cycling five other causes of weathering which results in the breaking down of rocks into smaller particles.

PRE-REQUISITE KNOWLEDGE OF THE LEARNERS:
NOTE: It is required that students fulfil conditions of Unit III Test items before proceeding on to Unit IV.

INSTRUCTIONAL AIDS:
- Transparency: Showing generalization V.
- Transparency: Showing weathering along the rock-joints (Chart 4-7).
- Transparency: Showing plant roots penetrating rock cracks (Chart 4-8).
- Chart 4.0 : 4.0 showing defining attributes of external processes of the earth and major actions of external process on the face of the land.
- Chart 4.1 : Hierarchical outline showing agents of external processes.
- Chart 4.2 : Expanded Hierarchy showing examples of land forms due to external processes.
For the purpose of ascertaining unit wise individual’s achievement; formative evaluation will be adopted at the end of each Unit. Corrective feedback will follow the remediation and/or enrichment procedures as stated below.

Teacher will use tutorial for those students who may lack knowledge essential for the programme and/or unit;

Hierarchical outlines showing agents of external process (Chart 4.1) will form part of alternative remediation.

Transparency showing weathering along the rock joints (Chart 4.7) and (Chart 4.8) showing plant roots penetrating rocks through cracks will also form alternative sources of remediation.

CONTENT SEQUENCES:

- Action of external processes on the face of the land.
- Agents of external processes.
- Weathering as an agent of external processes operating on the face of the land.
- Causes of sudden changes in weather phenomena resulting in the breaking down of rocks.
- Other causes of weathering which help in the breaking down of rocks on the face of the land.

OTHER INSTRUCTIONAL PACKAGES/LEARNING TASKS:

- Chalks, (assorted colours).
- Chalkboard, dusters, rulers etc.
- Lectures and discussion.

INSTRUCTIONAL PROGRAMME AND SEQUENCING LEARNING UNITS:

Refer to the syntax of this Lesson.

POST ASSESSMENT:
(FORMATIVE EVALUATION):

For the purpose of ascertaining unit wise individual’s achievement; formative evaluation will be adopted at the end of each Unit. Corrective feedback will follow the remediation and/or enrichment procedures as stated below.

PRESCRIPTION:

Teacher will use tutorial for those students who may lack knowledge essential for the programme and/or unit;

Hierarchical outlines showing agents of external process (Chart 4.1) will form part of alternative remediation.

Transparency showing weathering along the rock joints (Chart 4.7) and (Chart 4.8) showing plant roots penetrating rocks through cracks will also form alternative sources of remediation.
ENRICHMENT:

Some topics relevant to IX grade social studies (Geography) will be assigned to those students who have achieved mastery faster than the others. [Oxford children’s encyclopaedia AB to ZU Vols.1 to 9 (1996) and the Oxford Children’s Reference Library (2). Exploring the World (1966).

Teacher will guide students through the enrichment material.

SYNTAX
Phase I: Clarify the Objectives of the Lesson:
Generalization IV-V:

Teacher presents five objectives of unit IV and presents the advance organiser. External processes act slowly on the face of the land by wearing out; tearing down the highlands and soils, carry away, and deposit the worn out material into the low lands far away from their original places. They reduce the differences in heights between the highlands and lowlands with the action of external agents like rivers, winds, rainfall, waves, glaciations, and weathering. External processes are therefore sometimes referred to as gradational processes.

(Chart 4.0)
DEFINING ATTRIBUTES OF EXTERNAL PROCESSES OF THE EARTH

(Major Actions of External Processes on the Face of the land)

- Reduce the differences in heights between the low lands and high lands
- Take place in the atmosphere and Hydrosphere
- Affects the surface of the land
- Act slowly
- Wear out
- Tear down
- Carry away
- Deposit worn out material down the low lands far away from their original places

(Chart 4.1)
HIERARCHICAL OUTLINE SHOWING Agents of External Processes

- Weathering
- Winds
- Rivers
- Erosion
- Glaciers
- Waves
- Rainfall
Give Examples: (Chart 4.2)

EXPANDED HIERARCHICAL OUTLINE SHOWING

Examples of Land Forms due to External Processes

- Alluvial soils
- Sand Dunes (Barchans)
- Loess soils
- Mushroom rocks (Zeungen)
- Lateral Moraines
- Oxbow lakes
- River levees
- Stalactites and Stalagmites
- Cirques

Repeat:

- Refer to:
  - Advance organizer
  - Defining attributes of external processes of the earth - i.e. major actions of external processes in the face of the land (Chart 4.0)
  - Hierarchical outline showing agents of external processes.
  - Extended hierarchical outline showing examples of land forms due to external processes (Chart 4.2).

Awareness of the learner's relevant knowledge and experience:

- Prompt for more examples relevant to this learning tasks and the organizer.

Phase II: Present Material:

- Present differentiation of concepts in the less on progressively i.e.
  - Defining attributes of external processes of the earth-major actions of external processes on the face of the land (Chart 4.0)
  - Hierarchical outlines showing agents of external processes on the face of the land (Chart 4.1).
  - Expanded hierarchy showing examples of land forms due to external processes (Chart 4.2).
  - Present the differentiated hierarchies sequentially by adding elements being discussed during the lesson in the hierarchies.

Maintain attention:

- By constantly referring to the learning hierarchies, attributes, examples and generalization earlier presented.
Make organization explicit:
- All learning tasks to be tackled sequentially throughout the lesson.
- Involve students in the lesson a lot and keep on checking their understanding abilities throughout the lesson session.

PHASE III: Strengthening of Cognitive Organization:
- (Chart 4.3) Hierarchical outline showing defining attributes of weathering.

Revise Principle of integrative reconciliation:

(Chart 4.3) DEFINING ATTRIBUTES OF WEATHERING

- Produce a layer of loose rock particles on the earth's surface
- Break down rocks
- Uses sudden changes in weather phenomena
- Acts on exposed rocks surfaces
- Slow chemical and organic changes take place leading to formation of soils
- Uses sun's heat and constant temperature changes

(Chart 4.4) HIERARCHY SHOWING CAUSES OF SUDDEN CHANGES IN WEATHER PHENOMENA WHICH HELP IN THE BREAKING DOWN OF ROCKS.

Causes of Sudden Changes in Weather Phenomena:
- Temperature variations
- Moisture content
- Precipitation
- Protrusion of plant roots
Water enters the rocks through their joints. In the course of time, rocks split up and eventually fall out into smaller pieces.

Definition of Weathering: Weathering is the process of breaking down of rocks by sudden change in weather phenomena with the help of temperature variations, moisture content, precipitation and protrusion of plant roots.

(Chart 4.6)
(Chart 4.7)
Relation control of the intellectual structure as students continually relate the learning tasks to the organizer earlier presented.

Teacher’s Role:

- Interactive discussion sessions:
  - Students relate attributes of weathering to the causes of sudden change in weathering which help in the breaking down of rocks. (Chart 4.3 and 4.4).
  - Some areas of topics in (Chart 4.1, 4.2 and 4.0) respectively.

- Common for the two types of organizers (generalization and Analogy)

Social system reflects upon the kind of teacher-taught interrelational patterns in the class with very specified roles of the teacher and students.

- Promote active reception learning:

Clarify:

Appendix-D

Helps students differentiate new learning tasks from previously learned tasks.

Encourage more interactive learning situations especially in Phase III of the lesson.

Encourage students to initiate more questions and comments.
PRINCIPLES OF REACTION:
Students' Role:

- Students are encouraged to initiate their own questions in response to their own drives of meaning.
- Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge.
- Students are helped to use critical approach to knowledge by making differentiated and reconciliation of new learning tasks relevant to students' cognitive structure (as in phase III of the Syntax of the model).

SUPPORT SYSTEM:

- In Phase II, proper caution is taken in the organization of instructional material. This is because, a well organised material is the critical support requirement of the model, and
- That, the effectiveness of advance organizer depends on an integral and appropriate relationship between the conceptual organizer and the content.
- Well formed and synchronized structural hierarchies of content and transparency of Over Head Projector (OHP) will form the support system during instruction.

SUMMATIVE EVALUATION:

- This will be administered at the end of the experiment to grade students according to their enrichment of the course intentions.
- Summative evaluation will be final and grades assigned will effect students achievement throughout their scholastic career during this course.
INSTRUCTIONAL PACKAGES
(GENERALIZATION AS ADVANCE ORGANIZER)

INSTRUCTIONAL EVENTS FOR UNIT V
Topic: Gradational Processes
Focus: Common for two types of advance organizers
(Generalization and Analogy).

⇒ One main focus of this unit is to help students know the meaning of
gradational processes and its components, similarities and differences
between the components.

⇒ At the end of instructions, students will have studied the enrichment and/or remedial,
material and will be able to:
  • Define the term gradational processes.
  • Circle from the list given two moving agents of gradational process which
  transport weathered material from one place to another.
  • Circle from the list given two components of gradational processes.
  • Define the term degradation.
  • Define the term aggradation.
  • Write in their answer sheets as many as possible similarities between
  degradation and aggradation.
  • Write in their books as many differences as possible between degradation and
  aggradation.
  • Circle from the list given, the main agents of gradation which carry the eroded
  earth material from the highlands down to the low lands by depositing the
  eroded material into the sea.

PREREQUISITE KNOWLEDGE OF THE LEARNERS:

NOTE: It is required that students fulfil conditions of test items based on Unit IV test items before proceeding to the next unit.

INSTRUCTIONAL AIDS:
⇒ Chart 5.0 : Hierarchy of defining attributes of gradational processes (Relating
this with (Chart 4.0) Defining attributes of external processes done in the
previous lesson.
⇒ Chart 5.1 : Definition of gradational processes.
Teacher will use tutorial for those students who may lack knowledge essential for the programme and/or unit.

PRESCRIPTION:

REMEDIATION:

For the purpose of ascertaining unit-wise individual's status achievement, formative evaluation will be adopted at the end of each unit. Corrective feedback will follow the remediation and/or enrichment procedures stated below.

♦ Gradational processes.
♦ Moving agents of gradational processes.
♦ Components of gradational processes.
♦ Definition of degradation.
♦ Definition of aggradation.
♦ Similarities between degradation and aggradation.
♦ Differences between degradation and aggradation.
♦ Moving agents of gradation.

Refer to the syntax of this lesson

OTHER INSTRUCTIONAL AIDS:

♦ Chalks (assorted colours)
♦ Chalkboard, dusters, rulers
♦ Lectures and discussions

CONTENT SEQUENCE:

♦ Gradational processes.
♦ Moving agents of gradational processes.
♦ Components of gradational processes.
♦ Definition of degradation.
♦ Definition of aggradation.
♦ Similarities between degradation and aggradation.
♦ Differences between degradation and aggradation.
♦ Moving agents of gradation.

INSTRUCTIONAL PROGRAMME AND SEQUENCING

LEARNING UNITS:

POST-ASSESSMENT:

FORMATIVE EVALUATION:

For the purpose of ascertaining unit-wise individual's status achievement, formative evaluation will be adopted at the end of each unit. Corrective feedback will follow the remediation and/or enrichment procedures stated below.

PRESCRIPTION:

REMEDIAION:

♦ Teacher will use tutorial for those students who may lack knowledge essential for the programme and/or unit.
Hierarchical outline showing similarities and differences between degradation and aggradation (Chart 5.8), components of gradational process (Chart 5.3), and moving agents of gradation (Chart 5.2) will be used during remediation for this unit.

Hierarchical outline of gradational process will also form part of alternative source of remediation.

Some topics relevant to IX class students will be assigned to those students who have achieved mastery faster than others (Oxford Children's Encyclopaedia AB to ZU Vols. 1 to 9 (1996) and the Oxford Children. References Library (2) Exploring the World, 1996).

Teacher will guide students through the enrichment material.

Teacher presents eight objectives of Unit V and presents the advance organizer.

External processes act slowly by wearing out; teaching down, the highlands and soils; carry away and deposit the worn out material in the lowlands away from, their original places. They reduce differences in heights between the highlands and low lands with the action of external agents like rivers, winds, rainfall, waves, glaciers, and weathering. External Processes are therefore sometimes referred to as gradational process.

Chart 5.0

HIERARCHY OF DEFINING ATTRIBUTES OF GRADATIONAL PROCESSES
(Relate this with Chart 4.0) Defining attributes of external Processes in the previous Lesson)

Attributes of Gradational Processes

- Reduce the Surface of Land
- Take place in the atmosphere and hydrosphere
- Affects the Land surface
- Act slowly
- Wear out
- Tear down
- Carry away
- Deposit
DEFINITION OF GRADATIONAL PROCESSES

These are the processes which reduce the land surface by wearing out, tearing down, carrying away and deposit all the weathered rock and soil particles in different regions away from their original place.

Chart 5.2
EXAMPLES OF MOVING AGENTS OF GRADATIONAL PROCESS:
(Relate these examples with (Chart 4.1) Agents of External Processes already done in the previous lesson)

Examples of Moving Agents of Gradational Process
(Weathered material are transported by these moving agents)

- Rivers
- Weathering
- Glaciers
- Rainfall
- Waves
- Winds

GIVE EXAMPLES:

Repeat:
- Refer to:
  - Advance organizer earlier presented
  - Defining attributes of gradational process (Chart 5.0) and relate it with (Chart 4.0) defining attributes of external processes done in the previous lesson.
  - Definition of gradational processes; (Chart 5.1) and
  - Hierarchical outline showing examples of moving agents of gradational processes (Chart 5.2) and relate these examples with (Chart 4.1), Agents of external processes already done in the previous lesson

Awareness of the learners' relevant Knowledge and experience:
- Prompt for more examples relevant to this learning unit and the organizer.

Phase II: Present Material:
- Present differentiation of concepts in the lesson progressively i.e.
  - Defining attributes of gradational processes (Chart 5.0) and Relate it with (Chart 4.0). Defining attributes of external processes done in the previous lesson.
  - Defining of gradation processes (Chart 5.1) and
  - Hierarchy of defining-attributes of gradational processes (Chart 5.0)
Appendix -D

Takes along the Deposit the eroded to becoming particles far away prominent from their original place.

Active in the Carry eroded material high land away from their original areas places with the help of winds, rainwater, rivers.

Remove the earth crust from the highlands with the help of rivers rain water, winds.

▼

Decreases the land level where it is active.

Poor type of soil Takes place at the same time with aggradation.

Maintain Attention:

Make Organization Explicit:

Logical Order:

Phase III : Strengthening of cognitive Organization:

Revise Principles of Integrative reconciliations

Hierarchical outline showing examples of moving agents of gradational processes (Fig. 5.2).

Present the differentiated hierarchies sequentially by adding elements being discussed during the lesson in the hierarchy.

By Constantly referring to the learning hierarchies, defining attributes, examples and generalization earlier presented at the beginning of the lesson.

All the learning tasks to be tackled sequentially throughout the lesson.

Involve students in the lesson a lot and keep on checking their understanding abilities throughout the lesson session.

Chart 5.4

DEFINING ATTRIBUTES OF DEGRADATION

Aggradation

Chart 5.3

HIERARCHY SHOWING COMPONENTS OF GRADATIONAL PROCESSES

Degradation

(Chart 5.4)
Aggradation
- Is a component of gradational processes.
- Take place at the same time with degradation in different areas.
- Acts gradually on the face of the land over along period of time.

Degradation
- Is a component of gradational processes.
- Take place at the same time with aggradation in different areas.
- Acts gradually on the face of the land for along period of time.

SIMILARITIES BETWEEN DEGRADATION AND AGGRADATION

<table>
<thead>
<tr>
<th>Degradation</th>
<th>Aggradation</th>
</tr>
</thead>
<tbody>
<tr>
<td>♦ Is a component of gradational processes.</td>
<td>♦ Is a component of gradational processes.</td>
</tr>
<tr>
<td>♦ Take place at the same time with degradation in different areas</td>
<td>♦ Take place at the same time with degradation in different areas</td>
</tr>
<tr>
<td>♦ Acts gradually on the face of the land for along period of time</td>
<td>♦ Acts gradually on the face of the land over along period of time</td>
</tr>
</tbody>
</table>
Interactive Discussion Sessions

♦ Students relate how agents of gradation process affect the face of the land the earth (Lithosphere) our environment.

Promote Active Reception Learning:

- Weathering
- Glaciers
- Waves
- Winds
- Rivers

Hierarchical Outline Showing Main Agents of Gradation Relate this (Chart 5.2) and (Chart 4.1) is earlier discussed.

Agents of Gradation Processes

Interactive Discussion Sessions

♦ Students relate how agents of gradation process affect the face of the land the earth (Lithosphere) our environment.

Clarify:

- Some areas of the topic related to the definition of gradations processes (Chart 5.1); defining attributes of degradation (Chart 5.4); definition of aggradation (Chart 5.5); and similarities and differences between degradation and aggradation (Chart 5.8 and Chart 5.9) respectively.
In Phase II; proper caution is taken in the organization of instructional material. This is because, a well-organized material is the critical support requirement of the model; and that

- Well-formed and synchronized structural hierarchies of content and transparencies of Over Head Projector (OHP) will form the support system during instructions.

This will be administered at the end of the experiment to grade students according to their achievement of the course intentions.

Summative Evaluation will be final and grades assigned will reflect students' achievement throughout their scholastic career during this course.

Social system reflects upon the kind of teacher taught inter-relational patterns in the class with very specified roles of the teacher and students.

Teacher's Role:
- Retain control of the intellectual structure as students continually relate the learning tasks to the organizer earlier presented
- Helps students differentiate new learning tasks from previously learned tasks;
- Encourage more interactive learning situation especially in Phase III of the lesson and;
- Encourage students to initiate more questions and comments.

PRINCIPLES OF REACTION:

Students' role:
- Students are encouraged to initiate their own questions in response to their drives of meaning;
- Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge;
- Students are helped to use critical approach to new learning tasks relevant to the students' cognitive structure (as in Phase III of the Syntax of the Model);
- The teacher clarifies the learner's reaction to new learning tasks.

Support System

- In Phase II; proper caution is taken in the organization of instructional material. This is because, a well-organized material is the critical support requirement of the model; and that
- The effectiveness of advance organizer depends on an integral and appropriate relationship between the conceptual organizers and the content;
- Well formed and synchronized structural hierarchies of content and transparencies of Over Head Projector (OHP) will form the support system during instructions.

Social System:

- Common steps for the two types of advance organizers (Generalization and Analogy).

Appendix-D

Retain control of the intellectual structure as students continually relate the learning tasks to the organizer earlier presented

Helps students differentiate new learning tasks from previously learned tasks;

Encourage more interactive learning situation especially in Phase III of the lesson and;

Encourage students to initiate more questions and comments.

Students are encouraged to initiate their own questions in response to their drives of meaning;

Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge;

Students are helped to use critical approach to new learning tasks relevant to the students' cognitive structure (as in Phase III of the Syntax of the Model);

The teacher clarifies the learner's reaction to new learning tasks.

In Phase II; proper caution is taken in the organization of instructional material. This is because, a well-organized material is the critical support requirement of the model; and that

The effectiveness of advance organizer depends on an integral and appropriate relationship between the conceptual organizers and the content;

Well formed and synchronized structural hierarchies of content and transparencies of Over Head Projector (OHP) will form the support system during instructions.

This will be administered at the end of the experiment to grade students according to their achievement of the course intentions.

Summative Evaluation will be final and grades assigned will reflect students' achievement throughout their scholastic career during this course.
The main focus of this lesson is to help students relate and integrate action of wind abrasion as an agent of gradation with the action of aggradation as a process of gradation and the resultant landforms due to these processes.

At the end of instructions, students will have studied the enrichment and/or remedial material and will be able to:

- Identify the defining attributes of wind abrasion.
- Circle from the given list four agents of gradation.
- Circle from the list given three landforms formed due to wind abrasion.
- Name from the picture parts marked A, B and C.

- Identify from the picture given the name of landform make E.
Draw accurately expanded and elaborated hierarchy of gradational processes showing degradation, aggradation, moving agents of degradation, land forms due to wind abrasion and land forms due to aggradation.

Identify the name of the landform marked D.
PRE-REQUISITE KNOWLEDGE OF THE LEARNERS:

NOTE: It is required that students fulfill conditions of Unit V before proceeding on to the next unit.

INSTRUCTIONAL AIDS:
- Chart 6.0: Defining attributes of wind erosion.
- Chart 6.1: Examples of landforms due to wind abrasion.
- Chart 6.2: Expanded and elaborated hierarchy of gradational processes.
- Chart 6.3: Transparency: Sand dunes (Barchans).
- Chart 6.4: Transparency: Mushroom rocks (Zeungen).

OTHER INSTRUCTIONAL AIDS:
- Chalks, (assorted colours).
- Chalkboard, Rocks, Dusters
- Lectures and discussions.

CONTENT SEQUENCES:
- Wind abrasion as an agent of gradation.
- Attributes of wind abrasion.
- Landforms due to wind abrasion.
- Expanded and Elaborated hierarchy of gradational processes.

INSTRUCTIONAL PROGRAMME AND SEQUENCING LEARNING UNITS:

POST ASSESSMENT:
FORMATIVE EVALUATION:
- For the purpose of ascertaining unit wise individual's achievement; formative evaluation will be adopted at the end of each Unit. Corrective feedback will follow the remediation and/or enrichment procedures stated above.

PRESCRIPTION:
REMEDICATION:
- Teacher will use tutorial for those students who may lack knowledge essential for the programme and/or unit;
- Hierarchies of defining attributes of wind abrasion (Chart 6.0) and expanded and Elaborated hierarchies of gradational processes (Chart 6.2) will form part of remediation.
Teacher presents seven objectives of unit VI and presents the advance organizer.

Wind abrasion is more dominant in desert regions. The absence of vegetative cover and rainfall helps a lot in the removal of dry and loose soil particles by strong winds causing land forms like Mushroom rocks, (zeungen) Sand dunes (Barchans) and Loess soils.

Identify defining attributes:

- Transparency of (Chart 6.3) sand dunes (Barchans) and Chart 6.4 showing mushroom rocks (Zeungen) will also form an alternative part of remediation.

- Some topics relevant to IX grade social studies students will be assigned to those students who have achieved mastery faster than others. [Oxford Children's Encyclopaedia AB to ZU vols. 1 to 9 (1996) and the Oxford Children's Reference Library (2). Exploring the World, 1966] will also form part of remediation package.

- Teacher will guide students through the enrichment material.

ENRICHMENT:

SYNTAX:

PHASE I: Clarify the Objectives of the Lesson:

Generalization VI:

- Teacher presents seven objectives of unit VI and presents the advance organizer.

- Wind abrasion is more dominant in desert regions. The absence of vegetative cover and rainfall helps a lot in the removal of dry and loose soil particles by strong winds causing land forms like Mushroom rocks, (zeungen) Sand dunes (Barchans) and Loess soils.

Identify defining attributes:

- (Chart 6.0)
  Defining Attributes of Wind Erosion

(Chart 6.0)
Attributes of Wind Erosion/Abraision

Dominant in desert regions
Associated with the absence of vegetative cover
Almost non existent in rainfall regions
Carry the particles away to different regions
Remove loose soil and dry soil particles by strong winds
Appendix-D

All learning tasks to be tackled sequentially throughout the lesson.
Involve students in the lesson a lot and keep on checking their understanding abilities throughout the lesson-session.

Make organization explicit:
Logical order:

Repeat:
Awareness of the students' relevant knowledge and experience:

Phase II: Present Material:

Maintain attention:

Give Examples:

Examples of land forms due to wind abrasion

Sand dunes or (Barchans)
Loess soils as in N.W. Beijing in China
Mushroom rocks (Zeungen)

Example:
Mushroom rocks (Zeungen)
Loess soils as in N.W. Beijing in China
Sand dunes or (Barchans)

Repeat:
Refer to advance organizer earlier presented:
• Attributes of wind abrasion
• Examples of land forms due to wind abrasion

Prompt for more examples relevant to the learning unit and the organizer experience:

Present defining attributes of wind abrasion
Hierarchy showing examples of land forms due to wind abrasion

By constantly referring to the hierarchical defining attributes, examples and generalization earlier presented.

All learning tasks to be tackled sequentially throughout the lesson.
Involve students in the lesson a lot and keep on checking their understanding abilities throughout the lesson-session.

(Chart 6.1)
Phase III: Strengthening of cognitive organization: 
Revise principle of integrative reconciliation: 

EXPANDED AND ELABORATED HIERARCHY OF GRADATIONAL PROCESSES

Gradational Processes

- Degradation (Component)
  - Moving Agents
    - Main Activity (Erosions)
      - Rivers
      - Winds
      - Waves
      - Glaciers
      - Weathering

- Aggradation (Component)
  - Main Activity (Deposition)
    - Example of Landforms due to (Aggradation)
      - Rivers
      - Alluvial soils
      - Terminal moraines
      - Lateral moraines
      - Loess soils
      - Silts

Examples of Landforms due to Wind Abrasion

- Sand Dunes (Barchans)
- Loess soils in N.W. Beijing in China
- Mushroom rocks (Zeungen)
The course rock particles and pebbles are carried only a few metres away. But fine sand grain particles are carried away and deposited in far distant lands like Loess soils in Beijing in China.
Promote active reception learning:

- Interactive discussion session:
  - Students relate gradational processes with its components, moving agents of degradation, land forms due to wind abrasion and land forms due to aggradation (Chart 6.2), Expanded and Elaborated Hierarchy of gradational processes.
  - Discuss (Chart 6.3 and 6.4) transparency showing sand dunes due to wind abrasion and Mushroom rocks (Chart 6.4). Transparency wing sand dunes due to wind abrasion and Mushroom rocks (Chart 6.4).

Clarify:

- Land forms due to aggradational activities and land forms due to wind abrasion (degradation) activities.

SOCIAL SYSTEM:

Social system reflects upon the kind of teacher-taught interelational patterns in the class with very specified roles of the teacher and students.

Teacher's Role:

- Retain control of the intellectual structure as students continually relate the learning tasks to the organizer earlier presented;
- Helps students differentiate new learning tasks from previously learned tasks
- Encourage more interactive learning situations especially in phase III of the lesson; and
- Encourages students to initiate more questions and comments.

PRINCIPLES OF REACTION:

Students' Role:

- Students are encouraged to initiate their own questions in response to their own drives of meaning.
- Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge.
- Students are encouraged to initiate their own questions in response to their own drives of meaning.
- Students are helped to use critical approach to knowledge by making differentiated and reconciliation of new learning tasks relevant to their cognitive structure (as in Phase III of the syntax of the model).

Appendix-D
In phase II, proper caution was taken in the organization of instructional material. This is because, a well-organized material is the critical support requirement of the model; and that the effectiveness of advance organizer depends on an integral and appropriate relationship between the conceptual organizer and the content. Well-formed and synchronized structural hierarchies of content and transparencies, and Over Head Projector (OHP) will form the support system during instruction. This will be administered at the end of the experiment to grade students according to their enrichment of the course intentions. Summative evaluation will be final and grades assigned will effect students’ achievement throughout their scholastic career during this course.
The main focus of this lesson is to help students relate the importance of rivers and the circulatory systems to human life and major landforms arising from river erosion as agents of degradation.

At the end of instructions, students will have studied the enrichment and/or remedial material and will be able to:
- By marking select statements, which best describe major attributes of a river.
- From the list given, identify two examples of geologically old rivers in India.
- Choose from the statements below, geologically new rivers in India.
- Discriminate from the choices given, one statement which best describe the importance of rivers as circulatory system.
- Identify from the choices given below, statements which best describe boding of water (Hydrosphere).
- Identify from the choices given, geologically old rivers in Africa.
- From the list given below, which one of them best illustrate rivers in India flowing into the Bay of Bengal.
- List out from the choices below, rivers in India flowing into the Arabian Sea.
- Identify by circling from the choices below, landforms due to river erosions.

PREREQUISITE SKILLS OF THE STUDENTS:

Note: It is required that students fulfill conditions of Unit VI test items before proceeding to the next unit.

INSTRUCTIONAL AIDS:
- Chart 7.0: Hierarchy showing defining attributes of rivers.
- Chart 7.1: Definition of rivers.
- Chart 7.2: Examples of Geologically old and new rivers.
- Chart 7.3: Hierarchical outline showing importance of rivers as circulatory systems.
♦ Teacher will use tutorial for those students who may lack knowledge essential for the programme and/or unit;
♦ Hierarchies showing rivers in India flowing into the Bay of Bengal and Arabian Sea as part of remediation packages.

OTHER INSTRUCTIONAL PACKAGES:

♦ Chalks (assorted colours)
♦ Chalkboard, dusters, rulers,
♦ Lectures and discussions.

CONTENT SEQUENCE:

♦ Attributes of a river.
♦ Examples of geologically old rivers of India.
♦ Examples of Geologically new rivers in India.
♦ Importance of rivers as circulatory system.
♦ Bodies of water (Hydrosphere).
♦ Geological old rivers in Africa.
♦ Rivers in India flowing into the Bay of Bengal.
♦ Rivers in India flowing into the Arabian Sea.
♦ Landforms due to river erosions.

INSTRUCTIONAL PROGRAMME AND SEQUENCING LEARNING EVENTS:

POST-ASSESSMENT FORMATIVE EVALUATION:

For the purpose of ascertain unit wise individual’s status achievement; formative evaluation will be adopted at the end of each unit. Corrective remedial feedback will follow the remediation and/or enrichment procedures has stated below.

PRÉSCRIPTION:

♦ Teacher will use tutorial for those students who may lack knowledge essential for the programme and/or unit;
♦ Hierarchies showing rivers in India flowing into the Bay of Bengal and Arabian Sea and their tributaries (Chart 7.7) as part of remediation packages.
A river is a body of water which flows, natural and is lower than the area around it; can move faster or slower and is either geologically old or new.
IV
>

Involve students a lot in the lesson and keep on checking their understanding abilities throughout the lesson-session.

Logical Order:

> All learning tasks to be tackled sequentially throughout the lesson.

Make organization Explicit:

> By constantly referring to the organizer, defining attributes of rivers (Chart 7.0); and examples of geologically old and new rivers (Chart 7.2)

Maintain attention:

> Prompt for more examples, a characteristics and attributes relevant to the learning unit and the organizer.

Awareness of the students' relevant knowledge and experience:

> Refer to the advance organizer earlier presented.
  ♦ Defining attributes of a river (Chart 7.0)
  ♦ Definition of rivers (Chart 7.1)
  ♦ Hierarchy showing examples of Geologically old and new rivers

Repeat:

> Present defining attributes of rivers (Chart 7.0).
  ♦ Present definition of rivers (Chart 7.1)
  ♦ Hierarchical outline showing examples of Geologically old and new rivers (Chart 7.2)

Give Examples:

> Example of geologically old and new rivers

Appendix-D

Chart 7.2
EXAMPLES OF GEOLOGICALLY OLD AND NEW RIVERS

Krishna Beas Ganga Brahmaputra Mississippi Amazon Zambezi Irrawady Nile Narmada Sutlej

Repeat:

> Refer to the advance organizer earlier presented.
  ♦ Defining attributes of a river (Chart 7.0)
  ♦ Definition of rivers (Chart 7.1)
  ♦ Hierarchy showing examples of Geologically old and new rivers

Make organization Explicit:

> By constantly referring to the organizer, defining attributes of rivers (Chart 7.0); and examples of geologically old and new rivers (Chart 7.2)

Logical Order:

> Involve students a lot in the lesson and keep on checking their understanding abilities throughout the lesson-session.
Appendix D

Chart 7.3
HIERARCHICAL OUTLINE

Economic Importance of Rivers as Circulatory System

- Generate Electricity
- Water used in industries
- Drinking Water
- Water for Cooling purpose i.e. (In Hospitals)
- Transport System
- Cooling Purpose
- River water used for irrigation purposes

Chart 7.4
HIERARCHY SHOWING IMPORTANCE OF BLOOD AS A CIRCULATORY SYSTEM TO HUMAN BODY

Blood Circulatory System

- Keep the body Temperatures warm (generate heat)
- Pure Blood used in the body and the impure Blood repurified for re-use
- Carry wastes
- Body use Blood as Industries uses water
- Transport System (food)
Appendix-D

VI

Congo Nile

Ravi Ganga Yamuna Indus Sutlej Beas Godavari Narmada

Rivers in India

Examples)

Rivers in Africa

(Fig. 7.6)

BODIES OF WATER

(Hydrosphere)

Rivers Ponds Lakes Swamps Oceans

Rivers in India
(Examples)

Zambezi Congo Nile

Ravi Ganga Yamuna Indus Sutlej Beas Godavari Narmada

Chart 7.5

SIMILARITIES AND DIFFERENCES BETWEEN RIVERS AND BLOOD AS CIRCULATORY SYSTEM

<table>
<thead>
<tr>
<th>Blood circulatory System</th>
<th>Rivers-as Circulatory System</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Provide life blood to the human body.</td>
<td>• Provide life blood (water) for industrial use, irrigation purposes, drinking, transport etc.</td>
</tr>
<tr>
<td>• Major Transport system</td>
<td>• Used for transport system</td>
</tr>
<tr>
<td>• Carry food and other nutrients in one channel</td>
<td>• Carry eroded materials in one channel</td>
</tr>
</tbody>
</table>

DIFFERENCES

• Carry impure blood in another channel

• Carry all wastes in the same channel.
Appendix-D

VII

SOCIAL SYSTEM:
Common steps for both types of advance organizers (Generalization and Analogy)

- Social system reflects upon the kind of teacher-taught interrelational patterns in the class with very specified roles of the teacher and students.

Interactive Discussion Sessions
- Students relate the river system to the circulatory system Chart 7.3 and 7.4 and similarities and differences between river and circulatory system (Chart 7.5) respectively.
- Discuss (Chart 7.6) bodies of water Hydrosphere (Chart 7.7), rivers in India flowing into the Bay of Bengal, Arubians and their tributaries, and (Chart 7.8) landforms due to river erosion.

Clarify:
- (Chart 7.4) Hierarchy showing importance of blood as a circulatory system to human body and relate it further with (Chart 7.3) hierarchical outline showing importance of rivers as circulatory system.

SOCIAL SYSTEM:
- Common steps for both types of advance organizers (Generalization and Analogy)
  - Social system reflects upon the kind of teacher-taught interrelational patterns in the class with very specified roles of the teacher and students.

(Chart 7.4)
DIFFERENT RIVERS IN INDIA FLOWING INTO THE BAY OF BENGALE
AND ARABIAN SEA AND THEIR TRIBUTARIES

(Chart 7.7)
DIFFERENT RIVERS IN INDIA FLOWING INTO THE BAY OF BENGALE
AND ARABIAN SEA AND THEIR TRIBUTARIES

(Chart 7.8)
LAND FORMS DUE TO RIVER EROSIONS
Teacher's Role:

♦ Retain control of the intellectual structure as students continually relate learning tasks to the organizer.
♦ Helps students differentiate new learning tasks from previously learned tasks;
♦ Encourage more interactive learning situations especially in Phase III of the lesson and;
♦ Encourage students to initiate more questions and comments.

PRINCIPLES OF REACTION:
Student's Role:

♦ Students are encouraged to initiate their own questions in response to their drives own of meaning.
♦ Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge.
♦ The teacher clarifies the learner's reaction to new learning tasks.
♦ Students are helped to use critical approach to knowledge by making differentiated and reconciliation of new learning tasks relevant to the student's cognitive structure as in Phase III of the Syntax of the model.

SUPPORT SYSTEM:

♦ In Phase II, proper caution is taken in the organization of instructional material. This is because, a well organized material is the critical support requirement of the Model.
♦ That, the effectiveness of advance organizer depends on an integral and appropriate relationship between the conceptual organizer and the content.
♦ Well, formed and synchronized structural hierarchies of content and transparencies of over head projector (OHP) will form the support system during instructions.

SUMMATIVE EVALUATION:

➤ This will be administered at the end of the experiment to grade students according to their achievement of the course intensions
➤ Summative Evaluation will be final and grades assigned will reflect students achievement throughout their scholastic career during this course.
INSTRUCTIONAL PACKAGES
(GENERALIZATION AS ADVANCE ORGANIZER)

INSTRUCTIONAL EVENTS FOR UNIT VIII
Focus: Common for two types of advance organizers (Generalization and Analogy).

The primary focus of this lesson will be to encourage students relate major functions of rivers into their cognitive structure by relating with the circulatory system.

INSTRUCTIONAL OBJECTIVES

- Identify from the choices given geologically old type of rivers.
- Name from the four choices geologically new types of rivers.
- Differentiate perennial and intermittent rivers.
- Represent hierarchically the work of rivers as circulatory system.
- Name two different types of landforms due to river deposition (Aggradation).
- Name at least three sources of river waters.
- Name at least four rivers flowing into the Bay of Bengal.
- Name at least three rivers flowing into the Arabian Sea.

PREREQUISITE KNOWLEDGE OF THE LEARNERS:

Note: It is required that students fulfil conditions of unit 7 test items before proceeding to unit 8.

INSTRUCTIONAL AIDS:

- Chart 8.0: Hierarchy showing different types of Blood streams.
- Chart 8.1: Hierarchy showing the work of Blood streams.
- Chart 8.2: Hierarchy showing examples of food and wastes being carried by different Blood streams.
- Chart 8.3: Hierarchy showing Geologically different types of rivers.
- Chart 8.4: Hierarchy showing other types of rivers.
- Chart 8.5: Hierarchy showing the work of rivers (Circulatory System).
- Chart 8.6: Showing hierarchy linking a river system to circulatory system.
- Chart 8.7: Hierarchy showing examples of items carried by rivers.
- Chart 8.8: Hierarchy showing rivers as Builders (Aggradation).
- Chart 8.9: Differences between rivers and circulatory system.
Teacher will use tutorial for those students who may lack knowledge essential for the programme and/or unit; hierarchies showing rivers in India flowing into the Bay of Bengal and Arabian Sea and their tributaries (Chart 7.7) as part of remediation packages. Hierarchy showing landforms due to river erosion (Chart 7.8) will also form part of an alternative source of remediation package.

OTHER INSTRUCTIONAL AIDS:
- Chalks (assorted colours).
- Chalkboard.
- Dusters, Rulers.
- Lectures and Discussion.

