

**Elementary Teachers' Training  
(In Service)**

**Two Year D.El.Ed. Course**

**Revised Syllabus**

**Two Year D.El.Ed. Course (ODL) for Para-teachers  
and Residual Primary School Teachers 2015-17**

**ENVIRONMENTAL SCIENCE**

**(English Version)**

West Bengal Board of Primary Education

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West Bengal Board of Primary Education

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Neither this book nor any key, hints, comments, notes, meaning, connotations, annotations, answers and solution by way of questions and answer or otherwise should be printed, published or sold without the prior approval in writing of the President, West Bengal Board of Primary Education.

**Publisher : Prof. (Dr) Manik Bhattacharya, President**

West Bengal Board of Primary Education

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## Prelude

It gives us immense pleasure to announce that a Two-year D.El.Ed Course, ODL Mode (approved by N.C.T.E) is about to commence as a result of the collaborative efforts of the WBBPE with the Govt. of West Bengal in the School Education Deptt. after having overcome all the obstacles. This is going to solve the problems of the existing in-service untrained Primary Teachers of our state in the context of N.C.F. - 2005, N.C.F.T.E.-2009 and RTE Act-2009 as well. It has been decided that this two year teacher-training course will be conducted in the Open Distance Learning Mode under the aegis of the West Bengal Board of Primary Education for the next three years. Following the order of the School Education Department, W.B., a team of experts comprising eminent educationists, representatives of N.C.T.E and IGNOU has very sincerely prepared the syllabus, study materials, guide books for the trainees and the Coordinators and Counsellors of the 2 year D.El.Ed Course (ODL Mode) under the supervision of WBBPE. The curriculum and Syllabus of the core papers, four method papers with one compulsory optional paper out of two and four practical papers have been framed. Separate year wise study materials have been prepared for each paper and approved by NCTE.

The WBBPE will be glad if these study materials and guide books, which have been developed following the norms of the Open Distance Learning Mode, prove to be fruitful.

The WBBPE welcomes constructive suggestions and feedback for the improvement of these publications. The West Bengal Board of Primary Education would also like to convey sincere gratitude to all the eminent academicians from the NIOS, NCTE, IGNOU, SCERT, West Bengal DIETs, PTTIs and the Syllabus Committee and all others involved in the process of composition, editing and publication of these books.

**Dr. Manik Bhattacharya**

President

West Bengal Board of Primary Education

December, 2014

**PREFACE**  
(About Us)

Keeping in mind the structure of National Curriculum Framework - 2005, National Curriculum Framework for Teacher Education-2009 and all other relevant sub-clauses of RTE Act- 2009, steps have been taken to prepare a structure of teaching subjects and other relevant subjects for D.El.Ed Course for two years through distance education. The aim of this present course is to give conceptions of these three compulsory matters so that teachers' conceptions and activities come in their area of thinking. All teachers should have concrete, clear and transparent conceptions of this RTE Act. The teacher will always keep in mind while giving teaching in the classroom following the methods and techniques by way of discussion and presentation that he will have to note whether learners are eager, concentrative and responsive. By this, the progress of the class teaching can be understood. Provision of additional time shall be kept for the active participation of the learners in the classroom teaching. Learners have every right to know subject matter. It should be kept in mind that teaching and learning should be friendly to the learners and should be child-centric. Activity method, heuristic method and questioning shall be followed in the teaching-learning process. Learner shall be kept away from all sorts of mental fear and anxieties. They will be allowed with liberty and freedom to give their opinion in their learning process. In this context eight sub-clauses of clause 29 of RTE Act 2009 shall be remembered. Regarding evaluation it has been stated that total evaluation of knowledge and power of application of a child shall be done. This is my request to all teachers that they will keep in mind @@ their role and do their best.

Keeping in mind the difficulties of the student teachers who do not excel in Bengali, the present English version has been produced from the original module in Bengali version. Hope this translated module would serve the purpose of those student teachers.

Be your total efforts successful and beneficial to the learners.

*Prof. Dr. Manik Bhattacharya*  
*President*  
*West Bengal Board of Primary Education*

## *Preface for the Second Edition*

Modules of Two Year D. El. Ed Course were first prepared in the year 2012 for the teachers' training of in-service Primary Teachers of West Bengal through ODL mode. The modules were very much popular to its clientele and were effective in imparting training. In the mean time the curricula of Primary Education and of regular Two Year D. El. Ed. have been changed. With a view to incorporate those changes in the Primary Teachers' Training the content and style of presentation have also been changed in the modules of Two Year D. El. Ed. (ODL) Course for the next session. Hope this module would enjoy more support from its clientele. Any suggestion for the improvement of this module will be thankfully received.

With best wishes to all,

December, 2014.

Prof.(Dr.) Manik Bhattacharya

**President**

**WBBPE**

## ***Preface to the Reprint of Environmental Science***

***(Written according to the ODL- Syllabus, revised in 2014)***

**Reference : Two Year D.El.Ed. Course (ODL) for Para-teachers and Residual Primary Teachers**

**Session-2015-17**

**(Vide NCTE-Approval No. F.62-3/2011/NCTE/N&S, Dated : 24.04.2015)**

It gives me profound pleasure to write that the reprint-edition of the Module Environmental Science for the Teacher trainees, undergoing the second year of Two Year D.El.Ed. (ODL) Course for untrained Para-teachers of both Primary and Upper Primary schools as well as residual primary teachers has been procured both in Bengali and English versions and is being distributed free of cost to all the registered trainees.

This Reprint Edition has also been updated accordingly by the members of the Core-faculty Council of the Board. This book is only meant for the Two year D.El.Ed. (ODL) Course-2015-17 for in-service teachers, not for any other course or syllabus. No such book can be sold in the market. If anybody is found to be selling this book or photocopy there of or printing notebook/guidebook, she/he shall be punished in accordance with law.

Hope, this book will help the trainee teachers understand the spirit and content of the subject for furtherance of the search for quality in Elementary Education.

February-2018

Prof (Dr.) Manik Bhattacharya

President  
West Bengal Board of Primary Education

# Content

- Unit 1 : Importance of EVS learning at the elementary stage.
- Unit 2 : Aims and Objectives of EVS.
- Unit 3 : Different Approaches and Methods for Teaching-Learning of EVS.
- Unit 4 : Resources and Materials for Teaching-Learning of EVS.
- Unit 5 : Critical Analysis of the Contents of EVS Meant for class I to VIII.
- Unit 6 : Evaluation in Environmental Science
- Unit 7 : Process-based Skill enhancing teaching-learning Plan– Pre-Internship and Internship.
- Unit 8 : Project – Activity Method.



# Unit - 1

Importance of EVS learning at the elementary stage :

## Structure

### 1.1 Introduction

### 1.2 Meaning of Environmental Science

### 1.3 Nature of Environmental Science

### 1.4 Characteristics of Environmental Science

### 1.5 Process or Approaches of Environmental Science

### 1.6 Goals of Environmental Science

### 1.7 Sum up

### 1.8 Exercise

### 1.9 Check your Progress

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## 1.1 Introduction

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The importance of Environmental Science in the curricula of Primary and upper-Primary stage is very enlarging. It's aim is to make people well known to environment, who would be able to solve the different problems related to environment and able to restore the resources of the environment properly. This would be the essential factor of education in all stages.

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## 1.2 Meaning of Environmental Science

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Primarily, the meaning of Environmental Science is the Social Science based on the integration of Natural Science, History, Geography, Political Science and Economics. In other words, it can be said that, Environmental Science is the natural Science which is existed around the children. This Science includes specially the knowledge of living and non-living-water, soil, air, earth, sun, moon, plants, animals, natural environments and the knowledge about their interdependence. This Science also includes the concepts about independence, tolerance, softness, nationality, human values etc.

This meaning of EVS is also reflected in the child-centric Environmental Science of Primary and upper Primary stages prescribed by NCF - 2005.

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## 1.3 Nature of Environmental Science

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At present, Environmental Science (EVS) is very important in child education like language learning, mathematics and Science learning. This EVS, is very essential in developing mental, physical, social, knowledge, natural and geographical environment etc. Realising the importance of EVS, this can be divided into two parts — (i) Natural Science (ii) Social Science.

### **1.3.1 : Natural Science :**

The Science of the Natural Environment which is existed surrounding us, is called Natural Science. When this Natural Science is again analysed, it can be known as —

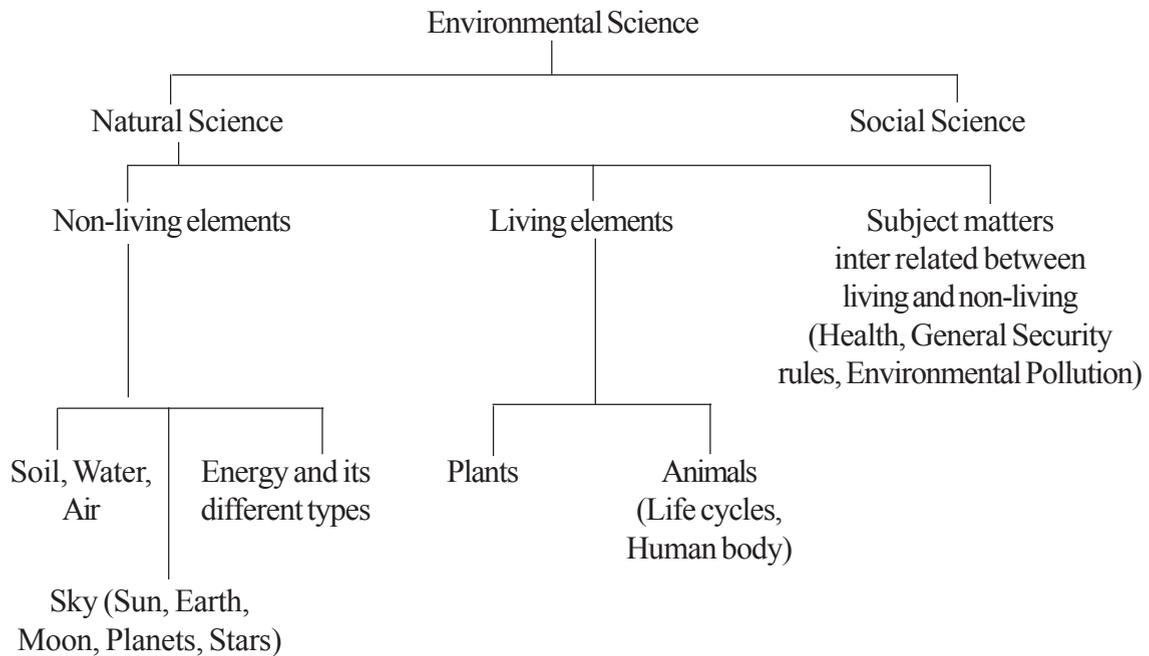
1. Non-living elements :
  - (a) Soil, Water, Air
  - (b) Sky, Sun, Earth, Moon, Planets, Stars
  - (c) Energy and its classification
2. Living elements :
  - (a) plants
  - (b) Animals — life cycles, Human body
3. Matters related with living and non-living elements
  - (a) Restoration of Health
  - (b) General Traffic rules
  - (c) Environmental Pollution and its remedies

### **1.3.2 : Social Science :**

Different and varieties of subjects of society are included in Social Science. For example, History, Geography, Political Science, Economics, Sociology, Anthropology etc may be considered. The knowledge and attitude of Social Science is essential for establishing peaceful and lawful society. The aims of curriculum of this social science should be made the learners' conscious through proper queries from different angles of known social realities. The reality about society should be developed within the learners. So, selection of content matters and their arrangements should be made in the text book in such a way, that the learners can get meaningful direction in all the elements of the subject matters. Although, some times it is seen, social science is treated as an unsuccessful subject. Not only that, less importance is given to it comparing the natural science. But, it is not to be forgotten, social science is essential in attaining necessary social, cultural and analytical skills for matching with ever increasing and inter related world. So, it's values are deep and extended. It is also to be remembered that, like Natural and Physical Science, Social Science is equally important to learners. It is to be admitted that the contribution of scientific queries, developing concept and creativity are important in this subject. Social Science primarily, carries general responsibility on freedom, confidence, inter related respect, dignity for varieties and deep feeling for human values. Also, the aims of Social Science is to rouse rational, moral and mental power within the learners, so that the learners are to be conscious about all types of loss and values in destructing powers. This Social Science is developed in combination of History, Geography, Political Science and Economics. Every subject has its own specific methods and contents. So, divisional lines may be drawn in necessity. But in curriculum, specific subject thinking should be included in some cases, where inter related relationship is established and a whole concept is developed.

### 1.3.3 : Sketch related to EVS

Following sketch can be developed on EVS from the above mentioned discussion:



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### 1.4 : Characteristics of EVS

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The characteristics of EVS in Primary and upper-Primary stages are :

- (i) It is a child-centric concept, where the children take part in interaction. This work would be enthusiastic, related and correlated with the experience of children's daily life.
- (ii) Children's judgement or ideas of different activities will be determined on their age, mental stage, ability and energy.
- (iii) This will create natural curiosity within the children. This will help to develop different qualities and attitude like self confidence, queries, habits, courage to set questions within the children. It will encourage the children in solving various problems in daily life.
- (iv) It will develop desired skills within children.
- (v) It will help in developing rational thinking among children.
- (vi) It will help the children in taking part of some general activities and in inspiring to solve some general problems.
- (vii) It will help in developing open-minded and perseverance.
- (viii) It will make efficient in taking environmental-oriented life style.

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## **1.5 : Approaches of EVS**

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After getting knowledge about the nature of EVS, questions are arised how the learners will reach to the specified aims of EVS. In this regard, it may be said that, if the various approaches of EVS may be selected properly, then it will be possible to reach to those aims. Now let us see what are the possible approaches for this purpose.

### **Approaches :**

1. Observation
2. Classification
3. Comparison
4. Relation
5. Problem Solving
6. Communicational Skill
7. Hypotheses Formulation

#### **1.5.1 : Observation**

The subject matters of EVS are randomly scattered around us. Among these matters, in one side, there are subject matters of Natural Science, and in other side, there are subject matters of Social Science. The children in some cases observe them by their own selves, sometimes they observe by their near relatives — father, mother, brothers, sisters, teachers etc. Primarily this observational approach is easy and important.

#### **1.5.2 : Classification**

It is another important approach. It is very much dependable on observational approach. When the children observe the nature, they see various types of plants and animals. During observation of animals, they see, some have two legs, some have four legs, some have no leg. They see some animals having two legs, can fly with their feathers, some having four legs, walk on the ground. In this way the children can classify the animals on keen observation and also classify the plants into different categories.

On observing the sky, the children can classify the plants, stars etc.

#### **1.5.3 : Comparison**

Depending on observation and classification approach, there arises one important approach which is ‘comparison’. When the children classify among the animals and plants, they do generally one more work. They can understand what are the similarities and dis-similarities among different classification of animals and plants. Thus a comparison among different types of animals and plants are made by the children. In this way a comparison may be made among objects of the sky.

#### **1.5.4 : Relation**

When comparison among animals is made by the children, then can know what type of relationships are there among the animals. For example, in comparing herbivorous animals with carnivorous animals, the children can be understood the relationship existed between these two types of animals — the relation between food and its consumer. In this way they can realise the relationship existed between plants and animals, planets and stars etc.

#### **1.5.5 : Problem Solving**

The large area of environment that is surrounded around the children is always carrying various types of incidents. Out of these incidents, some incidents appear before the children as problems. To solve these problems is the special type of approach of EVS.

For example, in rainy season, when lightning happens in the atmosphere, high sound is created, the plants are burnt, animals, people die. This is one of the problems. Now, the approach of EVS is to solve the problem. In this way, various happenings are created in the environment and the approach of EVS is to solve these problems.

#### **1.5.6 : Communicational Skill**

During observation, the children see various things by their own effort or by others, they try to explain them to their fellow learners. So, they try to explain the incidents by their own language. This is the communicational skill and this is the new approach of EVS. In EVS, this type of approach is very important, because, lack of this type of skill creates great trouble and hence the importance of observational approach loses its importance.

#### **1.5.7 : Hypotheses Formulation**

On observing the various types of incidents that are always happening around us, various thoughts are arisen to explain the cause and effect. These thoughts are called Hypotheses.

For example, after planting a tender plant in a tub, it is seen that the plant becomes weak. Then various thoughts may be drawn about the weakness of the plant i.e; various Hypotheses may be drawn.

- (i) It may be happened that proper watering is not done.
- (ii) It may be happened that proper manure is not given.
- (iii) It may happen that some insects have attacked the plant.
- (iv) It may happen that some type of unknown disturbances have been created.

Like these, many other Hypotheses, may be drawn. Now, on testing the Hypothese, one/two Hypotheses, may be taken.

In this way, considering many Hypotheses and finally accepting the correct Hypotheses, is the best way of one of the approaches of EVS.

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## **1.6 : Goals of EVS**

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On the basis of National Curriculum Frame work - 2005 in EVS recommendation of National Policy of Education, following salient points have been mentioned :

- (i) Aims and objectives of education
- (ii) Social and surrounding position of children
- (iii) Nature of education in wider field
- (iv) Role of education in Human benefit
- (v) Education for rousing humanity

In this circumstance, National curriculum frame work - 2005 have been accepted by NTE and NCERT through different modifications and changes for timebased related works.

The specific objectives of NCF - 2005 are thus modified as —

- (i) Communication of education with the outside of school and personal life
- (ii) Development of children's personality
- (iii) Rousing consciousness through observation and exercise of knowledge
- (iv) Enhancement of values, self-respect and self-confidence
- (v) Creating Nationality
- (vi) School would be ideal place of all-round development
- (vii) For correlating healthy competition and discipline with the character building
- (viii) Developing content matter and their concepts and there by making realistic through experiments and observation

In the curriculum of NCERT, by application of NCF-2005, the curriculum of the child-centred EVS has been developed. In this concept, the primary and upper-primary objectives have been formulated.

### **Primary Stage :**

- (i) In this stage, the children would be the members of their surroundings in joyful mind and there by choose their lives.
- (ii) In this stage, the main objectives of EVS are to develop curiosities about natural environment, man and other animals and to nurture them.

- (iii) Development of originality in knowledge through children's observation, classification of objects etc. should be done and encouraging various creative works be mentioned.
- (iv) Considering Health as an important factor, EVS should be made more compact.

### **Upper-Primary stage :**

- (i) Children will take part in preparing simple mechanical instrument.
- (ii) The students will be connected with different types of activities, they will observe and know more about the environment and health related subjects.
- (iii) Scientific concepts are developed on the basis of activity and experiments. So, the students should be involved in various group activities happening within school and around themselves. They will interact among themselves and with the teachers and will represent their works through observation, demonstration and collection of information.
- (iv) In this stage, there should be continuous and comprehensive evaluation. But there is no provision for detaining any students in any class for their failure.
- (v) The matter of humanism is very important.
- (vi) Democratism, Independence, Morality, Self-respect, Respect, obedience etc. are very important factors. These are to be taught to the students in this stage.
- (vii) The school should be made as the field of child development.

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## **1.7 : Sum up**

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The aims of EVS included in the curriculum of primary and secondary stages, are to prepare the citizen well-versed in the knowledge about environmental and thereby they will be able to know about various problems of environment, to give effort for retaining the resources of environment.

Primarily, the meaning of EVS is the Social Science formed as an integration of Natural Science, History, Geography, Political Science and Economics. This science includes the concepts about living and non-living elements and about their inter-relationship among themselves, non-living elements include water, soil, air, earth, sun, moon etc and living elements include plants and animals. This science include another important subject – energy and its different classes.

The learners will determine different approaches for reaching to the different aims of EVS. The approaches are :

Observation, Classification, Comparison, Relation, Problem solving, Communicational skill, Hypotheses formulation. In the NCERT curriculum of EVS has been formulated on the basis of NCF 2005. This thought has been also included in the objectives of primary and upper-primary stages.

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## 1.8 : Exercise

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Answer the following questions (each within 50 words) :

- (i) What is the definition EVS ?
- (ii) What is organic elements ?
- (iii) What is the relationship between living and non-living elements?
- (iv) What are the characteristics of EVS ?
- (v) What do you meant by the approaches of EVS ?
- (vi) Discuss the stages of problem solving approach.
- (vii) What are the objectives of EVS ?

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## 1.9 : Check your progress

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Answer the above mentioned questions and check your progress :

- (i) \_\_\_\_\_
- (ii) \_\_\_\_\_
- (iii) \_\_\_\_\_
- (iv) \_\_\_\_\_
- (v) \_\_\_\_\_
- (vi) \_\_\_\_\_
- (vii) \_\_\_\_\_

## **Unit - 2**

### **Aims and Objectives of EVS**

#### **Structure :**

- 2.1 : Introduction**
- 2.2 : Objectives of the Lesson Unit**
- 2.3 : Aims of EVS**
  - 2.3.1 : Multidisciplinary Aims**
  - 2.3.2 : Utilitarian Aims**
- 2.4 : Objectives of EVS**
- 2.5 : Summary**
- 2.6 : Exercise**
- 2.7 : Check your Progress**

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### **2.1 Introduction**

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The Prime Aims of learning Environmental Study is to maintain and develop in a perfect way, the environment which is surrounding us and which is very essential for our daily life. The environment is consisted of various elements like water, air, soil, man and vast living organs. It is our duty to maintain these circumstances from the destruction. So, this subject matter is rightly included in the curriculum of school education (Primary and Upper Primary).

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### **2.2 Objectives of the Lesson Unit**

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On reading this unit, you will be able to —

- know about the local and distant environment and also get concept about living and non-living environment.
- know about natural and artificial cultural environment.
- know about the interdependence of living and non-living world.
- identify the problems of these environments and solve them.
- know how the children are capable of understanding the indepth discipline of the environment.
- know how the group and social attitude would be roused among the children.

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### **2.3 Aims of EVS**

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The civilisation has been advanced with time. So, needs of mankind have been enhanced. Population has been increased many times. There arises the scarcity of natural resources due to enhancement of

expenditure comparing with the storage of resources. So, natural balance is also severely disturbed. Therefore the main aim of environmental education is the education for restoring environmental balance and the development of health. Other aims of Environmental Education are :

- to enhance the environmental consciousness among the children.
- to create the socio-economic values and political values.
- to develop the concept about family and social structure.
- to develop balance in the behaviour of children, sympathy towards neighbours and environment.
- to restore the natural and social environment.
- to appreciate the needs for restoring biodiversity.
- to develop the concept about the animals living in the natural environment.

### **2.3.1 : Multidisciplinary Aims**

The multidisciplinary aims of environmental education is that, the learners have to acquire concept about many other subjects while learning one subject. As a result, for learning one subject, co-ordination among various subject develops-instead of confining concept within one subject. Through the learning of environmental education, the concepts of zoology, botany, physical science, chemistry, geology, history, geography and sociology are developed. Different information of our environment are easily got from the multidisciplinary aims of environmental studies. These knowledges enhances consciousness about our environment, and thus learn to restore the environment.

### **2.3.2 : Utilitarian Aims**

This type of aim makes the learners to understand the subject matters of environment rightly and largely and to apply the acquired knowledge in practical life. This aim also helps the learners to restore the environment without doing any damage and to make aware about the Governmental Projects regarding various types of pollution and their remedies. Thus utilitarian aim covers the following matters :

- To make favourable environment for living.
- To learn about the use of various resources of environment through observation of nature.
- To restore ecology and biodiversity.
- To identify different types of pollution and make aware about their remedies.
- To maintain rules of the environment for resisting universal temperature.
- To maintain environmental balance and to observe natural diversity.
- To inquire the causes for various problems regarding environment and to go ahead for solving them.

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## **2.4 : Objectives of EVS**

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Aims of environmental studies is wider. To make effective, aims of environmental studies are analysed into short and specific form — these are objectives. These objectives are classified into five stages which

are — Knowledge, Understanding, Application, Skill and Attitude. Now these objectives are discussed separately.

(i) Knowledge Objective :

- To know about natural and social environment and their different factors.
- To know about ecology and various resources of environment.
- To know about the interdependence of animals of environment.
- To know about various problems of environment.
- To know about the means of restoring environment, about the means of utilising the environment for the mankind.

(ii) Understanding Objective : The learners will be able —

- To identify the various objects of the environment with their specific characteristics.
- To establish differences and relationship among different objects of the environment.
- To explain the various cause and effect of the environment.
- To classify the various identical and non-identical objects of the environment.
- To follow the relationship of environment and mankind.

(iii) Application Objective : The learners will be able to —

- Restore the environment through enhancement of consciousness.
- Active to keep the environment healthy and pollution free.
- Live adjusting with the environment.
- Utilise the knowledge of the environment for keeping personal health and social health.

(iv) Skill Objective : The learners are able to —

- Analyse and judge the events of the nature through experiment.
- Develop skills for collecting right information.
- Acquire skills for doing works with their own hands.

(v) Attitude Objective : Following qualities will be developed among the learners —

- Working in group among the learners
- Attitude of co-operation and sympathy among the learners
- Discipline
- Rational mental attitude
- Scientific attitude
- Faith in living together

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## 2.5 : Summary

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As there are Aims and objectives in every case of Education, there are also Aims and objectives in EVS.

In all cases, the educational aims are long-term basis and on the other hand the objectives are short-term basis. In EVS, two specific aims are discussed in the present unit– (i) Multidisciplinary Aims (ii) Utilitarian Aims. In the discussion of Multidisciplinary Aims, it is said that the learners get concepts of Zoology, Botany, Physics, Chemistry, Geology, History, Geography, Sociology when they learn the EVS.

In the discussion of utilitarian Aims, different types of pollutions and their remedies are specifically expressed.

On the other hand, in the discussion of Objectives, Knowledge, Understanding, Skills, Application, Attitudes are expressed. The learners can acquire these objectives in short-term basis.

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## 2.6 : Exercise

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Answer the following questions (each within 50 words) :

1. What do you mean by Aims of EVS? What is its relation with objectives?
2. What are Multidisciplinary Aims?
3. What are the Utilitarian Aims?
4. What are the differences between the knowledge objectives and understanding objectives?
5. What are Attitude objectives?

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## 2.7 : Clues to answers

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you may take the following clues in answering the above mentioned questions.

Q. No.	Sub-units
1	2.2 & 2.3
2	2.3.1
3	2.3.2
4,5	2.4

## **Unit - 3**

### **Different Approaches and Methods for Teaching-Learning of EVS**

#### **Structure :**

- 3.1: Introduction**
- 3.2 : Objectives of lesson unit**
- 3.3 : Different Approaches for Teaching-Learning of EVS**
  - 3.3.1 : Transmission Approach**
  - 3.3.2 : Child Centric Approach**
  - 3.3.3 : Discovery Approach**
  - 3.3.4 : Constructivism Approach**
- 3.4 : Different methods for Teaching-Learning of EVS.**
  - 3.4.1 : Observation method**
  - 3.4.2 : Discovery method**
  - 3.4.3 : Local Field Study method**
  - 3.4.4 : Demonstration method**
  - 3.4.5 : Problem-Solving method**
  - 3.4.6 : Project method**
  - 3.4.7 : Experimental method**
- 3.5 : Summary**
- 3.6 : Exercise**
- 3.7 : Check your Progress**

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### **3.1 Introduction**

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Most of the old teaching methods were Subject Centred or Teacher Centred. These were quite different from modern teaching methods. At present, as the usual method is learner-centric, so many new and thoughtful methods have been invented that enhance the learners' creative power. The modern methods are called dynamic methods of teaching. In modern methods, as the importance has been entrusted more on the characteristics and activity, so these methods are established on psychological attitudes. For this reason, some persons have called these modern psychological methods as progressive method of Teaching. In the primitive and mediaval age, as the methods were determined by nature, these method were called logical methods of teaching.

In this unit some logical attitudes, such as Transmission approach, Discovery process have been discussed. Also some modern and progressive approaches like child centric, Constructivism have been discussed. In primitive mono-centric methods, the teachers and subject matters were active, but in democratic methods, the learners are active and the teachers and subject matters are passive.

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### 3.2 Objectives of lesson unit

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After reading this unit, you will be able to —

- Define and discuss the Comparative approaches of Transmission, child-centric, discovery and constructivism.
- Differentiate the differences between the approaches and methods and tell what approach is to be used in its specific field.
- Compare among different methods and guide the Primary classes by the application, of these methods.

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### 3.3 Different Approaches for Teaching-Learning of EVS

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In this Unit Logical approach of Teaching and Progressive approach of Teaching have been discussed in separate parts. On the basis of these attitudes or approaches, some methods have been invested in Environmental Studies. These methods have been discussed one by one in this Unit.

**3.3.1 : Transmission approach :** In all times the teachers thought various types of methods for teaching in easy processes and at the same times, the students also accepted those easy processes for learning more with less efforts. The Psychologists named this matter as transmission of learning. In this way, the concept of transmission has come into light.

So, transmission of learning is the influence of learning of any subject on the learning of another subject. According to Osgood (1949) and Ellis (1965), the transmission of learning is of 3 types — Positive transfer, Negative transfer and Zero transfer.

If the earlier learning helps the later learning or accelerates it, this influence is called the positive transmission. If the earlier learning creates any trouble or delays the later learning, then this influence is called the negative transmission. And the third probability is, if there is no existence of influence, this type of transmission is called zero transfer of learning.