CONTENT SEQUENCE:
- The work of rivers.
- Geologically old and new rivers.
- Perennial and intermittent rivers.
- Land forms due to river erosions (Depositions – Aggradation).
- Sources of river water.
- Direction of river flow.
- Rivers flowing into the Bay of Bengal.
- Rivers flowing into the Arabian Sea.

INSTRUCTIONAL PROGRAMME AND SEQUENCING LEARNING UNITS:
- Refer to the Syntax of the Lesson

POST-ASSESSMENT FORMATIVE EVALUATION:
- For the purpose of ascertain unit wise individual’s status achievement; formative evaluation will be adopted at the end of each unit. Corrective remedial feedback will follow the remediation and/or enrichment procedures has stated below.

PRESCRIPTION:

REMEDIAION:
- Teacher will use tutorial for those students who may lack knowledge essential for the programme and/or unit; hierarchies showing rivers in India flowing into the Bay of Bengal and Arabian Sea and their tributaries (Chart 7.7) as part of remediation packages. Hierarchy showing landforms due to river erosion (Chart 7.8) will also form part of an alternative source of remediation package.
ENRICHMENT:

SYNTAX : GENERALIZATION:
Phase I : Clarify Objectives of the Lesson
Generalization VIII:

Identify defining attributes:

> Some topics relevant to the IX grade students will be assigned to those students who have achieved mastery faster than others. [Oxford Children's encyclopaedia AB to ZU Vols. 1 to 9 (1996) and the Oxford Children's Reference Library (2) Exploring the World (1966)].

> Teacher will guide students through the enrichment material

> Teacher presents eight objectives of the unit and presents advance organizer.

Rivers just like aorta which is one of the main blood streams carry many sources of food for plants and animals, silts, boulders, gravels, sand, uprooted trees, dead animals and other organic and inorganic matter are transported away and later deposited down the streams into the sea which eventually form spectacular land features.

> (Chart 8.0)
HIERARCHY SHOWING DIFFERENT TYPES OF BLOOD STREAMS

Aorta ➔ Veins ➔ Arteries ➔ Capillaries

> (Chart 8.1)
HIERARCHY SHOWING WORK OF BLOOD STREAMS

Transport food to all parts of the body ➔ Reconditioning ➔ Overuse ➔ Mis-use ➔ Carry Wastes

Appendix-D
Give Examples:

- Referring to the advance organizer earlier presented:
  - Hierarchy showing different types of blood-streams (Chart 8.0).
  - Hierarchy showing the work of blood-streams (Chart 8.1).
  - Hierarchy showing examples of food and wastes being carried by different blood-streams (Chart 8.2).

Repeat:

- Refer to the advance organizer earlier presented:
  - Hierarchy showing different types of blood-streams (Chart 8.0).
  - Hierarchy showing the work of blood-streams (Chart 8.1).
  - Hierarchy showing examples of food and wastes being carried by different blood-streams (Chart 8.2).

Phase II: Present Material

- Present Hierarchy showing different types of Blood streams (Chart 8.0).
- Hierarchy showing the work of Blood streams (Chart 8.1).
- Hierarchy showing examples of food and wastes being carried by different blood streams (Chart 8.2).

Phase III: Strengthening of Cognitive Organization:

- By constantly referring to the organizer earlier presented; hierarchy showing different types of blood streams (Chart 8.0); Hierarchy showing the work of blood streams (Chart 8.1), and Hierarchy showing examples of food and wastes being carried by different blood streams.

- All learning tasks to be tackled sequentially throughout the lesson.

- Involve students a lot in the lesson and keep on checking their understanding abilities throughout the lesson-session.
Appendix-D

Some Tributaries of Satluj Passing the Rajasthan Desert

(Rajasthan)

HIERARCHY SHOWING THE WORK OF RIVERS
(Rivers as Circulatory Systems)

- Carry Food
- Erosion (Degradation)
- Deposition (Aggradation)
- Over-use
- Misuse
- Reconditioning
- Carry Wastes
- Transportation

HIERARCHY SHOWING GEOLOGICAL DIFFERENT TYPES OF RIVERS

- Geologically Big Old Rivers
  - Krishna
  - Ganga
  - Indus
  - Brahmaputra
  - Mississippi
- Geologically Small New Rivers
  - Soni
  - Sutlej
  - Ravi
  - Godavari
  - Luni
  - Ravi
  - Tapti
  - Kauvery
  - Beas

HIERARCHY SHOWING OTHER TYPE OF RIVERS

- Perenial Rivers
  - Nile
  - Zambezi
  - Amazon
  - Ganga
  - Brahmaputra
  - Indus
  - Godavari
- Intermittent Rivers
  - Gaggar in Rajasthan
  - Some Tributaries of Chambal from Rajasthan
  - Some Tributaries of Satluj Passing the Rajasthan Desert
VI

Circulatory System

♦ Wastes and food supply are carried through different channels like capillaries, arteries and veins.
♦ Rejected wastes are got rid of through excretory and respiratory systems.

River System

♦ Food supply and wastes are carried in the same river channel.
♦ Do not have rejected wastes.

Rivers as Builders

Sailing
Communication

Carry
Gravels

Carry
Uprooted
Trees

Impurities
Pebbles

Sailing
Communication

Transportation
Over-use
Mis-use

Carry
Wastes

Reconditioning
Deposition
Erosion

Over-use
Mis-use

Carry
Wastes

Rivers as Transport System

Sandy
Carry
Rocks

Deposition
Aggradation

River Levees
Sils
delta
Alluvial Soil

Differences between Rivers and Circulatory System

<table>
<thead>
<tr>
<th>River System</th>
<th>Circulatory System</th>
</tr>
</thead>
<tbody>
<tr>
<td>♦ Food supply and wastes are carried in the same river channel.</td>
<td>♦ Wastes and food supply are carried through different channels like capillaries, arteries and veins.</td>
</tr>
<tr>
<td>♦ Do not have rejected wastes.</td>
<td>♦ Rejected wastes are got rid of through excretory and respiratory systems.</td>
</tr>
</tbody>
</table>
(Chart 8.10)
HIERARCHY SHOWING SOURCES OF RIVER WATER

- Rainfall
- Spring Water
- Melting Ice/Glaciers

(Chart 8.11)
DIRECTION OF RIVER FLOWS

- Originate from Higher Grounds
- Flow through into Low Lands

- Mountains
- Hilly Areas
- Sea
- Ponds
- Oceans
- Lakes

(Chart 8.12)
HIERARCHIES SHOWING RIVERS FLOWING INTO BAY OF BENGAL AND ARABIAN SEA

- Rivers Flowing into Bay of Bengal
  - Brahmputra
  - Krishna
  - Mahanadi
  - Godavari
  - Ganga

- Rivers Flowing into Arabian Sea
  - Luni
  - Indus
  - Tapti
  - Narmada
ATTRIBUTES OF PERENNIAL RIVERS
- Flows throughout the seasons.
- Have constant supply of water.
- Most of them are big geologically old rivers with numerous tributaries.
- Flows over a wide distant land area.

ATTRIBUTES OF INTERMITTENT RIVERS
- Very fast, swift with strong water currents.
- Flows for a short time may be for some hours only.
- Dry up during dry seasons.
- No constant supply of river water.
- Flows for a short distant in a small land area.
- Most of them are found in the arid and semi arid lands.
- Have got a short life span of water in it.

Promote Active Reception Learning:
- Interactive discussion sessions.

Clarify:
- Hierarchy linking a river system to circulatory system (Chart 8.6) and hierarchy showing examples of items carried by rivers (Chart 8.7).

SOCIAL SYSTEM:
- Common steps for both types of advance organizers (Generalization and Analogy)

Teacher's Role:
- Retain control of the intellectual structure as students continually relate the learning tasks to the organizer earlier presented.
- Helps students differentiate new learning tasks from previously learned tasks.
- Encourage more interactive learning situations especially in Phase III of the lesson.
- Encourage students to initiate more questions and comments.
PRINCIPLES OF REACTION:  ♦ Students are encouraged to initiate their own questions in response to their own drives of meaning.
♦ Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge.
♦ Students are helped to use critical approach to knowledge by making differentiated and reconciliation of new learning tasks relevant to the students’ cognitive structure (as in Phase III of the model).
♦ The teacher clarifies the learner’s reaction to new learning tasks.

SUPPORT SYSTEM:
♦ In Phase II, proper caution is taken in the organization of instructional material. This is because, a well organized material is the critical support requirement of the model, and
♦ That; the effectiveness of advance organizer depends on an integral and appropriate relationship between the conceptual organizer and the content.
♦ Well found and synchronized structural hierarchies of contexts and transparencies of over head projector (OHP) will form part of the support system during instructives.

SUMMATIVE EVALUATION:
➤ This will be administered at the end of the experiment to grade students according to their achievement of the course intentions
➤ Summative Evaluation will be final and grades assigned will reflect students achievement throughout their scholastic career during this course.
INSTRUCTIONAL PACKAGES  
(GENERALIZATION AS ADVANCE ORGANIZER)

INSTRUCTIONAL EVENTS FOR UNIT IX  
Topic: Division of a River Course : I  
(Upper and Middle Courses)  
Focus: Common for two types of advance organizers  
(Generalization and Analogy).

➢ The main focus of this unit is to help students integrate the upper and middle courses of a river in their cognitive structure.

➢ At the end of instructions, students will have studied the enrichment and/or remedial material and will be able to:
  ➢ State the three courses of a river from the list of choices given.
  ➢ Describe the main gradation Activities in the upper course of a river.
  ➢ Identify major landforms due to gradation activities.
  ➢ Identify economic importance of the upper course of a river.
  ➢ Describe the main gradation activities of the middle course of a river.
  ➢ Identify major landforms due to gradation activities in the middle course of a river.
  ➢ Identify economic importance of the middle Course of a river.

OBJECTIVES:

PRE-REQUISITE SKILLS OF THE STUDENTS:
Note: It is required that students fulfill conditions of unit VIII test items before proceeding on to this unit.

INSTRUCTIONAL AIDS:

- Chart 9.0: Hierarchy showing various course of a river.
- Chart 9.1: Defining attributes of the upper course.
- Chart 9.2: Economic importance of the upper course.
- Chart 9.3: Examples of landforms in this course.
- Chart 9.4: Expanded and elaborated Hierarchy (River Course).
- Chart 9.5: Defining attributes of Middle course.
- Chart 9.6: Main aggradation activities.
- Chart 9.7: Landforms due to aggradation.
- Chart 9.8: Economic Importance
- Chart 9.9: Landforms
**OTHER INSTRUCTIONAL AIDS:**
- Chalk (assorted colours).
- Chalkboard, dusters, rulers, pointer.
- Lectures and discussions.

**CONTENT SEQUENCE:**
- Divisions of a river course I (the upper and middle courses).
- Main gradation activities of this course.
- Landforms due to gradational activities.
- Economic Importance of the river at this course.
- Middle course.
- Main gradational activities.
- Landforms due to gradational activities.
- Economic importance of the river course at this stage.

**INSTRUCTIONAL PROGRAMME AND SEQUENCING LEARNING EVENTS:**

**POST-ASSESSMENT:**

**FORMATIVE EVALUATION:**
- For the purpose of ascertaining unit-wise individual's status achievement, formative evaluation will be adapted at the end of each unit. Corrective feedback will follow the remediation and/or enrichment procedures stated above.

**PRESCRIPTION:**
- Teacher will use tutorial for those students who may lack knowledge essential for the programme and/or unit.
- Expanded and elaborated Hierarchy showing the river course (Chart 9.0), Hierarchy showing attributes of the upper river course (Chart 9.1) and examples of landforms in this region (Chart 9.3) will form part of remediation package.
- Defining attributes of the middle course of a river (Chart 9.5) will also form an alternative source of remediation package.

**ENRICHMENT:**
- Some topics relevant to IX grade students will be assigned to those students who have achieved mastery faster than others [Oxford Children's Encyclopaedia AB to ZU Vols. 1 to 9 (1996) and the Oxford Children's Reference Library (2) Exploring the World, (1966)].
- Teacher will guide students throughout the enrichment material.

**SYNTAX : GENERALIZATION:**
**Phase I : Clarify Objectives of the Lesson:**
- Teacher presents seven objectives of unit IX and proceeds to present advance organizers.
GENERALIZATION IX:

A river course is divided into three main courses:

- The upper course (with steep gradient);
- The middle course (with less steep gradient); and
- The lower course (with gentle gradient).

Identify defining attributes:

(Chart 9.0)

HIERARCHY SHOWING VARIOUS COURSES OF A RIVER

The Upper Course (Steep gradient)
The Middle Course (Less steep gradient)
The Lower Course (Gentler gradient)

(Chart 9.1)

DEFINING ATTRIBUTES OF THE UPPER COURSE

Greatest Erosion
Have many tributaries joining the main river
Water rushes down the steep slopes
High land degradation
Have steep slopes

(Chart 9.2)

ECONOMIC IMPORTANCE OF THE UPPER COURSE

River waters are harnessed for hydro electricity power generation
Picnic sites for tourism industry (The Grand Canyon) of Colorado (USA)
Give Examples:

➤ Refer to advance organizer.

♦ Hierarchy showing upper course of a river (Chart 9.0).
♦ Defining attributes of upper course of a river (Chart 9.1).
♦ Economic importance of the upper course (Chart 9.2).
♦ Examples of landforms in upper course (Chart 9.3).

➤ Prompt for more examples relevant to this learning task and the organizer.

Repeat:

➤ Refer to advance organizer.

♦ Hierarchy showing upper course of a river (Chart 9.0).
♦ Defining attributes of upper course of a river (Chart 9.1).
♦ Economic importance of the upper course (Chart 9.2).
♦ Examples of landforms in upper course (Chart 9.3).

➤ Present differentiated hierarchies sequentially by adding elements being discussed during the lesson in hierarchies.

Awareness of the learner's relevant knowledge and experience:

➤ By constantly referring to the learning hierarchies, attributes and examples and the organizer earlier presented.

Phase II: Present Material:

➤ Present differentiation of concepts in the lesson progressively i.e.

♦ Hierarchy showing upper course of a river (Chart 9.0).
♦ Defining attributes of upper course of a river (Chart 9.1).
♦ Economic importance of the upper course (Chart 9.2).
♦ Examples of landforms in upper course (Chart 9.3) etc.

➤ All learning tasks to be tackled sequentially throughout the lesson.

Maintain attention:

➤ Involve students in the lesson a lot and keep on checking their understanding abilities throughout the lesson session.

Logical order:
Phase III: Strengthening of Cognitive Organization:
Revise principle of integrative reconciliation:

(Chart 9.4)
EXPANDED AND ELABORATED HIERARCHY
(River Course)

Upper Course
(Steep gradient)

Attributes
(Main Gradation Activities)

Greatest maximum erosion
Have many Tributaries joining main river

Water rushes down the steep slopes
Plenty of rapids and falls
High land degradation
Have steep slopes/gradient

Land forms

V-shaped valleys Canyons Gulleys Ravines Rapids and Falls Gorges

Economic Importance

The river waters are harnessed for hydro electricity power generation
Picnic sites for tourism industry

Appendix-D
DEFINING ATTRIBUTES OF MIDDLE COURSE

- Water overflows the river banks and flood plains
- Water submerge vast areas
- Less steep gradient
- No degradation taking place
- Very great volumes of water
- Broad river channels
- Large sweeping curves called meanders

MAIN GRADATION ACTIVITIES

- Transport eroded material
- Deposit heavier load on the way
- Over-flood the river banks
- River meanders
- Submerge vast areas of flood plains

LAND FORMS DUE TO AGGRADATION ACTIVITIES

- Oxbow Lakes
- River Levese
- Alluvial soils in flood plains deposited
- River Basins
- Delta
Retain control of intellectual structure as students continually relate the learning tasks to the organizer earlier presented.

Helps students differentiate new learning tasks from previously learned tasks.

Encourage more interactive learning situations especially in Phase III of the lesson; and

Encourage students to facilitate more questions and comments.

Teacher’s Role:

Social system reflects upon the kind of teacher taught inter-relational patterns in the class with very specified roles of the teacher and students.

Promote active Reception Learning:

Interactive Discussions
- Discussion on expanded and elaborated hierarchies of upper and middle courses of a river (charts 9.4; 9.5; 9.6; 9.7; 9.8 and 9.9) respectively.

Clarify:

Economic Importance of middle course of a river (Chart 9.8).
- Common steps for both types of organizers (Generalization and Analogy).

SOCIAL SYSTEM:

- Retain control of intellectual structure as students continually relate the learning tasks to the organizer earlier presented.
PRINCIPLES OF REACTION:
Students' Role:

♦ Students are encouraged to initiate their own questions in response to their own drivers of meaning.
♦ Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge.
♦ Students are helped to use critical approach to knowledge by making differentiated and reconciliation of new learning tasks relevant to the students' cognitive structure (as in Phase III of the Syntax of the Model), and
♦ Teacher clarifies the learners' reaction to new learning tasks.

In Phase II, proper caution is taken in the organization of instructional material. This is because, a well organized material is the critical support requirement of the model;
♦ That, the effectiveness of advance organizer depends on an integral and appropriate relationship between the conceptual organizer and the content.
♦ Well formed and synchronized structural hierarchies of content and transparencies of over head projector (OHP) will form the support system during instruction.

SUMMATIVE EVALUATION:

♦ This will be administered at the end of the experiment to grade students according to their achievement of the course intentions.
♦ Summative Evaluation will be final and grades assigned will reflect students' achievement throughout their scholastic career during this course.
INSTRUCTIONAL PACKAGES
(GENERALIZATION AS ADVANCE ORGANIZER)

INSTRUCTIONAL EVENTS FOR UNIT X
Topic: Division of a River Course: II (Lower Course)
Focus: Common for two types of advance organizers
(Generalization and Analogy).

➢ The main focus of this lesson is to guide students identify major landforms in the lower course of a river and their economic importance to man.

➢ At the end of instructions, students will have studied the enrichment and/or remedial material and will be able to:
  ♦ Identify the major attributes of the lower course of a river.
  ♦ Describe the main aggradation activities in the lower course.
  ♦ Identify major landforms due to aggradation activities.
  ♦ Name major economic activities at the lower course.
  ♦ Identify attributes of a river delta.
  ♦ Give examples in Indian rivers having delta.
  ♦ Define the term estuary.
  ♦ Give attributes of an estuary
  ♦ Give examples of some rivers in India having estuaries.
  ♦ Differentiate between a delta and an estuary.
  ♦ Differentiate between a river tributary and a distributary.

PRE-REQUISITE SKILLS OF THE STUDENTS:

➢ Note: It is required that students fulfill conditions of Unit 9 test items before proceeding on to this unit.

INSTRUCTIONAL AIDS

♦ Chart 10.0: Attributes of the lower river course.
♦ Chart 10.1: Main aggradation activities.
♦ Chart 10.2: Economic Activities.
♦ Chart 10.3: Examples of landforms due to aggradation.
♦ Chart 10.4: Examples of rivers having delta.
For the purpose of ascertaining unit-wise individual's status achievement, formative evaluation will be adapted at the end of each unit. Corrective feedback will follow the remediation and /or enrichment procedures as stated below.

Teacher will use tutorial for those students who may lack knowledge essential for
the programme and /or unit;
Expanded and elaborated Hierarchy showing the river course (Chart 9.0), Hierarchy showing attributes of the upper river course (Chart 9.1) and examples of landforms in this region (Chart 9.3) will form part of remediation package.

Defining attributes of the middle course of a river (Chart 9.5) will also form an alternative source of remediation package.

Some topics relevant to IX grade, students will be assigned to those students who have achieved mastery faster than others [Oxford Children's Encyclopaedia AB to ZU Vols. 1 to 9 (1996) and the Oxford Children's Reference Library (2) Exploring the World, (1966)].

Teacher will guide students throughout the enrichment material.

Teacher presents seven objectives of unit IX and proceeds to present advance organizers.

The valley floor in the lower course of a river has extremely gentle slopes, clogged up and obstructed channels, which divide into a number of distributaries or branches called a delta.

**CHART 10.0**

ATTRIBUTES OF THE LOWER RIVER COURSE

- Many Crops can be grown here
- Extremely gentle slopes
- Low water velocity (current)
- No transportation at this stage
- Deposition (aggradation) is the most dominant process
- Clogged up/obstructed channels
- Rich alluvial soil
CHART 10.1
MAIN AGGRADATION ACTIVITIES

- Divisions and Sub-divisions of a river channel
- Clogged river channels
- Weak water velocity
- Deposition
- No transportation of eroded materials at this stage

CHART 10.2
MAIN AGGRADATION ACTIVITIES

- Agriculture is possible
- Fish can be caught easily trapped in the shallow lagoons
- Minerals like alluvial gold, petroleum may be harnessed in some areas

CHART 10.3
EXAMPLES OF LANDFORMS DUE TO AGGRADATION

- Rich alluvial soil deposits in the flood plans
- Clogged up river channels
- Many rivers distributaries formed
- Lagoons
- Rich river levees formed at the river banks
- River Delta

Give Examples:

Minerals like alluvial gold, petroleum may be harnessed in some areas.

Fish can be caught easily trapped in the shallow lagoons.

Agriculture is possible.
Throughout the lesson sessions, involve students in the lesson at the end and keep on checking their understanding abilities. All learning tasks to be tackled sequentially through the lesson.

Logical Order:

Main Attention:

Identify defining attributes:

Repeat:

Phase II: Present Material:

Make Organization Explicit:

EXAMPLES OF RIVERS HAVING DELTA

- River Nile in Egypt flowing into the Mediterranean Sea.
- The eastern flowing rivers of India flowing into the Bay of Bengal i.e. Krishna, Kaveri, Godavari, Brahmaputra etc.

Refer to advance organized presented:

- Hierarchy showing attributes of the lower course of a river (Chart 10.0).
- Hierarchy showing main aggradation activities (Chart 10.1).
- Hierarchy showing economic activities (Chart 10.2).
- Hierarchy showing examples of landforms due to aggradation (Chart 10.3).

Present differentiation of concepts in the lesson progressively:

- Examples of rivers having a Delta (Chart 10.4).
- Examples of rivers having a Delta (Chart 10.4).
- Hierarchy showing examples of landforms due to aggradation activities (Chart 10.0).
- Hierarchy showing economic activities (Chart 10.2).
- Hierarchy showing main aggradation activities (Chart 10.1).
- Hierarchy showing examples of landforms due to aggradation (Chart 10.3).
- Hierarchy showing attributes of the lower course of a river (Chart 10.0).

Prompt for more examples relevant to this learning task and the organizer earlier presented.

Present differentiated hierarchies sequentially by adding elements being discussed:

- Hierarchy showing examples of landforms due to aggradation activities (Chart 10.0).
- Hierarchy showing economic activities (Chart 10.2).
- Hierarchy showing main aggradation activities (Chart 10.1).
- Hierarchy showing examples of landforms due to aggradation (Chart 10.3).

All learning tasks to be tackled sequentially throughout the lesson.

Involve students in the lesson a lot and keep on checking their understanding abilities.

By constantly referring to the learning hierarchies, attributes and examples and the organizer earlier presented:

- By constantly referring to the learning hierarchies, attributes and examples and the organizer earlier presented.

Awareness of the learners' relevant knowledge and experience:

Experience of the learners' relevant knowledge and experience:

Repeat:

- The lessons regarding rivers flowing into the Bay of Bengal.
- River Nile in Egypt flowing into the Mediterranean Sea.
- Examples of rivers having a Delta (Chart 10.4).

Identify defining attributes:
**Appendix D**

**CHART 10.5**

**ATTRIBUTES OF A RIVER DELTA**

- Vast Triangular In shape
- Have deposits of rich alluvial soils
- Eroded materials deposited down the mouth of river
- Mud gets mixed with sea water and projects outwards

**CHART 10.6**

**ATTRIBUTES OF A RIVER ESTUARY**

- Carry eroded materials into deep sea
- No sedimentation at the confluence
- Rapids have deep, narrow channels
- Have very clear entrance at sea
- Enters the sea with only one mouth (tributary)

**CHART 10.7**

**DEFINITION OF AN ESTUARY**

Is a swift flowing river which enters the sea with only one entrance (mouth) with deep narrow clear channels.

**CHART 10.8**

**EXAMPLES OF RIVERS HAVING ESTUARIES**

- River Congo in Central Africa
- Rivers in India flowing into the Arabian Sea.
- Narmada
- Lurii
- Indus

Phase III: Strengthening of cognitive Organization:
Revise Principles of Integrative Reconciliation:
### Differences Between a River Delta and an Estuary

<table>
<thead>
<tr>
<th>River Delta</th>
<th>Estuary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have many entrances as it enters the sea.</td>
<td>Has only one entrance as it enters the sea.</td>
</tr>
<tr>
<td>Has wide channels.</td>
<td>Has deep narrow channels.</td>
</tr>
<tr>
<td>Characterized by depositions.</td>
<td>No deposition takes place right from its source up to the sea.</td>
</tr>
<tr>
<td>Due to high aggradation, the surrounding catchment areas have very poor soil texture.</td>
<td>Due to too much degradation, the surrounding catchment areas have very poor soil texture.</td>
</tr>
<tr>
<td>Active in aggradation.</td>
<td>Active in degradation.</td>
</tr>
<tr>
<td>Branches away from the main river.</td>
<td>Joins the main river at the confluence and adds more water to it.</td>
</tr>
<tr>
<td>Tributary</td>
<td>Tributary</td>
</tr>
</tbody>
</table>

### Chart 10.9

- **Sedimentation in the main channel.**
- **Silt rapid flow at all levels.**
- **Has no distributaries as it enters the sea.**
- **Has clear entrance.**
- **Has deep narrow channel.**
- **Has many entrances as it enters the sea.**
- **A river delta.**
Economic importance of the Lower course of a river (Chart 10.11) and differences between a delta and estuary (Chart 10.9 and Chart 10.10).

**Lower River Course**
- Extremely Gentle Slopes
- Main Aggradation Activities
- Clogged Rich in fish river channels river lagoons
- Weak water currents

**Depositions Divisions and sub-divisions of**
- River channels
- Landforms

**Economic Importance**
- Agriculture
- Fishing can be done in the lagoons
- Petroleum and gas may be found
- Minerals like alluvial gold may be found

**Between a delta and estuary (Chart 10.9 and Chart 10.10).**

**EXPANDED AND ELABORATED HIERARCHY SHOWING LOWER RIVER COURSE**

- Economic Importance of the Lower course of a River (Chart 10.11) and differences
- Discuss expanded and elaborated hierarchy on the lower river course

**Promote Active Reception Learning:** Interactive discussions

Discuss expanded and elaborated hierarchy on the lower river course (Chart 10.1).
Appendix-D

Social system reflects upon the kind of teacher taught interrelational patterns in the class with very specified roles of the teacher and students.

**Teacher's Role:**

- PRINCIPLES OF REACTION:
  - Retain control of intellectual structure as students continually relate the learning tasks to the organizer earlier presented.
  - Helps students differentiate new learning tasks from previously learned tasks.
  - Encourage more interactive learning situations especially in Phase III of the lesson, and
  - Encourage students to facilitate more questions and comments.

- Students Roles:
  - Students are encouraged to initiate questions in response to their own drives of meaning.
  - Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge.
  - Students are helped to use critical approach to knowledge by making differentiated and reconciliation of new learning tasks relevant for the students' cognitive structure (as in Phase III of the syntex of the Model, and
  - Teacher clarifies the learner's reaction to new learning tasks.

**Support System:**

- SUMMATIVE EVALUATION
  - In Phase II, proper caution is taken in the organization of instructional material.
  - This is because a well organized material is the critical support requirement of the model and
  - That, the effectiveness of advance organizers depend on an integral and
  - Well formed and synchronized structural hierarchies of the content and
  - Appropriate relationships between the conceptual organizers and the content.
  - The effectiveness of advance organizers depend on an integral and
  - Well formed and synchronized structural hierarchies of the content and
  - In Phase II, proper caution is taken in the organization of instructional material.

IX

SOCIAL SYSTEM: Common steps for both types of organizers (Generalization Analogy)
INSTRUCTIONAL PACKAGES

Chart 11.4: Land forms due to underground water.
Chart 11.5: Hierarchy showing examples of components of mouth part.

INSTRUCTIONAL PACKAGES

Chart 11.0: Transparency showing human mouth part in relation to caverns in limestone regions.
Chart 11.1: Contents of underground water.
Chart 11.2: Structural outline of characteristics of underground water.
Chart 11.3: Effects of underground water.
Chart 11.6: Land forms due to underground water.

INSTRUCTIONAL OBJECTIVES:
The main focus of this unit is to encourage students to know the working of underground water as an agent of gradation and integrate them with resultant land forms on the face of the land and link this to the human head unit III already done.

At the end of instructions, students will be able to:

♦ Define effects of underground water as an agent of gradation.
♦ State major characteristics of underground water.
♦ Describe how caverns or caves in limestone regions are formed.
♦ Give two major functions of underground water.
♦ State major characteristics of underground water.
♦ Identify some characteristics of stalactites and stalagmites.
♦ Define differences between stalactites and stalagmites.
♦ Describe how caverns or caves in limestone regions are formed.
♦ Define two major functions of underground water.

INSTRUCTIONAL AIDS:
- Chart 11.0: Transparency showing human mouth part in relation to caverns in limestone regions.
- Chart 11.1: Contents of underground water.
- Chart 11.2: Structural outline of characteristics of underground water.
- Chart 11.3: Effects of underground water.
- Chart 11.4: Land forms due to underground water.
- Chart 11.5: Hierarchy showing examples of components of mouth part.

PRE-REQUISITE SKILLS OF THE STUDENTS:
- Note: It is required that students fulfill conditions of unit X test items before proceeding to this unit.

INSTRUCTIONAL EVENTS FOR UNIT XI

Topic: Underground Water as an Agent of Gradation

(Generalization as Advance Organizer)
CONTENT SEQUENCE:

INSTRUCTIONAL PROGRAMME AND SEQUENCING

LEARNING EVENTS:

POST-ASSESSMENT:

PRESCRIPTION:

OTHER INSTRUCTIONAL AIDS:

Appendix-D
The entire mouth of a human being looks like the caverns found in the limestone regions. The mouth structure (Chart 11.0) where the teeth resemble stalactites and stalagmites, the saliva flows like underground water and springs waters and salivary ducts resemble the underground waterways. (1996)

**Teacher:**

She will guide students throughout the enrichment material.

**SYNTAX : GENERALIZATION:**

Teacher presents seven objectives of unit XI and proceeds to present advance objectives identifying defining attributes:

**PHASE I: Clarify Objectives of the Lesson:**

**ENRICHMENT:**

**GENERALIZATION XI:**

THE MOUTH STRUCTURE

(Chart 11.0)

[Diagram of mouth structure with labels:]

- TOP TEETH
- LOWER TEETH
- MOUTH CAVITY
- TEETH INITIATION
- TEETH DEVELOPMENT
- TEETH FUNCTION
- TEETH CARE

Enrichment: Showing differences between stalactites and stalagmites (Chart 11.1) will

Apéndice D
Appendix-D

Consists of soluble rocks like limestone.
- Consists of calcium.
- Rainwater dissolves carbon dioxide from the atmosphere.
- Reacts chemically with calcium carbonate and calcium-bicarbonate formed.

**EFFECT OF UNDERGROUND WATER ON THE FACE OF THE LAND**

*Most active in limestone region*
*Rain water absorbs carbon-dioxide from the atmosphere*
*Soluble limestone rocks dissolve in water*
*Formation of furrows as landforms*
*Formation of dints as landforms*
*Rainfall reacts chemically with calcium carbonate resulting to the formation of soluble calcium-bicarbonate*

**COMPONENTS OF UNDERGROUND WATER**

- Consists of soluble rocks like limestone.
- Consists of calcium.
- Rainwater dissolves carbon dioxide from the atmosphere.
- Resulting to formation of soluble calcium-bicarbonate.

**STRUCTURAL OUTLINE SHOWING CHARACTERISTICS OF UNDERGROUND WATER**

- Formation of soluble calcium-bicarbonate from rainwater absorbs carbon-dioxide from the atmosphere.
- Resulting to formation of soluble calcium-bicarbonate.
Appendix-D
Awareness of the learner's relevant knowledge and experience:

Phase II: Present Material:

Maintain attention:
- Make organization explicit;
- Logical order:
- Revise principle of integrative reconciliation:
  - Prompt for more essential features of the learning tasks and provide more examples relevant to the organizer.
  - Present differentiation of concepts in the lesson progressively so that students can see how ideas relate to each other.

Phase III: Strengthening of Cognitive Organization:

Give organization explicit:
- Make organization explicit;
- Logical order:
- Revise principle of integrative reconciliation:
  - Prompt for more essential features of the learning tasks and provide more examples relevant to the organizer.
  - Present differentiation of concepts in the lesson progressively so that students can see how ideas relate to each other.

INTEGRATIVE RECONCILIATION
RELATIONSHIP BETWEEN MOUTH AND CAVE OR CAVES IN THE LIMESTONE REGIONS

- The upper jaw looks like the roof of a cave.
- The lower jaw looks like the floor of a cave.
- The upper teeth are facing downwards and whitish in color resemble the stalactites, which hang from the roof of a cave.
- The lower teeth are facing upwards, resembling stalagmites, which grow from the floor of a cave.

VI
When the mouth is shut, the teeth come together which resembles pendants or pillars of the stalactite and stalagmites which have power and meet together in the cave.

The salivary glands are dean and colourless just like the crystal clear spring waters.

The spores or root hair on the mouth ache resembles the sinkholes and the hair like the forest, trees with grass covering the caves.

FORMATION OF CAVES OR CAVERNS IN LIMESTONE REGIONS
- Soluble caldum bi-carbonate and water percolate through rock-joints and fissures leading to formation of caves below the ground.
- Warm cave water seepage evaporates leading to deposition of lime in the upper (roof) of the caves making various shapes.
- The lime deposits grow slowly with some dropping down on the cave floor.
- These deposits grow from the cave bottom facing upwards, are known as stalagmites.
- The ones, which grow from the cave bottom facing downwards, are known as stalactites.
- In some caves in limestone regions, both stalactites and stalagmites grow until they join together forming rock pillars (columns) known as pendants in the cave.

PICTURE OF STALACTITES AND STALAGMITES: IN RELATION TO THE MOUTH
- In some caves in limestone regions, both stalactites and stalagmites grow until they join together forming rock pillars (columns) known as pendants in the cave.
- When the mouth is shut, the teeth come together which resemble pendants in the cave.
Both are found in limestone regions.

Both landforms are formed through the same process.

Both are formed out of limestone rocks.

Both are found in caves or caverns in limestone regions growing either upwards or downwards.

Both form pillars (Pendants) after along period of time before joining together to form pillars or columns.

Both are formed through chemical processes.

DIFFERENCES BETWEEN STALACTITES AND STALAGMITES IN RELATION TO THE MOUTH

Are narrower and slender
Grows downward towards the floor bottom of the cave.

Have broader bases and thick as it grows upwards.
Grow upward from the cave bottom towards the roof of the cave facing upwards.

SIMILARITIES BETWEEN STALACTITES AND STALAGMITES

Promote active Reception Learning:

Interactive Discussions:

Common steps for both types of organizers (Generalization and Analogy).
Teacher's Role:

**PRINCIPLES OF REACTION:**

- Retain control of the intellectual structure as students continually relate the learning tasks to the organizer earlier presented.
- Helps students differentiate new learning tasks from previously learned tasks.
- Encourage more interactive learning situations especially in Phase III of the lesson and.
- Encourage students to initiate more questions and comments.
- Students are encouraged to initiate their own questions in response to their own drives of meaning.
- Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge.
- Students are encouraged to differentiate new learning task and reconcile them with a well organized material relevant to the students' cognitive structure (as in Phase III of the Syntax of the Model).
- Teacher clarifies the learners' reaction to new learning tasks.
- In Phase II, proper caution is taken in the organization of instructional material. This is because a well organized material is the critical support requirement of the model.
- Teacher differs the learners' reaction to new learning tasks.

**SUMMATIVE EVALUATION:**

- It will be administered at the end of the experiment to grade students according to their achievement of the course intentions.
- Summative Evaluation will be final and grades assigned will reflect students' achievement throughout their scholastic career during this course.

**SUPPORT SYSTEM:**

- Well formed and synchronized structural hierarchies of content and transparencies will form the support system during instruction.
- Effective relationships between the conceptual organizer and the content.
- The effectiveness of advance organizer depends on an integral and applicable relationship between the conceptual organizer and the content.
- Teachers clarify the learners' reaction to new learning tasks.

**Social system reflects upon the kind of teacher-student interactional patterns in the class with very specified roles of the teacher and students.
INSTRUCTIONAL PACKAGES

INSTRUCTIONAL EVENTS FOR UNIT XII

Topic: Glaciers
Focus: Common for two types of advance organizers (Generalization and Analogy).

INSTRUCTIONAL PACKAGES

DEFINING CHARACTERISTICS OF GLACIERS

Examples of different types of glaciers.

INSTRUCTIONAL OBJECTIVES:

1. Define the meaning of the term glaciers as an agent of gradation.
2. Identify major characteristics of glaciers.
3. Name from the incomplete statements two types of glaciers.
5. Explain the meaning of the term glaciers as an agent of gradation.
6. Identify major characteristics of glaciers.
7. At the end of this unit, students will be able to:
   - Identify the sources which get their water from snow glaciers on the Himalaya mountain.
   - Identify from the list given landforms due to glaciation.
   - Study the effect of action of valley glaciers on the face of the land.
   - Differentiate Continental and Mountain Glaciers.
   - Name from the incomplete statements two types of glaciers.
   - Identify major characteristics of glaciers.

PRE-REQUISITE SKILLS OF THE LEARNERS:

Note: It is required that students fulfill conditions of unit XI test items before proceeding to this unit.

INSTRUCTIONAL AIDS:

Chart 12.0: Defining attributes of glaciers.
Chart 12.1: Examples of different types of glaciers.
Chart 12.2: Characteristics of snow-line.
Chart 12.3: Definition of glaciers.
Chart 12.4: Examples of mountains having permanent ice and snow.
Chart 12.5: Examples of places covered by ice and snow.
Chart 12.6: Differences between Continental and Mountain Glaciers.