According to Brunner's Contemporary views, transfer of learning is of two types — Specific and general. When the learning is used again and again in the presence of specific skills or techniques, these transfer of learning is called **Specific Transfer of learning**. Again, the learning is used for generalisation of some concepts or for wide space, then this transfer is called **General Transfer of learning**.

After Brunner's two types of transfer, Graviel Salomon and David N. Parkins (1989) Said about another two types of transfer on the basis of experiments and observations — Low-road Transfer and Highroad Transfer.

**Low-road Transfer :** When, after acquiring specific skills become so acquainted due to several exercise that these are used in similar situations spontaneously without any report, then this type of transfer is called Low-road Transfer.

**High-road Transfer :** When the areas of limitation of some concepts, rules or laws are not narrow, then the understanding about their globalisation is formed. This is in future life applied in various fields. This type of transfer is called High-road Transfer.

So, out of two transfers, first one depends on similarities of the situation and second one depends on Knowledge skills.

**3.3.2 : Child Centric Approach :** Children's Environmental Science teaching will be in the field of nature. Through experiment and observation when the children learns, this becomes very thoughtful and full of experience. From the environment, that is surrounded around the children, they get new experience through their free mixing. Teachers only can help the children in gaining this type of experience. Young children of Pallas/Paras mix deeply with their environments. They get knowledge of environmental science through their practical experiences about the environment.

Thus, the child-centric education is built up by learners' self interest, attitude, skill, desire etc. The introducer of this type of teaching arrangement is French Psychologist Jean Jacques Rousseau. In later years, Pastalozzi, Froebel, John Dewey, Swami Vivekananda, Rabindranath Tagor etc. Philosophers/educationists have completed the idea of modern child-centric education.

#### **Characteristics of Child-Centric education :**

The characteristics are as follows –

- **Child or Person-centric education :** This is person-centric education where the person is child. The aim of this educational system is the all-round development of the child in a healthy social environment.
- **Children's freedom :** In this educational system the children get the opportunity of learning according to their needs, desire and interest without external control.
- **Activity :** In this system the children learn by doing works.
- **Interest for vocational education :** In this educational system the children get education as per their ability and desire. So, they can choice their future profession.
- **Improvement of human relationship :** In child-centric education teacher's relationship with the learners becomes friendly and here the teachers act as patron.

**3.3.3 : Discovery approach :** In Environmental Science learners' independent thinking, taking inference through experiment and observation, logical power or scientific attitude development become very important by this approach.

Renound Chemist of England, H.E. Armstrong first introduced this approach. This approach is familiar as Heuristic approach. The word 'Heuristic' is a greek word taking from 'Heurisco' which means 'I discover'.

According to H.E. Armstrong, “Heuristic method is a method of teaching which involves our placing the students as far as possible in the attitude of a discoverer.”.....

**Advantages of Discovery approach :**

- (i) The learners actively acquire knowledge through work, so their scientific skills are enhanced and they solve their problems by themselves.
- (ii) The learners independently can analyse the problems by National thinking and solve them without taking others’ help.
- (iii) Here, as the learners take the position of discovers, their scientific attitude is constructed.
- (iv) The discovered information is newly discovered by the children.

**Disadvantages of Discovery approach :**

- (i) This approach takes much time and labour.
- (ii) In this stage, the learners’ maturation is low, so it is not easy to overcome the problems without taking others’ help.
- (iii) The method is person-centric, so success may not come to the whole class.
- (iv) This approach is effective for the talented learners, but not effective for the mediocre learners.
- (v) It is very difficult to get success without adequate trained teachers.

**3.3.4 : Constructivist Approach :** In teaching-learning process of environmental science Constructivist approach is very important. Jerome Bruner and David Asubel are Constructivist Psychologist. Their constructivism is called cognitive construction. They did much experiment and observation or knowledge construction. According to some Psychologists, social base and experience are very important in the field of learning. So their theories are called Social Constructivism. One of such Psychologist is Lev Vygotsky.

**Jerome Bruner :** According to Bruner, the meaning of learning is to acquire those concepts and those methods are to discover the concepts for satisfying quaries. In experiment, three stages of learning are—(a) Learning through sense organs. (b) Learning through activity and (c) Construction of concept through teaching aid. Here the learners will discover by themselves, teacher will act as helper.

**Example :** Related matters : Fruits/ Birds/ Fishes/Flowers/Leaves.

1. **Example :** The students at first will tell different types of Leaves/Fruits.
2. **Sample :** They will collect different types of Leaves/Fruits.
3. **Classification :** Different shaped, coloured and painted flowers or fruits or leaves will be classified by the students. In this case, they may take the help of teachers.
4. **Identifying characteristics :** General and special characteristics of leaves, fruits and flowers are to be identified and with these characteristics, a table is to be prepared.
5. **Writing the description :** on the basis of characteristics they will write the description individually or in a group.

**Concept of David Ausubel :** According to Ausubel, true learning is meaningful learning. And this meaningful learning is the construction of new knowledge with the integration of new information and old information. He saw three types of learning :

- (a) Acceptable Learning
- (b) Dull Learning
- (c) Meaningful Learning

Acceptable Learning and Dull Learning have no long-term existence, but meaningful learning has long-term existence. So, he said to the teachers that they have to teach or enthuse the learners according to their previous knowledge and the learners should be careful about the integration of new and old experience.

**Application of David Ausubel's method in the field of education :**

- i) According to Ausubel at first the learning matter is to be presented before the learners. This is called advance organisation. When this Advance organisation is presented, the learners will try to realise the meaning by knowing the matter and assembling them.
- ii) Through Advance organiser, the learners will be able to analyse the information obtained from previous experience.
- iii) Through analysing, they will be able to test the new information.
- iv) After testing, they will be able to take inference.
- v) From several inferences the learners will be able to create permanent organisation.
- vi) The learners will take similar different inferences through logical approach.

Example : Flowering and Non-flowering plants : The plants who produce fruits, are called **flowering plants** and who are not able to produce fruits, are called **non-flowering plants**. This is a permanent conclusion. Brinjal, Chilli, Paddy, Clitoria, Muster, Mango etc. plants bear flowers, so they are called flowering plants. On the other hand, Fern, Mos, Phanimansa etc. do not bear flowers, so they are called non-flowering plants.

**Vygotsky :** Vygotsky did important research on cognitive development and verbal development of children. According to him, there are two bases of cognitive development–

- a) Organic base b) Social and Cultured base

- A child makes various sound before speaking any word. This is not a scattered incident. On the basis of organic base, the nature of this change is fixed according to the social environment, which is really a gradual and continuous change. The children acquire the language that is used by the members of their families. In separate environment, the communicating language is different.
- Vygotsky thinks, when communicating medium is exchanged with the children, not only communicating language is exchanged, but social change occurs also. And without this social exchange, children's advancement is not possible.

Like communicational exchange, the children speaks within themselves. As a result, the assimilation of language occurs. Communicational exchange and assimilation nourish children's thinking, logic and language.

- Vygotsky thinks, learning process should be consistent with the development of children. Teachers may help them in reaching to the goal. In some societies, children may learn only some counting, in other environment some children may learn addition, although in both cases, the degree of development is same. Vygotsky says this stages of development as 'adjacent developmental stage'.

**Example 1.** According to Vygotsky, if children's social and cultural environment is judged for determining developmental stage, then the teacher will rightly think how much development can be done for them (adjacent development limit).

**Example 2.** If the teacher can assume, how much development is possible with respect to the present developmental stage, then he can determine what amount of assistance may be given to them. Vygotsky called it 'Scaffolding'.

#### **Application of Vygotsky's Theory :**

- a) At first the teacher will determine what is the position of the learners, developmental stage. As for example, children of 2 to 7 years of age can understand two words 'light' and 'heavy' by holding the bodies, but can not assume a small thing (like star) is greater than an apparent big thing (at near position).
- b) Determining the limit of the adjacent development, if a teacher thinks that it is possible to teach about 'light or heavy' or 'small or big', then he will do this, otherwise not.
- c) It is to be considered what amount of 'Scaffolding' is necessary. For example, for purchasing any material from a shop, it is to know, whether there is any knowledge about balance machine or not. If not, then necessary 'scaffolding' is to be given.
- d) the children exchange their cultural experience among themselves. This is very essential in reaching goal of life.

Thus, the contribution of Jean Piaget, Vygotsky, Jerome Bruner etc. towards constructivism is given as :

- a) Long-term existence of Acceptable learning and Dull learning is low. So, meaningful learning is existed much in case of learners.
- b) New knowledge construction is possible for integrating the new information with the old information.

- c) Learning should be effective through invention instead of rote learning.
- d) Learner's learning would be fruitful by modification of old concept or extension of old one and on the basis of old experience.

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### 3.4 Methods of Teaching Learning of Environmental Studies

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**Introduction :** The objective of modern education is to make Psychological, keeping away the traditional education and artificiality of education. For this, different types of psychological methods have been discovered. In traditional educational system, importance was given on memorisation of theoretical knowledge. There was no scope for showing children's natural activity. The main aim of this book-oriented teaching method was to help the learners in passing the Examination. The education was full-fledged process of acquiring knowledge. There was no scope of developing learners' personality. For changing this type of mechanical situation in education, different educationists had given consent in favour of giving importance on children's self-need, attention and natural activity. Due to their efforts, modern child-centric idealism has been established. And for effectiveness of this philosophy, following methods have been introduced :

**3.4.1 : Observational method :** Learner's acquisition of knowledge by seeing the objects with their own eyes or identifying by other sense organs, is called observation. Teaching through observation is called observational method. When the learners observe on any special subject without any direction, then the method is called **uncontrolled observational method**. On the other hand, when the learners observe the subject matters of environmental science on the basis of specific direction, then the method is called **Controlled observational method**. The Uncontrolled observations are generally social and natural environmental observations and the observations happen within any classroom, are called **Controlled** observation.

In Controlled and Uncontrolled observations, separate types of methods of teaching are used for the learners.

In natural environment, the learners observe sky, planets, stars, rainfall, temperature, plants, insects, animals, canals, ponds, rivers etc. In social environment they observe different types of people, dresses, dwelling places etc. In these Uncontrolled environment, teachers have to prepare specific tables. Following the tables, the learners will fill the specific tables on observation for a specific subject-matters. After that, the teacher will complete the teaching lesson on the discussion of the contents of the tables.

**Example :**

Subject : Environmental Science

Unit : Leaves of Trees.

Class : .....

Name of the observers	Roll Nos.	Name of the trees	Shape of the leaves	Simple leaves	Compound leaves	Classification of Compound leaves	Dates of Collection of leaves

In this way the learners will come in class along with filled - in tables and related leaves and the teacher will evaluate on the basis of learner's observation.

Similarly, with in the class-room, teaching-learning process may be done in a controlled environment. The experiments on the germination of Peas. The learners will fill the tables as earlier and later on, the teacher will evaluate.

Following merits and de-merits are seen in the observation method :

**Merits :**

- i) The learner's knowledge, understanding, skills etc. are developed as they work actively.
- ii) Close relation is developed among the teachers and the learners.
- iii) Learner's observational power is enhanced.
- iv) Co-operation, sympathy etc, are developed among the learners.
- v) Learners get much opportunity in thinking freely and independently.

**De-merits :**

- i) In giving lesson in this method sufficient time is required.
- ii) All units of a subject can be taught through this method.
- iii) Efficient teachers are necessary for successful teaching in this method. Indiscipline, may arise due to lack of efficient teachers.

**3.4.2 : Discovery method :** Some discussions about the ‘Discovery’ have been given earlier in this unit. Now, using the approach of the Discovery, the Discovery method is discussed below.

In the discovery method, the learners directly observe, collect the datas, analyse the datas and finally take inference.

Example :

Sub : Environmental Science

Class :

Unit : .....

Today’s lesson .....

At first a particular unit of EVS is to be selected. If the unit becomes large, then the unit is divided into a few sub-units and one or two such sub-units are then considered for to-day’s lesson. The sub-unit is to be distributed among the learners. For this a few groups are to be formed among the learners. Then different learning matters are to be distributed to the different groups in the form of problems. And the learners are to fill the specific table after taking various observation as per their respective problems. The table may be in the following form :

Name of the Group (A/B/C..)	Roll nos.of the learners for diff. groups	observation	Analysis	Inference taking
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The Various tables collected from different groups will be submitted to the subject teacher. On the basis of different inferences obtained from different groups the teacher will give the global evaluation.

**3.4.3 : Local Field Study Method :** This is an important method. Taking the learners from the classroom of a school to the outer space for few hours and giving some ideas/conceptions about the natural environment of that space, is called ‘Local Field Study Method’.

The time space may be covered from a few hours to 2/3 days. This ‘Local Field Study’ may be called educational tour or excursion. In all cases the whole process is performed under the guidance of one or more teachers.

**a) Need for field Study :**

In case of EVS, there are some needs. According to Rousseau and Raskin, learners’

- real knowledge is acquired.
- scientific attitude is developed.
- interest about subject matter is enhanced.
- social qualities are developed.
- concept and attitude about the subject is developed.

**b) Educational importance of field study :**

Learner’s

- observational power is enhanced.
- problem solving power is increased.
- logic and judging power are developed.
- interest for collecting T.A. from the environment is increased.
- curiosity is developed.

**c) Method of executing Field Study :**

The steps of the Field Study method are –

**1st Step :** Selection of place and division of groups among the learners.

**2nd Step :** Distribution of activities to the teachers and learners after arriving on the specific place.

**3rd Step :** Collection of information by the learners and properly writing them on the note-books. In this case teachers will help the learners.

**4th Step :** Presentation of acquired knowledge and information, discussion and exchange of views.

**5th Step :** This is the final step and important one. In this part, the evaluation of the particular field study is done. Teachers will do this with the help of the learners.

Example :

class : ..... Sub : Environmental Science

Unit \_\_\_\_\_

Sub-unit :

a)

b)

c)

Today’s lesson .....

Initially, Particular unit of any class is selected. Then the unit is divided into a few sub-units. One/Two Sub-units are taken for today’s lesson. According to these sub-units, specific spot is selected. After that, different groups are framed among the learners and different activities are distributed to these groups. In the execution period the learners will collect information, write down on their note-books under the guidance of their teachers. At the end, the noted information is placed in the classroom, and after discussion and exchanging views, the inference is taken.

In this way, teaching-learning process is completed through the field study method.

**3.4.4 : Demonstration method :** This demonstration method is more acceptable in India, an under advanced country. In one side, it is a scientific method, on the other side it is a psychological method. In the class-room, in this method, the teacher himself or with the help of learners does experiment or teachers teach with the help of T.A. During teaching process, he writes the important matters on the board.

**a) Characteristics of Demonstration method :**

In this method

- learners' activities in the class-room are enhanced.
- learners' attention is increased.
- learners' conception about subject matters is developed due to presentation of concrete T.A. in the class-room.
- many learners' can be understood at a time with a few T.A.
- learners' can reach to the right inference testifying scientific truth, principles, theories.

**b) Advantages of Demonstration method :**

The advantages of this method are

- attitude of E. V.S. is built up.
- learners' skills are increased.
- the method is more acceptable due to low cost and less time consumption.
- in this method the learners can take part directly . So, its acceptance to the learners is much.

**c) Disadvantages of Demonstration method :**

In spite of having so many advantages, Demonstration method have the following disadvantages, which are

- In this method, generally a teacher teaches with the help of one T.A. in the class-room. So, the visibility of the T.A. is not equally reached to the learners of a class.
- Learners' skill-development relating to the experiments done in the class, becomes poor, as the learners' do not get much opportunities in handling the experiment.
- In this method it is not possible to take to the all learners individually. So, in many cases, many of the learners are ignored.
- In this method meritorious and curious learners are got importance. So, its acceptance in the field of education becomes less.

**d) Ways for doing more effective of Demonstration method :**

For enhancing the effectiveness of the Demonstration method, following activities are to be done.

- Before teaching the E. V.S., proper selection of unit/sub-unit are to be found out which are more appreciating for this method.

- Teacher initially will test the T.A. which are to be used in the class-room. As a result, the effectiveness of T.A. as a whole the teaching method is enhanced.
- The teacher should have to think about the very slow or fast motion of the method.
- During demonstration method, the teacher should always remember about the objectives of lesson unit. Also, he should keep in mind, whether the objectives are how much followed.
- During lesson delivery, the teacher should be always conscious about the learner's participation.
- Teacher should write on the board about the demonstration.

**e) Application of Demonstration method in class-room :**

Class \_\_\_\_\_

Subject :

Unit : \_\_\_\_\_

Sub-unit : \_\_\_\_\_

a) \_\_\_\_\_

b) \_\_\_\_\_

c) \_\_\_\_\_

Today's lesson : \_\_\_\_\_

At first a teacher will select a class, then will select unit/sub-unit for the demonstration.

Selecting the today's lesson, the teacher will ask the learners about the previous knowledge. The teacher will write the to-day's lesson on the board. In the presentation stage, the teacher will ask the learners with the help of T.A. The learners will give the probable answers. On the basis of these answers, the inference will be written. These works are given below in the Tabular form :

<b>Teacher's work (Showing T.A. and questioning)</b>	<b>Learner's work (Probable answers)</b>	<b>Inference taken by the teacher with the help of learners</b>

In this way, the teacher will teach the learners in the class-room following the Demonstration method.

**3.4.5 : Problem Solving method :** The process in which the teacher and the learners jointly eliminate the educational troubles, is called ‘Problem Solving Process’. Following this process, when a teacher teaches in the class, then this method of teaching is called **problem solving method**.

The base of this method is John Dewey’s science related principles. In England ‘Spence’s Report (1936)’, in America, ‘Modification of Science teaching (1960)’ and in India, ‘Kothari Commission (1964-66)’, it is said that science should be learnt through ‘Problem Solving method’.

About the nature of problem, it is said, children’s mind is guided by curiosity and wonder. To the children, their lives, environment and incidents of the environment are always realised as problems. In problem solving method, the learners are to face the problems. In this method, due to teaching, learners’ creativity, thinking power, logic and power of judgement, skills, scientific attitudes etc. are enhanced. For this the teacher should be very much enthusiastic.

**A) Characteristics of Problem Solving method :**

The characteristics of Problem Solving method are

- the problem will be learners centric.
- the teacher will help the learners in solving the problems.
- the subject matter will be presented in the form of problems.
- it is to be remembered always that, whether the problem is presented according to the ability of the learners.
- the problem will be in such a way that, it will activate the learner’s physical and mental condition.

**B) Advantages of Problem Solving method :**

The advantages of this method are

- As the method is scientific in nature, learners’ nature of enquiry is developed.
- In this method learners’ nature of activity is roused.
- Interest is created within the learners.
- Intensity for collecting information among the learners is increased.
- Learner’s independent thinking power is developed.
- Learners try to apply the concept and knowledge of problem-solving in their Practical lives.

**C) Disadvantages of Problem Solving method :**

The disadvantages are

- Every unit of any curriculum can not be taught by this method.
- This method is always effective only for the meritorious learners.

- For effectiveness of this method, skilled teachers are always required.
- Much time is required for teaching process.

**D.) Steps of Problem Solving method :**

The steps of this method are —

1. **Presentation of the Problems :** Life centred Problems should be presented to the learners. It is to be seen that the learners are to be enthusiastic in solving the problems.
2. **Analysis of the problems :** To realise the problem rightly, it should be broken into parts.
3. **Collection of facts :** In solving the problems, the learners will collect facts. In this case, they will collect the facts/information inside and outside of school.
4. **Analysis of the facts :** The learners will find out/judge the collected facts/information with the problems. When this relationship is obtained, then influence will be drawn.
5. **Inference :** Inference or Hypothesis may be one or many. These are formed on the basis of analysis of the facts/information.
6. **Validity of the Inference / Hypothesis :** For determining the validity, the Inferences/Hypotheses are to be tested. If the validity is proved, the Inferences/Hypotheses are accepted, otherwise will be rejected.
7. **Application of the Inference/Hypothesis :** The Inference/Hypothesis when accepted, have to be applied in various needs of life.
8. **Preparation for taking Higher Studies :** On the basis of real experience for problem-solving, the learners will go forward in taking Higher education.

**E.) Application of the problem-solving method :**

Class: \_\_\_\_\_

Subject : Environmental Science

Unit : \_\_\_\_\_

Sub-unit :

a) \_\_\_\_\_

b) \_\_\_\_\_

c) \_\_\_\_\_

Today's lesson : \_\_\_\_\_

For application of the method, class, unit, sub-unit, to-days lesson are to be selected properly. In tabular form different stages of the method are shown below :

1 Selection of prob- lem	2 Analysis of of the problem	3 Collection of infor- mation on facts	4 Analysis of infor- mation or facts	5 Taking inference or Hy- potheses	6 Testing of Hypoth- eses	7 Solution of prob- lem	8 Applica- tion in real life

Teacher will cover the teaching lesson by the filled in table with the help of the learners.

**3.4.6 : Project Method :** In the twentieth century, Project method has been introduced in order to establish children’s activity in the field of education, although in this respect, the Discovery method had been introduced in the earlier period. But the Discovery method was person-dependent education. Project method is primarily group dependent education, yet in this method person dependent education is not neglected.

Project method is set up or the Principles of American educationist John Dewey’s ‘problem solving and Activity’. Kilpatrick, disciple of John Dewey, is the introducer of Project method. According to Kilpatrick, ‘Project is a whole-hearted purposeful activity proceeding in a social environment.’ Another disciple of Dewey, Stevenson says in a simple form, ‘A Project is a problematic act carried to completion in its natural setting’

**A. Characteristics of Project method :**

Analyting the above definitions, following Characteristics of the Project method are got :

- (i) The prime character of the method is — it is a problematic Project.
- (ii) Another important character is , it has always some objectives.
- (iii) The learners can take part group-wise in the Project independently.

- (iv) During activity, the learner work spontaneously.
- (v) Learners do the work in social environment.
- (vi) There is an another important characteristic is, completion of work comes at the end of the Project.

**B. Advantages of Project method :**

Advantages of this method are :

- As the method is learner — centric, the learners plan the project by themselves.
- In this method the work is not imposed on the learners, so they do the work spontaneously.
- As the learning is done through work, so there is a probability of forgetting.
- Social qualities are developed as the learners work group-wise in social environment.
- It is a correlated method. So, in the process of doing any project on EVS, correlation among different school subjects are developed.
- Learners’ original thinking power is developed.

**C. Disadvantages of Project method :**

Disadvantages of this method are :

- All units of any subject (say EVS) can be taught through this method.
- In this method teaching takes much time. It is very difficult to cover all the units of a subject in an academic calender.
- Execution of this method is expensive.
- Execution of the method requires always experienced teacher.
- Acquition of theoretical knowledge is neglected.

**D. Stages of Project method :**

There are four stages of this method which are :

1. Purposing
2. Planning
3. Executing
4. Evaluating

**E. Application of Project method :**

class : —                      subject : — Environmental Science

Lesson Unit : \_\_\_\_\_

For application of the Project method in the class-room, above mentioned four stages are applied.

**1st stage : Purposing** — According to the lesson unit of the class, objectives are selected. This work is to be done by the subject teacher with the help of the learners.

**2nd Stage : Planning** — After selection of objectives, proper planning is to be done. In this case, Primarily teacher’s role is prominent. The planning should be perfect, otherwise, the whole project would be completely unsuccessful. So, for proper planning —

- (i) a few groups have to be formed among the learners.
- (ii) the main objective is to be divided into a few small objectives and these objectives are to be distributed among different groups.
- (iii) proper place is to be selected for the planning and proper arrangements are to be made to reach to the place.
- (iv) time and date are to be fixed for the execution of the project.
- (v) during the project work, proper works are to be allotted to the teacher and the learners.
- (vi) proper communication is to be made with the person who will help the project team.

**3rd stage : Execution** — This is the most important stage after selection of objectives and making of planning. At this stage, the teacher and the learners would do their respective works according to the planning made earlier. Teacher may help the learners whenever need or may change the planning slightly if situation demands.

**4th stage : Evaluation** — After completion of works, the learners would submit their worked reports in writing to their teacher. After observing the reports, the teacher would make inference on discussion with the learners.

In this way, a project on an unit of EVS may be evaluated and thus teaching process will be completed by project method.

**3.4.7 : Experimental method :** In this method, the learners do their works by themselves. Before doing works, they have to acquire theoretical knowledge about their works. This knowledge is acquired by teachers and text books. In laboratory, learners’ theoretical knowledge is tested by practical knowledge.

Experimental method is the middle stage of discovery method and demonstration method, because in discovery method activity is more and theoretical knowledge is less, on the other hand in demonstration method, acquisition of knowledge is more, activity is very less.

In environmental science teaching the scope of experimental method is much and the learners are also very much interested in taking lesson in this method.

**A. Advantages of experimental method :**

The advantages of this method are :

- In this method the objectives of EVS i.e., knowledge, understanding, skill, attitude, application ability etc. are developed.
- Social qualities of the learners are developed.

- Good-relationship is established between teacher and learners.
- Learners' self-confidence is enhanced.
- As the learners themselves do their work, they do not forget easily.

**B. Disadvantages of Experimental method :**

The disadvantages of this method are :

- In this method, all units of the curriculum are not effective.
- This method is expensive, much time consuming and varietyless.
- In this method, the teacher is to be busy all the times.
- Class-discipline is disturbed.
- It is not possible to keep attention to all learners of the class.

**C. Organisation of the experimental method :**

In this method following works have to be done systematically for smooth organisation :

1. **Distribution of work :** The success of this method depends on the smooth distribution of works among the learners. So, initially, proper lesson unit is to be selected according to the class. Then, number of groups are to be formed according to the number of learners and workable instruments. For smooth working, troubles may arise if number of learners within a group are much. So, for maintaining balance, the number of learners in a group should be decided rightly.
2. **Acquisition of theoretical knowledge related to subject unit :** Before starting the experiment, the learners have to acquire proper theoretical knowledge. For this they have to read the text books and take teacher's help.
3. **Written direction :** Generally the teacher distributes the written direction to the learners for smooth work. The written documents contain :
  - (i) Objective of experiment
  - (ii) Required instruments
  - (iii) Experimental method
  - (iv) Statement for precaution
  - (v) Rules for tabling the experimental results
  - (vi) Rules for explanation of the experimental results.
  - (vii) Inference

4. **Execution of Experiment** : The learners perform experiment according to written direction and theoretical knowledge.
5. **Explanation of experimental result** : Learners would explain the experimental result according to direction.
6. **Writing note-book** : Learners would write all the result of the experiment according to rules.
7. **Re-arrangement of the laboratory** : At the end of the experiment, the learners have to re-arrange all the instruments systematically, as were arranged before performing the experiment.

In this way in the experimental method lesson may be taught to the learners.

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### 3.5 Summary :

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In this unit, at first various approaches of EVS are discussed. The approaches are : Transmission approach, Child centric approach, Discovery approach and Constructivism approach. Every approach has its own idea. These ideas are separately stated in the first stage.

In the second stage, various teaching methods based on aforesaid approaches, have been discussed. The methods are : Observation method, Discovery method, Local field study method, Demonstration method, Problem solving method, Project method, Experimental method. In every method, its significance, advantages, dis-advantages, working steps of the method etc. are discussed. It is to be remembered in mind that none of the method is ideal and complete in form, yet every one has its own approach, characteristics. So, a teacher has to select the right method for a particular unit when he is going to teach in the class-room. And, if it is done, then the **teaching-learning** process will be successful.

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### 3.6 Exercise :

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Answer the following questions (each within 50 words)

1. What is transmission of learning ?
2. What do you mean by child-centric education ?
3. What is the main statement of constructivist approach ?
4. What is discovery method ?
5. Write down the needs of field study.
6. Who is the introducer of project method ? State it's stages.
7. What is problem solving method ? Write the name of its stages.
8. What is the role of teacher in experimental method ?
9. What do you mean by demonstration method ?

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### 3.7 : Check your progress :

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For checking your progress answer the above mentioned questions of Exercise and compare the answers with the discussion of the present unit.

**Ans.**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_

## **Unit - 4**

### **Resources and Materials for Teaching-Learning of EVS**

#### **Structure**

##### **4.1 : Introduction**

##### **4.2 : Objectives Objectives of lesson unit**

##### **4.3 : LTM used in Teaching-Learning of EVS**

##### **4.4 : LTM — Improvised LTM.**

###### **4.4.1 : LTM**

###### **4.4.2 : Principles of Preparation and Selection of LTM**

###### **4.4.3 : Principles of uses of LTM**

###### **4.4.4 : Needs of LTM**

###### **4.4.5 : Improvised LTM**

###### **4.4.6 : Uses of Improvised LTM**

###### **4.4.7 : Methods of Preparing improvised LTM**

###### **4.4.8 : A few improvised LTM**

###### **4.4.9 : Educational Values of improvised LTM**

###### **4.4.10 : Summary**

###### **4.4.11 : Exercise**

###### **4.4.12 : Answer to check your Progress**

##### **4.5 : Use of Local Resources and use of Nature Corner in Teaching-Learning of EVS.**

###### **4.5.1 : Local Resources**

###### **4.5.2 : Sources of Local Resources**

###### **4.5.3 : Methods of using Local Resources**

###### **4.5.4 : Nature Corner**

###### **4.5.5 : Methods of using Nature Corner**

###### **4.5.6 : Summary**

###### **4.5.7 : Exercise**

###### **4.5.8 : Answer to Check your Progress.**

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#### **4.1 Introduction**

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Through the teaching learning process of natural science, children of primary schools can utilise the variations of their neighbouring environment in different ways. Different facts are continuously going on around

the children. They want to know, to understand - this eagerness of children are to be utilised in science teaching. A child accepts the truth by logical thinkings.