Appendix-D
Refer to the syntax of this unit

- Land forms due to glaciation
- Action of valley glaciers on the face of the land
- Characteristics of mountain glaciers
- Mountain glaciers
- Characteristics of continental glaciers
- Continental glaciers
- Type of glaciers
- Characteristics of glaciers
- Meaning of the term glaciers

- Lectures and class discussions
- Blackboard, duster, ruler, pointer
- Chalks (asserted columns)

- Chart 12.7
- Chart 12.8
- Chart 12.9

- Chart 12.10: Land forms due to glaciation
- Chart 12.9: Action of valley glaciers
- Chart 12.8: Action of valley glaciers
- Chart 12.7: Characteristics of continental glaciers

**Instructional Programme and Sequencing:**

**Learning Events:**

- Post-assessment:

**Formative Evaluation:**

- Teacher will use local exit to assess students who may lack knowledge essential for the programme and/or unit.

- Remediation and/or enrichment procedures stated above:

- Remediation will be adapted at the end of each unit. Corrective feedback will follow the formative evaluation.

- Teacher will use quiz to determine unit-wise individual's status achievement. Remedial and/or enrichment exercises will be conducted as needed.

- Teacher will use tutorial for those students who may lack knowledge essential for the programme and/or unit;
In the polar regions, snow lines are found at the sea level. These are moving masses of ice found in the polar regions and high mountain areas.

**Definition of Glaciers**

Glaciers are moving masses of ice found in the polar regions and high mountain areas having permanent ice and snow cover. Very cold temperatures below freezing point are found in high altitudes of snow lines. Snow moving sheets are slow moving masses of ice or snow that form in high altitudes. Glaciers are agents of degradation and occur in the polar regions and high mountain peaks. Snow lines are formed at sea level in the polar regions.

**Characteristics of Snow Line**

- An agent of degradation
- High mountain peaks
- Formation at sea level
- Snow line is associated with temperatures below freezing point
- Snow moving sheets
- Slow moving masses of ice or snow
- Permanent ice and snow cover
- Very cold temperatures below freezing point
- Found in high altitudes

**Defining Attributes of Glaciers**

- Having permanent ice and snow cover
- Glaciers are moving masses of ice found in the polar regions and high mountain areas
- Teacher presents the objectives of unit 12 and proceeds to present advance organizer
- Teacher will guide students throughout the enrichment material

**Enrichment**

- Generalization X:
  - Phase I: Clarify objectives of the lesson
  - Syntax: Generalization

- Wanda (1996)
  - Same topics relevant to IX grade students will be assigned to those students who have achieved mastery. Children's Reference Library (2): Exploring the NZ Vols. 1 to 9 (1996) and the Oxford Children's Reference Library (2): Exploring the some topics relevant to IX grade students will be assigned to those students who have achieved mastery.
Give Examples:
(Chart 12.3)
EXAMPLES OF DIFFERENT TYPES OF GLACIERS

<table>
<thead>
<tr>
<th>TYPES OF GLACIERS</th>
<th>EXAMPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continental Glaciers</td>
<td>Mt. Everest (Asia)</td>
</tr>
<tr>
<td>Mountain Glaciers</td>
<td>Mt. Kilimanjaro (East Africa)</td>
</tr>
<tr>
<td>Mountain Glaciers</td>
<td>Mt. Alps (Europe)</td>
</tr>
</tbody>
</table>

Repeat:
(Chart 12.5)
EXAMPLES OF REGIONS COVERED BY ICE AND SNOW

<table>
<thead>
<tr>
<th>Region (USA)</th>
<th>Alaska (USA)</th>
<th>Yukon (Canada)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Tundra Region</td>
<td>Arctic Circle</td>
<td>Tundra</td>
</tr>
</tbody>
</table>

Refer to advance organizer earlier presented.
The area is permanently below the freezing point. Continental glaciers get warmer and meet due to warmth of the earth.

### Phase III: Strengthening of Cognitive Organization

- Review Principle of Integrative Reconciliation
- Logical Order
- Make Organization Explicit
- Maintain Attention

#### Differences between Continental & Mountain Glaciers

<table>
<thead>
<tr>
<th>Continental Glaciers</th>
<th>Mountain Glaciers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperatures vary.</td>
<td>Temperatures are permanently below the freezing point.</td>
</tr>
<tr>
<td>Occur in the Polar Regions.</td>
<td>Occur on High Mountain Altitudes.</td>
</tr>
<tr>
<td>Extensive thick ice-sheets covering the entire land surface.</td>
<td>Region is characterized by thin sheets of ice up to 5500 meters above sea level and is not extensively spread.</td>
</tr>
</tbody>
</table>

#### Characteristics of Continental Glaciers

- Found in the continents of arctic and Antarctic Circles. Alaska, Yukon, etc.
- Permanently covered by thick ice-sheets.
- Have low temperatures.
- Temperatures are permanently below the freezing point.

#### Characteristics of Mountain Glaciers

- Temperatures may vary considerably.
- Occur on high mountain altitudes.
- Region is characterized by thin sheets of ice up to 5500 meters above sea level and is not extensively spread.
Common steps for both types of organizers (generalization and analogy).

Promote active reception learning:
- Characterize continental glaciers (Chart 12.7) and mountain glaciers (Chart 12.8).
- Actions of valley glaciers (Chart 12.9).
- Characteristics of continental glaciers (Chart 12.7).
- Elaborate more on differences between continental and mountain glaciers (Chart 12.6).

Examples of land forms due to glaciation (Chart 12.10):

- U-shaped valleys
- T-shaped moraines
- L-shaped moraines
- Terminal moraines
- Cirques

Characterize:

- Characteristics of mountain glaciers (Chart 12.8).

Appendix-D

CHARACTERISTICS OF MOUNTAIN GLACIERS

- Occur in high mountain regions.
- Both snow and ice accumulate in depressions along the valley leads near the summit.
- Forms valley glaciers.
- U-shaped valleys.
- T-shaped moraines.
- L-shaped moraines.
- Terminal moraines.
- Cirques.

ACTIONS OF VALLEY GLACIERS ON THE FACE OF LAND (Chart 12.9)

- Slow movement of solid ice-blocks.
- High friction as ice comes into contact with the valley floors.
- Glaciers melt and turn into huge water torrents as it descends down the valley to the lower altitude.
- rivers, Indus, Ganga, Yamuna and Brahmaputra originate from snow glaciers of the Himalaya Mountains.

Appendix-D

SOCIAL SYSTEM:

Students to reconcile and integrate relationships between mountain glaciers and actions of valley glaciers (Chart 12.9).

Social system reflects upon the kind of teacher-student interactions that take place in the classroom with very specified roles of the teacher and students.

Appendix-D
Teacher's Role:
♦ Retain control of the intellectual structure as students continually relate the learning tasks to the organizer earlier presented.
♦ Helps students differentiate new learning tasks from previously learned tasks.
♦ Encourage more interactive learning situations especially in Phase III of the lesson and.
♦ Encourage students to initiate more questions and comments.

PRINCIPLES OF REACTION:
Students' Role:
♦ Students are encouraged to initiate their own questions in response to their own drives of meaning.
♦ Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge.
♦ Students are helped to use critical approach to knowledge by making differentiated and reconciliation of new learning tasks relevant to the students' cognitive structure (as in Phase III of the Syntax of the Model, and
♦ Teacher clarifies the learners' reaction to new learning tasks.

SUPPORT SYSTEM:
♦ In Phase II, proper caution is taken in the organization of instructional material. This is because, a well organized material is the critical support requirement of the Model and
♦ That, the effectiveness of advance organizer depends on an integral and appropriate relationship between the conceptual organizer and the content.
♦ Well formed and synchronized structural hierarchies of content and transparencies of over head project (OHP) will form the support system during instruction.

SUMMATIVE EVALUATION
♦ This will be administered at the end of the experiment to grade students according to their achievement of the course intensions.
♦ Summative Evaluation will be final and grades assigned will reflect students' achievement throughout their scholastic career during this course.
Appendix II D1

ML-ANAL Group

Instructional Packages...
INSTRUCTIONAL PACKAGES

INSTRUCTIONAL EVENTS FOR UNIT I (PART I).

Topic: The Biosphere I.

Focus: Common for both types of advance organizers

ANALOGY AS ADVANCE ORGANIZER

Instructional Packages

PRE-REQUISITE KNOWLEDGE OF THE LEARNERS:

The primary focus of this unit will be to help students relate and integrate Biosphere into their cognitive structure with the help of its defining attributes (Chart 1.1) and Hierarchies linking an insect's body with Biosphere (Chart 1.6).

At the end of instructions, students will have studied the enrichment and/or remedial material and will be able to:

- Define the term Biosphere in their own words.
- Complete the incomplete statements regarding the three components of Biosphere.
- Name by completing the blank spaces provided, three examples of living organisms found in the lithosphere.
- Write from the incomplete statements, two examples of living organisms found in the atmosphere.
- Complete the sentence by naming at least three living organisms found in the hydrosphere.

Note: It is required that students fulfill the conditions of the entry behavior test items before proceeding on to Unit 1.
A schematic Hierarchical outline is drawn below (Chart 1.8) showing the meeting place where all the three spheres, the earth (lithosphere) and water (Hydrosphere) meet. The hierarchy will be differentiated sequentially by building up hierarchical outline of Biosphere. Examples of living organisms found in the three components: examples of living organisms found in the components: examples of living organisms found in the biosphere. Students Differentiate Sequentially: Again this will be followed by the meeting place where all the three spheres, the earth (lithosphere) and water (Hydrosphere) meet. The hierarchy will be differentiated sequentially by building up hierarchical outline of Biosphere. Examples of living organisms found in the three components: examples of living organisms found in the biosphere. Students Differentiate Sequentially: Again this will be followed by the meeting place where all the three spheres, the earth (lithosphere) and water (Hydrosphere) meet. The hierarchy will be differentiated sequentially by building up hierarchical outline of Biosphere. Examples of living organisms found in the three components: examples of living organisms found in the biosphere. Students Differentiate Sequentially: Again this will be followed by the meeting place where all the three spheres, the earth (lithosphere) and water (Hydrosphere) meet. The hierarchy will be differentiated sequentially by building up hierarchical outline of Biosphere. Examples of living organisms found in the three components: examples of living organisms found in the biosphere. Students Differentiate Sequentially: Again this will be followed by the meeting place where all the three spheres, the earth (lithosphere) and water (Hydrosphere) meet. The hierarchy will be differentiated sequentially by building up hierarchical outline of Biosphere. Examples of living organisms found in the three components: examples of living organisms found in the biosphere. Students Differentiate Sequentially: Again this will be followed by the meeting place where all the three spheres, the earth (lithosphere) and water (Hydrosphere) meet. The hierarchy will be differentiated sequentially by building up hierarchical outline of Biosphere. Examples of living organisms found in the three components: examples of living organisms found in the biosphere. Students Differentiate Sequentially: Again this will be followed by the meeting place where all the three spheres, the earth (lithosphere) and water (Hydrosphere) meet. The hierarchy will be differentiated sequentially by building up hierarchical outline of Biosphere. Examples of living organisms found in the three components: examples of living organisms found in the biosphere. Students Differentiate Sequentially: Again this will be followed by the meeting place where all the three spheres, the earth (lithosphere) and water (Hydrosphere) meet. The hierarchy will be differentiated sequentially by building up hierarchical outline of Biosphere. Examples of living organisms found in the three components: examples of living organisms found in the biosphere. Students Differentiate Sequentially: Again this will be followed by the meeting place where all the three spheres, the earth (lithosphere) and water (Hydrosphere) meet. The hierarchy will be differentiated sequentially by building up hierarchical outline of Biosphere. Examples of living organisms found in the three components: examples of living organisms found in the biosphere. Students Differentiate Sequentially: Again this will be followed by the meeting place where all the three spheres, the earth (lithosphere) and water (Hydrosphere) meet. The hierarchy will be differentiated sequentially by building up hierarchical outline of Biosphere. Examples of living organisms found in the three components: examples of living organisms found in the biosphere.
Chart 1.8(a) Micro-organisms

All aquatic animals like fish, whale, seals etc.

All aquatic plants like splrcgyra, water Lilies, planktons

Examples of living Organisms

Component

Elements of living Organisms

Examples of Living

\[ \text{Chart 1.5(e)} \]

Examples of Living

Micro-organisms

Plants

Birds

Man and Animals

Micro-organisms

Plants

Birds
DEFINING ATTRIBUTES OF BIOSPHERE

Biosphere

Components of the

Life is possible

in all three

components of

Biosphere

All three spheres are

Encompasses

Component of the

Zone of contact

where all the

three spheres

meet at a

uniform common

ground or zone of

contact

Central focal point

of the three

spheres

Atmosphere

Lithosphere

Hydrosphere

Biosphere

(Chart 1.1, Revised)
Definition of Biosphere

"Is a narrow common zone of contact where the earth (Lithosphere), Air (Atmosphere) and Water (Hydrosphere) meet."

Students describe/discuss low different parts of an insect's body relate to biosphere.

Chart 1.6: EXTENDED AND ELABORATED HIERARCHIES LINKING AN INSECT'S BODY WITH BIOSPHERE (Point of Integrative Reconciliation Takes Place Here or There)

Chart 1.7: Definition of Biosphere
## Chart 1.5

<table>
<thead>
<tr>
<th>Similarities and Differences Between An Insect and Biosphere</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Components of an Insect:</strong> The Head, Thorax, and Abdomen are components of the insect.</td>
</tr>
<tr>
<td><strong>Components of the Biosphere:</strong> The Lithosphere, Atmosphere, and Hydrosphere are components of the Biosphere.</td>
</tr>
<tr>
<td><strong>Similarities:</strong> All living and non-living organisms are found in the Biosphere. An insect is part of the Biosphere.</td>
</tr>
<tr>
<td><strong>Differences:</strong> An insect cannot live without its components. The Biosphere cannot be found in insects.</td>
</tr>
</tbody>
</table>
An Insect's Body - Biosphere

Point of Integration

Hydrosphere (carry food)

Lithosphere (Component)

An Insect's Body - Biosphere

Point of Integration

Mouth Parts

Compound eyes

Head (feelers, brain)

Thorax (wings, air)

Abdomen (watery, like hydrosphere, carry food)

An Insect's Body - Biosphere

EXTENDED AND ELABORATED HIERARCHY LINKING AN INSECT'S BODY WITH BIOSPHERE

Chart 1.4
DEFINING ATTRIBUTES OF BIOSPHERE

Biosphere is a narrow common zone of contact where all three spheres meet at a uniform common ground or zone of contact.

Life is possible in all three components of Biosphere.

All three spheres are components of the Biosphere.

Central focal point located at the Earth's surface where all three spheres are in contact.

Atmosphere

Lithosphere

Hydrosphere

Interactive discussion session Chart 1.1 (Revised) to be used as pasting of strips.

Phase II:

Promote Active Reception Learning:
Analogy!

Give Examples:

Geography is the study of man and his environment to be viewed as a complete picture of a narrow common zone of contact where the earth (Lithosphere), air (Atmosphere), and water (Hydrosphere) meet. The narrow common zone of contact where these three spheres meet is termed as the Biosphere.

Examples of Living Organisms Found in the Components

**Lithosphere**
- Plants
- Animals
- Man and the Family
- Micro-organisms

**Hydrosphere**
- All aquatic plants like spirngale, algae
- All aquatic animals like fish, whales, hippos, seals etc.
- All living organisms like plankton

**Atmosphere**
- Birds
- Micro-organisms

**Phase III: Clarify Objectives of the Lesson:**
Teacher presents seven objectives of unit I and proceeds to present advance organizer.
Appendix-D

Chart 1.2
EXAMPLES OF COMPONENTS THAT FORM BIOSPHERE

♦ Hydrosphere (water) -> is a component
♦ Atmosphere (air)
♦ Lithosphere (earth)

Chart 1.1
DEFINING ATTRIBUTES OF BIOSPHERE

Give Examples:

- Ground or zone of contact
- Common nucleus
- Life is possible
- Core of the earth
- Encompasses all spheres
Encourage students to initiate more questions and comments.

Encourage more interactive learning situations especially in Phase III of the lesson.

Help students differentiate new learning tasks from previously learned tasks.

Reinforce control of the instructional structure as students continually relate the learning to the organizers earlier presented.

Identify Defining Attributes:

Social System:

Teachers' role:

Common steps for both types of organizers (generalization and analogy):

¢ Prompt for more examples relevant to the learning task and the organizer.
¢ Examples of living organisms found in the components (Chart 1.3).
¢ Examples of components that form Biosphere (Chart 1.2).
¢ Defining attributes of Biosphere (Chart 1.1).
¢ Hierarchical outline: Expanded and Elaborated Hierarchy (Chart 1.0).

After returning to advance organizer earlier presented, repeat:

Repeat:

EXPANDED AND ELABORATED HIERARCHY

Component

■ * -

Component ► Component

The Earth (Lithosphere)

Face of the land where we find elements of the physical and biological environments.

Air (Atmosphere)

Where we find elements of the terrestrial environment.

Water (Hydrosphere)

Where we find elements of the aquatic environment.

Biosphere

(Meeting Place)

The Biosphere reflects upon the kinds of teacher-student instructional patterns in the class with very specified roles of the teacher and students.

Awareness of the learner's relevant knowledge and experience:

Examples of components that form Biosphere (Chart 1.2).

Defining attributes of Biosphere (Chart 1.1).

Hierarchical outline: Expanded and Elaborated Hierarchy (Chart 1.0).

After returning to advance organizer earlier presented, repeat:

Identify Defining Attributes:

Appendix-D

1
Students are encouraged to initiate their own questions in response to their own drives of meaning;
Note: It is required that students fulfil conditions of unit I test items before proceeding to the next lesson.

INSTRUCTIONAL EVENT FOR UNIT I PART II

Topic: Mathematical Explanations

Focus: Common for both types of advance organizers (Generalization and Analogy)

(ANALOGY AS ADVANCE ORGANIZER)

INSTRUCTIONAL PACKAGES

Students:

PRE-REQUISITE KNOWLEDGE OF THE INSTRUCTIONAL PACKAGES

OBJECTIVES:

♦ Explain why 2 is more suitable than 2x and 7z in the explanation of Biosphere.
♦ Relate 2, 2x, and 7z with Biosphere.
♦ State at least two similarities of mathematical explanations of Biosphere in relation to a Venn diagram of Biosphere.
♦ Emphasize on the position of Biosphere in terms of figures 2, 24, and 72 respectively.
♦ Relate 2, 24, and 72 with Biosphere.

PRE-REQUISITE
STUDENTS:

At the end of instructions, students will have studied the enrichment and/or remedial material and will be able to:

♦ Find the GCD of set ABCDE (4, 6, 8, 12, 18).
♦ Find the LCM of set ABCDE (4, 6, 8, 12, 18).
♦ Find the GCD of set FGH (4, 6, 8).
♦ Find the LCM of set FGH (4, 6, 8).
♦ Find the GCD of set UK (6, 8, 12).
♦ Find the LCM of set UK (6, 8, 12).
♦ Find the GCD of set LMN (8, 12, 18).
♦ Find the LCM of set LMN (8, 12, 18).

The primary focus of this unit will be to help students relate and integrate Biosphere into their cognitive structure through mathematical explanations.

Focus: Common for both types of advance organizers (Generalization and Analogy)
For the purpose of ascertaining unit-wise individual's status achievement, formative evaluation will be adopted at the end of each unit. Corrective feedback will follow the remediation and/or enrichment procedures stated below.

♦ Chart 1.3 (c): Some examples of division of sets ABCDE (4, 6, 8, 12, 18)
♦ Chart 1.4 (d): Some Examples of division of sets FGH (4, 6, 8)
♦ Chart 1.5 (e): Some examples of division of sets UK (6, 8, 12)
♦ Chart 1.6 (f): Some examples of Division of sets LMN (8, 12, 18)
♦ Chart 1.7 (i-iv): Expanded and elaborated Hierarchies of sets and Venn Diagram Representations (Analyses of concepts).
♦ Chart 1.8 (a): Interrelationships showing positions of 2; 24; and 72 in Venn-Diagram in relation to Biosphere.

OTHER INSTRUCTIONAL PACKAGES/LEARNING TASKS:
♦ Chalks (assorted colours)
♦ Chalkboard, dusters, rulers
♦ Lecture and discussion

CONTENT SEQUENCE:
♦ Finding GCD of sets ABCDE (4, 6, 8, 12, 18)
♦ Finding LCM of sets ABCDE (4, 6, 8, 12, 18)
♦ Finding GCD of sets of FGH (4, 6, 8)
♦ Finding LCM of sets of FGH (4, 6, 8)
♦ Finding GCD of sets of UK (6, 8, 12)
♦ Finding LCM of sets LMN (8, 12, 18)
♦ Finding GCD of sets LMN (8, 12, 18)
♦ Relate 2; 24; and 72; with Biosphere
♦ Attributes of mathematical explanations of Biosphere.
♦ Suitability of 2 over 24 and 72 in the mathematical explanation of Biosphere.
♦ Refer to the syntax of this lesson

INSTRUCTIONAL AIDS:
♦ Transparency: Showing Analogy II.
♦ Chart 1.1(a): Showing, Attributes, similarities, relationships, and differences of GCDS, and LCMS in relation to Biosphere.
♦ Chart 1.2(b): Hierarchy showing analysis of concepts (Lithosphere, Atmosphere and Hydrosphere, 2, 24 and 72).
All the components of the sets are divisors of the whole set.

**Biosphere:**
- 24 and 72 have appeared twice in all the sets i.e. in FGH (4,6,8), IJK (6,8,12) and sets ABCDE (4,6,8,12,18) and sets LMN (8,12,18).
- In all the sets 2 is found to be the LCM.
- 24 and 72 are found to be the GCD.
- All the components of the sets are divisors of the whole set.

**SYNTAX:**

**PHASE I:** Clarify objectives of the Lesson:
- Teacher presents all the eleven objectives of unit I Part II and prescribes the advance
- Teacher guides students through the enrichment material.
- Teacher will use tutorial for those students who may lack knowledge essential for the

**REMEDIAL:**
- Teacher will guide students through the enrichment material.
- Teacher will use tutorial for those students who may lack knowledge essential for the

**PRESCRIPTION:**
- Teacher will guide students through the enrichment material.
- Teacher will use tutorial for those students who may lack knowledge essential for the

**ENRICHMENT:**
- Teacher will guide students through the enrichment material.
- Teacher will use tutorial for those students who may lack knowledge essential for the
Our concern is restricted to the Greatest common divisors and the least common multiple only.

Example: the divisors of the sets A, B, C, D, and E (4, 6, 8, 12, 18) may be substituted as follows: 4 for the Earth (Lithosphere); 6 for the Atmosphere (Air); and 18 for the Hydrosphere (Water) to form the Biosphere where they all meet at a narrow common zone of contact (Chart 1.3(c)).

Some Examples of the Divisors of Sets F, G, H (4, 6, 8)

These components of the sets converge at a particular point which forms their zone of contact.

Hierarchy showing analysis of concepts (Lithosphere, Atmosphere, Hydrosphere 2.24, 4, 7.2, 2 to form Biosphere)
Make Organization explicit > All learning tasks to be tackled sequentially throughout the lesson.

Part II: Present Material:

- Attribute/similarities/relationships and differences of GCDs and LCMs in relation to Biosphere (Chart 1.1 (a).
- Some examples of the Divisions of sets ABCDE (4,6,8,12,18) (Chart 1.3 (b).
- Some examples of Divisors of sets FGH (4,6,8) (Chart 1.4 (d).
- Some examples of Divisors of sets IJK (6,8,12). (Chart 1.5 (e).
- Some examples of Divisors of sets LMN (8,12,18). (Chart 1.6 (f).

Prompt for more examples relevant to this learning task and the organiser.

But we are restricted to the GCDs and LCM only.

<table>
<thead>
<tr>
<th>Chart 1.6 (f)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[2,3,4,5]</td>
</tr>
<tr>
<td>[2,3,4,6]</td>
</tr>
<tr>
<td>[2,3,4,6,12]</td>
</tr>
<tr>
<td>[2,3,4,6,8]</td>
</tr>
<tr>
<td>[2,3,4,6,9]</td>
</tr>
<tr>
<td>[2,3,4,6,10]</td>
</tr>
<tr>
<td>[2,3,4,6,12]</td>
</tr>
</tbody>
</table>

Awareness of the students’ relevant knowledge:

- By constantly referring to the hierarchies, examples and generalization earlier presented.

Make Organization explicit > All learning tasks to be tackled sequentially throughout the lesson.

[2,3,4,6,12]
Phase III: Strengthening of Cognitive Organisation:

Revise Principle of Integrative reorganisation:
throughout the lesson - session.

Chart 1.7 (i) (Revisited)

Finding the GCD and LCM of the sets to show their relationship with Biosphere (Chart 1.7 (i)

EXPANDED AND ELABORATED HIERARCHIES

Sets ABCDE (4, 6, 8, 12, 18) =

GCD = \(2 \times 3\)

LCM = \(2 \times 3 \times 3\)
EXPANDED AND ELABORATED HIERARCHIES

GCD

LCM

= 2\cdot3

= 2^4

= 2

VENN Diagram representation:

(Analysis of Concepts)

Set A

Set B

Set C
**Appendix-D £**

**Sets UK [6, 8, 12]**

**GCD**

**LCM**

\[ Z = \text{tz} = e^x e^z = \text{GCD} > \text{N}) \]

**VENN Diagram representation**

(Analysis of Concepts)

**SET**

**SET**

**SET**

**SET**

**SET**

**EXPANDED AND ELABORATED HIERARCHIES**

<table>
<thead>
<tr>
<th>6, 8, 12 (Common Factor)</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>3, 4, 6 (No common factor)</td>
<td>2</td>
</tr>
<tr>
<td>2, 3, 6 (No common factor)</td>
<td>2</td>
</tr>
<tr>
<td>2, 3, 2, 6 (No common factor)</td>
<td>2</td>
</tr>
<tr>
<td>3, 1, 3 (No common factor)</td>
<td>3</td>
</tr>
<tr>
<td>2, 2, 2, 3 (No common factor)</td>
<td>2</td>
</tr>
<tr>
<td>2, 2, 3, 1, 3 (No common factor)</td>
<td>3</td>
</tr>
</tbody>
</table>

\[ \text{LCM} = 2 ^ 4 = 16 \]

\[ \text{GCD} = 2 ^ 4 = 16 \]

\[ \text{SELs Lk (6, 8, 12)} = \star \]
Sets LMN \{8,12,18\}

Appendix-D

CO CO ro ro ro

1,1,1

1,1,3

CO

\sim<\circ

2,3,9

4,6,9

8,12,18

(Not common factor)

(Not common factor)

(Not common factor)

(Common factor)

\text{GCD} = 23 \times 33

\text{LCM} = 2 

\text{VENN Diagram representation}

\text{(Analysis of Concepts)}

\text{IX EXPANDED AND ELABORATED HIERARCHIES}
INTERRELATIONSHIPS SHOWING POSITION OF 2;24 AND 72 IN VENN DIAGRAMS IN
RELATION TO BIOSPHERE

Appendix-1)
SOCIAL SYSTEM
Social system reflects upon the kind of teachers
Teacher's Role:
explain the Biosphere.

> The relationships between 2;24 and 72 with Biosphere and why 2 is the most acceptable
least common multiple that may be substitute to Biosphere.

> Common steps for both types of - organizers generalization and analogies

TAught interregional patterns in the class with very specified roles of the teacher and students.

Retain control of the intellectual structure - students continually relate the learning tasks to the organizer earlier presented;

Helps students differentiate new learning tasks from previously learned tasks;

Encourage more interactive learning situations especially in phase III of the lesson and;

Encourage students to initiate more questions and comments.

PRINCIPLES OF RELATION:

Students Role:
Students are encouraged to initiate their own questions in responses to their own drives of meaning;

Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge;

Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge;

Meaning:
Students are encouraged to initiate their own questions in responses to their own drives of meaning;

Promote Active reception Learning: > Interactive discussion. More discussions on how mathematical illustrations were used to

SUMMATIVE EVALUATION:

> Students are encouraged to initiate their own questions in responses to their own drives of meaning;

> Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge;

> Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge;

> The teacher clarifies the learners' reaction to new learning tasks.

In Phase II, proper caution is taken in the organization of instructional material. This is because a well-organized instructional material is the critical support requirement of the model and;

Well formed and structural hierarchies of contents and transparencies of Over-Head Projector (OHP) will form support system during instruction;

That the effectiveness of advance organizers depends on an integral and appropriate relationship between the conceptual organizer and the content;

Well formed and structural hierarchies of contents and transparencies of Over-Head Projector (OHP) will form support system during instruction;

> That the effectiveness of advance organizers depends on an integral and appropriate relationship between the conceptual organizer and the content;

> Well formed and structural hierarchies of contents and transparencies of Over-Head Projector (OHP) will form support system during instruction;

This will be administered at the end of the experiment to grade students according to their achievement of the course intentions;

Summative evaluation will be held and grades assigned will reflect students' achievement throughout their scholastic career during this course.

The effectiveness of advance organizers depends on an integral and appropriate relationship between the conceptual organizer and the content.
Appendix-D

INSTRUCTIONAL EVENTS FOR UNIT II

Topic: Composition of our environment

Focus: Common for both types of advance organizers

Topic: Composition of our environment

INSTRUCTIONAL PACKAGES

ANALOGY AS ADVANCE ORGANIZER
Appendix-D

1

♦

Chart 2.2: Expanded and Elaborated Hierarchy showing examples of components found in the Physical environment.

Chart 2.3: Expanded and Elaborated hierarchy showing examples of components found in the Biological environment.

Chart 2.4(i): Interdependency between Physical and Biological Environments.

Chart 2.4(ii): Hierarchical out-time showing interrelationship between Physical and Biological Environments of the Earth.

Chart 2.5: Man's Dependency on the Biosphere

OTHER INSTRUCTIONAL AIDS:
♦ Chalks (Assorted colors)
♦ Chalkboard, Dusters, rulers, pointers.
♦ Lectures and Discussion.
♦ Chalkboard, displays, charts, posters.

INSTRUCTIONAL PROGRAMME AND SEQUENCING

CONTENT SEQUENCE:
♦ The Physical environment
♦ The Biological environment
♦ Elements of the Physical environment.
♦ Elements of the Biological environment.
♦ Interdependency between Physical and Biological environments.
♦ Dependency of man on the Biosphere.

LEARNING UNITS:
♦ Refer to the syntax of the lesson.

REMEDICATION:
♦ Teacher will use tutorials for those students who may lack knowledge essential for the programme.

PRESCRIPTION:
♦ Extended and Elaborated Hierarchies showing the entire spectrum of our environment will form part of remediation package (Chart 2.4)
♦ Defining attributes, similarities and differences will also form part of the package.

POST ASSESSMENT:
♦ (FORMATIVE EVALUATION): For the purpose of ascertaining unit wise individual's status achievement, formative evaluation will be adopted at the end of each unit. Corrective feedback will follow the remediation and/or enrichment procedures stated below.

PRESCRIPTION:
♦ Teacher will use tutorials for those students who may lack knowledge essential for the programme and/or unit;
♦ Extended and Elaborated Hierarchies showing the entire spectrum of our environment will form part of remediation package (Chart 2.4)
♦ Defining attributes, similarities and differences will also form part of the package.

OTHER INSTRUCTIONAL AIDS:
♦ Chalks (Assorted colors)
♦ Chalkboard, Dusters, rulers, pointers.
♦ Lectures and Discussion.
♦ Chalkboard, displays, charts, posters.

INSTRUCTIONAL PROGRAMME AND SEQUENCING

CONTENT SEQUENCE:
♦ The Physical environment
♦ The Biological environment
♦ Elements of the Physical environment.
♦ Elements of the Biological environment.
♦ Interdependency between Physical and Biological environments.
♦ Dependency of man on the Biosphere.

LEARNING UNITS:
♦ Refer to the syntax of the lesson.
ENRICHMENT: "Oxford children's encyclopaedia AB to ZUV rols. 1 to 9 (1996) and the oxford children's reference Library (2) Exploring the World (1966), will be used as enrichment packages for those students who achieved mastery faster. Teacher will guide students through the enrichment material.

MAN'S DEPENDENCY ON BIOSPHERE

<table>
<thead>
<tr>
<th>Physical Environment</th>
<th>Biological Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man needs raw material to meet his wants.</td>
<td>Man needs raw material to satisfy his human wants.</td>
</tr>
<tr>
<td>Has a variety of raw material to supply.</td>
<td>Has a variety of raw material to supply.</td>
</tr>
<tr>
<td>Has abundance of food.</td>
<td>Has abundance of food.</td>
</tr>
<tr>
<td>Man needs food for his survival.</td>
<td>Man needs food for his survival.</td>
</tr>
<tr>
<td>Inter-dependency of living and non-living organisms in the Biosphere.</td>
<td>Inter-dependency of living and non-living organisms in the Biosphere.</td>
</tr>
<tr>
<td>Both living and non-living forms co-exist together in mutual existence in the Biosphere.</td>
<td>Both living and non-living forms co-exist together in mutual existence in the Biosphere.</td>
</tr>
<tr>
<td>Man exploits his co-exist together in mutual existence in the Biosphere.</td>
<td>Man exploits his co-exist together in mutual existence in the Biosphere.</td>
</tr>
</tbody>
</table>

Revise the Principle of Integrative Reconciliation:

MAN'S DEPENDENCY ON BIOSPHERE (Chart 2.5)

FACULTY PLAN:

ENRICHMENT:

Teachers will guide students through the enrichment material.
Interdependence between Physical and Biological Environments

- Matter and energy is exchanged between the Physical and Biological Environments.
- Plants get their food from soil (Detritus feeders).
- Both plants and animals once dead get decayed with the help of micro-organisms.
- The decomposed organic and inorganic matter returns to the soil thereby replenishing it.
- Water and energy is exchanged between the Physical and Biological Environment.

Chart 2.4 (i)

They all need one another (They all need one another)

Point of Integration Reconciliation Takes Place Here Or There

Chart 2.4 (ii)
Our environment called the earth (Lithosphere) is composed of two types of environments: the Physical environment and the Biological environment. This phase is common step for both types of the organizers and has been taken care of in generalization component.

Examples of components found in the biological environment:

**Mangos**

**Grass**

**Maize**

**Dogs**

**Cats**

**T**

**Plants**

**Fly**

**Cattle**

**Goals**

**Insects**

**Parasites**

**Bacteria**

**Micro-organisms**

**Elements**

Promote active reception learning: > Interactive Discussions:
Social system reflects upon the kind of teacher taught interrelational patterns in the class with very specified roles of the teacher and students.
Students Role:

- Help students differentiate new learning tasks from previously learned tasks.
- Encourage students to initiate more discussions and communications.
- Retain control of the intellectual structure as students continuously relate the learning.
- Help students differentiate new learning tasks from previously learned tasks.
- Establish knowledge.
- Teacher clarifies the learners' reaction to new learning tasks.
- Teachers' Role: Retain control of the intellectual structure as students continually relate the learning.

Support System:

- Helps students differentiate new learning tasks from previously learned tasks.
- Encourage students to initiate more discussions and communications.
- This will be administered at the end of the experiment to grade students.
- Summative evaluation will be final and grades assigned will affect students

Principles of Reaction:

- This will be administered at the end of the experiment to grade students.
- Support system during instructions.
- Well formed and synchronized structural hierarchies of content and transparencies of
- weil organized material is the critical support requirement of the Model and
- Teacher clarifies the learners' reaction to new learning tasks.
- This will be administered at the end of the experiment to grade students.
- Students are encouraged to differentiate new learning tasks and reconcile them with
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- Students are encouraged to differentiate new learning tasks and reconcile them with
- Students are encouraged to differentiate new learning tasks and reconcile them with
- Students are encouraged to differentiate new learning tasks and reconcile them with
- Students are encouraged to differentiate new learning tasks and reconcile them with
INSTRUCTIONAL EVENTS FOR UNIT III

Topic: FACE OF THE LAND:

Focus: Common for two types of advance organizers

Instructional Packages

(ANALOGY AS ADVANCE ORGANIZER)

Prerequisite Knowledge of the Learners:

Note: It is required that students fulfill conditions of unit II before proceeding to unit III.

Instructional Objectives:

The main focus of this unit will be to help students identify major forces that operate on the face of the earth (Lithosphere) and the resulting landforms due to the action of these forces on the face of the land.

The action of these forces on the face of the earth.

The main focus of this unit will be to help students identify major forces that operate on the face of the earth (Lithosphere) and the resulting landforms due to the action of these forces on the face of the land.

INSTRUCTIONAL AIDS:

Chart 3.0: Defining attributes of different types of landforms found on the face of the land. Chart 3.1: Characteristics of variations of land forms. Chart 3.2: Examples of different land forms on the face of the land. Chart 3.3: Hierarchy showing types of natural processes of the earth whose actions on the face of the land cause landforms.

PREREQUISITE KNOWLEDGE OF THE LEARNERS:

It is required that students fulfill conditions of unit II before proceeding to unit III.

Instructional Objectives:

1. Identify at least six landforms due to gradual changes of landforms due to gradual changes of landforms.
2. Identify at least six landforms due to gradual changes of landforms.
3. Identify two types natural processes of the earth whose actions on the face of the land cause landforms.
4. Identify the characteristics of variations of land forms.
5. Identify the characteristics of variations of land forms.
6. Identify the characteristics of variations of land forms.
7. Identify the characteristics of variations of land forms.

INSTRUCTIONAL AIDS:

Chart 3.0: Defining attributes of different types of land forms found in the face of the land.

Chart 3.1: Characteristics of variations of land forms.

Chart 3.2: Examples of different land forms on the face of the land.

Chart 3.3: Hierarchy showing types of natural processes of the earth whose actions on the face of the land cause landforms.
Some topics relevant to IX grade Social Studies (Geography) will be assigned to those students who have achieved mastery faster than others. (Oxford Children's Encyclopaedia A to ZU Vols. 1 to 9 (1996) and the Oxford Children's Reference Library Exploring the World, (1966).

**Other Instructional Aids:**

- Chalks (assorted colours).
- Chalkboard, dusters, rulers, pointers.
- Lectures, discussions.
- Hierarchical outlines of the face of the land (Chapters 3.0) and other alternatives.

**Content Sequence:**

Refer to the syntax of the lesson on the face of the land.

- Factors causing gradual changes on the face of the land.
- Factors causing sudden changes on the face of the land.
- Natural processes of gradual changes forming landforms.
- Natural processes of sudden changes forming landforms.
- Characteristics of landforms.
- Features found on the face of the land.

**Prescription:**

- Teacher will use tutorial for those students who may lack knowledge essential for the programme and/or unit.
- Hierarchical outlines of the face of the land (Chart 3.0) will form another alternative source of information.
- Hierarchies comparing characteristics of human head to the face of the land (Chart 3.6) will also form part of the alternative source of information.

**Enrichment:**

Some topics relevant to IX grade Social Studies (Geography) will be assigned to those students who have achieved mastery faster than others.

**Remediation:**

- Teacher will use tutorial for those students who may lack knowledge essential for the programme and/or unit.
- Hierarchical outlines of the face of the land (Chart 3.0) will form another alternative source of information.
- Hierarchies comparing characteristics of human head to the face of the land (Chart 3.6) will also form part of the alternative source of remediation.

For the purpose of ascertaining unit-wise individual status achievement, formative evaluation will be used at the end of each unit. Corrective feedback will follow the remediation and/or enrichment procedures stated below.

**Post-Assessment:**

- Chart 3.6: Hierarchy Comparing the characteristics of Human Head to the face of the Land.
- Chart 3.7: Extended and Elaborated Hierarchy showing changes causing landforms on the face of the land and Resulting examples of landforms.
Changes Causing Land Forms

EXTENDED AND ELABORATED HIERARCHY

SHAPES, RELATIVES, CLASS

EXTENDED AND ELABORATED HIERARCHY (Chart 3.7)

Teacher will guide students through the enrichment material.

SYNTAX: ANALOGY:

PHASE I: Strengthening of Cognitive Organisation:

Revised Principle of Integrative Reconciliation:

???
### Chart 3.6

**Hierarchy Comparing the Characteristics of Human Face Head to the Face of the Land**

<table>
<thead>
<tr>
<th>Human Face Characteristics</th>
<th>Land Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chin: Looks like chin of a</td>
<td>Inselbergs: Looks like</td>
</tr>
<tr>
<td>Human being, isolated in a</td>
<td>a plain, or cliffs and</td>
</tr>
<tr>
<td>plain, protruding upwards</td>
<td>mountains, isolated</td>
</tr>
<tr>
<td></td>
<td>are like the chin</td>
</tr>
<tr>
<td></td>
<td>are like the chin of</td>
</tr>
<tr>
<td></td>
<td>a human being,</td>
</tr>
<tr>
<td></td>
<td>isolated, on the</td>
</tr>
<tr>
<td></td>
<td>plains.</td>
</tr>
<tr>
<td>Ears: Like basins, salty</td>
<td>Basins: Look like the</td>
</tr>
<tr>
<td>and shallow. Eddies look</td>
<td>caverns.</td>
</tr>
<tr>
<td>like the caverns.</td>
<td>Ears: Look like</td>
</tr>
<tr>
<td></td>
<td>basins, salty and</td>
</tr>
<tr>
<td></td>
<td>shallow.</td>
</tr>
<tr>
<td>Mouth: Like caves found in</td>
<td>Caverns: Found in the</td>
</tr>
<tr>
<td>the limestone regions,</td>
<td>limestone regions,</td>
</tr>
<tr>
<td>teeth like stalactites</td>
<td>have pendants called</td>
</tr>
<tr>
<td>and stalagmites which</td>
<td>stalactites and</td>
</tr>
<tr>
<td>look like teeth of a</td>
<td>stalagmites, look</td>
</tr>
<tr>
<td>human being,</td>
<td>like teeth of a</td>
</tr>
<tr>
<td>saliva like underground</td>
<td>human being, isolated</td>
</tr>
<tr>
<td>water and spring waters.</td>
<td>in a plain, or</td>
</tr>
<tr>
<td></td>
<td>cliffs and mountains.</td>
</tr>
<tr>
<td>Hair: Like a forest.</td>
<td>Forest: Protects the</td>
</tr>
<tr>
<td></td>
<td>land surface from</td>
</tr>
<tr>
<td></td>
<td>soil erosion, heat</td>
</tr>
<tr>
<td></td>
<td>of the sun and heat;</td>
</tr>
<tr>
<td></td>
<td>has a renewable</td>
</tr>
<tr>
<td></td>
<td>resource.</td>
</tr>
</tbody>
</table>

**CoT:**

1. **Human Face Characteristics**
   - Chin: Like a chin of a human being, isolated in a plain, protruding upwards.
   - Ears: Like basins, salty and shallow. Eddies look like the caverns.
   - Mouth: Like caves found in the limestone regions, teeth like stalactites and stalagmites which look like teeth of a human being, isolated, on the plains.
   - Hair: Like a forest. Protects the land surface from soil erosion, heat of the sun and heat; has a renewable resource.

2. **Land Characteristics**
   - Inselbergs: Looks like a chin of a human being, isolated, on the plains.
   - Caverns: Found in the limestone regions, have pendants called stalactites and stalagmites which look like teeth of a human being, isolated, on the plains.
   - Desert: Dry, with very little rain and vegetation.
   - Forest: Protects the land surface from soil erosion, heat of the sun and heat; has a renewable resource.
   - River: Flows like a nose, drains water into the sea, a delta, irregular in shape and appearance. Flows from highlands to lowlands (delta). Linear features like a valley. Linear features like a valley. Linear features like a valley, integrates in the desert.

**Notes:**

- Inselbergs are like chin of a human being, isolated, protruding upward on the plains.
- Basins are like the caverns.
- Ears are like basins, salty and shallow. Eddies look like caverns.
- Caverns are found in the limestone regions, have pendants called stalactites and stalagmites which look like teeth of a human being, isolated, protruding upward on the plains.
- Desert is dry, with very little rain and vegetation.
Further the attributes of external and internal processes of landforms (Chart 3.4) and (Chart 3.5).

**Attributes of Internal Processes**
- Cause sudden changes on the face of the land.
- Takes place suddenly and violently causing loss of life and property.
- Takes place in the interior parts of the earth causing sudden changes on the face of the land.

**Attributes of External Processes**
- Causes gradual changes on the face of the land.
- Carry away the eroded material and deposit them down the low lands away from their original place.
- External forces act slowly, by wearing out and tearing down the highlands and soils.
- Takes place in the atmosphere and hydrosphere thereby effecting the face of the land.

Hierarchical Showing Types of Natural Processes of the Earth:

<table>
<thead>
<tr>
<th>Causes of Land Forms</th>
<th>External Processes</th>
<th>Internal Processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td></td>
<td></td>
</tr>
<tr>
<td>External processes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>惩戒 specified</td>
<td>Can carry away the eroded material and deposit them down the low lands away from the face of the land.</td>
<td></td>
</tr>
<tr>
<td>Causes gradual changes on the face of the land.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Promote Active Reception Learning:

- Interactive discussion i.e.
- Students discuss more on the extended and elaborated hierarchy showing changes causing land forms on the face of the land resulting and examples of land form (Chart 3.7)
- Hierarch showing characteristics of human face/head to the face of the land (Chart 3.6)
- Hierarchy comparing the characteristics of human face/head to the face of the land (Chart 3.6)
VARIATIONS OF LAND FORMS

ANALOGY III: Just like the face of a human being, the face of the land called the earth (Lithosphere) is rarely uniform in characteristic height, shape, appearance and size. It is always irregular. The sizes, appearances, shapes and heights of Mountains, Hills, plateaus, Valleys, Plains, seas, lakes and Plains as major components of land forms are never the same on the face of the land. Examples:

<table>
<thead>
<tr>
<th>LAND FORMS</th>
<th>Chart 3.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAND FORMS</td>
<td>Chart 3.1</td>
</tr>
</tbody>
</table>

CHARACTERISTICS VARIATIONS OF LAND FORMS

PHASE II: Present Material: This is a common step for both types of organizers and has been done at the end of Phase II. Present Material:

PHASE III: Clarify Objectives of the Lesson: Teacher presents all six objectives of Unit III and proceeds to present advance organizer.
## Defining Attributes of Different Types of Land Forms Found on the Face of the Land

<table>
<thead>
<tr>
<th>Landform</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mountains</td>
<td>Broad at the bottom, narrow and thin at the apex.</td>
</tr>
<tr>
<td></td>
<td>Snow-covered mountains.</td>
</tr>
<tr>
<td></td>
<td>Some mountains like the Great Himalayas are covered by snow.</td>
</tr>
<tr>
<td></td>
<td>Most of them are not covered by snow.</td>
</tr>
<tr>
<td></td>
<td>Volcanic eruptions or folding movements.</td>
</tr>
<tr>
<td></td>
<td>Smaller than mountains.</td>
</tr>
<tr>
<td></td>
<td>Flat at the top, rise at the sides.</td>
</tr>
<tr>
<td></td>
<td>Have steep undulating slopes.</td>
</tr>
<tr>
<td></td>
<td>Rich for agriculture.</td>
</tr>
<tr>
<td></td>
<td>Are U-shaped or V-shaped depressions found between two hills or mountains.</td>
</tr>
<tr>
<td></td>
<td>Have rivers or lakes at the bottom, like the Great Rift Valley of Africa.</td>
</tr>
<tr>
<td></td>
<td>Rich for agriculture, either shaped or V-shaped.</td>
</tr>
<tr>
<td></td>
<td>Flat or depressed land.</td>
</tr>
<tr>
<td></td>
<td>Desert areas.</td>
</tr>
<tr>
<td></td>
<td>Formed by wind blowing in desert regions.</td>
</tr>
<tr>
<td></td>
<td>Run hundreds of kilometres.</td>
</tr>
<tr>
<td></td>
<td>Formed in desert areas.</td>
</tr>
<tr>
<td></td>
<td>Sand dunes.</td>
</tr>
<tr>
<td></td>
<td>Desert plains.</td>
</tr>
<tr>
<td></td>
<td>Located in low elevated land.</td>
</tr>
<tr>
<td></td>
<td>Low altitude.</td>
</tr>
<tr>
<td></td>
<td>Flat or depressed land.</td>
</tr>
<tr>
<td></td>
<td>Flattened plains not for agriculture.</td>
</tr>
<tr>
<td></td>
<td>Desert plains.</td>
</tr>
<tr>
<td></td>
<td>Desert areas.</td>
</tr>
</tbody>
</table>

### Landforms

- **Mountains**
  - Broad at the bottom, narrow and thin at the apex.
  - Some mountains like the Great Himalayas are covered by snow.
  - Most of them are not covered by snow.
  - Volcanic eruptions or folding movements.
  - Smaller than mountains.
  - Flat at the top, rise at the sides.
  - Have steep undulating slopes.
  - Rich for agriculture.
  - U-shaped or V-shaped depressions found between two hills or mountains.
  - Have rivers or lakes at the bottom, like the Great Rift Valley of Africa.
  - Rich for agriculture, either shaped or V-shaped.
  - Flat or depressed land.

- **Hills**
  - Flame-like mountains.
  - Steep and undulating slopes.
  - Flat or gentle rise at the sides.
  - Rich for agriculture.

- **Plains**
  - Flat or depressed land.
  - Desert plains.
  - Located in low elevated land.
  - Low altitude.
  - Flattened plains not for agriculture.

- **Sand Dunes**
  - Desert areas.
  - Formed by wind blowing in desert regions.
  - Run hundreds of kilometres.
  - Found in desert areas.

### Defining Attributes

- Volcanic eruptions.
- Folding movements.
- Mountain like the Great Himalayas are covered by snow.
- Some mountains are covered by snow.
- Most of them are not covered by snow.
- Volcanic eruptions or folding movements.
- Smaller than mountains.
- Flat at the top, rise at the sides.
- Have steep undulating slopes.
- Rich for agriculture.
- U-shaped or V-shaped depressions found between two hills or mountains.
- Have rivers or lakes at the bottom, like the Great Rift Valley of Africa.
- Rich for agriculture, either shaped or V-shaped.
- Flat or depressed land.
- Desert plains.
- Located in low elevated land.
- Low altitude.
- Flattened plains not for agriculture.
- Desert areas.
- Formed by wind blowing in desert regions.
- Run hundreds of kilometres.
- Found in desert areas.
- Desert plains.
- Located in low elevated land.
- Low altitude.
Awareness of the learner's relevant knowledge:

Social System:

♦ Defining attributes of different landforms found in the face of the land (Chart 3.0).
♦ Characteristic variations of land forms (Chart 3.1).
♦ Examples of different landforms found on the face of the land (Chart 3.2).
♦ Prompt for more essential defining attributes of different landforms found in the face of the land.

In phase II, refer to advance organizer in the organization of instructional material. This is essential to differentiate new learning tasks from previously learned tasks; and encourage students to initiate more questions and comments.

Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge.

Summative Evaluation:

Repeat: Refer to advance organizer.

Support System:

Students are helped to use critical approach to knowledge by making differentiated and reconciled learning tasks relevant to students' cognitive structure as Phase III of the model.

Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge.

Elicit student's questions to differentiate new learning tasks and reconcile them with existing knowledge.

Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge.

Teacher Role:

Teacher controls the learning tasks new learning tasks in the class with very special roles of the teacher and students.

Social System Reflects upon the kind of teacher taught and learn interaction patterns in the class.

Summative Evaluation:

Teacher reflects upon the kind of teacher taught and learn interaction patterns in the class.
INSTRUCTIONAL EVENTS FOR UNIT IV
Topic: Action of external processes on the face of the land.

Focus: Common for two types of advance organizers
(Generalization and Analogy).

INSTRUCTIONAL OBJECTIVES:

PRE-REQUISITE KNOWLEDGE OF THE LEARNERS:
The main focus of this unit is to guide students know major agents of external
processes and integrate them with the resultant land forms on the face of the
land.

At the end of the instruction, students will have studied the enrichment and/or remedial
material and will be able to:

IDENTIFY:
− the causes of external processes which help in breaking down of rocks.
− types of external processes from list G given below.
− identify from the choices given that water is the main agent of external processes on
  the face of the land.
− identify from the choices given that major agents of external processes are valley
  cutting, weathering, erosion, and deposition.
− identify from the choices given major action of weathering which results in the
  breaking down of rocks into smaller particles.

INSTRUCTIONAL AIDS:

NOTE: It is required that students fulfill conditions of Unit III Test items before proceeding to Unit IV.

INSTRUCTIONAL AIDS:

Transparency 
Showing analogy V. 
Showing weathering along the rock-joints (Chart 4.7). 
Showing plant roots penetrating rock cracks (Chart 4-7). 
Chart 4.0: Showing defining attributes of external processes of the earth and major actions of external process on the face of the land.

Chart 4.1: Hierarchical outline showing agents of external processes.

Chart 4.2: Showed weathering processes which help in breaking down of rocks.

Chart 4.3: Definition of external processes.

Chart 4.4: Showing valley cutting processes on the face of the land.

INSTRUCTIONAL PACKAGES

(ANALOGY AS ADVANCE ORGANIZER)

INSTRUCTIONAL EVENTS FOR UNIT IV
**CONTENT SEQUENCE:**

- Causes of sudden changes in weather phenomena
- Weathering as a agent of external processes operating on the face of the land
- Action of external processes on the face of the land
- Teacher and discussion
- Transparencies showing weathering along the rock joints (Chart 4.7) and (Chart 4.8)
- Teacher will use tutorial for those students who may lack knowledge essential for the purpose of ascertaining unit wise individual's achievement. Formative evaluation will be adopted at the end of each unit. Corrective feedback will follow remediation and/or enrichment procedures as stated below.
- Sources of remediation:
  - Hierarchical outlines showing agents of external processes (Chart 4.1), will form part of the programme and/or unit.
  - Teacher will guide students through the enrichment material.
  - Transparencies showing weathering along the rock joints (Chart 4.7) and (Chart 4.8)

**REFERENCES:**

- Teacher will use tutorial for those students who may lack knowledge essential for the purpose of ascertaining unit wise individual's achievement. Formative evaluation will be adopted at the end of each unit. Corrective feedback will follow remediation and/or enrichment procedures as stated below.

**TASKS:**

- Other instructional packages/learning
  - Chart 4.5: Weathering processes on the face of the land
  - Transparencies showing weathering along the rock joints (Chart 4.7) and (Chart 4.8)
  - Teacher will use tutorial for those students who may lack knowledge essential for the purpose of ascertaining unit wise individual's achievement. Formative evaluation will be adopted at the end of each unit. Corrective feedback will follow remediation and/or enrichment procedures as stated below.

**INSTRUCTIONAL PROGRAMME AND SEQUENCING:**

- Causes of sudden changes in weather phenomena
- Weathering as a agent of external processes operating on the face of the land
- Action of external processes on the face of the land
- Teacher and discussion
- Transparencies showing weathering along the rock joints (Chart 4.7) and (Chart 4.8)
- Teacher will use tutorial for those students who may lack knowledge essential for the purpose of ascertaining unit wise individual's achievement. Formative evaluation will be adopted at the end of each unit. Corrective feedback will follow remediation and/or enrichment procedures as stated below.

**REFERENCES:**

- Teacher will use tutorial for those students who may lack knowledge essential for the purpose of ascertaining unit wise individual's achievement. Formative evaluation will be adopted at the end of each unit. Corrective feedback will follow remediation and/or enrichment procedures as stated below.

- Transparencies showing weathering along the rock joints (Chart 4.7) and (Chart 4.8)
- Teacher will guide students through the enrichment material.

**REFERENCES:**

- Teacher will use tutorial for those students who may lack knowledge essential for the purpose of ascertaining unit wise individual's achievement. Formative evaluation will be adopted at the end of each unit. Corrective feedback will follow remediation and/or enrichment procedures as stated below.

- Transparencies showing weathering along the rock joints (Chart 4.7) and (Chart 4.8)
- Teacher will guide students through the enrichment material.
Water enters the rocks through their joints. In the course of time, rocks split up and eventually fall out into smaller pieces.

PHASE I: Strengthening of cognitive organization:
Revise principle of integrative reconciliation:

TRANSPARENCY SHOWING PLANT ROOTS PENETRATING ROCKS CRACKS AND HELP IN BREAKING DOWN OF ROCKS INTO SMALLER PIECES

TRANSPARENCY SHOWING WEATHERING ALONG THE ROCK JOINTS
Definition of Weathering: Weathering is the process of breaking down of rocks by sudden changes in weather phenomena with the help of temperature, variations, moisture content, precipitation, and protrusion of plant roots.

Causes of Sudden Changes in Weather Phenomena Which Help in the Breaking Down of Rocks

- Temperature variations
- Moisture content
- Precipitation
- Protrusion of plant roots

Other Causes of Weathering

- Type of soil and fissures
- Water and seepage
- Rock joints
- Organic substances
- Chemical reactions

HIERARCHICAL OUTLINE

(Chart 4.4)

(Chart 4.5)

(Chart 4.6)
External processes act slowly on the face of the land by wearing out, tearing down the highlands and soils, carry away and deposit the worn out material in the lowlands. External processes act slowly on the face of the land by wearing out, tearing down the highlands and soils, carry away and deposit the worn out material in the lowlands. They reduce the differences in heights between the highlands and lowlands. Weathering phenomena are constant temperature changes, constant temperature changes, loose rock particles on the earth's surface, loose rock particles on the earth's surface. External processes act slowly on the face of the land by wearing out, tearing down the highlands and soils, carry away and deposit the worn out material in the lowlands. External processes act slowly on the face of the land by wearing out, tearing down the highlands and soils, carry away and deposit the worn out material in the lowlands. They reduce the differences in heights between the highlands and lowlands. Weathering phenomena are constant temperature changes, constant temperature changes, loose rock particles on the earth's surface, loose rock particles on the earth's surface. External processes act slowly on the face of the land by wearing out, tearing down the highlands and soils, carry away and deposit the worn out material in the lowlands. External processes act slowly on the face of the land by wearing out, tearing down the highlands and soils, carry away and deposit the worn out material in the lowlands. They reduce the differences in heights between the highlands and lowlands. Weathering phenomena are constant temperature changes, constant temperature changes, loose rock particles on the earth's surface, loose rock particles on the earth's surface. 

Hierarchical outline showing defining attributes of weathering:

- Attributes of weathering:
  - Formation of soils
  - Rocks change
  - Rocks erode
  - Rocks exposed
  - Weathering phenomena
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 defining attributes of external processes
(Major Actions on the Face of the Land)
Appendix-fX
U

Examples of land forms due to the external processes
(Chart 4.2)

Expanded hierarchy
Examples of land forms due to the external processes
(Chart 4.2)
Awareness of the Learner's Relevant knowledge and the organized cognitive structure (as in phase III of the Syntax of the model. Appendix-1)

Principles of Reaction:

Students' Role:
- Encourage students to initiate more questions and comments.
- Encourage students to initiate more questions and comments especially in Phase III of the lesson.
- Helps students differentiate new learning tasks from previously learned tasks.
- Encourages students to the organized interrelational patterns in the class with very specific roles of the teacher and students.

Teachers' Role:
- Social system reflects upon the kind of teacher-student interrelational patterns in the class with very specific roles of the teacher and students.
- Common for the two types of organizers (generalization and analogy).
- Students' role.
- Expectance of the learners' Relevant Knowledge and the organized cognitive structure (as in phase III of the Syntax of the model. Appendix-1)

Appendix-1
This is because a well-organized material is the critical support requirement of the model. That is, the effectiveness of the advance organizer depends on an integral and appropriate relationship between the conceptual organizer and the content. Well-formed and synchronized structural hierarchies of the Over-Head Projector (OHP) will form the support system during instruction.

**SUMMATIVE EVALUATION:**

- Grades will be administered at the end of the experiment to grade students according to their enrichment of the course intentions.
- Summative evaluation will be final and grades assigned will affect students' achievement throughout their scholastic career during this course.

**SUPPORT SYSTEM:**

In Phase II, proper caution is taken in the organization of instructional material.
INSTRUCTIONAL EVENTS FOR UNIT V

Topic: Gradational Processes

Focus: Common for two types of advance organizers (Generalization and Analogy).

INSTRUCTIONAL PACKAGES

ANALOGY AS ADVANCE ORGANIZER

INSTRUCTIONAL OBJECTIVES

1. Define the term gradational processes.
2. Circle from the list given two moving agents of gradational process which transport weathered material from one place to another.
3. Circle from the list given two components of gradational processes which describe the gradational processes which transport weathered material from one place to another.
4. Define the term degradation.
5. Define the term aggradation.
6. Define the term degradation.
7. Define the term aggradation.
8. Write in their answer sheets as many as possible similarities between degradation and aggradation.
9. Write in their books as many differences as possible between degradation and aggradation.

INSTRUCTIONAL AIDS:
- Chart 5.0: Hierarchy of defining attributes of gradational processes (Relating this with Chart 4.0: Defining attributes of external processes done in the previous lesson).
- Chart 5.1: Definition of gradational processes.

NOTE: It is required that students fulfill conditions of test items based on Unit IV test items before proceeding to the next unit.

PREVIOUS LESSON:

INSTRUCTIONAL PACKAGES

ANALOGY AS ADVANCE ORGANIZER
remediation and/or enrichment procedures stated below.

**INSTRUCTIONAL PROGRAMME AND SEQUENCING**

**CONTENT SEQUENCE:**
- Gradational processes.
- Moving agents of gradational processes.
- Differences between degradation and aggradation.
- Definition of degradation.
- Components of degradation processes.
- Moving agents of degradation processes.
- Gradational processes.
- Definition of aggradation.
- Components of aggradation processes.
- Moving agents of aggradation processes.

**OTHER INSTRUCTIONAL AIDS:**
- Chalks (assorted colours)
- Chalkboard, dusters, rulers
- Lectures and discussions
- Chalkboard, discussion, charts

**POST-ASSESSMENT:**

For the purpose of ascertaining unit wise individuals' status achievement, formative evaluation will be adopted at the end of each unit. Corrective feedback will follow the remediation and/or enrichment procedures stated below.

**FORMATIVE EVALUATION:**

**LEARNING UNITS:**

Refer to the syntax of this lesson.
Appendix-D,
REMEDIATION:
ENRICHMENT:
♦ Teacher will use tutorial for those students who may lack knowledge essential for the programme and/or unit.
♦ Hierarchical outline showing similarities and differences between degradation and aggradation (Chart 5.8), components of gradational process (Chart 5.3); and moving agents of gradation (Chart 5.4) will be used during remediation for this unit.
♦ Hierarchical outline of gradational process will also form part of alternative remedial source.
Some topics relevant to IX class students will be assigned to those students who have achieved mastery faster than others (Oxford Children's Encyclopaedia AB to ZU Vols. 1 to 9 (1996) and the Oxford Children's Reference Library (2) Exploring the World, 1966).
Teacher will guide students through the enrichment material.

Hierarchical Outline showing main agents of Degradation and Relate this to Chart 5.10 (ANALOGY):

Phase I: Strengthening of Cognitive Organization.
REVISE Principle of Integrative Reconciliation:
Rivers Winds Waves Glaciers Weathering
Agents of Gradation Process
PRESCRIPTION:
<table>
<thead>
<tr>
<th>DIFFERENCES BETWEEN GRADATION AND AGGRADATION</th>
<th>SIMILARITIES BETWEEN DEGRADATION AND AGGRADATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>♦ The type of landforms in areas where it is most effective are U-shaped valleys in the river courses.</td>
<td>♦ Effective in shaping up the face of the land.</td>
</tr>
<tr>
<td>♦ Removal and carrying away of the eroded earth's crust is the main feature.</td>
<td>♦ Acts gradually on the face of the land for a long period of time.</td>
</tr>
<tr>
<td>♦ Effective in the higher levels (Highlands).</td>
<td>♦ Effective in shaping up the face of the land.</td>
</tr>
<tr>
<td>♦ Characterized by poor type of soil in the areas where it is effective.</td>
<td>♦ Acts gradually on the face of the land.</td>
</tr>
<tr>
<td>♦ Decreases the land elevation where it is effective.</td>
<td>♦ Effective in shaping up the face of the land.</td>
</tr>
</tbody>
</table>

**DEGRADATION**

- Process taking place here responsible for the shaping of land where it is most effective are U-shaped valleys and almost flat type due to siltation process taking place here.
- Deposition and building up of the surrounding landscape is the main feature.
- Effective in the low land areas.
- Rich type of alluvial soil, good for agriculture in areas where it is effective.
- Increases the face of the land where it is effective.
- Decreases the land elevation where it is effective.

**AGGRADATION**

- Process taking place here responsible for the shaping of land where it is most effective are U-shaped valleys and almost flat type due to siltation process taking place here.
- Deposition and building up of the surrounding landscape is the main feature.
- Effective in the high land areas.
- Anchored by the higher levels. Effective in areas where it is effective. Characteristics of good type of soil.
- Increases the face of the land by deposition where it is effective.

**SIMILARITIES BETWEEN DEGRADATION AND AGGRADATION**

- Effective in shaping up the face of the land.
- Acts gradually on the face of the land for a long period of time.
- Takes place at the same time with degradation in different areas.
- Is a component of Gradational process.
DEFINITION OF AGGRADATION

Aggradation is the process by which deposition of eroded earth's material takes place in the lowlands leading to gradual increase in height of the land level.

DEFINITION OF THE TERM DEGRADATION COMPONENT

Degradation is the process by which material of the earth's crust are removed from the highlands by erosion of the landscapes with the help of rivers, rain waters, and wind and later deposited far away from their original place.

DEFINITION OF THE TERM DEGRADATION COMPONENT

Degradation is the process by which material of the earth's crust are removed from the highlands by erosion of the landscapes with the help of rivers, rain waters, and wind and later deposited far away from their original place.
Appendix-D,

Poor type of soil in areas where it is most prevalent

Deposit the eroded particles far away from their original at the same time Decreases the places with aggradation land level

Remove the eroded earth's Crust from highlands with the help of rivers, rain Active in Carrying eroded material away from their original places with the help of wind, rain

Takes a long time to become water, winds highland areas water, prominent

Phase II: Presents Material:

Phase III: Clarify objectives of the lesson:

ANALOGY V:

Defining Attributes of Degradation

Chart 5.3

HIERARCHY SHOWING COMPONENTS OF GRADATION AL PROCESSES

Chart 5.4

DEFINING ATTRIBUTES OF DEGRADATION
Attributes of Gradational Processes

Chart 5.0

HIERARCHY OF DEFINING ATTRIBUTES OF GRADATIONAL PROCESSES

CHART 5.0

DEFINITION OF GRADATIONAL PROCESSES

These are processes which reduce the land surface by wearing out, tearing down, carrying away and deposit all the weathered rock and soil particles in different regions away from their original place.

DEFINITION OF GRADATIONAL PROCESSES

Examples of Moving Agent

By moving agents

Weathered Material Transported

Rivers

Weathering

Glaciers

Waves

Rainfall

Examples of Moving Agents of Gradational Processes

Chart 5.2
The teacher clarifies the learner's reaction to new learning tasks.

Students are encouraged to differentiate new learning tasks and reconcile them.

Appendix-1)
This is because a well-organized material is the critical support requirement of the model, and:

- The effectiveness of the advance organizer depends on an integral and appropriate relationship between the conceptual organizers and the content;
- Well-formed and synchronized structural hierarchies of content and transparencies of Overhead Projector (OHP) will form the support system during instructions.

Summative Evaluation will be Final and grades assigned will reflect students' achievement throughout their scholastic career during this course. This will be administered at the end of the experiment to grade students according to their achievement of the course intentions.
INSTRUCTIONAL PACKAGES
(ANALOGY AS ADVANCE ORGANIZER)
INSTRUCTIONAL EVENTS FOR UNIT VI
Topic: Wind Abrasion as an agent of gradation.

INSTRUCTIONAL OBJECTIVES:
At the end of instructions, students will have studied the enrichment and/or remedial material and will be able to:

♦ Identify the defining attributes of wind abrasion.

4 Circle from the list given three landforms formed due to wind abrasion.

4 Identify the defining attributes of wind abrasion.

The main focus of this lesson is to help students relate and integrate the action of wind abrasion as an agent of gradation with the action of aggradation as a process of gradation for the resultant landforms due to these processes.

(Generalization and Analogy)
Focus: Common for two types of advance organizers.
Topic: Wind Abrasion as an agent of gradation.

INSTRUCTIONAL PACKAGES
(ANALOGY AS ADVANCE ORGANIZER)
Draw accurately expanded and elaborated hierarchy of gradational processes 
showing degradation, aggradation, moving agents of degradation, land forms due 
to wind abrasion and land forms due to aggradation.

**Diagram:**

- Identify the name of the landform marked D.
Appendix-D

Pre-requisite Knowledge of the Learners:

NOTE: It is required that students fulfill conditions of Unit V before proceeding to the next unit.

Institutional Program and Sequencing

Content Sequences:

Learning Units:

Instructional Aids:

Post Assessment:

Formative Evaluation:

Remediation:

Preparation:

Instructional Program:

Expend and elaborated hierarchies of gradational processes.

Attributes of wind erosion.

Wind erosion as an agent of gradation.

Lectures and discussions.

Chalkboards, Rocks, Dusters

Chart 6.0: Transparency: mushroom rocks (Zeungen).

Chart 6.1: Examples of land forms due to wind abrasion.

Chart 6.2: Explaining attributes of wind erosion.

Chart 6.3: Expanded and elaborated hierarchy of gradational processes.

Chart 6.4: Sand dunes (Barchans).

Chart 6.5: Expanded and elaborated hierarchy of gradational processes.

Chart 6.6: Wind erosion as an agent of gradation.

Refer to the syntax of the lesson.

For the purpose of ascertaining unit-wise individual achievement, formative evaluation will be adopted at the end of each Unit. Corrective feedback will follow remediation and/or enrichment procedures stated above.

The remediation and/or enrichment procedures stated above would be the referral point for those students who may lack knowledge essential for the programme and/or unit.

Teach the remediation and/or enrichment procedures stated above.

Note: It is required that students fulfill conditions of Unit V before proceeding to the next unit.
Grain particles are carried away and deposited in far distant lands and eventually form loess soils in Beijing, China.

The coarse rock particles or pebbles are carried away only a few metres, but fine sand particles are carried away and eventually form loess soils in Beijing, China.

## Appendix D

**ENRICHMENT:**

**SYNTAX (ANALOGY):**

**PHASE I:** Strengthening of cognitive organization:

*Revise Principle of Integrative Reconciliation:*

Some topics relevant to IX grade social studies students will be assigned to those students who have achieved mastery faster than others. (Oxford Children's Encyclopaedia AB to ZV, vols. 1 to 9, 1996) will also form part of remediation package. (Chart 6.4)

Teacher will guide students through the enrichment material.

**TRANSPARENCY SHOWING MUSHROOM ROCKS (ZEUNGEN):**

Some topics relevant to IX grade social studies students will be assigned to those students who have achieved mastery faster than others. (Oxford Children's Encyclopaedia AB to ZV, vols. 1 to 9, 1996) will also form part of remediation package. (Chart 6.4)
EXPANDED AND ELABORATED HIERARCHY OF GRADATIONAL PROCESSES

Sand Dunes
(Barchans)
Loess soils
in N.W. Beijing
in China
Land Forms
Mushroom
rocks
(Zeungen)
Rivers
Alluvial
Terminal
Levees
moraines
soils
Winds
Deltas
Glaciers
Weathering
Moving Agents
(Erosion)
(Rivers)
Lateral
Loess
moraines
soils
Land Forms
Due to
(Aggradation)
Aggradation
(Erosion)
Main Activity
Component
Deformation
(Aggradation)
Aggradation
Main Activity
Component
Rivers
Leaves
Terminal
Loess
moraines
soils

Appendix D
Students relate gradational processes with its components, moving agents of degradation, land forms due to wind abrasion and land forms due to aggradation (Chart 6.2), expanded and elaborated hierarchy of gradational processes. Discuss (Chart 6.3) and (Chart 6.4) transparency showing sand dunes due to wind abrasion and Mushroom rocks (Chart 6.4).

Examples of landforms due to wind abrasion

- Sand dunes or (Barchans)
- Sand Loess Soils
- Mushroom rocks (Zeungen)

ANALOGY VI: Wind abrasion is more dominant in desert regions. The absence of vegetation, strong winds carrying sand grains from one place to another, and the removal of dry and loose soil particles by rain and surface run-off help a lot in the removal of dry and loose soil particles by wind abrasion. The presence of vegetation prevents the removal of soil particles by wind abrasion.

Phase II: Present Material:
- Landforms due to aggradation and landforms due to wind abrasion.
- Discuss (Chart 6.2) extended and elaborated hierarchy of gradational processes.
- Students relate gradational processes with its components, moving gears of degradation and erosion due to wind abrasion.
- Give Examples:

Phase III: Clarify objectives of the Lesson:
- Teacher presents seven objectives of unit VI and proceeds to present the advance organizer.

Promote active Reception Learning:
- Interactive discussion Session
PRINCIPLES OF REACTION:

♦ Students are encouraged to initiate their own questions in response to their own drives of meaning.

Students’ Role:

Encourage students to initiate more questions and comments.

Encourage more interactive learning situations especially in phase III of the lesson.

Help students differentiate new learning tasks from previously learned tasks.

Reinforce links to the organizer earlier presented.

Teacher’s Role:

♦ Retain control of the intellectual structure as students continually relate the learning tasks to the organizer earlier presented.

♦ Helps students differentiate new learning tasks from previously learned tasks.

♦ Encourage more interactive learning situations especially in phase III of the lesson.

♦ Encourage students to initiate more questions and comments.

Social System:

Social system reflects upon the kind of teacher-student interactional patterns in the class with very specified roles of the teacher and students.

SOCIAL SYSTEM:

AWARENESS OF THE STUDENTS’ RELEVANT KNOWLEDGE AND EXPERIENCE:

Prompt for more examples relevant to the learning unit and the organizer.

Examples of landforms due to wind abrasion.

Attributes of wind abrasion.

Refer to advance organizer earlier presented.

Attributes of wind abrasion.

Repeat:

DEFINING ATTRIBUTES OF WIND ABRAZION

Carry the desert regions

Vegetation cover in regions away to different regions of eroded soil particles

Remove loose soil particles

By strong winds

Attributes of wind abrasion

Charn 6.0

Identify defining attributes:
Students are encouraged to initiate their own questions in response to their own drives of meaning.

Students are helped to use critical approaches to knowledge by making differentiated means of meaning.

Students are encouraged to initiate their own learning tasks and reconcile them with existing knowledge.

Students are helped to use critical approaches to knowledge by making differentiated learning tasks relevant to their cognitive structure (as in Phase III of the model).

This will be administered at the end of the experiment to grade students according to their enrichment of the course intensions.

Summative evaluation will be final and grades assigned will affect students' achievement throughout their scholastic career during this course.

The effectiveness of advance organizer depends on an integral and appropriate relationship between the conceptual organizer and the content.

Well formed and synchronized structural hierarchies of content and transparencies, and Over Head Projector (OHP) will form the support system during instruction.

Well formed and synchronized structural hierarchies of content and transparencies, and Over Head Projector (OHP) will form the support system during instruction.

This is because a well organized material is the critical support requirement of the model and the effectiveness of advance organizer depends on an integral and appropriate relationship between the conceptual organizer and the content.

This will be administered at the end of the experiment to grade students according to their enrichment of the course intensions.

Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge.
INSTRUCTIONAL EVENTS FOR UNIT VII

**Topic:** River Systems

**Focus:** Common for two types of advance organizers (Generalization and Analogy)

**INSTRUCTIONAL PACKAGES**

- Chart 7.0: Hierarchical outline showing defining attributes of rivers.
- Chart 7.1: Definition of rivers.
- Chart 7.2: Examples of geologically old and new rivers.
- Chart 7.3: Hierarchical outline showing importance of rivers as circulatory systems.