Scientific attitude grows in him/her. The child gains direct experiences through nature's observations. The child comes in contact with different objects of nature, plays with the object, observe it properly. Thus nature becomes the resource of science teaching.

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## 4.2 Objectives of lesson unit

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After reading this unit will be add to—

- familiar with different living and non-living objects of environments.
- utilise these object in real life.
- find out the relationship amongst these objects.
- utilise the environmental objects as TLM.
- draw poctures of some objects as TLM.
- draw pictures of some objects of environment.
- construct some improvised TLM.

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## 4.3 LTM used in teaching-learning of EVS

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When a child comes in contract with nature, he/she learns many things, in nature. Nature has different rules and disciplines, obstructions and hazards, from which child learn many things. Child will gain experiences of plants, rivers, ponds, birds, animals, fruits, flowers, sand, stone, houses etc. in nature. This experience will be child's first stage of learning. In this case nature will be the first teacher. From nature observation, different questions will arise in child's mind. Child comes in contact with different types of objects in nature. So in case of science education the only one resources is the nature. This vast resources are spreaded over the entire diversed earth. To use there resources in the field of science are the only expectation.

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## 4.4. : L T M - Improvised LTM

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### 4.4.1 Teaching Aid (LTM) :

The materials which are used to make the learning subject perceptable by the senses and learning very easily, are called teaching aids.

#### Classification of teaching aids :

- 1) **Readable** : Newspapers, Text books, science magazine etc.
- 2) **Audio** : Radio, Tape recorder, Mobile.
- 3) **Visual** : Model, Chart, Picture, Map, Specimen of real object etc.
- 4) **Audio-Visual** : Film, T. V., Video, Mobile and computer.

#### **4.4.2 Preparation of Teaching Aid, Principle of Selection :**

The disposed materials of the environment, the materials which are of no use, low cost materials are used to prepare teaching aids. The Principles of preparation of teaching aids are discussed below :

- 1) Environmental objects are to be used to prepare teaching aids as far as possible.
- 2) The construction of teaching aids should be easy and simple.
- 3) Teaching aids should be less gorgeous.
- 4) Teaching aids should be subject related.
- 5) Instead of using pictures, charts etc, real teaching aids should be used.
- 6) With the help of lessons, teaching aid, should be prepared.
- 7) The materials needed for the teaching aid preparation should be of low cost.
- 8) Complex teaching aids should not be selected.

#### **4.4.3. Principles of use of teaching aid (TLM / LTM) :**

- 1) While using TA / TLM, learners should be familiarised with every part of the TA/TLM.
- 2) No. of TA / TLM, more than actual need, should not be used.
- 3) TA / TLM should be used with the help of learners.
- 4) After use, TA / TLM should be preserved in a specific place.
- 5) It should be noted that on using TA / TLM, complications may not arise.
- 6) After use of one TA / TLM it has to be removed and then further process is to be proceeded.

#### **4.4.4. Need of TA / TLM / LTM**

- 1) In case of learning with TA / TLM, more senses are used and learning becomes easy and simple.
- 2) Learners' attention can be drawn very easily.
- 3) TA / TLM inspires the learners.
- 4) Learners' attention can be drawn very easily.
- 5) Many complex problems or concepts are made clear by the use of TA / TLM
- 6) Learners' acquired knowledge becomes realistic by the use of TA/TLM.
- 7) TA/TLM, makes learner more active and collects more answers from the learners.
- 8) By the use of TA / TLM, learners get concrete concept of subject matter.
- 9) Brings variations in teaching and the monotony in teaching-learning is diminished.
- 10) Scientific and logical attitude grows on learners and they can draw right conclusion.

#### **4.4.5. Improvised TLM / LTM**

In case of natural teaching, there is a need of improvised TLM, improved apparatus and library. In our country, due to want of money, science education is not being improved. For this reason, in a country like ours, improvised TLM / apparatus have made importance. So, to overcome the want of costly apparatus, teachers and learners together may prepare different apparatus, models and other TLM, with the help of low cost raw materials.

The TLM (s) which the teachers and learners together prepare with the help of cheap and easily available materials are called improvised TLM or Instruments.

#### **4.4.6. Uses of improvised TLM**

- 1) The components of improvised TLM are available easily.
- 2) The principle of learning by doing is carried out
- 3) The apparatus / TLM are very simple as per the age of the learners.
- 4) Learners can easily identify and buy the raw materials.

#### **4.4.7 : Preparation process of improvised TLM**

The preparation follows several steps. The steps are as follows :

- 1) The sources of raw materials are to be selected first.
- 2) The size, shape and construction of the improvised apparatus/TLM should be known previously.
- 3) The TLM should be capable of helping the learners to achieve the competencies.

#### **4.4.8 : Some improvised TLM**

##### **(a) Preparation of simple Balance :**

Two same size lids of babyfood container are to be taken and at equal distance in circumference, three wholes (in each lid) are to be made and three cotton or nylon threads not same size are to be tied in the wholes and a cylindrical wooden pipe is to be taken and a strong thread is to be tied in the middle of the pipe and the two lids are to be hanged at the two sides of the pipe. This will work as a simple balance by taking weight on one lid and things on the other lid.

##### **(b) Instrument to observe liquid pressure :**

Two or more wholes can be made at the same distance from the bottom of a long halcum powder container. At first by closing the wholes with fingers or some other way, Water is to be poured into the container. Now on releasing the fingers, water will come out of the wholes with pressure. But it will be noted that water from different wholes are dropping at different places not at the same place. At the lower hole, more distant is the dropping place. From this the learner will conclude that at lower whole more is the water pressure. So more distance is the dropping place.

#### 4.4.9 : Educational Values of improvised apparatus

- 1) Helps in developing thinking power in learners.
- 2) The science teaching of a school becomes self-sufficient with the help of improvised apparatus TLM.
- 3) Teaching by preparing apparatus / TLM, helps in developing scientific attitude in learners. For this, the principle of education, learning by doing becomes feasible.
- 4) As the learners prepare the TLM by their own hand, their construction and creative ability are developed.
- 5) The qualities like self-confidence, self-dependence etc are inculcated in learners.
- 6) As the teachers as well as the learners become active, a good relationship develops among them.
- 7) As the learners work together, a co-operative attitude is developed in them.

#### Check your progress :

- 1) What are the different classes of Teaching aid / TLM?

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- 2) Mention two principle of use of TA / TLM.

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- 3) What are improvised instrumets / TLM?

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#### 4.4.10 : Let us Sum up

On taking the learners of primary stages, out of classroom, they will acquire amazing experiences themselves from environment.

At one side they will collect different environmental materials and will be able to, use them as TLM and at the same time, they will be able to prepare some improvised instruments/TLM, out of those materials for teachers.

On observing the curriculum of ‘Paribesh Parichiti’ of primary stage, it can be noted that, learners’ previous knowledges have been expected on animals, plants, weather, clay, sand, rocks, sun, moon, motion of earth etc,

The above mentioned subject matter are to be experienced by the learners directly from nature without which, teaching learning of science can not be completed.

The aims and objectives of science education at any stage of education are specified on the basis of learners' age, maturation, social need and changable environment. By science education learners are not made scientists but they are helped to acquire the ability of (i) adjustment with the variable environment, (ii) Application of the scientific knowledge in real life, (iii) explanation of natural facts in scientific manner, (iv) development of (a) five senses, (b) Social qualities, (c) Superstitian free mind etc.

#### 4.4.11 : Excercises

- A) Answer the following (not more than 50 words) :
- 1) What are teaching aids?
  - 2) Write two needs of TLM.
  - 3) Maintain two characteristics of low cost TA.
- B) Answer within 150 words :
- 1) Discuss the principles of selection of T. A.
  - 2) Describe the needs of teaching aid.
  - 3) Describe the principles of teaching aid preparation.
  - 4) Mention the educational values of improvised apparatus / TLM.
  - 5) Write in detail, the mental powers of Preparation of one improvised TLM.

#### 4.4.12 : Answers to check your progress

- 1) The classes of Teaching aids are —
  - a) Readable - Newspapers, Textbooks, Scientific magazines etc.
  - b) Audio - Radio, Taperecorder, Mobile etc.
  - c) Visual - Film, T.V. Video, Computer etc.
- 2) Two principles of use of teaching aids are —
  - a) While using T.A, teacher will take the help of learners.
  - b) Learners are to be familiarized with each Part of the TA / TLM
- 3) Improvised apparatus are —

For teaching and learning, those instrument TA / TLM which are made up of low cost and easily available materials prepared by the teachers as well as the learners together, are called improvised apparatus TLM.

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### 4.5 : Use of Local Resources and use of Nature Corner in Teaching-Learning of EVS

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As various types of TLM/LTM (s) are used in teaching-learning of EVS, the resources which are Scattered in and out of learners domestic place or Schools, may be used for this purpose. These resources are sometimes directly shown in the class-room or sometimes may be collected in a room of School building permanently for using them whenever required. Thus, the resources used in the class-room for teaching-learning in two different ways, are discussed separately.

### 4.5.1 : Local Resources :

Generally, the local resources are available, in low cost or no cost, easily. Example : In an around of learners' dwelling places or school, these resources are available of the types — plants & trees, cultivated land, canals and ponds, rivers, various beasts and birds, forests, conveyances, houses, people, local maps etc.

### 4.5.2 : Sources of local resources :

At a glance, there may arise some differences among various resources, yet, some natural similarities are seen among few resources. So, on the basis of similarities, the resources may be placed in same classes.

- a) **Local social environment** : Dresses, food, dwelling places, people, cultural activities etc.
- b) **Local geographical environment** : Canals, ponds, rivers, forests, hill & mountain, deserts, sky, air, rainfall, temperature, atmosphere etc.
- c) **Local natural environment, maps and charts** : With the help of maps, the situation of a place, natural environment etc. can be known with the help of charts, weather of a year, population etc. of a place is also known.
- d) **Communicational media** : Newspapers, Radio etc. communicational medias are used to get the information of flood situation of different places. Also, natural calamities, different ritual functions, traffic rules, mass communicational information etc, of different places are known by the aftersaid medias.
- e) **Documentary films, photograph** : From these sources, visual type of information may be got. These information are very important resources to the learners. Locally collected these resources are playing important roles in teaching-learning of EVS.

### 4.5.3 : Methods of using local Resources :

The teacher himself or with the help of learners, will collect the resources. Then he will use these resources in the class-room during his teaching process. In this stage, a lesson plan will be prepared by the teacher before hand. The structure of the lesson plan is :

Subject — Environmental Science

Class — \_\_\_\_\_

Unit — \_\_\_\_\_

Sub-unit :

a) \_\_\_\_\_

b) \_\_\_\_\_

c) \_\_\_\_\_

Teacher will collect local resources as per the sub-unit of EVS and in preparing the lesson plan these information are to be incorporated.

After that, the teacher will come to the class taking the above mentioned resources. For proper use of these resources the teacher will divide the learners into a few groups. The resources are to be distributed equitably among the different groups. Later on, during teaching lesson, teacher will tell each group to complete the fixed work-Paper. In this way, at the end of teaching process, he will collect these papers from different groups and discuss about the teaching of that day.

In this way, the resources are used in the class-room.

#### **4.5.4 : Nature Corner :**

In EVS, nature Corner is an important matter. The matter is to arrange the collected resources from the nature in a room of a school-building or in a part of class-room of a school. Generally, the teachers of a school are the in-charge of these nature-corners. The teachers themselves or with the help of learners collect the various types of resources from the nature. After that, the teachers will arrange the collected resources as per rules. Actually, these nature-corners are the laboratories of EVS. For proper arrangement of these rooms following works are to be done :

- (a) As per instruction of the teachers, the learners will collect the natural resources from different places. Teachers may directly do this work. During collection they will tell the learners about the causes of collecting these resources and at the same time they will give answers and explain to the learners. At last, the collected resources will be kept in the fixed place of the class-room.
- (b) Teachers and learners will keep the resources in the class-room — dry leaves, trees, flowers, fruits, different seeds, feathers of birds, soil and pieces of stones of different areas, dolls and playing materials collected from local fairs etc.
- (c) The collected resources are to be classified according to their nature and similarities, while keeping the resources in a class. It is always kept in mind that all the smaller resources are to keep one side and all other bigger resources are to keep on the other side of the room. At last, the name of the resources are to be marked by small cutting papers attached to them.

#### **4.5.5 : Methods of using Nature Corner :**

In order to use the Nature Corner properly, the teacher has to prepare a lesson plan before giving the teaching lesson to the learners. The parts of the lesson plan are :

Subject : Environmental Science

Class : \_\_\_\_\_

Lesson Unit : \_\_\_\_\_

The collected resources from the nature :

a) \_\_\_\_\_

b) \_\_\_\_\_

c) \_\_\_\_\_

etc.

Before using nature corner, it is to be taken that the resources have been collected as per curriculum of a particular class. As a result, during teaching process, the collected resources are arranged into classes — (a), (b), (c), ----- according to the lesson unit.

In the teaching-learning process, at first the teacher will divide the learners into a few groups. After that, the groups are entrusted with the resources of (a), (b), (c),

----- During advancement of the teaching lesson, the discussion, explanation, advanced information etc. are given to the learners systematically, according to (a), (b), (c) ---- classes. At the same time, the learners of different groups, entrusted with the resources of (a), (b), (c) ----- classes, are asked to take notes or their respective work-sheets.

In this way, at last the teacher will finish the lesson and the learners will submit their respective work-sheets to the teacher with proper information.

This is the use of nature corner.

#### **4.5.6 : Summary**

In teaching learning of EVS, local resources are used. Various resources have been scattered in nature surrounding learners' dwelling places and their schools. During class teaching these resources are to be used as LTM. Teacher himself or by the learners, brings these resources in the school. After that he completes his teaching by preparing specific lesson plan and by using these resources. The learners state about their learning in the work-Sheets.

In this way, nature corner is also an important factor in the teaching of EVS.

Nature corner is a fixed space in a class-room where the resources collecting from the nature, are kept nicely. In that specific space, the teacher himself on with the help of learners, keep the resources and arrange in regular rules. During class-teaching, the teacher uses the arranged resources as LTM wherever needed. The learners also in this case help the teacher and state about their learning in the specific work-sheets.

#### **4.5.7 : Exercise :**

Answer the following questions (each within 20 words)

1. What do you mean by local resources?
2. What are the local resources of Social Sources?
3. What are the local resources of Geographical Sources?
4. What is nature corner?
5. What are the rules of Collected resources in Nature Cornner?

#### **4.5.8 : Answer to chek your Progress :**

1. The resources which are Scattered around the lerners' dwelling places and schools in the nature, are called local resources.
2. Local resources of social sources are — dresses, food, dwelling places, people, cultural programmes etc.
3. Local resources of Geographical Sources are — Canals, marshy lands, rivers, forest, hills & mountains, deserts, sky, air, rainfall, temparature, weather etc.
4. The collected resources of the nature are when stored in a fixed place, of a class room, the place is called 'Nature Corner'.
5. The resources are collected from the nature and are classified. After that, the resources of a particular class are arranged according to their nature (smaller to biger size systematically). At last, the resources are marked giving name, date of collection, place of collection etc.

## **Unit - 5(A)**

### **Critical Analysis of the contents of EVS Meant for class I to VIII**

#### **Structure :**

- 5.1 A brief discussion of the contents of EVS meant for class I to III**
- 5.1.1 Introduction**
- 5.1.2 Objectives of the unit**
- 5.1.3 Abiotic and Biotic**
- 5.1.4 Human Body**
- 5.1.5 Food**
- 5.1.6 Dress**
- 5.1.7 Habitation**
- 5.1.8 The Sky, The Sun & The Moon**
- 5.1.9 Family and Society**
- 5.1.10 Let us sum up**
- 5.1.11 Exercise**
- 5.1.12 Answer to “check your progress”**

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#### **5.1 : A brief discussion of the contents of EVS meant for class I to III**

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##### **5.1.1 : Introduction**

In classes I and II, the environmental concerns are to be taken care of through the concept of integrated learning as well as environmental studies and are to be taught as an independent curricular area in class III. Keeping in view the developmental characteristics and needs of the child at primary stage (age group 6-11 years), the NCF - 2005, and RTE - 2009 has perceived environmental studies as an integrated area which are analysed below.

##### **5.1.2 : Objectives of the unit**

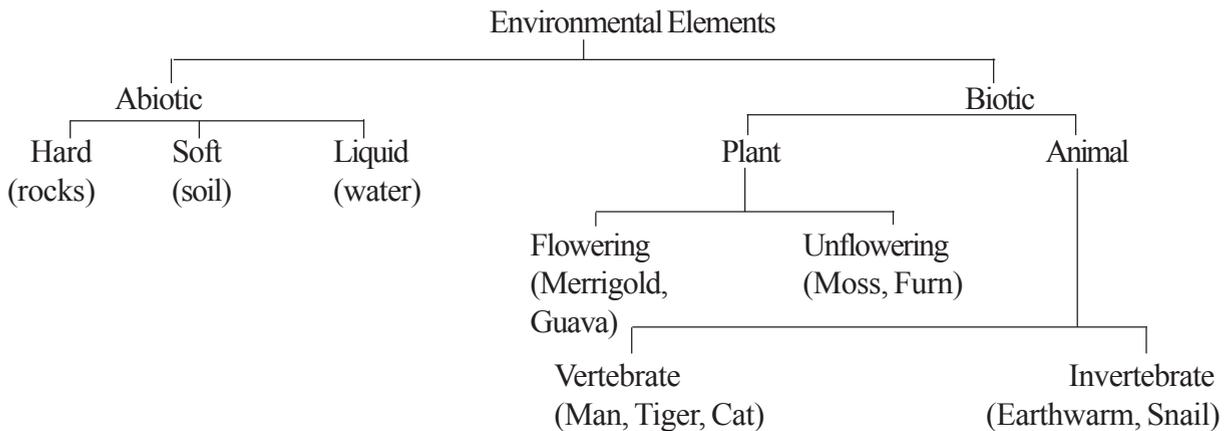
- The learners would be able to identify the biotic and abiotic components from our surroundings.
- They could tell the names of different limbs of human body and activities of those limbs — and thus the learners may engage themselves in different professions in future.
- The learners would be able to identify the common foods through environment and would classify them in next stage and would acquire knowledge about the importance of those foods.

- A clear conception would develop in them about the habitation, its classifications and the materials used for construction of house.
- The conception would develop among the children about the day and the night sky, the sun and the moon and the cloud and the rain.
- The knowledge of learners would develop about the meaning of family and they would gradually understand that the greater sense of family is called the society.

### 5.1.3 : Abiotic and Biotic

The elements which exist in our environment are classified into two types of components like Abiotic and Biotic. Lifeless components are called abiotic. These do not move from one place to another without the help of man. These are also classified into three parts — hard, soft and liquid.

On the other hand, who have life are called living being. They are classified into two — animal and plant. Animal — Vertebrate and Invertebrate. Example — Vertebrate — man, animal. Invertebrate — Butterfly, Earthworm. Plants — which grow up from under the surface of the ground, which have stem, branches, leaves, flowers and fruits.



### 5.1.4 : Human Body

The outer limbs of human body are hand, leg, hair, nose, face, mouth, teeth etc. The learners will acquire the primary knowledge about how the priliminary activities can be performed with the help of these outer limbs.

#### Check your progress — 1

- (a) State in brief the objectives of learning environmental acquaintance.

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(b) Write with example the differences of living and non-living components.

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(c) Mention three kinds of human occupation and describe in brief the types of movement of human limbs while working.

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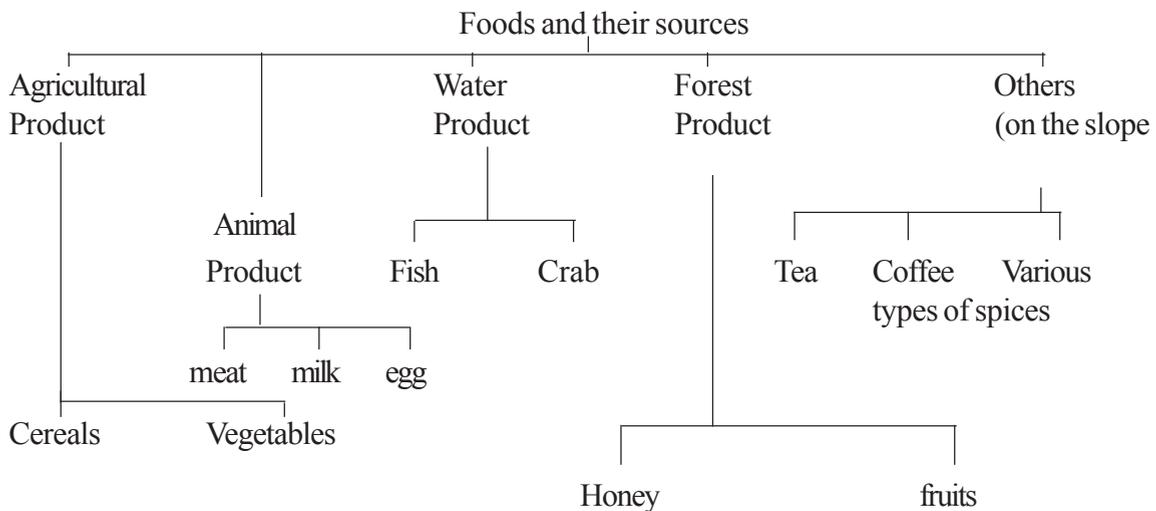
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Gradually the learners could perform different types of activities with the help of these limbs which would help them to involve in different professions.

### 5.1.5 : Food

The learners of primary classes know the names of our general and simple foods. Among those, the main are rice, fish, vegetable, fruit etc. For the physical and mental growth and development, it is necessary to eat these foods in time and in sufficient quantity. These foods are classified into various parts according to their sources. For example.



natural product

### 5.1.6 : Dress

One of the main primary needs of human life is clothes. Observing the clothes of a person of any area, the environmental condition of that area can be understood, For example, the dress of little boys and girls for going to school differs from that of playing.

Other than these, the dress of persons engaged in different occupations also varies. We also wear different types of dresses in different seasons. If the learners learn to observe these matters with the help of their teachers, a clear conception would develop about the environment around them.

**Check your progress — 2**

(a) Write down the main foods of our country and state the sources of these.

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(b) Mention the main physical conditions necessary for paddy cultivation.

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(c) From which sources other than animal body milk is produced ?

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(d) How do you identify the persons engaged in different activities in the field of district annual sports and games ?

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(e) How do you feel the diversity of Indian climate observing the people around you ?

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- (f) How do you help your learners in primary level to be skilled in observation by the dress of the people around them ?

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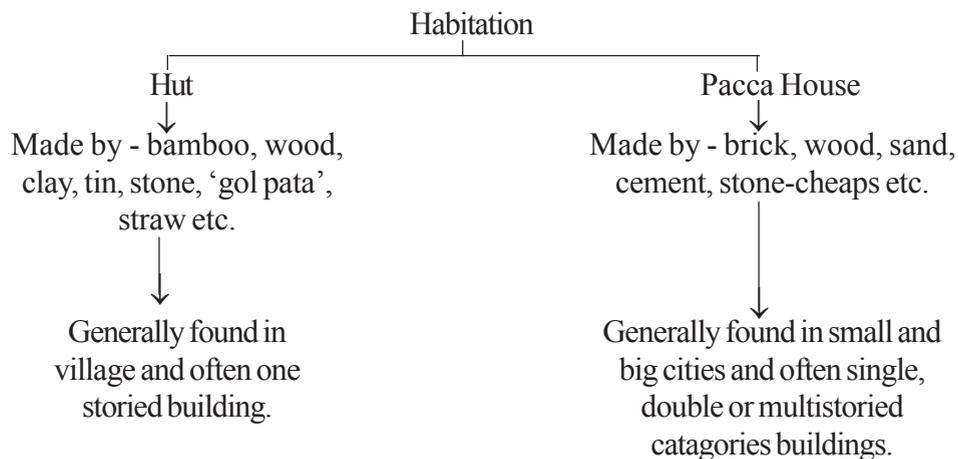
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### 5.1.7 : Habitation

Habitation is one of the prime need of human life and is a main ingredient of environmental acquaintance. In common word it is called home.

The classification of it is as follows :-



### 5.1.8 : The Sky, The Sun & The Moon

In the morning, the surrounding environment becomes brighter with the rising Sun. After that the Sun gradually rises up and bright light is found in glittering Sky. But when the Sky is covered with black clouds and the rays of light become dim then it rains.

After Sunset, the light of the sky falls off and the surrounding environment is also covered with dark shade. Then innumerable stars glitter on the sky and the moon light is also found. In the evening, when the Moon rises in the sky, the natural environment also becomes charming.

### Check your progress — 3

- (a) Mention the names of the materials by which the huts are constructed.

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(b) Mention the characteristics of the pacca house.

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(c) Describe the panorama of the sky of the following times :- (in brief)

- (i) At dawn
- (ii) At rainy day
- (iii) At full moon night
- (iv) At new moon night

### 5.1.9 : Family and Society

When a group of men or animals live or stay together in a dwelling place then primarily it is called a family. For an example, in a human family, father-mother, uncle-aunt, grand father-grand mother, sister-brother, they all live together in a house. Like that when the animals like tigers, lions, monkeys etc. live in a group and in a particular place then they are also called by a tiger family or a lion family etc.

Again some members of any family dwell at separate places for different reasons. They may be called — maternal uncle-aunt etc. But they are also the members of the same family. In a larger sense these total members of families — dwelling in different houses separately, grouped together form society. That means, society is the larger form of a family.

So, we find that the school in other sense a part of the society. Because, here head-master, other teachers, students and non-teaching staff are the members of a family called school.

### Check your progress — 4

(a) What is a family ?

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(b) What is a society ?

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(c) “School is the miniature form of a society.” – Describe it.

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### 5.1.10 : Let us sum up

In primary education, the learners would recognise and define the environment, by identifying all types of biotic and abiotic components around us.

After that they would differentiate living and non-living i.e. who have life are called living and lifeless components are called non-living.

After that learners would identify the different limbs of human body and their movements by which men become skilled in different fields — which leads them to engage in different professions.

With the physical development men need food, dress and shelter. These varies with the environmental diversity. So, diversity is found in food, dress and houses in different environmental situations.

The compulsory components of environmental acquaintance are the family and the society. The living creature who live all together in a common place is called a family. The extended form of a family is called a society.

### 5.1.11 : Exercise

#### (A) Answer the following questions (within 50 words) :

- (a) What are the differences between non-living and living components of environment ?
- (b) What are the main classifications of living components ?
- (c) In what forms the non-living components are found ?
- (d) What is plant ?
- (e) Write the names of main limbs of human body and describe their functions.
- (f) Write down the different sources of foods of men and other animals.
- (g) How would you describe the environment and time of that place — following the diversity of human dress ?
- (h) How many types of human habitation are there ? What are those ?
- (i) How does the environment change after the sun rise ?
- (j) What are the things visible in the night sky ?
- (k) Why school is called the miniature form of society ?

#### (B) Answer the following questions (within 150 words)

- (a) Explain the objectives of teaching about environmen in the primary stages.
- (b) Describe the life-cycle of living domain.

- (c) Describe how the different non-living materials are used in our daily life ?
- (d) Why the mental development is necessary for natural physical development ?
- (e) Describe the main sources of foods with proper example.
- (f) Explain the relation of selection of dress with climate.
- (g) What is the logic behind the customs & discipline of wearing uniform dress of the students of some school ?
- (h) What is the relation between the diversity of season and dress ?
- (i) In which region are generally the huts found ? Explain its reason.
- (j) What do you mean by eco-friendly areas ?
- (k) How do the sky, the sun and the moon are related with our environment ?

**(C) Answer the following questions (within 250 words)**

- (a) How do the animal and plants are inter-dependent for survival ? Explain it.
- (b) Discuss how the prime elements of climate influence the environment around us.
- (c) Discuss the causes of formation of day and night and its effects on the changes of our environment. (following the primary standard)

**5.1.12 : Answer to “check your progress”**

- 1. (A)**
- Biotic and Abiotic elements will be identified around them.
  - Can be able to tell the names of human limbs.
  - Children can identify the lights and simple food items and can classify the food items in future.
  - A clear conception will be develop about human shelter and its classification.
  - The children will have the clear conception about the day and night sky, the moon and the sun, and cloud and rain.
  - They will understand about the picture of a family and in the greater sense of family is the society.

- |            |   |   |
|------------|---|---|
| <b>(B)</b> | <b>Non-living</b>   | <b>Living</b>   |
|            | <ul style="list-style-type: none"> <li>● Lifeless (Rocks)</li> <li>● Cannot move</li> </ul> | <ul style="list-style-type: none"> <li>● Full of life (man)</li> <li>● They can move</li> </ul> |

**(C) Main occupation in mans’ life :-**

Writer — hand, eyes.