**INSTRUCTIONAL AIDS:**
- Chart 7.0
- Chart 7.1
- Chart 7.2

**INSTRUCTIONAL OBJECTIVES:**
- Identify by circling from the choices below, landforms due to river erosion.
- List out the choices below, rivers in India flowing into the Arabian Sea.
- From the list given below, identify which best describe boding of water (Hydrosphere).
- Discriminate from the choices given below, one statement which best describe importance of rivers as circulatory systems.
- From the list given, identify two examples of geologically old rivers in Africa.
- From the list given below, identify from the choices given below, geologically old rivers in India.
- From the list given below, identify from the choices given below, geologically new rivers in India.
- From the list given below, choose from the statement given, one statement which best describes major attributes of a river.

**INSTRUCTIONAL PACKAGES**

- Note: It is required that students fulfil conditions of Unit VI test items before proceeding to the next unit.

**PREQUISITE SKILLS OF THE STUDENTS:**
- By tick marking select statements, which best describe major attributes of a river.
- From the list given below, which one of them best illustrate rivers in India flowing into the Bay of Bengal.
- From the list given below, rivers in India flowing into the Arabian Sea.
- From the list given below, landforms due to river erosion.
- From the list given below, rivers in India flowing into the Arabian Sea.
- From the list given below, landforms due to river erosion.
- From the list given below, rivers in India flowing into the Arabian Sea.
- From the list given below, landforms due to river erosion.
- From the list given below, rivers in India flowing into the Arabian Sea.

**INSTRUCTIONAL AIDS:**
- Chart 7.0
- Chart 7.1
- Chart 7.2

**INSTRUCTIONAL PACKAGES**

- Chart 7.0
- Chart 7.1
- Chart 7.2

**INSTRUCTIONAL OBJECTIVES:**
- Identify by circling from the choices below, landforms due to river erosion.
- List out the choices below, rivers in India flowing into the Arabian Sea.
- From the list given below, identify which best describe boding of water (Hydrosphere).
- Discriminate from the choices given below, one statement which best describe importance of rivers as circulatory systems.
- From the list given, identify from the choices given below, geologically old rivers in Africa.
- From the list given below, which one of them best illustrate rivers in India flowing into the Bay of Bengal.
- From the list given below, rivers in India flowing into the Arabian Sea.
- From the list given below, landforms due to river erosions.

**INSTRUCTIONAL PACKAGES**

- Note: It is required that students fulfil conditions of Unit VI test items before proceeding to the next unit.
the programme and/or unit;
Hierarchies showing rivers in India flowing into the Bay of Bengal and Arabian Sea and their tributaries (Chart 7.7) as part of remediation packages.

Teacher will use tutorial for those students who may lack knowledge essential for

Post-Assessment Formative Evaluation:
For the purpose of ascertaining unit wise individual’s status achievement; formative evaluation will be adopted at the end of each unit. Corrective remedial feedback will follow the remediation procedures as stated below.

Remediation:
Teacher will use tutorial for those students who may lack knowledge essential for

INSTRUCTIONAL PROGRAMME AND SEQUENCING

CONTENT SEQUENCE:
♦ Attributes of a river.
♦ Examples of geologically old rivers of India.
♦ Examples of geologically new rivers in India.
♦ Importance of rivers as circulatory systems.
♦ Bodies of water (Hydrosphere).
♦ Geological old rivers in Africa.
♦ Rivers in India flowing into the Bay of Bengal.
♦ Rivers in India flowing into the Arabian Sea.
♦ Landforms due to river erosions.
♦ Leagues and discussions.
♦ Chalks (assorted colours).

OTHER INSTRUCTIONAL PACKAGES:
♦ Chalks (assorted colours).
♦ Chalkboard, dusters, rulers.
♦ Lectures and discussions.
♦ Charts (assorted colours).

PRESCRIPTION:
Teacher will use tutorial for those students who may lack knowledge essential for

Legend and illustrations (Chart 7.7) as part of remediation packages.

Instructional packages:

Learning Events:
Post-Assessment Formative Evaluation:
For the purpose of ascertaining unit wise individual’s status achievement; formative evaluation will be adopted at the end of each unit. Corrective remedial feedback will follow the remediation procedures as stated below.

Remediation:
Teacher will use tutorial for those students who may lack knowledge essential for

INSTRUCTIONAL PROGRAMME AND SEQUENCING

CONTENT SEQUENCE:
♦ Attributes of a river.
♦ Examples of geologically old rivers of India.
♦ Examples of geologically new rivers in India.
♦ Importance of rivers as circulatory systems.
♦ Bodies of water (Hydrosphere).
♦ Geological old rivers in Africa.
♦ Rivers in India flowing into the Bay of Bengal.
♦ Rivers in India flowing into the Arabian Sea.
♦ Landforms due to river erosions.
♦ Leagues and discussions.
♦ Chalks (assorted colours).

OTHER INSTRUCTIONAL PACKAGES:
♦ Chalks (assorted colours).
♦ Chalkboard, dusters, rulers.
♦ Lectures and discussions.
♦ Charts (assorted colours).

PRESCRIPTION:
Teacher will use tutorial for those students who may lack knowledge essential for

Legend and illustrations (Chart 7.7) as part of remediation packages.

Instructional packages:
Teacher will guide students through the enrichment material

Enrichment:

Some topics relevant to the IX grade students will be assigned to those students who have achieved mastery faster than others. (Oxford Children's encyclopaedia AB to ZU Vols. 1 to 9 (1996) and the Oxford Children's Reference Library (2) Exploring the World)

Teacher will guide students through the enrichment material

In addition to remediation package

Hierarchically showing landforms due to river erosion (Chart 7.8) will also form part of

Hierarchically showing landforms due to river erosion (Chart 7.8) will also form part of
DIFFERENCES AND SIMILARITIES BETWEEN RIVERS AND BLOOD AS CIRCULATORY SYSTEMS

<table>
<thead>
<tr>
<th>SIMILARITIES</th>
<th>DIFFERENCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide life blood to the human body.</td>
<td>Carry impure blood in another channel.</td>
</tr>
<tr>
<td>Major transport system</td>
<td>Carry all wastes in the same channel.</td>
</tr>
<tr>
<td>Carry food and other nutrients in one channel.</td>
<td>Carry eroded material in one channel.</td>
</tr>
</tbody>
</table>

SIMILARITIES
- Provide life blood (water) for industrial and personal use.
- Used to transport system (indirectly).
- Carry eroded material in one channel.
- Carry all wastes in the same channel.

DIFFERENCES
- Used for transport system.
- Carry eroded material in one channel.
- Carry all wastes in the same channel.
Appendix-D

Hierachy showing importance of blood as circulatory system (Chart 7.4)

Economic Importance of Rivers as Circulatory Systems (Chart 7.2)

Blood circulation system

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Water used in industries</th>
<th>Generating electricity</th>
<th>Drinking water</th>
<th>Cooling water</th>
<th>Transport system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keep the body warm</td>
<td>Pure blood used in</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature warm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immune system health and function</td>
<td>Body blood used</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irrigation purposes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generate electricity</td>
<td>Water used</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water for cleaning/hospital purposes (Domestic)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water used in industries</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Electricity</td>
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<tr>
<td>Cooling water</td>
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<td></td>
</tr>
<tr>
<td>Transport system</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Drinking water</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generating electricity</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Water used in industries</td>
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<td></td>
</tr>
<tr>
<td>Economic Importance of Water</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Promote active reception learning:
- Interactive Discussion Sessions
- Discuss (Chart 7.6) bodies of water (Hydrosphere (Chart 7.7)), rivers in India (Chart 7.8), and (Chart 7.4)
- Discuss (Chart 7.7) bodies of water (Hydrosphere (Chart 7.7)), rivers in India (Chart 7.8), and (Chart 7.4)
- Keep the body temperature warm (generate heat)
- Pure blood used in the body and impure blood is purified and reused
- Carry water

Landforms due to river erosion.
Appendix-D

Clarify:

Phase II: Present Materials:
Phase III: Clarify objectives of the Lesson:

ANALOGY VII:
Give Examples:

Sutlej ♦ (Chart 7.4) Hierarchy showing importance of blood as a circulatory system to human body and relate it further with (Chart 7.3) hierarchical outline showing importance of rivers as a circulatory system.

> This is a common step for both types of advance organizers and had been taken care of in the syntax of generalization package.

Teacher presents eleven objectives of Unit VII and processes to present the advance organizer.

Examples of Geologically Old and New Rivers

Geologically Old and New Rivers

DEFINING ATTRIBUTES OF RIVERS
(Chart 7.1)

A river is a body of water which flows, natural and is lower than the area around it. Can flow faster or slower and is geologically old or new. A river system is important to the elements of the physical environment just like the circulatory system is to the human body. Rivers Ganga, Brahmputra, Mississippi, Mississippi, Amazon, Beas, Narmada and Irrawaddy, Nile, Zambezi, Mississippi, Amazon, Ganges. Beas, Narmada and Irrawaddy, Nile, Zambezi, Mississippi, Amazon, Ganges, Beas, Narmada and Irrawaddy, Nile, Zambezi, Mississippi, Amazon, Ganges.
Students are encouraged to initiate their own questions in response to their awareness of the student's relevant knowledge and experience.

**HIERARCHY SHOWING DEFINING ATTRIBUTES OF RIVERS**

- Flows from higher to lower grounds
- Lower than the area around it
- Is a body of water which can move faster or slower depending on the land gradients
- Geologically old and new
- Is natural but not man made

**Attributes of Rivers**

- Geodacry
- Spatial Patterns
- Rivers as
- Defining attributes of rivers (Chart 7.0)
- Definition of rivers (Chart 7.1)
- Refer to the advance organizer and other presented hierarchy showing defining attributes of rivers.
The teacher clarifies the learner's reaction to new learning tasks. Students are encouraged to differentiate new learning tasks and reconcile these with existing knowledge. Support System: In Phase II, proper caution is taken in the organization of instructional material. This is because a well-organized material is the critical support requirement of the model. Appropriate relationships between the conceptual organizer and the content will provide the effectiveness of advance organizers depends on an integral and well-formed and synchronized structural hierarchies of content and transparencies of overhead projector (OHP) will form the support system during instructions. Summative Evaluation will be final and grades assigned will reflect students' achievement throughout the course. This will be administered at the end of the experiment to grade students according to their achievement of the course intensions. Students are helped to use critical approach to knowledge by making differentiated and reconciliation of new learning tasks relevant to the student's cognitive structure as in Phase III of the Syntax of the model. 

SUMMATIVE EVALUATION:
INSTRUCTIONAL EVENTS FOR UNIT VIII

Focus: Common for two types of advance organizers (Generalization and Analogy).

INSTRUCTIONAL OBJECTIVES

The primary focus of this lesson will be to encourage students relate major functions of rivers into their cognitive structure by relating with the circulatory system.

- Identify from the choices given geologically old type of rivers.
- Name from the four choices geologically new types of rivers.
- Differentiate perennial and intermittent rivers.
- Represent hierarchically the work of rivers as circulatory system.
- Name two different types of landforms due to river deposition (Aggradation).
- Name at least three sources of river waters.
- Name at least three rivers flowing into the Bay of Bengal.
- Name at least three rivers flowing into the Arabian Sea.

PREREQUISITE KNOWLEDGE OF THE LEARNERS

Note: It is required that students fulfill conditions of unit 7 test items before proceeding to unit 8.

INSTRUCTIONAL AIDS:

- Chart 8.0: Hierarchy showing different types of blood streams.
- Chart 8.1: Hierarchy showing the work of blood streams.
- Chart 8.2: Hierarchy showing examples of food and wastes being carried by different blood streams.
- Chart 8.3: Hierarchy showing Geologically different types of rivers.
- Chart 8.4: Hierarchy showing other types of rivers.
- Chart 8.5: Hierarchy showing how different types of blood streams.
Hierarchies showing rivers in India flowing into the Bay of Bengal and Arabian Sea and their tributaries (Chart 7.7) as part of remediation packages. Hierarchies showing rivers in India flowing into the Bay of Bengal and Arabian Sea and their tributaries (Chart 7.7) as part of remediation packages. Hierarchies showing rivers in India flowing into the Bay of Bengal and Arabian Sea and their tributaries (Chart 7.7) as part of remediation packages.

Teacher will use tutorial for those students who may lack knowledge essential for the remedial remediation package. Remedial remediation package.

Follow the remediation and enrichment procedures as stated below.

For the purpose of ascertaining unit wise individual's status achievement, formative evaluation will be adopted at the end of each unit. Corrective remedial feedback will follow the remediation and enrichment procedures as stated below. Remedial remediation package.

Teacher will use tutorial for those students who may lack knowledge essential for the remedial remediation package. Remedial remediation package.

Content sequence:

Infrastructural Programmes and Sequencing:

Instructional Aids:

Chart 7.8: Hierarchy showing hills forms due to river erosion (Depositions and Aggradation).

Chart 8.10: Hierarchy showing alternative source of remediation package.

Chart 8.11: Hierarchy showing sources of river waters.

Chart 8.12: Hierarchy showing rivers flowing into the Bay of Bengal and Arabian Sea.

Chart 8.13: Attributes of perennial rivers.

Chart 8.14: Attributes of intermittent rivers.

Refer to the Syntax of the Lesson.
Some topics relevant to the IX grade students will be assigned to those students who have achieved mastery faster than others. [Oxford Children's encyclopaedia AB to ZU Vols. 1 to 9 (1996) and the Oxford Children's Reference Library (2) Exploring the World (1966)].

Teacher will guide students through the enrichment material.

**Attributes of Intermittent Rivers** (Chart 14)

- Very fast and swift with strong water currents.
- Flow for a short time in a small land area.
- Have a shorter life span of water in it.
- No constant water supply.
- Flows for a short time in the end and semi dry lands.
- Dry up during dry seasons.
- Have a shorter life span of water in it.

**Attributes of Intermittent Rivers** (Chart 13)

- Flows throughout seasons.
- Have consistent supply of water.
- Most of them are big and geologically old rivers with numerous tributaries.
- Flows over a wide distant land area.
- Flows for a long time in a wide and semi dry lands.
- Flows for a long time in a semi dry and semi wet lands.

**Phase I: Strengthening of Cognitive Organization**

Reverse principle of integrative reconciliation:

- Enrichment: (Analog):
Rainfall Spring V^ter Melting ice Glaciers

Showing Sources of River Water

Food supply and wastes are carried in the same river channel.

Wastes and food supply are carried through different channels like capillaries, arteries, and veins.

Food supply and wastes are carried in the same river channel.

Recessed wastes are got vide of through excretory and respiratory systems.

Do not have recessed wastes.
Promote Active Reception Learning: Interactive Discussion Session

- More interactive discussions on attributes of perennial and intermittent rivers

**Hierarchical Showing Geological Different Types of Rivers**

![Hierarchical Diagram]

**Hierarchical Showing Other Type of Rivers**

- Congo Nile Zambezi Amazon Ganges Brahmaputra
- Some Tributaries of Chambal from Rajasthan Desert
- Some Tributaries of Satluj Passing Rajasthan
- Some Tributaries of Ganges
- Regnig in India
- Konkan
- Krishna
- Ganges
- Stress
- Brahmaputra
- Mississippi
- Indus
- Nile
- Nile
- Congo

**Hierarchical Showing Other Type of Rivers**

- New Rivers
- Old Rivers
- Geologically Small
- Geologically Big
Teacher presents analogies of the Unit and proceeds to present advance organizer.

**Phase II: Present Material:**

**ANALOGY:**

Showing examples of items carried by rivers (Chart 8.7).

This is a common step for both types of advance organizer and had already been covered in the syntax of generalization package of Unit 8.

Rivers just like aorta, which the main blood streams carry away many sources of food for plants, and animals, silts, boulders, gravels, sand, uprooted trees, dead animals, and other organic and inorganic materials. These dead material and food for plants and animals eventually accumulate and form spectacular land features.

**Phase III: Clarify Objectives of the Lesson:**

Give Examples (Chart 8.2):

- Haemoglobin
- Iron
- Oxygen
- Pure Blood
- Liver
- Urea
- Pure Blood
- Haemoglobin
- Liver
- Pure Blood
- Urea
- Iron
- Oxygen

Identify Defining Attributes (Chart 8.0):

- Blood as a Transporter
- Used-Salts, Sugar
- Urine
- Impure Blood

**HIERARCHY SHOWING EXAMPLES OF FOOD AND WASTES**

**BEING CARRIED BY DIFFERENT BLOODSTREAMS**

**HIERARCHY SHOWING DIFFERENT TYPES OF BLOODSTREAMS**

Aorta
Arteries
Capillaries
Veins
differentiated and reconciliation of new learning tasks relevant to the students' cognitive structure (as in Phase III of the model).

I'Q-xrpuzddy

Repeat:

(Chart 8.1)

**HIERARCHY SHOWING WORK OF BLOOD STREAMS**

Transport food to all parts of the body

---

Reconditioning

Over

Misuse

Carry

Over

Use

Wastes

Transport pool to wastes

HIERARCHY SHOWING WORK OF BLOOD STREAMS

(Chart 8.1)
**SUPPORT SYSTEM:**

- In Phase II, proper caution is taken in the organization of instructional material. This is because, a well-organized material is the critical support requirement of the model, and
- That the effectiveness of advance organizer depends on an integral and appropriate relationship between the conceptual organizer and the content.
- Well-found and synchronized structural hierarchies of contexts and transparencies of overhead projector (OHP) will form part of the support system during instructives.

**SUMMATIVE EVALUATION:**

- This will be administered at the end of the experiment to grade students according to their achievement of the course intentions.
- Summative Evaluation will be final and grades assigned will reflect students' achievement throughout their scholastic career during this course.
- The teacher clarifies the learner's reaction to new learning tasks.
Appendix-D
(ANALOGY AS ADVANCE ORGANIZER)

INSTRUCTIONAL EVENTS FOR UNIT IX

Topic: Division of a River
Course: I
(Upper and Middle Courses)

Focus: Common for two types of advance organizers
(Generalization and Analogy)

(ANALOGY AS ADVANCE ORGANIZER)

OBJECTIVES:

The main focus of this unit is to help students integrate the upper and middle courses of a river in their cognitive structure.

1. At the end of this unit, students will be able to:
   - Identify economic importance of the middle course of a river.
   - Identify major landforms due to gradation activities of the middle course of a river.
   - Identify major landforms due to gradation activities of the upper course of a river.
   - Identify major landforms due to gradation activities of the upper course of a river.
   - Identify major landforms due to gradation activities of the upper course of a river.
   - Identify major landforms due to gradation activities of the upper course of a river.
   - Identify major landforms due to gradation activities of the upper course of a river.
   - Identify major landforms due to gradation activities of the upper course of a river.

PRE-REQUISITE SKILLS OF THE STUDENTS:

Note: It is required that students fulfill conditions of unit VIII prior to proceeding with this unit.

INSTRUCTIONAL AIDS:

- Chalkboard, dusters, rulers, pointer.
- Lectures and discussions.
- Chalkboard: Upper and Middle Courses.
- Chalk (assorted colors).
- Chart 9.0: Upper Course.
- Chart 9.1: Upper and Middle Courses.
- Chart 9.2: Economic Importance.
- Chart 9.3: Economic Importance of the Upper Course.
- Chart 9.4: Economic Importance of the Upper Course.
- Chart 9.5: Economic Importance of the Upper Course.
- Chart 9.6: Economic Importance of the Upper Course.
- Chart 9.7: Economic Importance of the Upper Course.
- Chart 9.8: Economic Importance of the Upper Course.
- Chart 9.9: Economic Importance of the Upper Course.

INSTRUCTIONAL PACKAGES:

- Other Instructional Aids:
  - Charts 9.0 to 9.9

INSTRUCTIONAL EVENTS FOR UNIT IX:

(ANALOGY AS ADVANCE ORGANIZER)
Appendix-D

♦ Main gradation activities of this course.
♦ Land forms due to gradational activities
♦ Economic Importance of the river at this course.

Middle course

♦ Main gradational activities.
♦ Landforms due to gradational activities.
♦ Economic importance of the river course at this stage.

For the purpose of ascertaining unit-wise individual's status achievement, formative evaluation will be adapted at the end of each unit. Corrective feedback will follow the remediation and/or enrichment procedures stated above. For the purpose of ascertaining unit-wise individual's status achievement, remediation and/or enrichment procedures stated above.

Teacher will guide students throughout the remediation material.

Teacher will use tutorial for those students who may lack knowledge essential for the programme and/or unit;

Expanded and elaborated Hierarchy showing the river course (Chart 9.0), Hierarchy showing attributes of the upper river course (Chart 9.1) and examples of landforms in this region (Chart 9.2) will form part of remediation package.

Defining attributes of the middle course of a river (Chart 9.5) will form part of remediation package.

For the purpose of ascertaining unit-wise individual's status achievement, remediation and/or enrichment procedures stated above.

CONTENT SEQUENCE:

Divisions of a River course (the upper and middle courses).

Economic importance of the river course at this stage.

Landforms due to gradational activities.

Middle course.

Economic importance of the river at this course.

Landforms due to gradational activities.

Middle course.

Economic importance of the river at this course.

Landforms due to gradational activities.

Middle course.

Divisions of a River course (the upper and middle courses).

CONTENT SEQUENCE:

Phase I: Strengthening of Cognitive Organization:

SYNTAX: ANALOGY:

For the purpose of ascertaining unit-wise individual's status achievement, remediation and/or enrichment procedures stated above.

POST-ASSESSMENT:

INSTRUCTIONAL PROGRAMME AND SEQUENCING:

FORMATIVE EVALUATION:

LEARNING EVENTS:

PRESCRIPTION:

ENRICHMENT:

PRE-EVENTS:

CONTENT SEQUENCE:

River Levees 
Broad River
Oxbow Lakes 
Alluvial plains
U-shaped valleys 
Deposited Channel River Basin

(Chart 9.0)
DEFINING ATTRIBUTES OF MIDDLE COURSE

Some river basins have salt pan deposits that may be harnessed. Large number of people living along the river flood plains are displaced by floods. Loss of life and property due to floods.

ECONOMIC IMPORTANCE

River Levees on the river banks are good for agriculture. Alluvial soils and deposits are good for agriculture. Submerge vast areas of flood plains.

MAIN GRADUATION ACTIVITIES


LAND FORMS DUE TO AGGRADATION ACTIVITIES

Over-flood the river banks. River measures. Areas of flood plains are deposits in the oxbow lakes. Alluvial soils in flood plains deposited.

ECONOMIC IMPORTANCE

Some river basins have salt pan deposits. Large number of people living along the river flood plains are displaced by floods. Loss of life and property due to floods.
The river waters are harnessed for hydroelectric power generation. Picnic sites for tourism industry contribute to the economic importance of the river.

**Land Forms**

- **Gorges and V-shaped valleys**
  - Economic importance
    - Tourism industry
    - Picnic areas for the public

- **Rapid slopes and falls**
  - Land Forms
    - tributaries joining main river
    - Have steep slopes down the river
    - Valley floors

**River Course**

- **Upper Course**
  - (Steep gradient)
  - Have steep slopes and hills
  - High land
  - Main river erosion
  - Tributaries joining river
  - Have many tributaries

**Attributes**

- **Economic importance**
  - For hydroelectric power generation
  - Picnic areas are harnessed

**Expanded and Elaborated Hierarchy**

(Chart 9.4)

Appendix D
ECONOMIC IMPORTANCE OF THE UPPER COURSE

Phase II: Present Material:
♦ Discussions on expanded and elaborated hierarchies of upper and middle courses of a river (Chart 9.4; 9.5; 9.6; 9.7; 9.8 and 9.9) respectively.

- Economic Importance of middle course of a river (Chart 9.8).

Phase III: Clarify Objectives of the Lesson:

ANALOGY IX:
Teacher presents seven objectives of unit IX and proceeds to present advance organizer.

A river course is divided into three main courses:
♦ The upper course (with steep gradient);
♦ The middle course (with less steep gradient); and
♦ The lower course (with gentle gradient).

Give Examples:
(Chart 9.3)
V-shaped Valleys
Ravines
Plenty of Rapids
Canyons
Gorges
Gulleys
Gorges

EXAMPLES OF LAND FORMS IN THE MIDDLE COURSE

In Chart 9.2:
River waters are harassed for hydroelectric power generation.
Picnic site for tourism.
Industry (The Grand Canyon) of Colorado (USA) 1

Promote active Reception Learning: > Interactive Discussions
Helps students differentiate new learning tasks from previously learned tasks.

Teachers' Role: Refine control of intellectual structure as students continually relate the learning tasks to the organizer earlier presented.

Social System reflects upon the kind of teacher-student inter-relational patterns in the class with very specified roles of the teacher and students.

Common steps for both types of organizers (generalization and analogy):
- Prompt for more examples relevant to the learning tasks and the organizer earlier presented.
- Refer to advance organizer:
  - Hierarchy showing upper course of a river (Chart 9.0).
  - Defining attributes of upper course of a river (Chart 9.1).
  - Economic importance of upper course of a river (Chart 9.2).
  - Examples of landforms in upper course of a river (Charts 9.3).

Repeat:
- Awareness of the learners' relevant knowledge and experience:
  - Teacher's Role: Retain control of intellectual structure as students continually relate the learning tasks to the organizer earlier presented.

River Courses:
- Upper Course: Steep gradient, Have steep slopes, High land, High erosion, Have many tributaries joining the main river.
- Middle Course: Less steep gradient, Moderate erosion, Have steep slopes, Fewer tributaries joining the main river.
- Lower Course: Gentle gradient, Have steep slopes, No erosion, Have many tributaries joining the main river.
PRINCIPLES OF REACTION:

Students' Role:

SUMMATIVE EVALUATION:

Support System:

Lesson: and

Encourage more interactive learning situations especially in Phase III of the
INSTRUCTIONAL EVENTS FOR UNIT X

Topic: Division of a River Course: II (Lower Course)

Focus: Common for two types of advance organizers

Generalization and Analogy

OBJECTIVES:

1. The main focus of this lesson is to guide students to identify major landforms in the lower course of a river and their economic importance to man.
2. At the end of this lesson, students will have studied the enrichment and corrective materials and will be able to:
   - Identify major attributes of the lower course.
   - Name major economic activities at the lower course.
   - Identify major landforms due to aggradation activities.
   - Differentiate between a delta and an estuary.
   - Identify major attributes of the lower course. a river.
   - Differentiate between a river tributary and a distributary.
   - Define the term estuary.
   - Give attributes of an estuary.
   - Give examples of some rivers in India having estuaries.
   - Define attributes of a river delta.
   - Give examples in Indian rivers having delta.
   - Describe the main aggradation activities in the lower course.
   - Name major economic activities at the lower course.

PRE-REQUISITE SKILLS OF THE STUDENTS:

Note: It is required that students fulfill the conditions of Unit 9 test items before proceeding to this unit.

INSTRUCTIONAL AIDS

♦ Chart 10.0: Attributes of the lower river course.
♦ Chart 10.1: Main aggradation activities.
♦ Chart 10.2: Examples of some rivers in India having estuaries.
♦ Chart 10.3: Examples of major landforms due to aggradation.
♦ Chart 10.4: Examples of river having deltas.
♦ Chart 10.5: Attributes of a river delta.
♦ Chart 10.6: Examples of some rivers in India having estuaries.
♦ Chart 10.7: Definition of an estuary.
♦ Chart 10.8: Examples of rivers in India having estuaries.
♦ Chart 10.9: Difference between a delta and an estuary.

ANALOGY AS ADVANCE ORGANIZER

(NOTICE: PROVIDED IN UNIT X)
Appendix-D

4

OTHER INSTRUCTIONAL AIDS:

CONTENT SEQUENCE:

INSTRUCTIONAL PROGRAMME

LEARNING EVENTS:

POST-ASSESSMENT:

FORMATIVE EVALUATION:

PRESCRIPTION:

ENRICHMENT:

♦ Chart 10.10: Difference between tributary and a distributary.

♦ Chart 10.11: Expanded and elaborated hierarchy (lower river course).

♦ Chalk (Assorted colours)

♦ Chalkboard, dusters, pointers.

♦ Lecture and Discussions.

♦ Two lower course (gentle gradient).

♦ Main aggradational activities of this course.

♦ Landforms due to aggradation activities.

♦ Economic importance of lower river course.

♦ A river delta as a major landform.

♦ Attributes of river delta.

♦ Examples of rivers in India having deltas.

♦ Differences between a delta and a distributary.

♦ Differences between a distributary and an estuary.

♦ Economic importance of lower river course.

♦ Landforms due to aggradation activities.

♦ Whether aggradational activities of this course.

♦ Two lower course (gentle gradient).

♦ Teacher will use tutorial for those students who may lack knowledge essential for the programme and for unit.

♦ The programme will consist of:

1. A river delta and a distributary
2. Differences between a distributary and an estuary
3. Examples of rivers in India having estuaries
4. Attributes of estuaries
5. A river delta as a major landform
6. Economic importance of lower river course
7. Landforms due to aggradation activities
8. Whether aggradational activities of this course
9. Two lower course (gentle gradient)

♦ Teacher and Discussions

♦ Chart 10.10: Difference between tributary and distributary (lower river course)

♦ Chart 10.11: Expanded and elaborated hierarchy (lower river course)
Teacher will guide students throughout the enrichment material.

**SYNTAX : ANALOGY:**

Phase i: Strengthening of Cognitive Organization:

Revise Principle of Integrative Reconciliation:

*Expanded and Elaborated Hierarchies Showing Lower River Course* (Chart 10.11)

- Economic Importance
  - Alluvial soil
  - Ox-bow lakes
  - Delta river
- Transportation
  - R iver Basins
  - Rich river levees
  - Rich in fish where
  - Clogged river lagoons
- Deposition
  - Ox-bow lakes
  - Many River Cross-Cut
  - Levee
  - Delta soil
- Land forms
  - U-shaped valleys
  - Extremely gentle slopes
  - Main Aggradation Activities
  - Extremely Gentle
- Lower Course

Appendix D:

Revised Principle of Integrative Reconciliation:

Phase i: Strengthening of Cognitive Organization:

**Analytical Technique:**
### Chart 10.10: Difference Between a River Tributary and a Distributary

<table>
<thead>
<tr>
<th>Tributary</th>
<th>Distributary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slow, sometimes forming lagoons and oxbow lakes</td>
<td>Swift, high velocity, deep narrow channels</td>
</tr>
<tr>
<td>Sedimentation from the source to the mouth</td>
<td>No sedimentation</td>
</tr>
<tr>
<td>Has clear entrances</td>
<td>Has closed or blocked entrances</td>
</tr>
<tr>
<td>Has only one entrance at the sea</td>
<td>Has multiple entrances at the sea</td>
</tr>
<tr>
<td>Found in the lower course of a river</td>
<td>Found in the upper course of a river</td>
</tr>
<tr>
<td>Joins the main river downstream</td>
<td>Joins the main river at the confluence</td>
</tr>
<tr>
<td>No deposition takes place right from the source to the sea</td>
<td>Deposition occurs right from the source to the sea</td>
</tr>
<tr>
<td>Active in deposition</td>
<td>Active in erosion</td>
</tr>
<tr>
<td>Has wide channels</td>
<td>Has narrow channels</td>
</tr>
<tr>
<td>Due to high aggradation</td>
<td>Due to high degradation</td>
</tr>
<tr>
<td>Sedimentation areas are very poor</td>
<td>Sedimentation areas are very good</td>
</tr>
<tr>
<td>Due to too much degradation, the surrounding catchment areas have very poor soil texture.</td>
<td>Due to too much aggradation, the surrounding catchment areas have very rich soil texture.</td>
</tr>
</tbody>
</table>

### Chart 10.9: Differences Between a Delta and An Estuary

<table>
<thead>
<tr>
<th>Delta</th>
<th>Estuary</th>
</tr>
</thead>
<tbody>
<tr>
<td>No sedimentation at the confluence.</td>
<td>Sedimentation is the main feature.</td>
</tr>
<tr>
<td>Swift rapid flow at all levels.</td>
<td>Slow, sometimes very stagnant.</td>
</tr>
<tr>
<td>No distributaries at the sea.</td>
<td>Sedimentation from the sea to the delta.</td>
</tr>
<tr>
<td>No erosion.</td>
<td>Characterized by deposition.</td>
</tr>
<tr>
<td>Deep and narrow channel.</td>
<td>Has wide channels.</td>
</tr>
<tr>
<td>Only one entrance at the sea.</td>
<td>Has many entrances at the sea.</td>
</tr>
<tr>
<td>Found in the lower course of the river as it enters the sea.</td>
<td>Found in the upper course of a river.</td>
</tr>
<tr>
<td>Has clear entrances.</td>
<td>Has closed or blocked entrances.</td>
</tr>
<tr>
<td>No deposition takes place right from the source to the sea.</td>
<td>Deposition occurs right from the source to the sea.</td>
</tr>
<tr>
<td>Active in deposition.</td>
<td>Active in erosion.</td>
</tr>
<tr>
<td>Has wide channels.</td>
<td>Has narrow channels.</td>
</tr>
<tr>
<td>Due to high aggradation.</td>
<td>Due to high degradation.</td>
</tr>
<tr>
<td>Sedimentation areas are very poor.</td>
<td>Sedimentation areas are very good.</td>
</tr>
<tr>
<td>Due to too much degradation, the surrounding catchment areas have very poor soil texture.</td>
<td>Due to too much aggradation, the surrounding catchment areas have very rich soil texture.</td>
</tr>
</tbody>
</table>
ATTRIBUTES OF A RIVER DELTA

CHART 10.8
EXAMPLES OF RIVERS HAVING ESTUARIES
♦ Narmada
♦ Luni
♦ Indus (in Pakistan)
♦ River Congo (in Central Africa)
♦ Most Rivers in India flowing into the Arabian Sea.

CHART 10.7
DEFINITION OF AN ESTUARY
Is a swift flowing river which enters the sea with only one entrance (Mouth) with deep
clear narrow channels.

DEFINING ATTRIBUTES OF AN ESTUARY
(Chart 10.5)

Vast triangular in shape
Have deposits of river alluvial soils
Eroded material deposited down the mouth of a river
Mud gets mixed up with sea water
Projects outwards
Has wide flowing channels

Most of west flowing rivers
Enters the sea
With only one mouth
Carry eroded deposits
Deposit material
Into the sea
No sedimentation

DEFINITION OF A RIVER DELTA
(Chart 10.6)

FAST FLOWING RIVERS
WHERE MATERIALS ARE DEPOSITED

MOUTH OF RIVER

NO SEDIMENTATION

DEPRESSED DOWNSLANDS

ESTUARIES OF RIVERS HAVING ESTUARIES
(Chart 10.8)
Phase II: Present Material:
Phase III: Clarify Objectives of the Lesson:

ANALOGY X:
Give Examples:
♦ Discuss expanded and elaborated hierarchy on the lower river course (Chart 10).
♦ Economic importance of the lower course of a river (Chart 10.11).
♦ Differences between a delta and an estuary (Chart 10.9), and
♦ Differences between attributing and distributing (Chart 10.10).

This is a common step for both types of advance organizers. It has been taken care of in generalization package of the same Unit X.

Teacher presents twelve objectives of Unit X and proceeds on to present advance organizer.

The valley floor in the lower course of a river has extremely gentle slopes, clogged up and obstructed channels which divides into a number of distributaries, called a delta. (Chart 10.3)

Examples of Rivers Having a Delta

EXAMPLES OF RIVERS HAVING A DELTA
♦ Brahmaputra
♦ Ganga
♦ Godavari
♦ Kauvari
♦ Krishna
♦ The east flowing rivers in India flowing into the Bay of Bengal.
♦ River Nile in Egypt flowing into the Mediterranean Sea.

EXAMPLES OF LAND FORMS DUE TO AGGRADATION (DEPOSITION)

River delta formed
River levees formed at the river banks
Levees formed along the lower river course
River channels clogged up in the flood plains
Rich alluvial soils deposited
Rich alluvial soils deposited
River delta formed
River levees formed at the river banks
Levees formed along the lower river course
River channels clogged up in the flood plains
Rich alluvial soils deposited
Rich alluvial soils deposited

Interactive Discussion: Promote Active Reception Learning:
Agriculture is possible

Fish can be caught easily trapped in the shallow lagoons

Minerals like alluvial gold (petroleum) may be harnessed in some areas

Refer to advance organizer earlier presented

♦ Hierarchical outline showing economic activities of river course over
♦ Hierarchical outline showing economic activities (Chart 10.2)
♦ Hierarchical outline showing main aggradation activities (Chart 10.1)
♦ Hierarchical outline showing examples of land forms due to aggradation
♦ Examples of rivers having delta (Chart 10.4)

♦ Economic Activities (Chart 10.2)

♦ Main Aggradation Activities (Chart 10.1)

♦ Attributes of the lower river course (Chart 10.0)
SUMMATIVE EVALUATION: ♦ This will be administered at the end of the experiment to grade students according to their achievement of the course intentions.

♦ Summative Evaluation will be final and grades assigned will reflect students’ achievement throughout their scholastic career during this course.

Instructor:

transparencies of Over Head Projector (OHP) will form the support system during the reorganization of the content and thematic interrelations between the conceptual organizers and the content.

This is because, a well organized material is the critical support requirement of the model, and

PRINCIPLES OF REACTION:

♦ Helps students differentiate new learning tasks from previously learned tasks.

Student roles:

♦ Encourage students to formulate more questions and comments.

Social system:

♦ Social system involves the kind of teacher-student interpersonal interrelationships in the class. As well as the specific roles of the teacher and students.

♦ Common steps for both types of organizers (Generalization Analogies)

Practice:

Experience:

Awareness of the learners’ relevant knowledge and
INSTRUCTIONAL EVENTS FOR UNIT XI

Topic: Underground Water as an Agent of Gradation

Focus: Common for two types of advance organizers

(Analogies as Advance Organizers)

INSTRUCTIONAL PACKAGES

Chart 11.0: Transparency showing human mouth part in relation to caverns in limestone regions.
Chart 11.1
Chart 11.2
Chart 11.3: Effects of underground water.
Chart 11.4: Land forms due to underground water.
Chart 11.5: Hierarchy showing examples of components of mouth part.

INSTRUCTIONAL OBJECTIVES:

The main focus of this unit is to encourage students to know the working of underground waters as an agent of gradation.

At the end of the instructions, students will have studied the enrichment and remedial material and will be able to:

♦ Define effects of underground water as an agent of gradation.
♦ State major characteristics of underground water.
♦ Describe how caverns or caves in limestone regions are formed.
♦ State major characteristics of underground water.
♦ Describe how caverns or caves in limestone regions are formed.
♦ State major characteristics of underground water.
♦ State similarities between stalactites and stalagmites.
♦ State differences between stalactites and stalagmites.

PRE-REQUISITE SKILLS OF THE STUDENTS:

Note: It is required that students fulfill conditions of unit X test before proceeding on to this unit.

INSTRUCTIONAL AIDS:

Note: Chart 11.0 already done.

INSTRUCTIONAL PACKAGES

Chart 11.0: Transparency showing human mouth part in relation to caverns in limestone regions.
Chart 11.1
Chart 11.2
Chart 11.3: Effects of underground water.
Chart 11.4: Land forms due to underground water.
Chart 11.5: Hierarchy showing examples of components of mouth part.
stalactites and stalagmites (Chart 11.7), Similarities between stalagtites and stalagmites (Chart 11.10) and transparency showing picture of stalactites and stalagmites (Chart 11.9) will form part of remediation package. For the purpose of ascertaining unit-wise individual's status achievement, formative evaluation will be adapted at the end of each unit. Corrective feedback will follow the remediation and/or enrichment procedures stated above. Remediation and/or enrichment procedures stated above.

Teacher will use tutorial for those students who may lack knowledge essential for the remediation and/or enrichment procedures stated above. Remediation and/or enrichment procedures stated above.

Refer to the syntax of this unit

Differences between stalactites and stalagmites.

Similarities between stalactites and stalagmites.

Characteristics of stalactites and stalagmites.

Limestone due to underground water.

Formation of caves or caverns in limestone regions.

Characteristics of limestone under ground water.

Effects of underground water as agents of gradation.

Leaves and Dissections.

Chalkboard, Dusters, Pointers.

Chart (Assorted Colours).

Clean drinking water.

Calcium Bi-carbonate.

Clean drinking water.

Calcium Bi-carbonate.

Clean drinking water.

Calcium Bi-carbonate.

Clean drinking water.

Calcium Bi-carbonate.

Chalkboard, Dusters, Pointers.

Calcium Bi-carbonate.

Clean drinking water.

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Enrichment: Syntax: Analogy:

Phase I: Strengthening of Cognitive Organization:
Revise Principles of Integrative Reconciliation:

- Both functions are formed through the same process at the same time.
- Both are found in caves of limestone regions growing after water upwinds or
  downwinds of columns.
- Both are found in caves of limestone regions forming after a long period of time before joining together to form
  columns.

Simmelites Between stalactites and Stalagmites

**Stalactites**
- Grows downward from the roof of the cave.
- Have broad bases and thin as it grows downwards towards the floor of the cave.

**Stalagmites**
- Grows upward from the cave bottom towards the roof of the cave.
- Have narrow and slender as they grow upward towards the roof of the cave.

**Similarities Between Stalactites and Stalagmites**
- Both are formed through chemical processes.
- Both form pillars (pendants) after a long period of time before joining together to form columns.
- Both are found in limestone regions.
- Both landforms are formed through similar processes.

**Differences Between Stalactites and Stalagmites**

<table>
<thead>
<tr>
<th>Stalactites</th>
<th>Stalagmites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grows downward from the roof of the cave</td>
<td>Grows upward from the cave bottom</td>
</tr>
<tr>
<td>Have broad bases and thin as it grows downwards towards the floor of the cave</td>
<td>Have narrow and slender as they grow upward towards the roof of the cave</td>
</tr>
</tbody>
</table>

**Hierarchy showing differences between Stalactites and Stalagmites**

- Both are found in limestone regions.
- Both functions are formed through the same process at the same time.
- Both are found in caves of limestone regions growing after water upwinds or downwinds of columns.
- Both are found in caves of limestone regions forming after a long period of time before joining together to form columns.

**The Mouth**

- Teacher will guide students throughout the enrichment material.
- Students will be assigned to those students who have completed the relevant sections of the textbook.

**Appendix:**

- From an inanimate source of enrichment package.
- Hierarchically showing differences between Stalactites and Stalagmites (Chart 11.11).
FORMATION OF CAVES OR CAVERNS IN LIMESTONE REGIONS

Soluble calcium bi-carbonate and water percolate through rock-joints and fissures in the limestone regions, leading to formation of caves below the ground. Warm cave waters seepage evaporates leading to deposition of lime in the upper roof of the caves making various shapes. The lime deposits, which grow from the cave bottom facing upwards, are known as stalagmites. The ones, which grow from the cave floor facing downwards, are known as stalactites. In some caves in the limestone regions, both stalactites and stalagmites grow until they join together forming rock pillars known as pendants or columns in the cave.

IV

PICTURE OF STALACTITES AND STALAGMITES IN RELATION TO THE MOUTH (Chart 11.9)
Promote Active Reception Learning:

Clarify:

Phase II:

Phase III: Clarify Objectives of the Lesson:

INTEGRATIVE RECONCILIATION:

Relationship between mouth and cave or cavern in limestone regions

♦ The pores or root hair on the mouth—resembles the sink holes and the hair looks like forest or trees/grass covering the caves.

♦ The salivary glands are clear and colourless just like the crystal clear spring waters.

♦ When the mouth is shut, the teeth come together which resemble pendants or pillars or columns of stalactites and stalagmites which have grown and met together in the cave, and touching, forming stalactites, which hang from the ceiling or the roof facing downwards while the stalagmites grow upwards from the cave floor facing the roof.

♦ The lower teeth facing upwards are the same as the stalagmites pointing upwards and growing from the cave floor facing the roof.

♦ The upper teeth facing downwards (cave floor) and whitish in colour resemble the stalactites, which hang, or the roof of the cave facing downwards.

♦ The lower join looks like the floor of the cave.

♦ The upper jaw looks like the roof of a cave.

♦ The lower jaw look like the floor of the cave.

♦ The salivary glands are clear and colourless just like the crystal clear spring waters.

♦ The formation of caves or caverns in limestone regions (Chart 11.8).

♦ The formation of cavities or cavities in limestone regions (Chart 11.11).

♦ The pores or root hair on the mouth—resembles the sink holes and the hair looks like forest or trees/grass covering the caves.

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♦ The salivary glands are clear and colourless just like the crystal clear spring waters.

♦ The formation of caves or caverns in limestone regions (Chart 11.8).

♦ The formation of cavities or cavities in limestone regions (Chart 11.11).
Identify Defining Attributes:

- 1

Regions. Teeth resemble stalactites and stalagmites, the saliva flows like underground water, and spring waters and the salivary ducts resemble the underground river channels. The entire mouth of a human being looks like caves or caverns found in the limestone.

COMPONENTS OF THE MOUTH PART

| Upper Teeth | Lower Teeth | Pores | Upper Salivary Gland | Lower Salivary Gland | Upper Jaw | Lower Jaw | Tongue |

COMPONENTS OF CAVES OR CAVENS

| Chambers | Pendants or Pillars | Pendants | Columns or Columns of Columns | Furrows | Sink Holes | Stalactites | Stalagmites | Ledges | Clints or Lapis | Lower Cave | Upper Cave |

ANALOGY XI: The entire mouth of a human being looks like caves or caverns found in the limestone.
CHARACTERISTICS OF UNDERGROUND WATER

1. Calcium carbonate dissolves in water.
2. Rainwater absorbs carbon dioxide from the atmosphere.
3. Formation of furrows.
5. Rainfalls react chemically with calcium carbonate.

LAND FORMS DUE TO UNDERGROUND WATER

1. Caves
2. Caverns
3. Clints or lapies (irregular land surface with ridges and furrows)
4. Stalactites
5. Stalagmites
6. Pendants or pillars
7. Stalagglomerates
8. Fumaroles
9. Sinks and chimneys (irregular land surface with holes)

(Chart 11.4)
Calcium-bicarbonate.
Soluble rocks like limestone.
Calcium.
Rainwater.
Reacts chemically to calcium carbonate.

THE MOUTH STRUCTURE

SOCIAL SYSTEM:

Common steps for both types of organizers (Generalization and Analogy).

Preliminary for more essential features of the learning tasks and provide more examples relevant to the organizer.

Chart 1,1.2.
Chart 1,1.3.
Chart 1,1.4.
Chart 1,1.5.
Chart 1,1.6.

THE MOUTH STRUCTURE

Appendix-D

CONTENTS OF UNDERGROUND WATER

Appendix-D
Teacher's Role:

**PRINCIPLES OF REACTION:**
- Encourage students to initiate more questions and comments.
- Help students differentiate new learning tasks from previously learned tasks.
- Leads to the organizer becoming clearer.
- Retain control of the intellectual structure as students contribute relative the learning.

**SUMMATIVE EVALUATION:**
- Administer the summative evaluation at the end of the experiment to grade the students according to their achievement of the course intentions.

**SUPPORT SYSTEM:**
- Well-formed and synchronized instructional hierarchies of concepts and transparencies of overhead projector (OHP) will form the support system during instruction.
- This will be administered at the end of the experiment to grade students according to their achievement of the course intentions.

**STUDENTS’ ROLE:**
- Helps students differentiate new learning tasks from previously learned tasks.
- Encourage more interactive learning situations especially in Phase III of the lesson.
- Encourage students to initiate more questions and comments.
- Well formed and synchronized instructional hierarchies of concepts and transparencies of overhead projector (OHP) will form the support system during instruction.
- In Phase II, proper caution is taken in the organization of instructional material. This is because a well-organized material is the critical support requirement of the Model and because the effectiveness of advance organizer depends on an integral and appropriate relationship between the conceptual organizer and the content.
- Students are helped to use critical approach to knowledge by making differentiated and reconciliation of new learning tasks relevant to the students' cognitive structure (as in Phase III of the Syntax of the Model).
- Students are encouraged to differentiate new learning task and reconcile them with existing knowledge.
- Students are encouraged to initiate their own questions in response to the new data presented.
- Students are encouraged to initiate their own questions in response to the new data presented.

*Appendix 0*
INSTRUCTIONAL EVENTS FOR UNIT XII

Topic: Glaciers

Focus: Common for two types of advance organizers

(INSTRUCTIONAL OBJECTIVES)

The main focus of this unit is to encourage students to know the major types of external processes acting on the face of the land (the earth - lithosphere).

In the end of instruction, students will have studied the enrichment and/or remediation material and will be able to:

♦ Define the meaning of the term glaciers as an agent of gradation.
♦ Identify rivers which get their water from snow glaciers of the Himalaya mountains.
♦ Identify those glaciers that formed through the glaciers of the land.
♦ Identify the characteristics of different types of glaciers.
♦ Explain the meaning of the term glacier as an agent of gradation.
♦ Identify the differences between continental and mountain glaciers.

(INSTRUCTIONAL PACKAGES)

Chart 12.0: Defining Attributes of Glaciers.
Chart 12.1: Definition of Glaciers.
Chart 12.2: Characteristics of Glaciers.
Chart 12.3: Examples of Different Types of Glaciers.
Chart 12.4: Examples of Glaciers Having Permanent Ice and Snow.
Chart 12.5: Examples of Places Covered by Ice and Snow.
Chart 12.6: Differences Between Continental and Mountain Glaciers.

(INSTRUCTIONAL AIDS)

Note: It is required that students fulfill conditions of unit XI test items before proceeding on to this unit.
APPENDIX D:

OTHER INSTRUCTIONAL AIDS:

CONTENT SEQUENCE:

INSTRUCTIONAL PROGRAMME AND SEQUENCING:

LEARNING EVENTS:

POST-ASSESSMENT:

FORMATIVE EVALUATION:

Teacher will use Useful for those students who may lack Knowledge essential for the

Refer to the Syntax of this unit

Instructor Program and Sequencing

For the purpose of ascertaining unit-wise individual's status achievement, formative evaluation will be adopted at the end of each unit. Corrective feedback will follow the remediation and enrichment procedures stated above.

Chalks (asserted columns)
Blackboard, duster, ruler, pointer.

Meaning of the term glaciers.
Characteristics of glaciers.
Type of glaciers.
Continental glaciers.
Characteristics of continental glaciers.
Mountain glaciers.
Characteristics of mountain glaciers.
Valley glaciers.
Type of glaciers.
Characteristics of glaciers.

1. Refer to the Syntax of this unit

2. Chalks (asserted columns)

3. Blackboard, duster, ruler, pointer.

4. Instructor Program and Sequencing

5. Formative Evaluation:

6. Post-Assessment:

7. Chalks (asserted columns)

Chalks (asserted columns) will form part of remediation package.

Refer to Chart 11.9 showing the picture of stalactites and stalagmites. This chart will also form part of remediation package.

Refer to Chart 11.7 showing the picture of stalactites and stalagmites. This chart will also form part of remediation package.

Refer to Chart 11.10 showing the picture of stalactites and stalagmites. This chart will also form part of remediation package.

Refer to Chart 11.11 showing the picture of stalactites and stalagmites. This chart will also form part of remediation package.

Refer to Chart 12.7: Characteristics of continental glaciers.

Refer to Chart 12.8: Actions of valley glaciers.

Refer to Chart 12.9: Actions of valley glaciers.

Refer to Chart 12.10: Land forms due to glaciation.

Refer to Chart 11.7: Characteristics of continental glaciers.

Refer to Chart 11.9: Characteristics of glaciers.

Refer to Chart 11.10: Characteristics of glaciers.

Refer to Chart 11.11: Characteristics of glaciers.

Refer to Chart 12.7: Characteristics of continental glaciers.

Refer to Chart 12.8: Actions of valley glaciers.

Refer to Chart 12.9: Actions of valley glaciers.

Refer to Chart 12.10: Land forms due to glaciation.

Refer to Chart 11.7: Characteristics of continental glaciers.

Refer to Chart 11.9: Characteristics of glaciers.

Refer to Chart 11.10: Characteristics of glaciers.

Refere to Chart 11.11: Characteristics of glaciers.

Table of contents:

Chapter 12.10: Land forms due to glaciation.

Chapter 12.9: Actions of valley glaciers.

Chapter 12.8: Actions of valley glaciers.

Chapter 12.7: Characteristics of continental glaciers.
In the polar regions, snow line is found at sea level.

Glaciers are moving masses of ice found in the polar regions and high mountain areas having permanent ice and snow cover.

DEFINITION OF GLACIERS:

- These are moving masses of ice found in the polar regions and high mountain areas.
- In the equatorial regions, snow line is found at 5500 metres above sea level.
- In the polar regions, snow line is formed at sea level.
- Very cold temperatures below freezing point.
- Found in high altitudes.
- Slow moving sheets of mass frozen ice or snow.
- Having permanent ice and snow cover.

CHARACTERISTICS OF SNOW UNE:

- Is a height above which there is a permanent snow cover and ice.

ENRICHMENT:

- Some topics relevant to IX grade, students will be assigned to those students who

GENERALIZATION II:

Phase I: Clarify Objectives of the Lesson:

Teacher presents the objectives of unit 12 and proceeds to present advance organizer.

Teacher will guide students through the enrichment material.

Appendix V


Oxford Children's Reference Library
TYPES OF GLACIERS

Continental Glaciers

Mountain Glaciers

EXAMPLES OF MOUNTAINS HAVING PERMANENT ICE & SNOW COVER

Mt. Everest (Asia)
Mt. Kilimanjaro (East Africa)
Mt. Alps (Europe)

EXAMPLES OF REGIONS COVERED BY ICE AND SNOW

The Tundra Region

Alaska (USA)
Arctic Circle
Yukon (Canada)

EXAMPLES OF DIFFERENT TYPES OF GLACIERS

Characteristics of Snow Line (Chart 12.2)
Definition of Glaciers (Chart 12.1)
Defining Attributes of Glaciers (Chart 12.0)

Awareness of the learner's relevant knowledge and experiences:

• Examples of different types of glaciers (Chart 12.3).
• Characteristics of snow line (Chart 12.2).
• Definition of glaciers (Chart 12.1).
• Defining attributes of glaciers (Chart 12.0).

Refer to advance organizer earlier presented.

Repeat:
Give examples.
The area is permanently below the freezing point. Continental glaciers get warmer and meet due to warmth of the earth.

### Characteristics of Continental Glaciers

| Region is characterized by extensive ice-sheets covering all the land surfaces. |
| Temperatures may be very low, even below the freezing point. |
| Occur in regions characterized by cold temperatures, such as the Arctic and Antarctic Circles. |

### Characteristics of Mountain Glaciers

| Region is characterized by thin sheets of ice up to 5500 meters above sea level and is confined to the highest mountains. |
| Temperatures may vary considerably, with some areas experiencing freezing temperatures. |
| Occur at high mountain altitudes. |

---

**Summary:**
- Continental glaciers cover large areas of land and are found in the Arctic and Antarctic Circles.
- Mountain glaciers are smaller and found at high altitudes.
- Both have low temperatures and are characterized by cold conditions.

---

**Phase III: Strengthening of Cognitive Organization:**

- Revise principle of integrative reconciliation.
- Phase II: Presenting the main ideas sequentially.
  - Logical Order:
    - Make organization explicit.
    - Maintain attention.
    - Revise principle of integrative reconciliation.
  - Maintain attention:
    - Present differentiated hierarchies sequentially by avoiding elements being discussed during the lesson being discussed before the lesson's hierarchy.
    - New learning ideas to be linked sequentially throughout the lesson.
    - By consistently returning to the learning hierarchy, attributes, examples, and generalization earlier presented.
    - Throughout the lesson session.
    - Involve students in the lesson and keep on checking their understanding abilities.

---

**Appendix D:**

- Definition of glaciers (Chart 12.1).
- Characteristics of snow line (Chart 12.2).
- Examples of different types of glaciers (Chart 12.3).
- Examples of mountains having permanent ice and snow cover (Chart 12.4).
- Examples of different types of glaciers (Chart 12.5).
- Characteristics of snow line (Chart 12.6).
- Definition of glaciers (Chart 12.7).
Common steps for both types of organizers (Generalization and Analogy):

- Identify the types of organizers:
  - Continental glaciers (Chart 12.7) and (Chart 12.8)
  - Alpine (or Valley) glaciers (Chart 12.9)

- Characteristics of continental glaciers (Chart 12.7)
- Characteristics of mountain glaciers (Chart 12.8)

- Elaborate more on differences between continental and mountain glaciers (Chart 12.8)

- Clarify:
  - Interactive discussions
  - Snow and ice buildup on mountain glaciers

**Characteristics of Mountain Glaciers (Chart 12.8):**
- Occur in high mountain regions.
- Both snow and ice accumulate in depressions along the valley floors.
- Maintain summit.
- Form valley glaciers.
- Form mountain summits.
- Cool in high mountain regions.

**Examples of Land Forms Due to Glaciation (Chart 12.10):**
- Cirques
- Lateral moraines
- U-shaped valleys
- Terminal moraines
- Snap-pointed valleys
- Interim moraines

**Actions of Valley Glaciers on the Face of Land (Chart 12.9):**
- Slow movement of solid ice blocks.
- Friction at the base of glaciers.
- High friction at the base and contact with the valley floor.
- Snowmelt of cold ice blocks.
- Meltwater streams at the bottom of glaciers.

**Promote Active Reception Learning:**
- The Himalaya Mountains
- Rivers: Indus, Ganges, Yamuna, Brahmaputra
- Snow accumulates on mountain glaciers
- Valleys are formed from valley glaciers
- Rivers originate from snow glaciers
- Snowmelt creates meltwater streams
- Meltwater streams form rivers
- Promote discussion and integration of mountain glaciers and continental glaciers
Teacher’s Role:

- Retain control of the intellectual structure as students continually relate the learning tasks to the organizer earlier presented.
- Helps students differentiate new learning tasks from previously learned tasks.
- Encourage more interactive learning situations especially in Phase III of the lesson and.
- Encourage students to initiate more questions and comments.

PRINCIPLES OF REACTION:

Students' Role:

- Students are encouraged to initiate their own questions in response to their own drives of meaning.
- Students are encouraged to differentiate new learning task and reconcile them with existing knowledge.
- Students are helped to use critical approach to knowledge by making differentiated and reconciliation of new learning tasks relevant to the students' cognitive structure (as in Phase III of the Syntax of the Model, and
- Teacher clarifies the learners' reaction to new learning tasks.

SUPPORT SYSTEM:

- In Phase II, proper caution is taken in the organization of instructional material. This is because, a well organized material is the critical support requirement of the Model and
- That, the effectiveness of advance organizer depends on an integral and appropriate relationship between the conceptual organizer and the content.
- Well formed and synchronized structural hierarchies of content and transparencies of over head project (OHP) will form the support system during instruction.

SUMMATIVE EVALUATION

- This will be administered at the end of the experiment to grade students according to their achievement of the course intentions.
- Summative Evaluation will be final and grades assigned will reflect students' achievement throughout their scholastic career during this course.
INSTRUCTIONAL PACKAGES
(ANALOGY AS ADVANCE ORGANIZER)

INSTRUCTIONAL EVENTS FOR UNIT XII

Topic: Glaciers
Focus: Common for two types of advance organizers
(Generalization and Analogy).

INSTRUCTIONAL OBJECTIVES:

- The main focus of this unit is to encourage students to know the major types of glaciers, their characteristics, and landforms due to their activity as agents of external processes acting on the face of the land (the earth - Lithosphere).

- At the end of instructions, students will have studied the enrichment and/or remedial material and will be able to:
  - Define the meaning of the term glaciers as an agent of gradation.
  - Identify major characteristics of glaciers.
  - Name from the incomplete statements two types of glaciers.
  - Differentiate Continental and Mountain Glaciers.
  - State clearly the action of valley glaciers on the face of the land.
  - Identify from the list given landforms due to glaciation.
  - Identify rivers which get their water from snow glaciers of the Himalaya mountain.

PRE-REQUISITE SKILLS OF THE LEARNERS:

- Note: It is required that students fulfill conditions of unit XI test items before proceeding onto this unit.

INSTRUCTIONAL AIDS:

- Chart 12.0: Defining attributes of glaciers.
- Chart 12.1: Definition of glaciers.
- Chart 12.2: Characteristics of snow-line.
- Chart 12.3: Examples of different types of glaciers.
- Chart 12.4: Examples of mountains having permanent ice and snow.
- Chart 12.5: Examples of places covered by ice and snow.
Chart 12.6: Differences between continental and mountain glaciers.

For the purpose of ascertaining unit-wise individual's status achievement, formative evaluation will be adapted at the end of each unit. Corrective feedback will follow the remediation and/or enrichment procedures stated above. Teacher will use tutorial for those students who may lack knowledge essential for the programme and/or unit;

Expanded and elaborated Hierarchy showing the mouth with its components i.e. teeth as stalactites and stalagmites (Chart 11.7), Similarities between stalactites and stalagmites (Chart 11.10) and transparency showing picture of stalactites and stalagmites (Chart 11.9) will form part of remediation package. Hierarchy showing differences between stalactites and stalagmites (Chart 11.11) will also form an alternative source of remediation package.

PRESCRIPTION:

Refer to the syntax of this unit
Some topics relevant to IX grade, students will be assigned to those students who have achieved mastery faster than others [Oxford Children's Encyclopaedia AB to ZU Vols. 1 to 9 (1996) and the Oxford Children's Reference Library (2) Exploring the World, (1966)].

Teacher will guide students throughout the enrichment material.

Characteristics of Mountain Glaciers

- Found in the Himalaya Mountains, in Asia, Alps in Europe and Kilimanjaro in East Africa etc.
- Forms valley glaciers.
- Both snow and ice accumulate in depressions along the valley floors near the maintain summit.
- Occur in high mountain regions.

Examples of Land Forms Due to Glaciation

<table>
<thead>
<tr>
<th>U-shaped valleys</th>
<th>Sharp pointed ridges</th>
<th>Terminal Moraines</th>
<th>Lateral Moraines</th>
<th>Cirques</th>
</tr>
</thead>
</table>

Actions of Valley Glaciers on the Face of Land

- Rivers, Indus, Ganga, Yamuna and Brahmaputra originate from snow glaciers.
- Snow turns into roaring cold frigid streams of water.
- Glaciers melt and turn into huge water torrents as it descends down the mountain valley to the lower altitude.
- High friction as ice comes into contact with the valley floors.
- Slow movements of solid ice-blocks.

Syntax: Analogy:

Phase I: Strengthening of Cognitive Organizations:
Revise Principle of Integrative Reconciliation:
Interactive Discussions:
♦ Elaborate more on differences between Continental and Mountain glaciers (Chart 12.6).
♦ Characteristics of Continental glaciers (Chart 12.7).
♦ Actions of valley glaciers (Chart 12.9).

Students to reconcile and integrate relationship between mountain glaciers and Continental glaciers (Chart 12.7) and (Chart 12.8).

* This is a common step for both types of advance organizers and has been taken care of Continental glaciers (Chart 12.7) and (Chart 12.8).

Phase II: Present Material:

Promote Active Reception Learning:

Mountain Glaciers

- Region is characterized by thin sheets of ice up to the limits of 5500 metres above sea level and is not extensively spread.
- Temperatures may vary considerably.
- Occur on high mountain altitudes.

Continental Glaciers

- Region is characterized by extensive thick ice-sheets covering the entire land surface.
- Temperatures are permanently below the freezing point.
- Occur in the polar regions.

Phase III: Clarify Objectives of the Lesson:

Teacher presents the objectives of Unit XII and proceeds to present advance organizer.

Promote Active Reception Learning:

<table>
<thead>
<tr>
<th>Differences Between Continental and Mountain Glaciers (Chart 12.6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occur in the polar regions.</td>
</tr>
<tr>
<td>Temperatures vary.</td>
</tr>
<tr>
<td>No expansion is spread.</td>
</tr>
<tr>
<td>The entire land surface is below freezing point.</td>
</tr>
</tbody>
</table>

Characteristics of Continental Glaciers (Chart 12.7):

- Continental glaciers get warmer and meet due to warmth of the earth.
- Found in continents of Arctic and Antarctic Circles, Alaska, Yukon, etc.
- Permanently covered by thick ice-sheets.
- Have low temperatures.
- The area is permanently below freezing point.
- Continental glaciers get warmer and meet due to warmth of the earth.
ANALOGY XII: Glaciers are moving masses of ice found in the Polar Regions and High Mountain Areas having Permanent Snow-Cover.

Give Examples:

- The Tundra Region
- Alaska (USA)
- Arctic Circle
- Yukon Canada

EXAMPLES OF REGIONS COVERED BY ICE & SNOW

EXAMPLES OF MOUNTAINS HAVING PERMANENT SNOW-COVER

TYPES OF GLACIERS

CHARACTERISTICS OF SNOW LINE

- In the Polar Regions, snow line is found at the sea levels.
- In the equatorial regions, it is found 5500 metres above sea level.
- Is a height above which there is a permanent snow cover and ice.
Teacher's Role:

Social system reflects upon the kind of teacher taught interrelations patterns in the class with vary specified roles of the teacher and students.

- Retain control of the intellectual structure as students continually relate the learning tasks to the organizer earlier presented.
- Helps students differentiate new learning tasks from previously learned tasks.

### Awareness of the Learners’ Relevant Knowledge and Experience:

**SOCIAL SYSTEM:**

Social system reflects upon the kind of teacher taught interrelations patterns in the class with vary specified roles of the teacher and students.

<table>
<thead>
<tr>
<th>An agent of degradation</th>
<th>Snow line is formed at the sea level in the polar regions</th>
<th>Occur in the polar regions (arctic and antarctic circles)</th>
<th>Occur on high maintain peaks having permanent ice and snow line</th>
<th>Slow moving sheets of mass frozen ice or snow</th>
<th>Very cold temperatures below freezing point</th>
<th>Found in high altitudes 5500 metres above scale level</th>
</tr>
</thead>
</table>

### DEFINING ATTRIBUTES OF GLACIERS

**Repeat:**

- Refer to advance organizer earlier presented:
  - Defining attributes of glaciers (Chart 12.0).
  - Definition of glaciers (Chart 12.1).
  - Characteristics of snow-time (Chart 12.2).
  - Examples of different types of glaciers (Chart 12.3).
  - Examples of Mountains having permanent ice and snow cover (Chart 12.4).
  - Examples of places covered by ice and snow (Chart 12.5).

**Prompt for more essential features of the learning tasks and provide more examples relevant to the organizer.**
Encourage more interactive learning situation especially in Phase III of the lesson, and
Encourage students to initiate more questions and comments.

PRINCIPLES OF REACTION:

Students' Role:

♦ Students are encouraged to initiate their own questions in response to their own drives of meaning.

♦ Students are encouraged to differentiate new learning tasks and reconcile them with existing knowledge.
♦ Students are helped to use critical approach to knowledge by making differentiated and reconciliation of new learning tasks relevant to the student cognitive structure (as in Phase III of the Syntax of the Model).
♦ The teacher clarifies the learners' reaction to new learning tasks.

SUPPORT SYSTEM:

♦ In Phase II, proper caution is taken in the organization of instructional material. This is because, a well organized material is the critical support requirement of the model and;
♦ That, the effectiveness of advance organizer depends on an integral and appropriate relationship between the conceptual organizer and the content.
♦ Well-formed and synchronized structural hierarchies of content and transparencies of Overhead Projector (OHP) will form the Support System during instructions.

SUMMATIVE EVALUATION:

♦ This will be administered at the end of the experiment to grade students according to their achievement of the course intentions.
♦ Summative evaluation will be final and grades assigned will reflect student's achievement throughout their scholastic career during this course.
Appendix II E
Visual Aids:
Charts and Transparencies...
APPENDIX E

VISUAL AIDS
CHARTS AND TRANSPARENCIES

Chart 1.0
BIOSPHERE
(Meeting Place)

- The Earth (Lithosphere)
  Face of the land where we find elements of the Physical and Biological environments
  
  - is a
  (Component)

- Air (Atmosphere)
  where we find elements of the Terrestrial environment
  
  - is a
  (Component)

- Water (Hydrosphere)
  where we find elements of the aquatic environment
  
  - is a
  (Component)
Chart 1.1
DEFINING ATTRIBUTES OF BIOSPHERE

- Biosphere is a narrow common zone of contact
- Encompasses three spheres: Lithosphere, Atmosphere, Hydrosphere
- Situated at the Central focal point where all the three spheres meet at a uniform ground or zone of Contact
- Life is possible in all three components of the Biosphere
- All the three spheres are components of Biosphere

Chart 1.2
EXAMPLES OF COMPONENTS THAT FORM BIOSPHERE

- Lithosphere (earth) → is a → Component
- Atmosphere (air) → is a → Component
- Hydrosphere (water) → is a → Component
Chart 1.3
EXAMPLES OF LIVING ORGANISM FOUND IN THE COMPONENTS

- **Lithosphere**
  - Plants
  - Animals
  - Micro-organisms

- **Atmosphere**
  - Micro-organisms
  - All aquatic animals like fish, whales, hippos, seals etc.

- **Hydrosphere**
  - All aquatic plants like spirogyra, water lilies, planktons etc.
  - Micro-organisms

- Man and his family
Chart 1.6
EXTENDED AND ELABORATED HIERARCHIES LINKING AN INSECT'S BODY WITH BIOSPHERE

(AN INSECT'S BODY)

- Head (Part of an Insect's Body)
  - is a (Component)

- Thorax (Part of an Insect's Body)
  - is a (Component)

- Abdomen (Part of an Insect's Body)
  - is a (Component)

(BIOSPHERE)

- Lithosphere (like an Insect's Head)
  - is a (Component)

- Atmosphere (Like an Insect's wings)
  - is a (Component)

- Hydrosphere (Like water in the abdomen of an insect)
  - is a (Component)

[Point of Integrative Reconciliation Takes Place Here or There]
Microorganisms

All aquatic plants like whales, water lilies, spirogyra planktons etc.

All aquatic animals like fish, whale, Hippos, seals

All aquatic plants like whales, water lilies, spirogyra planktons etc.

Component
Examples of Living Organisms

BIOSPHERE (Meeting Place)

The earth (Lithosphere) face of the land where we find elements of the Physical and Biological environments

Component
Examples of Living Organisms

Component
Examples of Living Organisms

Component
Examples of Living Organisms

Man and his family
Animals
Plants
Micro-Organisms

Birds
Micro-Organisms

All aquatic animals like fish, whale, Hippos, seals

Micro-organisms
INTERRELATIONSHIPS SHOWING POSITION OF 2;24 AND 72 IN VENN DIAGRAMS IN RELATION TO BIOSPHERE
STRUCTURAL OUTLINE
Our Environment
(The Earth-Lithosphere)

The Physical Environment
The Biological Environment

(Chart 2.0)

OUR ENVIRONMENT
(THE EARTH-LITHOSPHERE)

Physical Environment
Biological Environment

Elements of Physical Environment
Elements of Biological Environment

Land
Air
Water
Plants
Animals
Micro-organisms
Chart 2.2
EXPANDED AND ELABORATED HIERARCHY
Examples of Components found in the Physical Environment

Physical Environment
  ↓
Elements
  ↓
Land
  ↓
(Components)
  ↓
Organic matter
Inorganic matter
  ↓
Air
  ↓
(Components)
  ↓
Oxygen
Hydrogen
Carbon dioxide
Rear gases
  ↓
Water
  ↓
(Components)
  ↓
Oxygen
Impure
Other solutions
Pure
Hydroge

Chart 2.2 (ii)
EXPANDED AND ELABORATED HIERARCHY
Components found in the Biological Environment

Biological Environment
  ↓
Elements
  ↓
Plants
  ↓
(Components)
  ↓
Mangoes
Grass
Maize
  ↓
Animals
  ↓
(Components)
  ↓
Dogs
Cats
Fly
Cattle insects
Wild Animals
Microorganisms
  ↓
Bacteria
Virus
Parasites
Chart 2.4 (ii)
POINT OF INTEGRATIVE RECONCILIATION TAKES PLACE HERE OR THERE
(They all need one another)

- Land
- Water
- Air
- Plants
- Micro-organisms
- Animals

Elements of Physical Environment

- Biological Environment

Elements of Biological Environment

- Biological Environment

Our-Environment
(The Earth-Lithosphere)
Appendix E

Chat 3.7
EXTENDED AND ELABORATED HIERARCHIES

CHANGES CAUSING LAND FORMS

- External Processes
  - Changes
  - Causes of Gradual Changes on Landforms
    - Wind
    - Weathering
    - River Erosion
    - Waves
    - Typhoons/Cyclones
  - Landforms
    - Molluscs
    - Cirques
    - Sinkholes
    - Stalactites
    - Stalagmites
    - Pendants
    - Molluscs
    - Barchan
    - Mushroom rocks
    - Sand Dunes
    - Internal Processes
      - Sudden Changes
        - Causes of Sudden Changes on Landforms
          - Earthquakes
          - Volcanic eruptions
          - Floods
          - Volcanic mts
          - Rift valleys
          - Plateaux
          - Rift Valleys
          - Levees
          - Lakes
DEFINING ATTRIBUTES OF EXTERNAL PROCESSES OF THE EARTH

(Major Actions of External Processes on the Face of the land)

- Reduce the differences in heights between the low lands and high lands
- Take place in the atmosphere and Hydrosphere
- Affects the surface of the land
- Act slowly
- Wear out
- Tear down
- Carry away
- Deposit worn out material down the low lands for away from their original places

EXPANDED HIERARCHICAL OUTLINE SHOWING Examples of Land Forms due to External Processes

- Alluvial soils
- Sand Dunes (Barchans)
- Loess soils
- Mushroom rocks (Zeugen)
- Lateral Moraines
- Oxbow lakes
- River Levese
- Stalactites and Stalagmites
- Cirques

DEFINING ATTRIBUTES OF WEATHERING

- Produce a layer of loose rock particles on the earth's surface
- Break down rocks
- Uses sudden changes in weather phenomena
- Acts on exposed rocks surfaces
- Slow chemical and organic changes take place leading to formation of soils
- Uses sun's heat and constant temperature changes
**Aggradation**

- Deposition and building up of the surrounding landscape is the main feature.
- Effective in the low lands.
- Rich type of alluvial soil good for agriculture in the areas where it is effective.
- Increases the face of the land deposition where it is effective.
- River courses in the lower regions are marked by U-shaped valleys and large amount of siltation taking place.

**Degradation**

- Removal and carrying away of the eroded earth's crust is the main feature.
- Effective in the higher levels (High lands).
- Characterised by poor type of soil in the areas where it is effective.
- Decreases the land elevation where it is effective.
- River courses here are V-shaped valleys as major landforms in this region.