Teacher — hand, eyes, face, ear, neck

Cultivator — hand, leg, eyes, head

- (2) (A) Rice — Agricultural products  
 Fish — Born in water  
 Vegetables — Agricultural products  
 Fruits — Agricultural products
- (B) **The necessary conditions of paddy cultivations are :-**
- Plain, fertile, alluvium soil.
  - Sufficient rain fall or sufficient water supply through irrigation.
  - Sufficient sun rays.
- (C) Milk is produced from soabean seeds or coconut crust.
- (D) ● District wise different sports uniforms of the children.  
 ● Different uniforms of the organizers.  
 ● Different uniforms of referees.
- (E) ● Cotton dress in summer season.  
 ● Woollen dress in winter season.  
 ● Rain-coats in rainy season.
- (F) ● That will help them in observation :-  
 ● The children would keep watch on the dress of their teachers.  
 ● Teacher would guide their students to keep watch on the persons involved in different activities in nearby health-centre or hospital.
- (3) (A) Bamboo, soil, straw, tiles, mat used in making up buildings. Sources are soil, jungle and agricultural by-product.
- (B) Pacca house made of bricks, sand, stone-chips, cement mixture those are hard enough to protect from natural calamity.
- (i) In the clear sky the bright light is seen.
  - (ii) The sunlight becomes dim and the sky covered with dark cloud.
  - (iii) The sky becomes bright in the full moon night.
  - (iv) The sky becomes dark in the new moon night.
- (4) (A) When men or animals live together under the same roof, they are called a family.
- (B) When members of the same family live outside the family but actually belong to that family. The total form or group of all these families taken together is called a society.
- (C) Students are like progeny to their teachers. When teachers, students and non-teaching staff pass out their time under the same roof in the school building, the teachers and the non-teaching staff take care of the little children and at that time school is called as the miniature form of a society.

## **Unit - 5 (B)**

### **Critical Analysis of the Contents of EVS Meant for class I and VIII**

#### **Structure**

#### **5.2. A brief discussion of the contents of EVS meant for class IV and V**

##### **5.2.1. Introduction**

##### **5.2.2. Objectives of lesson unit**

##### **5.2.3. Two surrounding elements — non-living and living**

##### **5.2.4. Our Body**

##### **5.2.5. Our food**

##### **5.2.6. Our sky**

##### **5.2.7. Environment and resource**

##### **5.2.8. Our district and states**

##### **5.2.9. Our History**

##### **5.2.10. Let us sum up**

##### **5.2.11. Exercise**

##### **5.2.12. Answer to check your progress**

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#### **5.2. A brief discussion of the contents of EVS meant for class IV and V**

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##### **5.2.1. Introduction**

Like the previous unit, following the concept of integration learning by considering the recommendations of National Curriculum Frame Work 2005 and National Policy of Education, Objectives of Teaching Environmental Science, we followed the books with the syllabus of class IV and V and analysed step by step the topics, concern with EVS, which are mentioned in different pages of those two books.

##### **5.2.2. Objectives of lesson unit**

- Differentiation of living and non-living can be determined from surrounding elements.
- Students will be able to prepare a list of living and non-living.
- The primary concept about the procreation of living creature will be developed.
- They will know about different kinds of living creature.
- They will learn about the kinds of animals and plants.
- The learners will know about the reasons on which the kinds of animals and plants depend.

- The distinct knowledge of learners would develop about non-living materials.
- They will be able to explain with example the three stages of matter.
- They will achieve knowledge about the activities of different limbs of human body, other birds and animals.
- After that the learners will develop a detail concept that how plants and animals are inter-dependent to survive their existence.
- Learners will know about the structure and activities of human body.
- They will know that human food habit depends on natural conditions of any place where they live.
- Learners will know the definition of a family and society. A clear concept will develop about the activities of the society.
- Learners will know about the sky and celestial sphere and influence of it on the Earth as well as the condition of the living creature on it.
- Learners will know about the definition of resource and the differentiation between natural resource and human resource.
- The learners will learn in which state they belong and in which district they dwell, what is the physical characteristics and social condition of that district.
- After understanding the matters they will come to know the historical importance of their own state as well as gradually they may know the history of other places of the country also.

### **5.2.3. Two surrounding elements — non-living and living**

The detail discussion is done in page no. 1 to 26 in class IV book and 43-57 pages in class V book on non-living and living elements surrounding us. Living creatures is also two types — (1) animal and (2) Plant. After that children would know about the animal kingdom. At first animals are classified into two classes :— (1) Which could be seen with the naked eyes - Ex- Tiger, Bird (2) Which can not be seen with naked eyes — Ex - different types of germs.

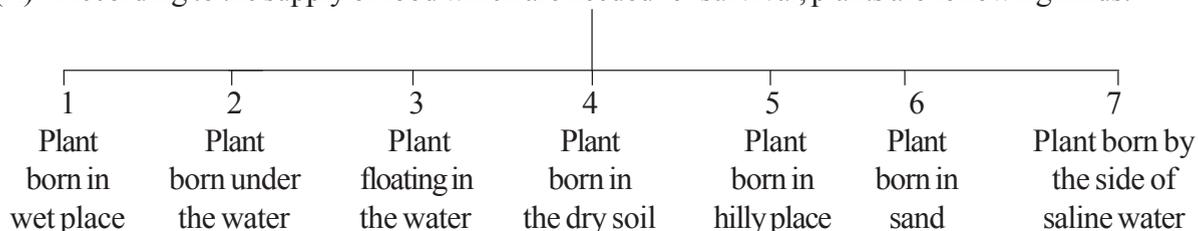
According to the dwelling places living creatures are divided into the following ways:—

- 1) Animals of land — tiger, lion, dog, cat
- 2) Animals in water — fish, crocodile, crab, shell
- 3) Amphibian — frog, snake, tortoise etc.
- 4) Animals in tree — snake, ant, different birds etc.

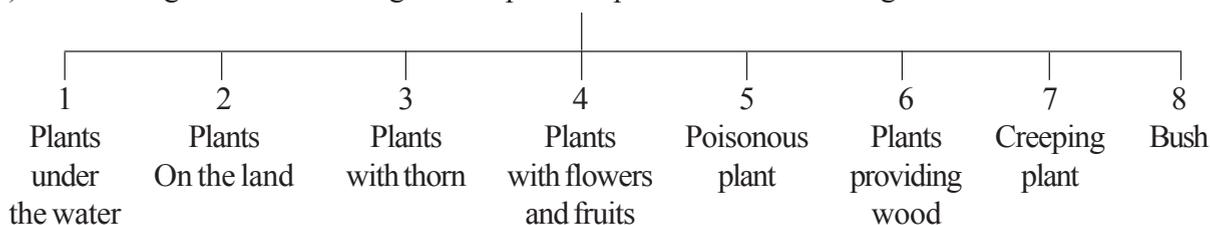
From the above mentioned reference the learners will learn more information about the animals. For example, pet and ferocious animals — and how do they manage to save themselves or collect their food. The main characteristics of birds are their beak, nails or the shape of wings and their usefulness. At last they will learn the names of some animals which are either extinct or about to be extinct.

The another branch of living creatures is plant. Now the learner should know about it like animals.

(A) According to the supply of food which are needed for survival, plants are following kinds:



B) According to the surroundings the shape of the plants are the following kinds :



The teachers will help them to learn the differentiation of above mentioned plants with the examples and pictures.

Now we come to the world of non-living materials. Children should get the clear ideas about the characteristics of non-living things, like — which is lifeless and do not move on their own. Now the teacher will help the learners in the classroom to prepare the list of non-living objects seen inside and outside the classroom with the help of question-answer method. Gradually the learners will feel the difference in it with their different sense of organs and realise their conditions and will try to develop their concepts about the different conditions of matter — solid, liquid and gaseous. Gradually they will be able to identify the different matters. They can get a clear concept about the proper application of these matters in their daily life within the classroom or outside.

#### 5.2.4. Our Body

With the reference of page no. 27-45 in the text book of class IV and that of page no. 1-15 in that of class V it is mentioned there : the description of main limbs and for protection and development of those limbs what types of food are needed. Teachers will realise and discuss with their learners and with question answer method they will highlight the ways of protection of these parts of body. For example in class IV book, there is a detail description about teeth. Because the activities, care and protection of teeth is directly related with the method of taking food, proper digestive method and the growth and development of the body. Like this, class V text book starts with an armour i.e. the skin of the body. Firstly, the skin of the body protect it from outer blow or any type of natural calamity. On the other hand, there are some important organs like muscle, vein, artery etc. exist just under the skin. Primarily the skin protects these organs from outer mild blow. So, teachers will discuss with the learners about it with great importance. They should keep in mind that always integrated method should be followed.

### 5.2.5. Our Food

The most important element of society and environment is food. So, learners should know what types of balanced food should be taken in our daily life. For natural diversity of India — as well as in our state, food habit of the people varies. Teachers may teach their learners from class IV and V text books the following page no. 130-139 and 93-121 respectively about this topic. For example the main food and drinking habit of the people of West Bengal means rice, chapati, vegetables, fish, egg, meat, milk, fruit juice, seasonal fruits. Also different types of light food prepared by frying paddy in sand heated on oven, bread, cakes, biscuits, preserved milk or milk powder and other tinned food.

Now teachers will explain to their students what types of food items we get directly from the agricultural field or pond, river, canal or cow-house or farm. There are some food items also which we get after some processing.

Teachers are requested to follow the mentioned part of the subject matter and help their students to prepare a list of food habits in districtwise. After that they will help their students to find out the inter relation between the foods and relief and climate. Thus through integrated learning the learners will wander from subject to subject. The foods which are surplus in one district, are sent to deficit areas or districts.

For completion of all these activities the huge human resources are needed and from this concept the ideas of different types of occupation will develop in their mind.

#### Check your progress — 1

A. What is preservation ? Why do plant or animal preservation is needed ?

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B. What is Bio diversity ? Prepare a list of bio diversity in different districts.

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C. How does the food function for growth and development of human body ? Mention three activities.

(i) 

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(ii) 

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(iii) 

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D. How does the human bones are attached with bone-joint ?

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E. What are the sources of food in our daily life ? Give example.

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### 5.2.6. Our Sky

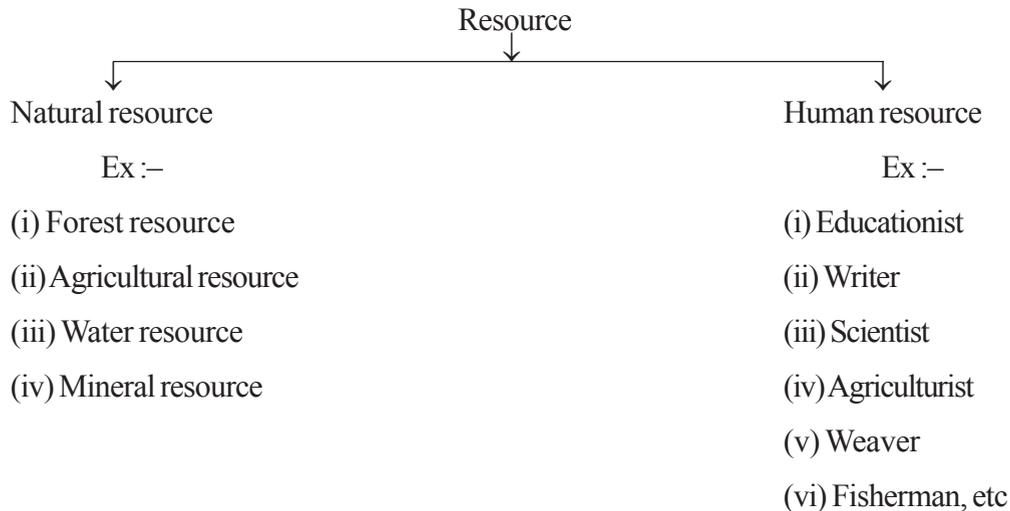
From the above discussion we come to know that different types of physical diversities are responsible for production of different types of foods. Again these physical diversities depend on the relation of the Earth with the Sun, Moon and other Stars. From the text books of class IV and V, and in pages from 66-76 and 153-165 respectively if followed by the teachers and learners, their conception will be clear regarding this.

For the sun rise and Sun set in the Earth, the Day and Night occur. The growth and development of animal kingdom is possible for the enough sunlight on the earth day time. All types of earthly activities depend on the existence of the sun. Again, about half of the month we enjoy the lighted night sky for the presence of the moon and other planets and stars.

Again, teachers will discuss that lunar phases and Tide are inter-related. So the teachers will help for some simple scientific experiments and question-answer method to make the matter clear. In this part of text book, Geography, Environmental Science and Science are integrated.

### 5.2.7. Environment and Resource

A clear conception about environment have already been developed with us. Now the learner should know about resources. The physical structure of the Earth varies from one region to another. Some regions are covered with mountains, some where exists plateaus, some where alluvium flood plains or sandy desert or sandy beach. Different materials which are hidden under these landforms are explored in series by man and are used for mankind. So we may call all these materials as resources. Again when man acquire knowledge from nature and by exercise his own intelligence and devote himself for welfare of mankind then it is called by human resource. So, resource is classified into two parts i.e. :—



As for reference, text book of class IV in page no. 100-117 and that of class V in pages 81-91, 114-132 may be concerned. Teachers are requested to follow the above mentioned references and guide their students that how men could accept their occupations from the natural resources by various exercises and also man and nature together may create some new resources. From class V book learners would come to know that how the human society have enriched by human resources. The teachers would try to create interest in their students by application of frequent exercises.

**Check your progress — 2**

(A) Describe with a simple experiment the occurrence of day night on the Earth.

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(B) How does tide occur ? What are its effects ?

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(C) Mention the names of such districts in WB, enriched in forest and mineral resources.

1) 

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2) 

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### 5.2.8. Our District and States

After knowing the previous environmental topics, now the learners should know about his/her own state, district and neighbouring districts. For reference page 58-80 of class V text book, this topic has been described in an organised manner. Teachers are requested to help their students the techniques of map-reading so that the learners will know the location and areas of different districts, common boundary lines among them, the landform or course of any river, or the names of district Headquarters. After that if they join all the districts with their common boundaries the picture of total state will come out. The interested learners will learn by themselves the names of the neighbouring states as well as the course of the important rivers in detail.

### 5.2.9. Our History

History is actually the real form of life style of ancient people. The important elements of history are old coins, different types of archeological materials, ancient architect, stone inscription, ancient manuscript and books, museum etc.

The main cause of the prosperity of human lifestyle is the development of transportation system. Interaction between the people of two regions were possible only for progress of transportation system. The teacher will follow this topic from page no. 153-160 of class IV text book and will explain before the students in easy method, and will ask more examples from them.

Other than these teacher will encourage their students of class V to collect information about the condition of ancient architectures — either in ruined condition or conserved property. Thus the learners will be interested to know in detail the ancient history of other districts. For this page no. 133-136 of class V text book may be followed.

### Check your progress — 3

(A) From which districts of West Bengal the ice-peaks are visible ?

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(B) What is Delta ? Where is it found in WB ?