---

### Chart 5.8

**SIMILARITIES BETWEEN DEGRADATION AND AGGRADATION**

<table>
<thead>
<tr>
<th>Degradation</th>
<th>Aggradation</th>
</tr>
</thead>
<tbody>
<tr>
<td>♦ Is a component of gradational processes.</td>
<td>♦ Is a component of gradational processes.</td>
</tr>
<tr>
<td>♦ Take place at the same time with aggradation in different areas</td>
<td>♦ Take place at the same time with degradation in different areas.</td>
</tr>
<tr>
<td>♦ Acts gradually on the face of the land for along period of time</td>
<td>♦ Acts gradually on the face of the land over along period of time.</td>
</tr>
</tbody>
</table>

---

### Chart 5.9

**DIFFERENCES BETWEEN DEGRADATION AND AGGRADATION**

<table>
<thead>
<tr>
<th>Differences Degradation</th>
<th>Differences Aggradation</th>
</tr>
</thead>
<tbody>
<tr>
<td>♦ Removal and carrying away of the eroded earth's crust is the main feature.</td>
<td>♦ Deposition and building up of the surrounding landscape is the main feature.</td>
</tr>
<tr>
<td>♦ Effective in the higher levels (High lands)</td>
<td>♦ Effective in the low lands.</td>
</tr>
<tr>
<td>♦ Characterised by poor type of soil in the areas where it is effective</td>
<td>♦ Rich type of alluvial soil good for agriculture in the areas where it is effective.</td>
</tr>
<tr>
<td>♦ Decreases the land elevation where it is effective</td>
<td>♦ Increases the face of the land deposition where it is effective.</td>
</tr>
<tr>
<td>♦ River courses here are V-shaped valleys as major landforms in this region.</td>
<td>♦ River courses in the lower regions are marked by U-shaped valleys and large amount of siltation taking place.</td>
</tr>
</tbody>
</table>
(Chart 6.0)
ATTRIBUTES OF WIND EROSION/ABRASION

- Dominant in desert regions
- Associated with the absence of vegetative cover
- Almost non-existent in rainfall regions
- Carry the particles away to different regions
- Remove loose soil and dry soil particles by strong winds

(Chart 6.2)
EXPANDED AND ELABORATED HIERARCHY OF GRADATIONAL PROCESSES
Gradational Processes

- Degradation (Component)
- Moving Agents
- Main Activity (Erosions)

- Rivers
- Winds
- Waves
- Glaziers
- Weathering

- Examples of Landforms due to Wind Abrasion

- Rivers
- Levees
- Alluvial soils
- Terminal moraines
- Lateral moraines
- Loess soils
- Silts

- Sand Dunes (Barchans)
- Loess soils in N.W. Beijing in China
- Mushroom rocks (Zeungen)

Main Activity (Deposition)

Example of Landforms due to (Aggradation)
Chart 7.0
HIERARCHY SHOWING DEFINING ATTRIBUTES OF RIVERS

DEFINING ATTRIBUTES OF RIVERS

\[ \rightarrow \]

- Flows from higher to lower ground
- Lower than the area around it
- Is a body of water which flows
- It can move faster or slower depending on the land gradients
- Geologically old or new rivers
- Rivers as spiritual purifiers (The Ganga/Nile)
- Is natural but not man made

Chart 7.3
HIERARCHICAL OUTLINE

Economic Importance of Rivers as Circulatory System

\[ \rightarrow \]

- Generate Electricity
- Water used in industries
- Drinking
- Water for cleaning purpose i.e. (In Hospitals)
- Transport System
- Cooling Purpose
- River water used for irrigation purposes
(Fig. 7.6)
BODIES OF WATER
(Hydrosphere)

- Rivers
- Ponds
- Lakes
- Swamps
- Oceans

Rivers in Africa (Examples)
- Zambezi
- Congo
- Nile

Rivers in India (Examples)
- Ravi
- Ganga
- Yamuna
- Indus
- Sutlej
- Beas
- Godavari
- Narmada
Gaggar in Some Tributaries Some Tributaries of Nile Zambezi Amazon Gangs Brahmaputra Indus Godavari

Intermitant Rivers Perenial Rivers

(Chart 8.4)
HIERARCHY SHOWING OTHER TYPE OF RIVERS

(Chart 8.3)
HIERARCHY SHOWING GEOLOGICAL DIFFERENT TYPES OF RIVERS

(Chart 8.0)
HIERARCHY SHOWING DIFFERENT TYPES OF BLOOD STREAMS

Rajasthan of Chambal from Satluj Passing the Rajasthan (Rajasthan Desert)
EXPANDED AND ELABORATED HIERARCHY
(River Course)

Upper Course
(Steep gradient)

Attributes
(Main Gradation Activities)

- Greatest maximum erosion
- Have many Tributaries joining main river
- Water rushes down the steep slopes
- Plenty of rapids and falls
- High land degradation
- Have steep slopes/gradient

Land forms

- V-shaped valleys
- Canyons
- Gulleys
- Ravines
- Rapids and Falls
- Gorges

Economic Importance

The river waters are harnessed for hydro electricity power generation
Picnic sites for tourism industry
West flowing rivers in India

Enters the sea with only one mouth (tritotary)

Have very dear entrance at sea

Have deep narrow channels

Have very clear entrance at sea

Enters the sea with many mouths distributaries

Have wide slow flowing channels

CHART 10.6
ATTRIBUTES OF A RIVER DELTA

Have wide slow flowing channels

Have deposits of rich alluvial soils

Eroded materials deposited down the mouth of river

Mudgets mixed with sea water and projects outwards

Enters the sea with many mouths distributaries

Have deap narrow channels

Have very clear entrance at sea

Enters the sea with only one mouth (tritotary)

CHART 10.5
ATTRIBUTES OF A RIVER DELTA

Vast Triangular In shape

Enters the sea with many mouths distributaries

Mudgets mixed with sea water and projects outwards

Eroded materials deposited down the mouth of river

Have very dear entrance at sea

Have wide slow flowing channels

Carry eroded material is deep into sea

Swift flowing rivers

Rapid

No sedimentation at the confluence

Eroded materials deposited down the mouth of river

Mudgets mixed with sea water and projects outwards

Enters the sea with many mouths distributaries

Have wide slow flowing channels

Have deposits of rich alluvial soils

Vast Triangular In shape

CHART 10.5
ATTRIBUTES OF A RIVER DELTA
Minerals like alluvial gold may be found. Petroleum and gas may be found. Fishing can be done in the lagoons. Agriculture is possible. Economic Importance.
LAND FORMS DUE TO UNDERGROUND WATER

- Caves or cavens
  - Clints or lapies (irregular land surfaces with ridges and furrows)
  - Stalactites
  - Stalagmites
  - Pendants or Pillars (columns)
  - Furrows
  - Sink holes

HIERARCHY SHOWING EXAMPLES OF COMPONENTS IN THE CAVE OR CAVERN

- Lower cave or cavern
  - Upper cave or cavern
  - Stalactites
  - Stalagmites
  - Sink Holes
  - Furrows
  - Pendants or pillars
  - Clints or lapies
DEFINING ATTRIBUTES OF GLACIERS

- Occur in the polar regions, arctic and antarctic circles
- Occur in high maintain peaks having permanent ice and snow line
- Slow moving sheets of mass frozen ice or snow
- Very cold temperatures below freezing point
- Found in high attitudes, 5500 metres above sea level
- Snow line is formed at sea level in the polar regions
- An agent of degradation

EXAMPLES OF REGIONS COVERED BY ICE AND SNOW

- The Tundra Region
- Alaska (USA)
- Arctic Circle
- Yukon Canada

EXAMPLES OF LAND FORMS DUE TO GLACIATION

- Cirques
- Lateral Moraines
- Terminal Moraines
- Sharp pointed ridges
- U-shaped valleys
Multiple Choice Type: (Please Circle the right letter only)

1. Which one of the statements given below best define the term Biosphere?
   a) Is an incomplete picture of a narrow common zone of contact where the earth (lithosphere), air (atmosphere) and water (hydrosphere) meet.
   b) Is a narrow common zone of contact where the earth (lithosphere), air (atmosphere) and water (hydrosphere) meet.
   c) Is a disjointed narrow common zone of context where the earth (lithosphere), air (atmosphere), and water (hydrosphere) meet.
   d) Is the hierarchical outline of the earth (lithosphere), air (atmosphere), and water (hydrosphere).  

2. Complete the incomplete statement by naming the three components of the biosphere.
   a) 
   b) 
   c) 

3. Name three examples of living organisms found in the lithosphere.
   a) 
   b) 
   c) 

4. Write two examples of living organisms found in the atmosphere.
   a) 
   b) 

5. Name at least three living organisms found in the hydrosphere.
   a) 
   b) 
   c) 

6. From the choices given below, which one is the best defining attribute of biosphere.
   a) Biosphere is a narrow common zone of contact where the earth (lithosphere), air (atmosphere) and water (hydrosphere) meet. It is encompassed by three spheres, and is situated at the central focal point where all the three spheres meet, and life is possible in all its three components.
   b) Biosphere is the mathematical representation of the GCD and LCM.
   c) All the three components of Biosphere do not support life at all.
   d) Biosphere is a larger common zone of contact being represented by 2, 24 and 72 mathematically.

7. Draw correctly, a hierarchical outline of the biosphere 

(1 Mark)

(3 Marks)

(3 Marks)

(2 Marks)

(3 Marks)

(1 Mark)

(7 Marks)
UNIT-I (PART-II)
FORMATIVE EVALUATION

DATE:___
TIME: 10 minutes

PROBLEM SOLVING TYPE

1. Find the G.C.D. of sets ABCDE (4,6,8,12,18) (1 Mark)
2. Find the LCM of sets ABCDE (4,6,8,12,18) (1 Mark)
3. Find the GCD of sets FGH (4,6,8) (1 Mark)
4. Find the LCM of sets FGH (4,6,8) (1 Mark)
5. Find the GCD of sets IJK (6,8,12) (1 Mark)
6. Find the LCM of sets IJK (6,8,12) (1 Mark)
7. Find the GCD of sets LMN (8,12,18) (1 Mark)
8. Find the LCM of sets LMN (8,12,18) (1 Mark)
9. With the help of Venn diagrams and without seeking help anywhere relate 2, 24, and 72, with the biosphere. (1 Mark)
10. In relation to a Venn Diagram of Biosphere; state at least two attributes of the mathematical explanations of Biosphere. (1 Mark)
11. In relation to the Venn Diagrams you have studied during the course of this lesson, explain why 2 is most suitable than 24 and 72 in the mathematical explanation of biosphere (Support your answers with extended and elaborated hierarchies) (9 Marks)
1. Write the names of two environments which our environment earth (lithosphere) is composed of:
   a) 
   b) 
   (2 Marks)

2. List down three major elements of the physical environment.
   a) 
   b) 
   c) 
   (3 Marks)

3. List down three major elements of the biological environment.
   a) 
   b) 
   c) 
   (3 Marks)

4. Match List A with List B by drawing lines showing the dependency between physical and biological environments (the first one is done for you).

<table>
<thead>
<tr>
<th>LIST A (Physical Environment)</th>
<th>LIST B (Biological Environment)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Soil</td>
<td>Animals</td>
</tr>
<tr>
<td>2. Energy</td>
<td>Dead plants and animals</td>
</tr>
<tr>
<td>3. Air</td>
<td>Micro-organisms</td>
</tr>
<tr>
<td>4. Water</td>
<td>Plants</td>
</tr>
<tr>
<td>5. Carbon-Dioxide</td>
<td>Detritus feeders</td>
</tr>
<tr>
<td>6. Nitrogen</td>
<td>Matter</td>
</tr>
</tbody>
</table>

(6 Marks)

5. Without seeking help from anywhere, describe how man's existence on our environment earth (lithosphere) depends upon the biosphere.

(6 Marks)
1. Name at least three landforms found on the face of the land that you know.
   a) ............................................................
   b) ............................................................
   c) ............................................................
   (4 Marks)

2. Which one of the choices below best explain the characteristic variations of landforms?
   a) Size, shape, height and appearance.
   b) Strength, height, glory and fame.
   c) Size, wisdom, cleverness and characteristic shape.
   d) Shape, height, glory and fame.
   (2 Marks)

3. Which two types of natural processes of the earth stated below whose actions on the face of the land causes land forms?
   a) The ears because they look like basins, salt lakes and depression.
   b) The mouth because they look like caverns with stalactites and stalagmites.
   c) Hair because they look like forests that protects the face of the land from the scorching heat of the sun and erosion.
   d) External and internal processes.
   (2 Marks)

4. Which one of the choices below best differentiate between sudden and gradual changes which occur during land forms formation?
   a) Sudden changes take place in the interior parts of the earth and occur very suddenly whereas gradual changes take place on the surface parts (or exterior parts) of the land and they occur gradually, slowly by wearing and tearing apart high lands and soils and carry them away and deposit the worn out material in the low lands away from their original places.
   b) Sudden changes take place on the surface parts of the land whereas gradual changes take place in the interior part of the land.
   c) The wearing and tearing a part of the land surface is the work of the sudden changes whereas the uplifting of volcanic mountains is the action of gradual changes.
   d) Both these changes are inseparable for they all cause landform.
   (2 Mark)

5. From the choices given below, identify four land forms due to sudden changes on the face of the land.
   a) Earth quakes, volcanic eruptions, floods, typhoons and cyclones.
   b) Temperature variations, precipitations, moisture content and protrusion of plant roots.
   c) Chemical changes, rock-joints, water seepage and organic substances.
   d) Oxbow-lakes, river levees, delta and estuary.
   (4 Marks)

6. Identify at least six land forms due to gradual changes on the face of the land.
   a) Mushroom rocks, loess soils, sand dunes, stalactites and stalagmites, cirques and moraines.
   b) Zeugen, Typhoons, Cyclones, Volcanic, Eruptions Earthquakes, Floods.
   c) Volcanic eruptions, oxbow lakes, sand dunes, floods, cyclones, typhoons.
   d) Only internal processes are responsible in this case.
   (6 Marks)
1. From the choices given below, identify four major actions of external processes on the face of the land.
   a) Formation of volcanoes, grand canyons, clouds and cloud covers.
   b) Precipitation, respiration, transpiration and evaporation.
   c) Wearing out, tearing down, carry away and deposit worn out materials.
   d) None of the above answers is correct. (4 Marks)

2. From list B given below identify by circling six agents of external land processes acting on the face of the land.

   List B: (Respond by Cycling the Correct Answer Only)
   a) Earthquakes
   b) Weathering
   c) Vulcanicity
   d) Rainfall
   e) Fold mountains
   f) River erosion
   g) Glaciers
   h) Winds
   i) Waves
   j) Biosphere. (6 Marks)

3. Which one of the sentences below best define the term weathering?
   a) Weathering is the process of building up of rocks by sudden changes in weather phenomena.
   b) Weathering is the process of deposition of broken rocks by sudden change in weather phenomena with the help of temperature variations, moisture content, precipitation and protrusion of plant roots.
   c) Weathering is the process of breaking down of rocks by gradual change in weather phenomena with the help of temperature variations, moisture contents, precipitations and protrusion of plant roots.
   d) Weathering is the process of breaking down of rocks by sudden change in weather phenomena with the help of temperature variations, moisture content, precipitation and protrusion of plant roots. (1 Mark)

4. From the list given below, circle four causes of sudden changes in weather phenomena which help in the breaking down of rocks.
   a) Chemical changes.
   b) Height of the land surface.
   c) Type of soil, rock structure or rock texture.
   d) Land configuration.
   e) Organic substances.
   f) Water seepage.
   g) Shape of the hand.
   h) Rock joints and tissues.
   i) Man’s interference with his environment. (5 Marks)
1. From the choices given below, which one best define the term gradational processes.
   a) These are process which produce the land surface by wearing out, tearing down, carrying away and deposit all the weathered rock and soil particles in different regions far away from their original place.
   b) These are processes which reduce the land surface by wearing out, tearing down, carrying away and deposit all the weathered rock and soil particles in different regions far away from their original place.
   c) These are processes which elevate land surfaces by wearing out, tearing down, carrying away and deposit all the weathered rock and soil particles into the sea far away from their original place.
   d) These are the processes which prolong land surfaces by wearing out, tearing down, carrying away and deposit are the weathered rock and soil particles into the sea far away from their original place.  
   (1 Mark)

2. Circle from the list given below, two moving agents of gradation process which transport weathered material from one place to the other.

   List of Moving Agents (Circle Only Two Correct Ones)
   a) Volcanic eruption
   b) Wind erosion
   c) Sand dunes
   d) River erosion  
   (2 Marks)

3. From the list of components given below, circle only two components of gradational processes.

   List of Components: (Circle Only Two Correct Ones)
   a) Weathering component
   b) Degradation component
   c) Deposition component
   d) Aggradation component  
   (2 Marks)

4. Which one of the choices below best define the term degradation?
   a) Degradation is the process by which material of the earth's crust are removed from the highlands by eroding the landscape with the help of agents like rivers, rainwater, winds, waves and glaciers.
   b) Degradation is the process by which material of the earth's crust are saved from the highlands from the forces of erosion with the help of rivers, rainwater and winds.
   c) Degradation is the process by which material of the earth's crust are deposited from the highlands by erosion of landscape with the help of rivers, rainwater and winds.
   d) Degradation is the process by which material of the earth's crust are left untouched from the highland by erosion of landscape with the help of winds, river and rainwater.  
   (1 Mark)

5. Identify from the choices given below, statements which best define the term aggradation.
   a) Is the process by which decomposition of eroded earth material takes place in the lowland, leading to gradual increase in the land level.
   b) Aggradation is the process by which deposition of eroded earth material take place in the lowlands leading to gradual increase in the land level.
   c) Aggradation is the process by which deposition of eroded earth material fail to take place in the lowlands leading to gradual decrease in the land level.
Appendix-F

d) Aggradation is the process by which deposition of eroded earth crust takes place in the highlands leading to gradual wear and tear of the earth's crust in the highland. (1 Mark)

6. Write as many as possible similarities between degradation and aggradation.

<table>
<thead>
<tr>
<th>Similarities</th>
<th>Between</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degradation</td>
<td>Aggradation</td>
</tr>
<tr>
<td>i)</td>
<td>i)</td>
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<td>vii)</td>
<td>vii)</td>
</tr>
</tbody>
</table>

(7 Marks)

7. Write as many as possible the differences between degradation and aggradation.

<table>
<thead>
<tr>
<th>Differences</th>
<th>Between</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degradation</td>
<td>Aggradation</td>
</tr>
<tr>
<td>i)</td>
<td>i)</td>
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<tr>
<td>ii)</td>
<td>ii)</td>
</tr>
<tr>
<td>iii)</td>
<td>iii)</td>
</tr>
</tbody>
</table>

(3 Marks)

8. Circle from the list given below, main moving agents of gradation which carry away eroded earth material from the highlands down to the lowlands by depositing the eroded material into the sea.

List of Main Moving Agents of Gradation
a) Wind erosion
b) Delta
c) River erosion
d) Eddies
e) Glaciers

(3 Marks)
1. Which one of the choices below best describe the attributes of wind abrasion?
   a) Dominant in desert areas, associated with absence of vegetations, almost nonexistent rainfall, carry the particles away to different regions and remove loose dry soil particles by strong winds.
   b) Not dominant in desert areas, not associated with absence of vegetation but effective in the dry lands.
   c) Effective in the wet land only.
   d) Not effective anywhere at all  
      (1 Mark)

2. From the list below, circle only four agents of gradation.

   List of Agents of Gradation
   a) Rivers
   b) Waves
   c) Soil
   d) Thunderstorm
   e) Lightning
   f) Glaciation
   g) Weathering
   h) Rift-Valley
      (4 Marks)

3. Circle from the list given below, three land forms formed due to wind abrasion.

   List of Landforms Due to Wind Abrasion
   a) Sand Dune (Barchans)
   b) Loess Solis
   c) Mushroom Rocks
   d) Stalactites and Stalagnites
   e) River Levees
      (3 Marks)

4. Name from the picture below parts marked A, B and C.

   Landform (E)

5. What is the name of land form marked E above?
   a) Sand Dunes or Barchans
   b) Mushroom Rocks (Zeungen)
3. Identify the name of the landform marked D in the diagram below.

Landform (D)

<table>
<thead>
<tr>
<th>List A: (Landforms)</th>
<th>List B: Where it is Commonly Found</th>
</tr>
</thead>
<tbody>
<tr>
<td>a Estuary</td>
<td>Found in Desert Regions</td>
</tr>
<tr>
<td>b River levees</td>
<td>Found in the Polar Regions and Mountains above 5500 meters above sea level.</td>
</tr>
<tr>
<td>c Delta</td>
<td>Found where a river enters the sea.</td>
</tr>
<tr>
<td>d Sand Dunes</td>
<td>Found in sea level.</td>
</tr>
<tr>
<td>e Mushroom Rocks</td>
<td>Found where a river enters the sea with only one mouth.</td>
</tr>
<tr>
<td>f Glaciers</td>
<td>Found in the lower course of a river.</td>
</tr>
</tbody>
</table>

7. Draw correctly expanded and elaborated hierarchy of gradational processes showing degradation, aggradation, moving agents of degradation landforms due to wind abrasion and landforms due to aggradation.

(7 Marks)
1. Which one of the statements below best describe the defining attributes of a river?
   a) Is a body of water which flows from higher to lower grounds and erode the face of the land in the process and is natural but not man made.
   b) Is a natural body of water which flows from lowland to highlands and erode the face of the land in the process.
   c) Is a body of water whose main work is deposition (aggradation) but not concerned with gradation (erosion).
   d) None of the above attributes is correct.  
   (1 Mark)

2. Which one of the choices below are examples of geologically old rivers in India?
   a) Ganga, Nile, and Zambezi
   b) Indus, Sutlej and Mississippi
   c) Amazon, Nile and Beas.
   d) Ganga, Krishna
   (1 Mark)

3. Which one of the choices below are examples of geologically new rivers in India?
   a) Mississippi, Ganga, Amazon
   b) Nile, Tapti, Beas
   c) Sutlej, Beas, Ravi
   d) Amazon, Brahmaputra, Narmada
   (1 Mark)

4. Discriminate from the choices below one statement which best describe the economic importance of rivers as circulatory system.
   a) Generate electricity, transportation, irrigation.
   b) Irrigation, killing both plants and animals during floods.
   c) Help in the destruction of human race
   d) Not important to human life.
   (1 Mark)

5. Identify from the choices below which best describe bodies of water (Hydrosphere)?
   a) Godavari, Narmada, Beas, Yamuna, Plains
   b) Nile, Ganga, Mountains
   c) Alluvial Soils, Delta, tributary
   d) Rivers, lakes, swamps, ponds, seas and oceans.
   (1 Mark)

6. From the choices given below, identify geologically old rivers of Africa.
   a) Zambazi, Congo, Nile
   b) Nile, Amazon, Ganga
   c) Tapti, Narmada, Yamuna
   d) Ganga, Krishna, Indus
   (3 Marks)

7. Identify rivers in India flowing into the Bay of Bengal from the list below. Circle the correct one only.

   List of Rivers Flowing into Bay of Bengal:
   a) Ganga, Krishna, Kauveri
   b) Indus, Narmada, Luni
   c) Amazon Cango, Nile
   d) Congo, Narmada, Nile
   (3 Marks)
8. List out by circling rivers in India flowing into the Arabian sea.
a) Ganga, Krishna, Kauveri
b) Narmada, Tapli, Luni and Mahi
c) Amazon, Congo, Nile
d) Zambezi, Narmada, Mississippi

9. Circle from the list below landforms due to river erosion.
a) Oxbow-lakes, alluvial plains, river basin, U-shaped Valleys, Delta.
b) Sand-dunes, Stalactite and stalagmites.
c) Mushroom rocks, river-levees, V-shaped Valleys.
d) River lagoons, Broad river channels, desert devils.
UNIT-VIII
FORMATIVE EVALUATION

DATE: 
TIME: 8 minutes

1. Identify from the choices given below, geologically old type of rivers in India.
   a) Ganga, Indus, Krishna
   b) Beas, Sutlej, Tapti
   c) Mississippi, Zambezi, Nile
   d) Bakra Beas Nangal Dam, Hirakkud Dam
   (1 Mark)

2. Choose from the list of statements given geologically new rivers in India.
   a) Ganga, Mississippi
   b) Zambezi, Narmada
   c) Ravi, Sutlej, Beas
   d) Amazon, Nile, Mississippi
   (1 Mark)

3. Differentiate perennial and intermitent rivers from the choices given below:
   a) Perennial rivers maintain constant flow throughout the year whereas intermitent rivers dry-out during certain seasons because of lack of water.
   b) Perennial rivers do not maintain constant flow of water throughout the year whereas intermitent rivers maintain the flow all seasons.
   c) Perennial rivers are deep, wide and fast running whereas intermitent rivers are slow, narrow and shallow.
   d) Perennial rivers do not meander whereas intermitent rivers meander alot throughout their courses.
   (1 Mark)

4. Represent hierarchichally the work of rivers as circulatry system.
   (5 Marks)

5. Name two different types of land forms due to river aggradation (deposition)
   a) ____________________________________________
   b) ____________________________________________
   (2 Marks)

6. Name at least three sources of river water you know.
   a) ____________________________________________
   b) ____________________________________________
   c) ____________________________________________
   (3 Marks)

7. Name at least four rivers flowing into the Bay of Bengal.
   a) ____________________________________________
   b) ____________________________________________
   c) ____________________________________________
   d) ____________________________________________
   (4 Marks)

8. Name at least three rivers flowing into the Arabian Sea.
   a) ____________________________________________
   b) ____________________________________________
   c) ____________________________________________
   (3 marks)
1. Complete the statement below:
   Three courses of a river are:
   a) 
   b) 
   c)                      (3 Marks)

2. Identify statements which best describe main gradation activities in the upper course of a river.
   a) Least minimal erosion with no tributaries.
   b) Water rushes down the steep slopes but fail to reach the sea.
   c) Highland degradation is less effective in this course.
   d) Greatest maximum erosion, with steep slopes, plenty of rapids and falls coupled with many tributaries.  (2 Marks)

3. From the list given below, identify by circling five major landforms due to gradation activities.

   List of Major Landforms Due to Gradation Activities:
   a) U-shaped valleys
   b) V-shaped valleys
   c) Gorges
   d) Stalactites and Stalagmites
   e) Gulleys
   f) Pillars or Pendants and Columns
   g) Rapids and Falls
   h) Canyons                      (5 Marks)

4. What are the economic importance of the upper course of a river?
   a) The river waters are harnessed for Hydro-electricity power generation.
   b) Its waters go waste due to rapidity.
   c) It is un economical because of the speed of water from this course.
   d) The water temperature is too cold for any economic activity to take place in this river course.  (2 Marks)

5. Which one of the statements below best describe the main gradation activities in the middle course of the river?
   a) Transport eroded material and deposit heavier material on the way.
   b) The river does not meander.
   c) Large vast land areas are not sub-mergand by water.
   d) No over flooding of the river banks.                      (1 Mark)

6. Identify by circling five major land forms due to river gradation in the middle course?

   List of Landforms Due to Gradation in the Middle Course:
   a) Canyons
   b) Oxbow Lakes
   c) River Levees
d) River Basins

e) Alluvial soils in flood plains deposited

f) Loss of Life and property

g) Earth quakes

h) Waves

i) Sand dunes

j) U-shaped Valleys

(5 Marks)

7. From the choices below, which statements best illustrate the major economic importance of the middle course of a river.

a) Some river basins are too deep to be harnessed.

b) River levee soils deposited during floods are not suitable for agriculture.

c) Fish ponds in oxbow lakes are not properly harnessed because most people don't eat fish.

d) Large number of people living along the river flood plains are displaced by floods and some river basins have salt pan deposits that may be harnessed.

(2 Marks)
UNIT-X
FORMATIVE EVALUATION

DATE: 
TIME: 10 minutes

1. Which one of the statements below state the major attributes of the lower course of a river?
   a) Extremely gentle slopes, clogged channels with a lot of deposition taking place.
   b) Extremely gentle, clear river channels with an estuary.
   c) Extremely gentle, clogged channels, with entrance.
   d) Extremely rough clogged channels with no entrance
   (1 Mark)

2. Choose from the statements below the one that best describe the main aggradation activities in the lower course of a river.
   a) Deposition, clogged channels, weak water velocity, no transportation division and sub-division of river channels.
   b) Deposition and erosion are the main aggradation features.
   c) Deposition, erosion, clogging, irrigation and agriculture is possible in this course.
   d) Deposition, degradation, Digging, slow and rapid river channels are prevalent at this stage.
   (1 Mark)

3. Identify the major landforms due to aggradation activities in the lower course of a river.
   Circle One From the Choices Below
   a) Sand-dunes, barchans, stalactites and stalagmites.
   b) Delta, Basin, Levees, and alluvial soils.
   c) Volcanic eruptions, Earthquakes, and desertifications.
   d) Volcanic eruptions, zeugens, and mushroom rocks.
   (1 Mark)

4. Name at least two major economic activities taking place at the lower course of a river.
   a) 
   b) 
   (2 Marks)

5. Identify by choosing statements which best illustrate attributes of a river delta.
   a) Vast triangular, with rich alluvial soil deposits and looks like the Greek letter Delta (Δ).
   b) Enters the sea with one mouth (Entrance and looks like Greek Letter Delta (Δ).
   c) Have wide swift, rapid channels with fast flowing water.
   d) Eroded materials carried away into the sea with no depositions taking place.
   (1 Mark)

6. Name two Indian rivers having a Delta.
   a) 
   b) 
   (2 Marks)

7. Which one of the statements below best define the term Estuary?
   a) Is a slow flowing river which enters the sea with only one entrance (mouth) with deep clear narrow channels.
   b) Is a swift flowing river which enters the sea with one entrance (mouth) with deep clear narrow channels. 
   (2 Marks)
Appendix-F

c) Is a swift flowing river which stops before entering the sea with one entrance (mouth) with deep clear narrow channels.

d) Is a swift flowing river which enters the sea with only two entrances (mouths) with shallow clogged narrow channels.

(1 Mark)

8. Which one of the statements below best illustrate attributes of an estuary?
   a) Swift flowing, rapid, with deep narrow channels and enters the sea with only one mouth.
   b) Slow with shallow floodplains.
   c) Rich with river basins and flood plains.
   d) Enters the sea with deltaic characteristics.

(1 Mark)

9. Name two examples of some rivers in India having estuaries.
   a) 
   b) 

(2 Marks)

10. What are the differences between a Delta and an estuary (Give as many answers as you can)

<table>
<thead>
<tr>
<th>Delta</th>
<th>Estuary</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>i</td>
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<tr>
<td>ii</td>
<td>ii</td>
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<td>iii</td>
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</tr>
<tr>
<td>iv</td>
<td>iv</td>
</tr>
</tbody>
</table>

(4 Marks)

11. What are the differences between a river tributary and distributary. Give as many points as you can.

<table>
<thead>
<tr>
<th>Tributary</th>
<th>Distributary</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>i</td>
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<tr>
<td>ii</td>
<td>ii</td>
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<tr>
<td>iii</td>
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<tr>
<td>iv</td>
<td>iv</td>
</tr>
</tbody>
</table>

(4 Marks)
UNIT-XI
FORMATIVE EVALUATION

DATE: 
TIME: 10 minutes

1. Identify statements which best define effects of underground water as an agent of
   gradation.
   a) Rainfalls react chemically with calcium carbonate resulting to the formation of
calcium bicarbonate, and rainwater absorbs carbon dioxide from atmosphere
resulting to the formation of furrows; clints and oxbow lakes.
   b) Soluble limestone rocks dissolve in water resulting to the formation of calcium-
carbonate, furrows, clints and lime.
   c) Formation of clints and mushroom rocks.
   d) Formation of furrows and river levees. (1 Mark)

2. Which one of the statements below best state major characteristics of underground
   water?
   a) Not  active in limestone regions.
   b) Rainwater repel carbonate from the atmosphere.
   c) Most active in limestone regions resulting to the formation of calcium carbonate and
other land forms like stalactites and stalagmites.
   d) Have no calcium carbonate and carbonate. (1 Mark)

3. Identify statements which best describe formation of caves or caverns in limestone
   regions.
   a) Soluble bi-carbonate do not percolate through rock-joints and fissures leading to
formation of caves down below the ground.
   b) Warm cave water do not encourage seepage leading to deposition of lime in the
upper (roof) and down on the roof floor.
   c) Lime deposits do not grow slowly with some droppings down on the cave floor.
   d) Soluble calcium bi-carbonate and water percolate through rock-joint and fissures
leading to the formation of caves below the ground and warm water seepage
   evaporate leading to deposition of lime in the roof of caves making various shapes
on the upper and bottom of the cave. (2 Marks)

4. Which one of the statements below are correct;
The two major land forms due to underground water in the limestone regions are
   __________ and __________
   a) Wind Abrasion and Wind Velocity.
   b) Sand dunes and mushroom rocks.
   c) Volcanoes and earthquakes.
   d) Stalactities and stalagmites (5 Marks)

5. Which one of the choices below is on of the characteristics of underground water in
   limestone regions?
   a) Rainfall reacts chemically with calcium carbonate resulting to the formation of soluble
calcium bicarbonate and soluble limestone rocks dissolves water leading to the
formation of lime in the caves or caverns.
   b) It is least active in limestone regions where rainfall reacts chemically with calcium
   carbonate resulting to the formation of soluble calcium bi-carbonate.
   c) Soluble limestone do not dissolve in water.
   d) Rainwater do not absorb calcium bi-carbonate. (1 Mark)
6. State as many similarities as you can between stalactites and stalagmites.

**Similarities Between Stalactites and Stalagmites:**

- a) 
- b) 
- c) 
- d) 
- e) 
- f) 

(6 Marks)

7. What are the differences between stalactites and stalagmites.

<table>
<thead>
<tr>
<th>Stalactite</th>
<th>Stalagmite</th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>i)</td>
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<tr>
<td>ii)</td>
<td>ii)</td>
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</tbody>
</table>

(4 Marks)
UNIT-XII
FORMATIVE EVALUATION

DATE: ____________
TIME: 10 minutes

1. Which one of the choices below best define the term glaciers:
   a) Glaciers are moving masses of ice found in the polar regions and high mountain areas having permanent ice and snow cover.
   b) Glaciers are the heights above sea level occupied by ice and snow.
   c) Glaciers are permanent ice-sheets found in the equatorial belts.
   d) Glaciers are stagnant ice masses found in Ganges and Brahama Putra river valleys.

2. Circle the right answer only in List B

<table>
<thead>
<tr>
<th>List A</th>
<th>List B: Characteristics of Glaciers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glaciers</td>
<td>a) Occur only in the Ganga and Brahma Putra valleys</td>
</tr>
<tr>
<td></td>
<td>b) Occur in the Polar Regions Artic and Antarctic Circles</td>
</tr>
<tr>
<td></td>
<td>c) Are moving masses of frozen ice-sheets or snow</td>
</tr>
<tr>
<td></td>
<td>d) Are agents of degradation</td>
</tr>
<tr>
<td></td>
<td>e) Are agents of aggradation</td>
</tr>
</tbody>
</table>

3. Name two types of glaciers you know:
   a) ___________________________
   b) ___________________________

4. Circle the statements that are TRUE about Continental Glaciers.

| Continental Glaciers | a) Occur in the polar regions. |
|----------------------| b) Temperature may vary considerably. |
|                      | c) Occur on high mountain altitudes. |
|                      | d) Temperatures are permanently below the freezing point |
|                      | e) Region is characterized by extensive thick ice-sheets covering the entire land surface. |
|                      | f) Region is characterized by thin ice-sheets upto the limits of altitude 5500 meters above sea level |

5. Which one of the following statements are false about the action of valley glaciers on the face of the land [Circle only FOUR FALSE Statements].

   False Statements
   a) Slow movement of solid ice-blocks.
   b) High friction as ice comes into contact with valley floors.
   c) Fast movement of solid ice-blocks.
d. Low friction as ice comes into contact with the valley floors.

Glaciers melt and turn into huge water torrents as it descends down the mountain valley to the lower altitudes.

f. Glaciers melt and turn into slow water currents as it descends down the mountain valley to the lower altitudes.

g. Snow turns into roaring cold frigid streams of water.

h. Snow turns into slow warm streams of water.

6. Name by circling three right answers of land forms due to glaciation from the list given below

List of Landforms Due to Glaciation:
   a) Cirque
   b) Sand dunes
   c) U-shaped valleys
   d) Lateral moraines
   e) Stalactites and Stalagmites

7. Circle from the list below, rivers which get their waters from snow glaciers of the Himalaya Mountains.

List of Rivers: Circle Only Four Correct Answers
   a) River Yamuna
   b) River Luni
   c) River Krishna
   d) River Godavari
   e) River Ganga
   f) River Narmada
   g) Brahma Putra
   h) River Indus
Appendix II G
Criterion Test...
APPENDIX - G
CRITERION TEST

General Instructions

♦ Do not turn this page until your are told to do so.
♦ Do not write or mark anything on this booklet.
♦ Use only the answer-sheet provided to you.
♦ This test consists of Six Sections.
♦ The directions for each section is given at the beginning of each section. Read them carefully and proceed at once to answer the questions.
♦ There is no time limit for each section but do not spend too much time on any one-test item.
♦ Do not guess.
♦ If you want to change your answer, do so by rewriting them clearly.

In this test, there are 93 questions for you to answer. You are expected to answer all of them. Credit will be given for those students who show exemplary performance.

BEST OF LUCK...
APPENDIX - G

SECTION A
Multiple Type (Please Circle) The Correct Letter Only

1. Which one of the choices below best defines the term glaziers?
   a) Glaziers are moving masses of ice sheets found in the Polar Regions and high
      mountain areas having permanent snow and ice covers.
   b) Glaziers are the heights above the sea levels occupied by snows and ice.
   c) Glaziers are permanent ice sheets found in the equatorial belts.
   d) Glaziers are stagnant ice sheets found in the Ganga and Brahmaputra river valleys.

2. Which one of the statements below is correct (the two major landforms due to
   underground water in the limestones regions are)?
   a) Wind abrasion and wind velocity
   b) Sand dunes and Mushroom rocks
   c) Volcanoes and earth quackes
   d) Stalacties and Stalagmites

3. Which statements below best define effects of underground water as an agent of
   gradation?
   a) Rainfall reacts chemically with calcium carbonate resulting to the formation of
      calcium-bi-carbonate, and rain water absorbs carbon-dioxide from the atmosphere
      resulting to the formation of furrows, Clint, and ox-bow lakes.
   b) Soluble limestone rocks dissolves in water resulting to the formation of calcium-
      carbonate, furrows, and lime.
   c) Fomiation of Clint and Mushroom rocks.
   d) Formation of furrows and river levees.

4. Which one of the following statements below best defines the term biosphere?
   a) Is an incomplete picture of a narrow common zone of contact where the earth
      (lithosphere air (atmosphere) and water (hydrosphere) meet?
   b) Is a narrow common zone of contact where the earth (lithosphere), air (atmosphere),
      and water (hydrosphere) meet?
   c) Is a disjoint narrow common zone of contact where the earth (lithosphere), air
      (atmosphere), and water (hydrosphere) meet?
   d) Is the hierarchical outline of the earth (lithosphere), air (lithosphere), and water
      (hydrosphere).

5. Which one of the choices of natural processes of the earth stated below whose actions
   on the face of the land causes landforms?
   a) The ears because they look like river basins, salt lakes, and depressions.
   b) The mouth because it resembles caves or caverns with the teeth looking like
      stalactites and stalagmites.
   c) Hair because they look like forests that protects the face of the land from the
      scorching heat of the sun and wind erosion.
   d) Eternal and internal processes.

6. From the forces given below, name at least four, which causes sudden changes on the
   face of the land.
   a) Earthquakes, volcanic eruptions, floods, typhoons and cyclones
   b) Temperature variations, precipitation, moisture contents, and protrusion of plant
      roots.
   c) Chemical changes, rock joints, water seepage, and organic substance
   d) Ox-bow lakes, river levees, delta and estuaries.

7. Which one of the statements below best defines the term estuary?
   a) Is a flowing river, which enters the sea with only one entrance (mouth), with deep
      clear narrow channels.
b) Is a swift flowing river which enters the sea with only one entrance (mouth) with deep clear narrow channel.

c) Is a swift flowing river which stops before entering the sea with only one entrance (mouth) with deep clear narrow channel.

d) Is a swift flowing river which enters the sea with only two entrances (mouths) with shallow clogged narrow channel.

8. Which one of the statements below best illustrates attributes of a river delta?
   a) Vast, triangular, with rich alluvial soil deposits and looks like the Greek letter Delta (Δ).
   b) Enters the sea with only one mouth (entrance) and looks like the Greek letter Delta (Δ).
   c) Have wide swift, rapid channels with fast flowing waters.
   d) Eroded materials are carried away into the sea with no deposition taking place.

9. Identify from the choices below, main aggradation activities taking place in the lower course of a river
   a) Deposition, clogged channels, weak water currents, no transportation taking place, divisions and sub-divisions of river channels.
   b) Deposition and erosion are the main aggradation activities taking place.
   c) Depositions, erosions, clogging, irrigation and agriculture are the main activities in this course.
   d) Deposition, degradation, digging, slows and rapid river channels are prevalent at this stage.

10. Identify from the statements given below, the one, which best describe main gradation activities taking place in the middle course of the river.
    a) Transport eroded material and deposit heavier ones on the way.
    b) The river does not meander in this in this course.
    c) Large vast land areas are not sub-merged by water in this course.
    d) No over flooding of the riverbanks at this stage.

11. Which one of the statements below best illustrates major actions of external processes on the face of the land?
    a) Formation of volcanoes, grand canyons, clouds and cloud covers.
    b) Precipitation, respiration, transportation and evaporation.
    c) Wearing out, tearing down, carry away and deposition of worn out materials.
    d) None of the above answers is correct.

12. Identify two major land processes acting on the face of the land.
    a) Biosphere and winds.
    b) Waves and fold mountains.
    c) Glaziers and earthquakes.
    d) Wind erosion and glaziers.

13. What are gradation processes?
    a) These are the processes which produce land surfaces by wearing out, tearing down, carrying away, and deposit all the weathered rock and soil particles in different regions far away from their original places.
    b) These are processes, which reduce the land surface by wearing out, tearing down, carrying away and deposit all the weathered rock and soil particles in different regions away from their original places.
    c) These processes, which elevate land surfaces by wearing out, tearing down, carrying away and deposit all the weathered rock and soil particles into the sea away from their original places.
    d) These are processes, which prolong land surfaces by wearing out, tearing down, carrying away and deposit all the weathered rock and soil particles into the sea away from their original places.
14. Which one of the choices below best defines the term degradation?
   a) Degradation is the process by which materials of the earth's crust are removed from the highlands by eroding the landscape with the help of agents like rivers, rainwater, winds and glaciers.
   b) Degradation is the process by which materials of the earth's crust are saved from the highlands from the forces of erosion with the help of rivers, rainwater, and winds.
   c) Degradation is the process by which materials of the earth's crust are deposited from the highlands by eroding the landscape with the help of rivers, rainwater, and winds.
   d) Degradation is the process by which materials of the earth's crust are left untouched from the highlands by eroding the landscape with the help of winds, rivers, and waters.

15. Which one of the statements below best defines the term aggradation?
   a) Is the process by which decomposition of eroded material of the eroded earth's material takes place in the lowlands leading to gradual increase in the land area.
   b) Aggradation is the process by which deposition of the eroded material takes place in the lowlands leading to the gradual increase of the land level.
   c) Aggradation is the process by which deposition of the eroded earth's material fail to take place in the lowlands leading to the gradual decrease in the land level.
   d) Aggradation is the process by which erosion of the earth's crust takes place in the highlands leading to the gradual wear and tear of the earth's crust in the highlands.

16. Which one of the following statements below best illustrates defining attributes of a river?
   a) Is a body of water, which flows from, higher to lower grounds and erode the face of the land in the process, it is natural but not man made and is also lower than the surrounding land area.
   b) Is a natural body of water, which flows from lowlands to highlands and erode the face of the land in the process.
   c) Is a body of water whose main work is deposition (aggradation) but not concerned with gradation (erosion).
   d) None of the statements above is correct.

17. Which of the statements below describes economic importance of rivers as circulatory systems?
   a) Generate electricity, transportation, and irrigation.
   b) Irrigation, killing of both plants and animals during floods.
   c) Help in the destruction of human race on the face of the earth.
   d) Not important to human life.

18. From the statements below which one best explain bodies of water?
   a) Godavari, Cauvery, Narmada, Beas, Yamuna, and Ganga plains.
   b) Nile valley, Ganga and Mountains.
   c) Alluvial soils, Delta, Tributary.
   d) Rivers, Lakes, Swamps, Ponds, and Oceans.

19. Which one of the choices below best illustrates the differences between perennial and intermittent rivers?
   a) Perennial rivers maintain constant flow throughout the year whereas intermittent rivers dry-out during certain seasons due to lack of water.
   b) Perennial rivers do not maintain constant flow of water throughout the year whereas intermittent rivers maintain the flows all seasons.
   c) Perennial rivers are slow narrow and shallow.
   d) Perennial rivers do not meander whereas intermittent rivers a lot throughout their course.
20. Which one of the statements below defines weathering?
   a) Weathering is the process of building up of rocks by sudden changes in weather phenomena.
   b) Weathering is the process of deposition of broken rocks by sudden changes in weather phenomena with the help of temperature variations, moisture contents, precipitation, and protrusion of plants roots.
   c) Weathering is the process of breaking down of rocks by gradual changes in weather phenomena with the help of temperature variations, moisture contents, precipitation, and protrusion of plants roots.
   d) Weathering is the process of breaking of rocks by sudden changes in weather phenomena with the help of temperature variations, moisture contents, precipitation, and protrusion of plants roots.

21. Which one of the statements below best describes the defining attributes of Biosphere?
   a) Biosphere is the face of the land where we find no living organisms.
   b) Biosphere is Air (Atmosphere) with no life in it.
   c) Water (Hydrosphere) does not exist in the Biosphere.
   d) Biosphere is a narrow common zone of contact where we find elements of the physical and biological environments like water (hydrosphere), air (atmosphere), and land (lithosphere).

22. Choose correctly, statements, which best explain the characteristic variation of landforms on the face of the land.
   a) Landforms vary in shapes, sizes, heights, and appearances.
   b) Landforms vary in velocity, heights, viscosity, and size.
   c) Landforms vary in size, shape, characteristics, and fitness.
   d) None of the above answers is correct.

23. Identify from the statements given the ones, which best illustrate natural processes whose actions on the face of the land causes landforms.
   a) Causes panic by helping to go to heaven.
   b) Act slowly, by wearing down, tearing apart, carry away, and deposit the eroded material down the river.
   c) Does not have any mercy on human beings.
   d) Brings a lot of sufferings and calamity to mankind.

24. Represent structurally, major defining attributes of gradation process.
   a) Active in the lowlands, very gradual, increase the land levels where it is active and rich in soil.
   b) Does not take place at the same time with degradation.
   c) Active in the highland areas only.
   d) Remove the earth's crust from the highlands and deposit them down in the lowlands.

25. Two examples of gradation processes are—
   a) Steam and wind
   b) Glaziers and human beings.
   c) Rivers and winds.
   d) Weathering and deposition.

26. From the choices below, identify statements which best describe major attributes of wind abrasion.
   a) Dominant in desert regions, and remove loose dry soil particles.
   b) Does not exist in the desert regions and has no strength at all.
   c) Deposit eroded material within the area where it is active.
   d) Associated with the presence of vegetative covers.

27. From the statement given below, identify geologically old rivers in Africa.
   a) Nile, Zambezi, Congo.
   b) Indus, Ganga, Amazon.
   c) Amazon, Mississippi, Brahmaputra.
   d) Beas, Satluj, Narmada.
28. Choose statements, which best illustrate defining attributes of a river delta.
   a) Vast triangular in shape with rich alluvial soil deposits.
   b) Enters the sea with only one mouth or entrance.
   c) Have deep narrow fast flowing channels.
   d) Have very clear entrance as it enters the sea.

29. Name from the choices below two landforms found in the middle course of a river.
   a) V-shaped valleys, rapids and falls, and ravines.
   b) Delta and estuary.
   c) Distributaries confluences, and river captures.
   d) River captures and delta.

30. Major characteristics of caves or caverns found in the limestone regions are.
   a) Rainwater does not absorb water since carbon dioxide and soluble limestone rocks
      does not dissolve in water.
   b) Soluble lime stones rocks dissolve in rain water forming furrows, clints, stalactites
      and stalagmites.
   c) Rainwater is not active in the limestone regions.
   d) If you are looking for good scenery you just go to the Rajasthan desert where
      rainwater is more active.

31. Which one of the statements below best defines the term stalagmites?
   a) Are narrow and slender at their bases.
   b) Grow facing down wards towards the roof floors.
   c) Have broad thick based as it grows upwards.
   d) None of the above answer is correct.

32. Which one of the following statements best describes stalactites?
   a) Are narrower and slender at their bases.
   b) Grow facing downwards towards the roof floor.
   c) Have broad thick bases as it grows downwards towards the floor.
   d) Grow upwards from the cave bottom towards the rooftop.

33. Which statements below best give the similarities between stalactites and stalagmites?
   a) Both are found outside the limestone regions.
   b) Both are found outside the caves or caverns in the limestone regions growing either
      upwards or downwards.
   c) Both form pillars or pendants after a long period of time before joining together to
      form columns.
   d) Both are found in India only and nowhere else in the world.

34. Which statements below best give characteristics of continental glaziers?
   a) Found in the continent of Arctic and Antarctic circles, Alaska, Yukon, etc and they
      are almost permanently covered by ice or snow throughout the year.
   b) Continental glaziers get colder and melt due to the coldness of the earth.
   c) Have high temperature variations.
   d) The area is permanently above the freezing point.

35. What are mountain glaziers?
   a) Occur in high mountain regions and both ice and snow accumulate in depressions a
      long the valley heads near the mountain summits.
   b) Found only in the Himalayas and nowhere else.
   c) Does not form valley glaziers.
   d) Melts only during winter seasons due to too many ice and snow covers.

36. Which one of the statements below best defines different characteristics of continental
    glaziers?
   a) Occur in the Polar Regions where the temperatures are permanently below the
      freezing point.
b) Occur only in the high mountain altitudes with high temperature variations.
c) The region is characterized by thin sheets of ice up to the limits of altitude 5500 metres above sea level.
d) None of the above answers is correct.

37. Which one of the following statements best defines different characteristics of mountain glaziers?
   a) Occurs only in the Polar Regions with temperatures permanently below the freezing point.
   b) The region is characterized by extensive thick ice sheets covering the entire landscape.
   c) Temperatures are constantly below zero degrees.
   d) The region is characterized by thin sheets of ice up to the limit of altitude 5500 metres above sea level and is not extensively spread.

38. Which one of the statements below gives the best defining attributes of glaziers?
   a) These are moving masses of ice found in the Polar Regions and high mountain areas having temporary ice and snow covers.
   b) These are moving masses of ice sheets found in the Polar Regions and high mountain areas having permanent ice and snow cover.
   c) These are static ice and snow covers found in the polar regions and high mountain areas with temporary ice and snow.
   d) These are moving masses of ice and snow found in the Polar Regions and high mountain areas with no permanent ice and snow covers.

39. Which is a snow line?
   a) It is height below which there is no permanent snow and ice covers.
   b) It is a height above which there is a permanent snow and ice cover.
   c) Found only in the Equatorial Rain Forests of the Amazon Basin.
   d) In the Polar Regions, snow line is found only in areas above the sea level.
SECTION B
Short Answer Type

40. Name four major attributes of perennial rivers.
   a) ________________________________
   b) ________________________________
   c) ________________________________
   d) ________________________________

41. Name three landforms found on the face of the land.
   a) ________________________________
   b) ________________________________
   c) ________________________________

42. Two examples of gradation processes are.
   a) ________________________________
   b) ________________________________

43. Three examples of landforms due to wind abrasion are.
   a) ________________________________
   b) ________________________________
   c) ________________________________

44. Write down at least six attributes of intermittent rivers.
   a) ________________________________
   b) ________________________________
   c) ________________________________
   d) ________________________________
   e) ________________________________
   f) ________________________________

45. Four mountains in the world having permanent glaciers are.
   a) ________________________________
   b) ________________________________
   c) ________________________________
   d) ________________________________

46. Name two different types of glaciers you know.
   a) ________________________________
   b) ________________________________

47. Name two major landforms due to glaciations.
   a) ________________________________
   b) ________________________________

48. Name some major effects of underground water found in the limestone regions.
   a) ________________________________
   b) ________________________________
   c) ________________________________

49. Explain by writing why rivers in India flowing into the Bay of Bengal are deltaic?

   ______________________________________________________________
   ______________________________________________________________
   ______________________________________________________________

50. Name two different types of glaciers you know?
   a) ________________________________
   b) ________________________________
51. Write down three major characteristics of snowline.
   a) ____________________________
   b) ____________________________

52. Name three components of biosphere.
   a) ____________________________
   b) ____________________________
   c) ____________________________

53. Name three examples of living organisms found in the lithosphere.
   a) ____________________________
   b) ____________________________
   c) ____________________________

54. Write two examples of living organisms found in the atmosphere.
   a) ____________________________
   b) ____________________________

55. Write the names of two environments, which our environment the earth (lithosphere) is a component.
   a) ____________________________
   b) ____________________________

56. Three major elements of the physical environments are.
   a) ____________________________
   b) ____________________________
   c) ____________________________

57. Three major elements of the biological environments are.
   a) ____________________________
   b) ____________________________
   c) ____________________________

58. The three courses of a river are.
   a) ____________________________
   b) ____________________________
   c) ____________________________

59. Name two rivers in India having a delta.
   a) ____________________________
   b) ____________________________

60. Name two rivers in India having estuaries.
   a) ____________________________
   b) ____________________________

61. Write the differences between a river and delta and an estuary.

<table>
<thead>
<tr>
<th>A River Delta</th>
<th>An Estuary</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
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<td>h)</td>
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</tr>
</tbody>
</table>
62. Write the differences between a river tributary and a distributary.

<table>
<thead>
<tr>
<th>A River Tributary</th>
<th>A Distributary</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
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<td>f)</td>
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</tr>
</tbody>
</table>

63. Write the differences between stalactites and stalagmites.

<table>
<thead>
<tr>
<th>Stalactites</th>
<th>Stalagmites</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>a)</td>
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<tr>
<td>b)</td>
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<tr>
<td>c)</td>
<td>c)</td>
</tr>
</tbody>
</table>

64. Name two types of glaziers that you know.
   a) ______________________________________
   b) ______________________________________
65. From the list given below, circle four causes of sudden changes in weather phenomena, which help in the breaking down of rocks.

List of causes (Circle only four correct answers)

a) Appearance of the land surface.
b) Temperature variation.
c) Precipitation.
d) Moisture content.
e) Shape of the land.
f) Action of man on the face of the land.
g) Protrusion of plants roots.
h) Size of the land surface.
i) Wearing and tearing down of the face of the land.
j) Our environment.

66. Circle five other causes of weathering which results in the breaking down of rocks into smaller particles.

List of other causes

a) Chemical changes.
b) Height of the land surface.
c) Type of soil, rock structure or temperature.
d) Land configuration.
e) Organic substances.
f) Water seepage.
g) Shape of the land.
h) Rock joints and fissures
i) Man's interference with his environment.

67. Circle two moving agents of gradation process which transport weathered material from one place to another.

List of moving agents

a) Volcanic eruption.
b) Wind erosion.
c) Sand dunes.
d) River erosion.

68. From the list given below, circle two components of gradation processes.

List of components

a) Weathering component.
b) Degradation component.
c) Deposition component.
d) Aggradation component.

69. From the list below circle only three landforms formed due to wind abrasion.

a) Sand dunes (barchans)
b) River levees
c) Loess soils in Beijing China.
d) Stalactites and stalagmites
e) Mushroom rocks (zeugunen)
From the diagram given below, name the landform marked (E). Circle the correct answer from the list.

**Landform (E)**

List of landforms
a) Loess soils
b) Mushroom rocks (zeungen)
c) Sand dunes (barchan)
d) Stalactites and stalagmites
e) U-shaped valleys
f) V-shaped valleys
g) Delta

Circle only three rivers flowing into the Bay of Bengal.

a) Indus, Narmada, and Luni.
b) Indus, Amazon, and Congo.
c) Congo, Ganga, and Cauveri.
d) Nile, Congo, and Narmada.
e) Ganga, Krishna, and Cauveri.
f) Krishna, Indus and Nile.
g) Brahmaputra, Krishna, and Zambezi.

Circle from the list below landforms due to river erosion.

List of landforms due to river erosion
a) River lagoons and mushroom rocks.
b) Broad river channels and sand storms.
c) Desert devils.
d) Mushroom rocks.
e) Ox-bow lakes, alluvial plains, river basins, U-shaped valleys, Delta, and river levees.
f) V-shaped valleys, Zeugengs, Barchans, Pillars or Pendants, and Columns.

Circle only group of landforms formed due to aggradation activities in the lower course of the river.

List of landforms due to aggradation activities in the lower course of a river
a) Sand dunes stalactites and stalagmites.
b) Delta, basins, levees, alluvial soils.
c) Volcanic eruptions.
d) Earthquakes.
e) Floods.
f) Desertification.
g) Mushroom rocks.
74. From the list below, circle two rivers in India, which get their waters from snow glaciers of the mighty Himalayas?

List of rivers
a) River Godavari.
b) River Krishna.
c) River Ganga.
d) River Yamuna.
e) River Narmada.
f) River Luni.

75. From the list given below, circle five major landforms due to gradation activities.

List of landforms due to gradation activities
a) V-shaped valleys.
b) Gorges.
c) Stalactites.
d) Stalagmites.
e) Gullies.
f) Pillars, columns, and pendants.
g) Rapids and falls.
h) The Grand Canyons of Colorado.

SECTION D
Draw and Label Type

76. For Questions 76-87 Draw and Label the diagrams in a separate sheet of paper provided to you. Good Labelled diagrams and hierarchical outlines will earn you more credits.

88. SECTION E
MATCHING TYPE

<table>
<thead>
<tr>
<th>List A Landforms</th>
<th>List B (where it is commonly found)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Estuary.</td>
<td>a) Found in desert regions.</td>
</tr>
<tr>
<td>b) River Levees.</td>
<td>b) Found in the polar regions and mountains 5500 metres above sea level.</td>
</tr>
<tr>
<td>c) Delta</td>
<td>c) Found where a river enters the sea with many mouths.</td>
</tr>
<tr>
<td>d) Mushroom rocks.</td>
<td>d) Found where a river enters the sea with only one mouth.</td>
</tr>
<tr>
<td>e) Glaciers.</td>
<td>e) Found in the lower course of the river.</td>
</tr>
</tbody>
</table>
89. Differences between sudden and gradual changes acting on the face of the earth.

<table>
<thead>
<tr>
<th>Sudden Changes</th>
<th>Gradual Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
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<td>h)</td>
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</tbody>
</table>

90. Match list A with list B by drawing lines showing dependency between physical and biological environments (the first one has already been done for you as an example).

<table>
<thead>
<tr>
<th>List A</th>
<th>List B</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Soil</td>
<td>a) Animals</td>
</tr>
<tr>
<td>b) Energy</td>
<td>b) Dead plants and animals</td>
</tr>
<tr>
<td>c) Air</td>
<td>c) Micro-organism</td>
</tr>
<tr>
<td>d) Water</td>
<td>d) Plants</td>
</tr>
<tr>
<td>e) Carbon-dioxide</td>
<td>e) Detritus feeders</td>
</tr>
<tr>
<td>f) Nitrogen</td>
<td>f) Matter</td>
</tr>
</tbody>
</table>

91. Identify from the diagram below, the name of landform marked D in the diagram by matching the hidden name against the place where it is commonly found.

<table>
<thead>
<tr>
<th>List A</th>
<th>List B where it is commonly found</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Found where a river enters the sea with only one mouth.</td>
</tr>
<tr>
<td>e) Glaciers</td>
<td>Found in the lower course of the river.</td>
</tr>
</tbody>
</table>
92. Circle statements below which are TRUE about continental glaziers.
   a) Occur in the polar regions.
   b) Temperature may vary considerably.
   c) Occur on high mountain altitudes.
   d) Temperatures are permanently below the freezing point.
   e) The region is characterized by extensive thick ice-sheets covering the entire land area.
   f) The region is characterized by thin ice-sheets up to the limits of altitude 5500 metres above sea level.

93. Which one of the following statements below is FALSE about the action of valley glaziers on the face of the land?
   a) Slow movements of solid ice-sheets.
   b) High friction as ice comes into contact with the valley floors.
   c) Fast movements of solid ice-sheets.
   d) Low friction as ice comes into contact with the valley floors.
   e) Glaciers melts and turn into huge water torrents as it descends down the mountain valleys to the lower altitudes.
   f) Glaciers melts and turns into slow water torrents as it descends down the mountain valley to the higher altitudes.
   g) Snow turns into roaring cold frigid streams of water as it rushes down the mountain valley.
   h) Snow turns into slow warm streams of water as it travels down the mountain valley.
Appendix II G1
Post-Assessment Test Items
(Summative Evaluation)
Response-Sheet...
APPENDIX – G₁
POST ASSESSMENT TEST ITEMS
(Summative Evaluation)
RESPONSE SHEET
Time Limit: 1 Hr

General Instructions

♦ Do not turn this page until you are told to do so.
♦ Do not write or mark anything on this booklet until you are told to.
♦ Use only the answer-sheet provided to you.
♦ This test consists of Six Sections.
♦ The direction for each section is given at the beginning of each section. Read them carefully and proceed at once to answer the questions.
♦ There is no time limit for each section but do not spend too much time on any one-test item.
♦ Do not guess.
♦ If you want to change your answer, do so by rewriting them clearly.

In this test, there are 93 test items for you to answer. Credits will be given for those students who show exemplary performance. Use pencils to draw and label the hierarchical outlines where applicable.

BEST OF LUCK...
Appendix-G,
RESPONSE (ANSWER SHEET) FOR TEST ITEMS NO. 1 TO 93

| Name: ___________________________ Gender (Male) ___________________________ (Female) ___________________________ |
|---------------------------------|-----------------------------|
| Grade - IX                      | Section ____________________ |
|                                 | Roll No. ___________        |
| Name of School__________________| Date: ___________            |

Date: ___________  Time Limit: 1 Hr.

SECTION A

MULTIPLE CHOICE TYPE

Please put a tick mark (✓) only against the Correct choice you have made

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1 | A | B | C | D | 21 | A | B | C | D | 22 | A | B | C | D | 23 | A | B | C | D | 24 | A | B | C | D |
| 2 | A | B | C | D | 25 | A | B | C | D | 26 | A | B | C | D | 27 | A | B | C | D | 28 | A | B | C | D |
| 3 | A | B | C | D | 29 | A | B | C | D | 30 | A | B | C | D | 31 | A | B | C | D | 32 | A | B | C | D |
| 4 | A | B | C | D | 33 | A | B | C | D | 34 | A | B | C | D | 35 | A | B | C | D | 36 | A | B | C | D |
| 5 | A | B | C | D | 37 | A | B | C | D | 38 | A | B | C | D | 39 | A | B | C | D | 40 | a) | b) |
| 6 | A | B | C | D | 41 | a) | b) |
| 7 | A | B | C | D | 42 | a) |

SECTION B

SHORT ANSWER TYPE

40. a) ____________________________________________
   b) ____________________________________________
   c) ____________________________________________
   d) ____________________________________________

41. a) ____________________________________________
   b) ____________________________________________
   c) ____________________________________________

42. a) ____________________________________________
   b) ____________________________________________
61. Differences Between

<table>
<thead>
<tr>
<th></th>
<th>A River Delta</th>
<th>An Estuary</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>a)</td>
<td></td>
</tr>
<tr>
<td>b)</td>
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<td>h)</td>
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<td></td>
</tr>
</tbody>
</table>

62. Differences Between

<table>
<thead>
<tr>
<th></th>
<th>A River Tributary</th>
<th>A Distributary</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>a)</td>
<td></td>
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<tr>
<td>f)</td>
<td>f)</td>
<td></td>
</tr>
</tbody>
</table>

63. Differences Between

<table>
<thead>
<tr>
<th></th>
<th>Stalactites</th>
<th>Stalagmites</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>a)</td>
<td></td>
</tr>
<tr>
<td>b)</td>
<td>b)</td>
<td></td>
</tr>
<tr>
<td>c)</td>
<td>c)</td>
<td></td>
</tr>
</tbody>
</table>

64. a)
SECTION C
CIRCLE CORRECT ANSWERS ONLY

65. List of causes (Circle only four correct answers).
   a) Appearance of the land surface.
   b) Temperature variation.
   c) Precipitation.
   d) Moisture content.
   e) Shape of the land.
   f) Action of man on the face of the land.
   g) Protrusion of plants roots.
   h) Size of the land surface.
   i) Wearing and tearing down of the face of the land.
   j) Our environment.

66. List of other causes.
   a) Chemical changes.
   b) Height of the land surface.
   c) Type of soil, rock structure or temperature.
   d) Land configuration.
   e) Organic substances.
   f) Water seepage.
   g) Shape of the land.
   h) Rock joints and fissures.
   i) Man's interference with his environment.

67. List of moving agents.
   a) Volcanic eruption.
   b) Wind erosion.
   c) Sand dunes.
   d) River erosion.

68. List of components.
   a) Weathering component.
   b) Degradation component.
   c) Deposition component.
   d) Aggradation component.

69. List of Land forms due to wind abrasion.
   a) Sand dunes (barchans)
   b) River levees
   c) Loess soils in Beijing China.
   d) Stalactites and stalagmites.
   e) Mushroom rocks (zeungen).

70. Land from marked (E) circle the correct answer from the list below.

   List of landforms
   a) Loess soils
   b) Mushroom rocks (zeungen)
71. Rivers flowing into the Bay of Bengal.
   a) Indus, Narmada, and Luni.
   b) Indus, Amazon, and Congo.
   c) Congo, Ganga, and Cauvery.
   d) Nile, Congo, and Narmada.
   e) Ganga, Krishna, and Cauvery.
   f) Krishna, Indus and Nile.
   g) Brahmaputra, Krishna, and Zambezi.

72. List of land forms due to river erosion.
   a) River lagoons and mushroom rocks.
   b) Broad river channels and sand storms.
   c) Desert devils.
   d) Mushroom rocks.
   e) Ox-bow lakes, alluvial plains, river basins, U-shaped valleys, Delta, and river levees.
   f) V-shaped valleys, Zeugens, Barchans, Pillars or Pendants, and Columns.

73. List of landforms due to aggradation activities in the lower course of a river.
   a) Sand dunes stalactites and stalagmites.
   b) Delta, basins, levees, alluvial soils.
   c) Volcanic eruptions.
   d) Earthquakes.
   e) Floods.
   f) Desertification.
   g) Mushroom rocks.

74. List of rivers in India which get their waters from snow glaciers of the mighty Himalayas?
   a) River Godavari.
   b) River Krishna.
   c) River Ganga.
   d) River Yamuna.
   e) River Narmada.
   f) River Luni.

75. List of landforms due to gradation activities.
   a) V-shaped valleys.
   b) Gorges.
   c) Stalactites.
   d) Stalagmites.
   e) Gullies.
   f) Pillars, columns, and pendants.
   g) Rapids and falls.
   h) The Grand Canyons of Colorado.
SECTION D

76. For Questions 76-87 Draw and Label the diagrams in a separate sheet of paper provided to you. Good Labelled diagrams and hierarchical outlines will earn you more credits.

SECTION E

88. Matching Type
Match Correctly List A with List B.

<table>
<thead>
<tr>
<th>List A Landforms</th>
<th>List B (where it is commonly found)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Estuary.</td>
<td>a) Found in desert regions.</td>
</tr>
<tr>
<td>b) River Levees.</td>
<td>b) Found in the polar regions and mountains 5500 metres above sea level.</td>
</tr>
<tr>
<td>c) Delta</td>
<td>c) Found where a river enters the sea with many mouths.</td>
</tr>
<tr>
<td>d) Mushroom rocks.</td>
<td>d) Found where a river enters the sea with only one mouth.</td>
</tr>
<tr>
<td>e) Glaciers.</td>
<td>e) Found in the lower course of the river.</td>
</tr>
</tbody>
</table>

89. Differences between sudden and gradual changes acting on the face of the earth.

<table>
<thead>
<tr>
<th>Sudden Changes</th>
<th>Gradual Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>a)</td>
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<tr>
<td>b)</td>
<td>b)</td>
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<td>h)</td>
<td>h)</td>
</tr>
</tbody>
</table>

90. Match list A with list B by drawing lines showing dependency between physical and biological environments (the first one has already been done for you as an example).

<table>
<thead>
<tr>
<th>List A</th>
<th>List B</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Soil</td>
<td>a) Animals</td>
</tr>
<tr>
<td>b) Energy</td>
<td>b) Dead plants and animals</td>
</tr>
<tr>
<td>c) Air</td>
<td>c) Micro-organism</td>
</tr>
<tr>
<td>d) Water</td>
<td>d) Plants</td>
</tr>
<tr>
<td>e) Carbon-dioxide</td>
<td>e) Detritus feeders</td>
</tr>
<tr>
<td>f) Nitrogen</td>
<td>f) Matter</td>
</tr>
</tbody>
</table>
List A | List B where it is commonly found
--- | ---
a) Estuary | Found in desert regions.
b) River levees | Found in the polar regions and mountains 5500 metres above sea level.
c) Delta | Found where a river enters the sea with many mouths.
d) Mushroom rocks | Found where a river enters the sea with only one mouth.
e) Glaciers | Found in the lower course of the river.

SECTION F
TRUE AND FALSE STATEMENTS

92. Circle only true statements about continental Glaciers.
   a) Occur in the Polar Regions.
   b) Temperature may vary considerably.
   c) Occur on high mountain altitudes.
   d) Temperatures are permanently below the freezing point.
   e) The region is characterized by extensive thick ice-sheets covering the entire land area.
   f) The region is characterized by thin ice-sheets up to the limits of altitude 5500 metres above sea level.

93. Circle only true statements about action of valley glaciers on the face of the land.
   a) Slow movements of solid ice-sheets.
   b) High friction as ice comes into contact with the valley floors.
   c) Fast movements of solid ice-sheets.
   d) Low friction as ice comes into contact with the valley floors.
   e) Glaciers melts and turn into huge water torrents as it descends down the mountain valleys to the lower altitudes.
   f) Glaciers melts and turns into slow water torrents as it descends down the mountain valley to the higher altitudes.
   g) Snow turns into roaring cold frigid streams of water as it rushes down the mountain valley.
   h) Snow turns into slow warm streams of water as it travels down the mountain valley.
Other Tools Used

* Standard Progressive Matrices SPM (Appendix II B1)
* Group Embedded Figures Test GEFT (Appendix II B2)
* Self-Esteem Inventory SEI (Appendix II B3)

School Form...
# STANDARD PROGRESSIVE MATRICES

**SETS A, B, C, D, & E**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

### Notes

Tested by ____________________________

Published by MANASAYAN, New Delhi by special arrangements with the original publisher H. K. LEWIS & CO. LTD., LONDON, of J. C. Raven
GROUP EMBEDDED FIGURES TEST

Introduction:

This test is designed to assess your ability to identify a simple form embedded within a complex pattern. The form we refer to as 'X' is hidden within the more complex figure below:

![Complex Figure](image)

To find the simple form in the complex figure and trace it with a pencil directly over the lines of the complex figure. The simple form, labelled 'X', must be the same size, proportions, and direction as it appears alone in the complex figure.

If the top right-hand triangle is the correct one, the bottom triangle is incorrect because it faces in the opposite direction. Therefore, it is not correct.

On the following pages, problems like the one above will appear. In each section, you will see a complex figure, and under it a letter corresponding to the simple form which is hidden. For each problem, look at the BACK COVER of this test to identify the simple form to find. Then try to trace it in pencil along the lines of the complex figure. Note these points:

- Look back at the simple forms as often as necessary.
- Do the problems in order. Don't skip a problem unless you are absolutely 'stuck' on it.
- Trace ONLY ONE SIMPLE FORM IN EACH PROBLEM. You may see more than one, but just trace one of them.
- The simple form is always present in the complex figure in the SAME SIZE, the SAME PROPORTIONS and FACEING IN THE SAME DIRECTION as it appears in the back cover of this booklet.

Instructions:

- Find the simple form in the complex figure and trace it with a pencil directly over the lines of the complex figure.
- The simple form is labelled 'X'.
- The simple form is always present in the complex figure in the SAME SIZE, the SAME PROPORTIONS and FACEING IN THE SAME DIRECTION as it appears alone.
- The correct answer with the simple form traced over the lines of the complex figure.
- If the top right-hand triangle is the correct one, the bottom triangle is incorrect because it faces in the opposite direction. Therefore, it is not correct.

For each problem, look at the BACK COVER of this test to identify the simple form to find. Then try to trace it in pencil along the lines of the complex figure. Note these points:
FIRST SECTION

Find Simple form "B"

Find Simple form "C"

Find Simple form "D"

Find Simple form "E"
SECOND SECTION

1. Find Simple Form 'G'

2. Find Simple Form 'A'

3. Find Simple Form 'S'

4. Find Simple Form 'E'

5. Find Simple Form 'B'

6. Find Simple Form 'C'

7. Find Simple Form 'E'

8. Find Simple Form 'F'

9. Find Simple Form 'H'
THIRD SECTION

1. Find Simple Form 'F'

2. Find Simple Form 'G'

3. Find Simple Form 'C'

4. Find Simple Form 'E'

5. Find Simple Form 'B'

6. Find Simple Form 'E'

7. Find Simple Form 'A'

8. Find Simple Form 'C'

9. Find Simple Form 'A'
Letter designates the simple figure embedded. To receive credit, subject's outline must duplicate the ones shown. For use with the Group Embedded Figures Test by Philip K. Oltman, Evelyn Raskin, and Herman A. Witkin. © Copyright, 1971, by Consulting Psychologists Press, Inc. 577 College Ave., Palo Alto, Calif. 94306. All rights reserved. Reproduction prohibited.
Coopersmith Inventory

Stanley Coopersmith, Ph.D.
University of California at Davis

Please Print

Name: ___________________________ Age: ______

School: __________________________ Sex: M ___ F ___

Grade: __________________________ Date: ______

Directions

On the next pages, you will find a list of statements about feelings. Each statement describes how you usually feel. Put an X in the column "Like Me." If the statement does not describe how you usually feel, put an X in the column "Unlike Me." There are right or wrong answers.
### Student Initiative

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Child actively takes initiative in activities.</td>
</tr>
<tr>
<td>2</td>
<td>Child initiates new ideas relative to classroom activities.</td>
</tr>
<tr>
<td>3</td>
<td>Child asks questions when she or he does not understand.</td>
</tr>
<tr>
<td>4</td>
<td>Child adapts easily to changes in procedures.</td>
</tr>
</tbody>
</table>

### Social Attention

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Child is quiet in class, speaks in turn, and appropriately.</td>
</tr>
<tr>
<td>2</td>
<td>Child talks appropriately about his or her school accomplishments.</td>
</tr>
<tr>
<td>3</td>
<td>Child cooperates with other children.</td>
</tr>
<tr>
<td>4</td>
<td>Child shows self-direction and independence in actions.</td>
</tr>
</tbody>
</table>

### Success/Failure

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Child readily accepts mistakes and failures.</td>
</tr>
<tr>
<td>2</td>
<td>Child appreciates his or her work.</td>
</tr>
<tr>
<td>3</td>
<td>Child expresses satisfaction with own work products, and activities.</td>
</tr>
</tbody>
</table>

### Social Attraction

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Child is sought by peers.</td>
</tr>
<tr>
<td>2</td>
<td>Child acts as a leader in group situations with peers.</td>
</tr>
</tbody>
</table>

### Self-Confidence

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Child readily expresses opinions.</td>
</tr>
<tr>
<td>2</td>
<td>Child appreciates his or her work.</td>
</tr>
</tbody>
</table>

---

**Total BASF Score**

Transfer scores to profile on next page.
V. Self-Confidence

15. This child readily expresses opinions.
16. This child appreciates his or her work, work products, and activities.

Self-Confidence Total

Transfer scores to profile on next page.

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Things usually don't bother me.
I find it very hard to talk in front of the class.
There are lots of things about myself I'd change if I could.
I can make up my mind without too much trouble.
I'm a lot of fun to be with.
I get upset easily at home.
It takes me a long time to get used to anything new.
I'm popular with kids my own age.
My parents usually consider my feelings.
I spend a lot of time daydreaming.
I wish I were younger.
I always do the right thing.
I'm proud of my school work.
Someone always has to tell me what to do.
I'm never happy.
I'm doing the best work that I can.
I can usually take care of myself.
I'm pretty sure of myself.
I'm easy to like.
My parents and I have a lot of fun together.
My teachers make me feel I'm not good enough.
I often feel ashamed of myself.
I often feel upset in school.
I'm not as nice looking as most people.
If I have something to say, I usually say it.
My parents understand me.
I usually feel as if my parents are pushing me.
I often get discouraged at school.
I often wish I were someone else.
I'm pretty tough to be me.
Things are all mixed up in my life.
Kids usually follow my ideas.
I have a low opinion of myself.
There are many times when I'd like to leave home.
I often feel upset in school.
I'm not very good at school.
I'm not as nice looking as most people.
I can make up my mind and stick to it.
I don't like to be with other people.
I often feel ashamed of myself.
Kids pick on me very often.
I always tell the truth.
My teachers make me feel I'm not good enough.
I don't like to be with other people.
I often feel ashamed of myself.
Kids pick on me very often.
I always tell the truth.
My teachers make me feel I'm not good enough.
I don't like to be with other people.