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(C) How the Tera-Cota temples were built in ancient Bengal ?

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(D) Architecture, Sculpture and Mansion — differentiate with two example for each.

(1) \_\_\_\_\_

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(2) \_\_\_\_\_

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(3) \_\_\_\_\_

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**5.2.10. Let us Sum up**

The primary students of class IV & V have followed discussion in detail about living and non-living elements. The classification of animals and plants and also the concepts about them have been developed in details among learners.

After that these three different conditions of non-living materials with examples also become clear to them. After that different parts of our body, its activities, development and the method of their proper protection have been discussed.

In the next chapter the human food habits, sources of those food, method of food collection and processing and preservation of those has been discussed in details.

In the next part the sun and the celestial bodies, and its relation with the living bodies in the earth has been discussed according to primary level students.

After that the definition of resources, its classification and the importance of it for welfare of mankind could be known.

The concept about own district, surrounding districts and about own state have been developed in the mind of primary students.

Lastly they have learned about the brief history of own district and own state. The method of collection of ancient information of their own districts by which they will be interested in this subject .

### 5.2.11. Exercise

#### (A) Answer the following questions (within 50 words) :—

- (a) What are the main functions of living creatures ?
- (b) Prepare a list of animals according to their habitation.
- (c) How the plants collect their foods that we find in our surroundings ?
- (d) What does it mean by non-living material ? Give example.
- (e) Describe the functions of teeth.
- (f) Why skin is called the armour of body ?
- (g) What are the main food of the people of West Bengal ?
- (h) What are the functions of Stomach ?
- (i) What is called agricultural crop ? Give four examples.
- (j) Without sunlight what would happen to the Earth?
- (k) What are seen in the day and night sky ?
- (l) What type of map is necessary for pointing the rivers of West Bengal ?
- (m) Write down the names of two ice-fed rivers.
- (n) What is the main reasons of developed life style of man ?
- (o) What is a museum ?
- (p) State two ways to know the ancient history of a particular place.

#### (B) Answer the following questions (within 150 words)

- (a) describe with drawing how animals and plants are interdependent for survival.
- (b) State the structural diversity of human body and its five functions accordingly.
- (c) Describe with drawing the digestive system of human body.
- (d) Describe with drawing the functions of human limbs which get protection from outer shock.
- (e) Explain the sources of main foods for daily human life.
- (f) Describe the changing views of day and night sky along with seasonal diversity of West Bengal.
- (g) Divide the districts of West Bengal according to physical characteristics.
- (h) What do you mean by the component of history ? Describe how do we know the ancient social system by these ?

#### (C) Answer the following questions. (within 250 words)

- (a) What is resource ? Analyse how natural resource influences on human life ?
- (b) Explain with example the Solar and Lunar Eclipse.
- (c) How does the Tide occur ? What is its influence on human life ?

### 5.2.12. Answer hint to check your progress — 1

- (a) The management of controlling the reasons for which the number of living creatures decrease is called conservation.
- (b) The animals and plants which we see around us is called bio-diversity. Clubbing some type of bio-diversity from different districts and make a region and prepare a list of bio-diversity.
- (c)
  - i) The growth and good formation of body.
  - ii) Effort and skill of activities.
  - iii) To be attentive in the whole day's work.
- (d) Ligament (see class V text book, chapter human body)
- (e) Forest production, agricultural production, aquatic, from animal body, tinned food (processed).

### Answer to check your progress — 2

- a) Take help of torch and ball in the dark classroom and make arrangement so that all the students can see the experiment.
- b) Sometimes the sun, sometimes the moon and sometimes both together attract the water mas of the Earth, and the river spated. (See the chapter environment and sky of class V)
- c) See the chapter resource of class V text book.

### Answer to check your progress — 3

- a) Darjeeling district.
- b) Write the description of landfom of Sundarban region of South 24 parganas.
- c) Soft soil was made hard after burning with high heat. (See the chapter Architecture of class IV T.B.)
- d) See the chapter architecture, sculpture and museum from class IV text book.

## **Unit-5 (C)**

### **Critical Analysis of the Contents of EVS meant for class I-VIII.**

#### **Structure**

**5.3. A brief discussion on critical analysis of the Contents of EVS meant for class VI-VIII text book.**

**5.3.1. Introduction**

**5.3.2. Objectives of lesson unit**

**5.3.3. Environment around us–plant and animal kingdom – its mutual relationship.**

**5.3.4. The events around us**

**5.3.5. Bio-diversity and classification of life**

**5.3.6. The role of matter in formation of environment – the role of living and non-living matter in formation of living body**

**5.3.7. Climatic change, cause and effect on environment – result is production of waste materials and risk of human health.**

**5.3.8. Physical environment – heat, light, magnet and uses of eco-friendly powers.**

**5.3.9. Environmental hazard – plant hazard, endangered animals and fuel hazard and their conservation**

**5.3.10. Environment and public health**

**5.3.11. Environmental policies**

**5.3.12. Let us sum up**

**5.3.13. Exercise**

**5.3.14. Answer-hint to check your progress**

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#### **5.3.A brief discussion on critical analysis of the Contents of EVS meant for class VI-VIII text book.**

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##### **5.3.1. Introduction**

At the first step of critical analysis of environmental acquaintance we have noticed environmental related science. But if we want to enter in deep, we need help of different branches of Science. Then by the observation of environment and through different branches of science, learning starts with development of environmental science. From class VI the learners starts in this manner and the last stage of upper-primary i.e. class VIII – when the students reach in this class they take science subject for learning environmental education properly.

Honouring to the objectives of NCF (2005) and following RTE act 2009, the syllabus of class VI to VIII have been analysed.

The formal concept of learning is to follow the constructivist concept.

### **5.3.2. Objectives of lesson unit**

- The diversity of nature attracts all the persons having different ages.
- Their observation skill will be developed.
- Through different experiments and analysis of their results, the unknown picture of known non-living world will be clear to the students.
- Through introduction of different factors of inevitable non-living world for partical needs, creativity, investigation and scientific thought have to be developed in the learners mind.
- Learners' concept about environment around us, living, non-living and their inter-relation will be cleared.
- They will learn how to observe the surrounding incidents methodically and with the help of their teachers and come to the conclusion.
- The learners will learn about the Bio-diversity and their classifications. The clear conception will be developed in relation with the changes of climate and waste matters.
- The learners will know the influence of physical and chemical materials on the environment.
- Learners will know in details about the pollution, problem and conservation of the environment.
- With the help of knowledge developepment about environment and public health awareness will be grown up in them.

### **5.3.3. Environment around us–Non–living and living and their interrelation**

For reference page No. 1-20 of class VI text book have been cosidered for discussion of our environment. In the first part, for explaining our environment around us, the clear picture about our family and society have been drawn. The learners and the related persons with them living together in a house in called the miniature form of society i.e. family and when these members of a family live outside the house for peaceful livelihood and make realtion with persons having different occupations – gradually forms society. For example, teacher, farmer, barbar, mechanics, driver, cook, shop-keeper etc – the persons whose help is necessary in any means to the members of the family. So, the first step in and around our environment is our family and society. Now let us see how animals are dependent on plants. At first let us discuss about man – how man depends on plants –

- For food – Agricultural product – for example – rice, flour etc are produced from Paddy and Wheat. These are the gift of plant. Food, produced from animal i.e. meat, milk, egg etc. – are generally get from herbivorous animals. In other hand these animals survive on grass and straw.

Again water base food – generally fish and oils of few fishes, those also live by taking different types of water plant. Different types of water base edible herb and water-fed fruits are also foods of man. Again forest base food – these are different types of fruits, honey etc.

- Plants which are necessary for different house–hold materials. For building construction the most important material is wood. For example – wooden windows, frame for unmetalled roofing or wooden furniture, colour for polish or gum – all these we get from plants.
- For making clothes – We depend on fibre for making clothes. For all types of fibre we depend on plants. For example we get cotton from cotton-plants, silk from silk-worm who make their shelter and fetch food from trees. Jute is one type of fibre crop from which the tendency of weaving cloths have a good demand.

Other than these the plants help us in our daily life. For example, for preparation of medicine, the use of plant is unavoidable. No body will dis-agree on the need of trees for protection of pollution. Because we breathe in Oxygen, trees release that and vice-versa. So, more trees within our peripheri make our environment pure.

Now let us see, how plants depend on animals.

- Pollination is one of the method for plant’s procreation. Bee, Butter-fly, humble-bee etc when fly from one flower to other then the pollen of different flowers mix together carried by the legs of these insects. Result is pollination and it helps procreation of plants.
- Birds fly from one fruit tree to another fruit tree and when they eat the ripe fruits, the seeds of the ripen fruits fall on the ground or the part eaten ripe fruit carried from one place to another and the seeds of those ripe fruits fall on the fertile ground and procreation of plants start. Thus other animals also carry the seeds of ripe fruits from one place to other and result in procreation of plants.
- Now let us see how palnts and animals are inter-dependent. Man generally takes animal product as well as agricultural product. We get agricultural product directly from plants but we depend on plant indirectly for getting animal food. For example, the good health of cow, goat, sheep etc which are vegetarian animals help provide sufficient amount of milk, meat etc. Chicken or meat producing birds depend on different types of cereals. Some animals have relation between food and its consumer. Large animals eat small animals and small animals generally eat grass and small trees. There are some parasitic animals who take shelter on other living bodies and take food from those bodies.

Thus we see that plants and animals are inter-dependent and thus maintain the balance of the environment.

### 5.3.4. The events around us

Every day and always different types of incidents occurring around us. For this some permanent or temporary changes take place. There are some variations among these incidents and the result also varies. Some examples are as follows :

Events	Characteristics
Sugar melts with heat	Unidirection
Ice melts in water	Reversible
Events	Characteristics
Day-Night occur everyday by turns	Periodic
In some place one day a storm occurs or in one year it is flooded. }	Non-Periodic
Plants born by germination	Desirable
Cutting the tree with an axe	Undesirable
Forest-fire	Natural
Light fire at cooking time	Man-made
Paddy production from seedling	Slow process
Spreading the wet clothes under the sun	Fast process

From the above discussion we came to the conclusion that from that events where the composition of main matter remain unchanged is called physical change and where the main structure and composition or characteristics totally change in irreversible way is called chemical change.

#### Check your progress – 1

**Direction :** Compare the hints given at the end.

(A) Mention the objectives of EVS as Compulsory subject from class VI to class VIII (at least 3)

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(B) Give three examples of inter-reactions between plant world and animal world.

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(C) Mention the Permanent or temporary changes of events among matters around us. (at least three)

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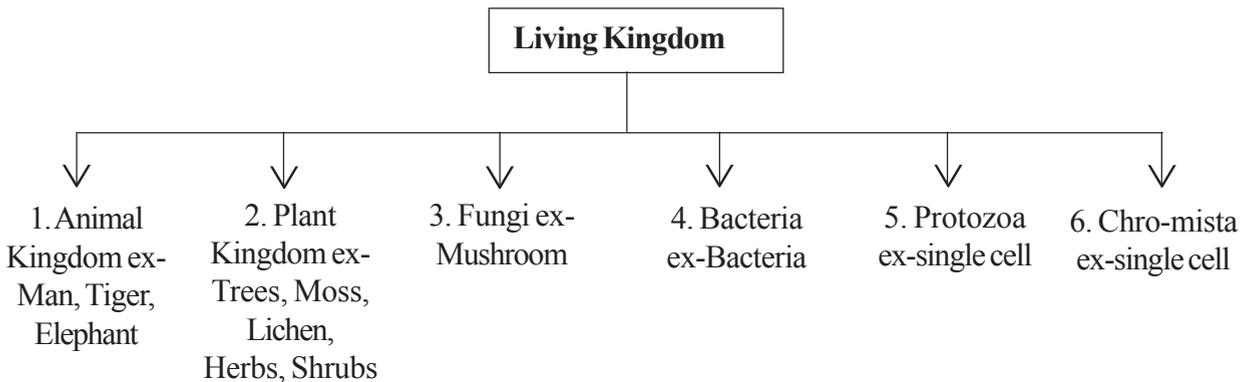
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### 5.3.5. Bio-diversity and its classification

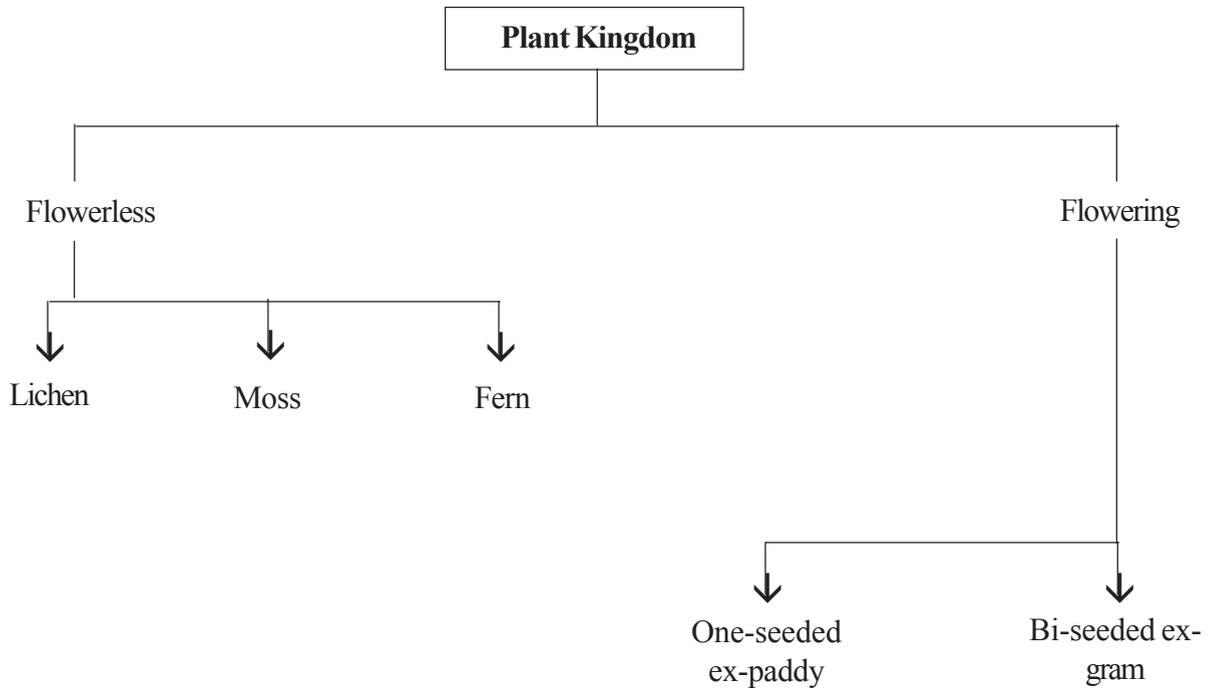
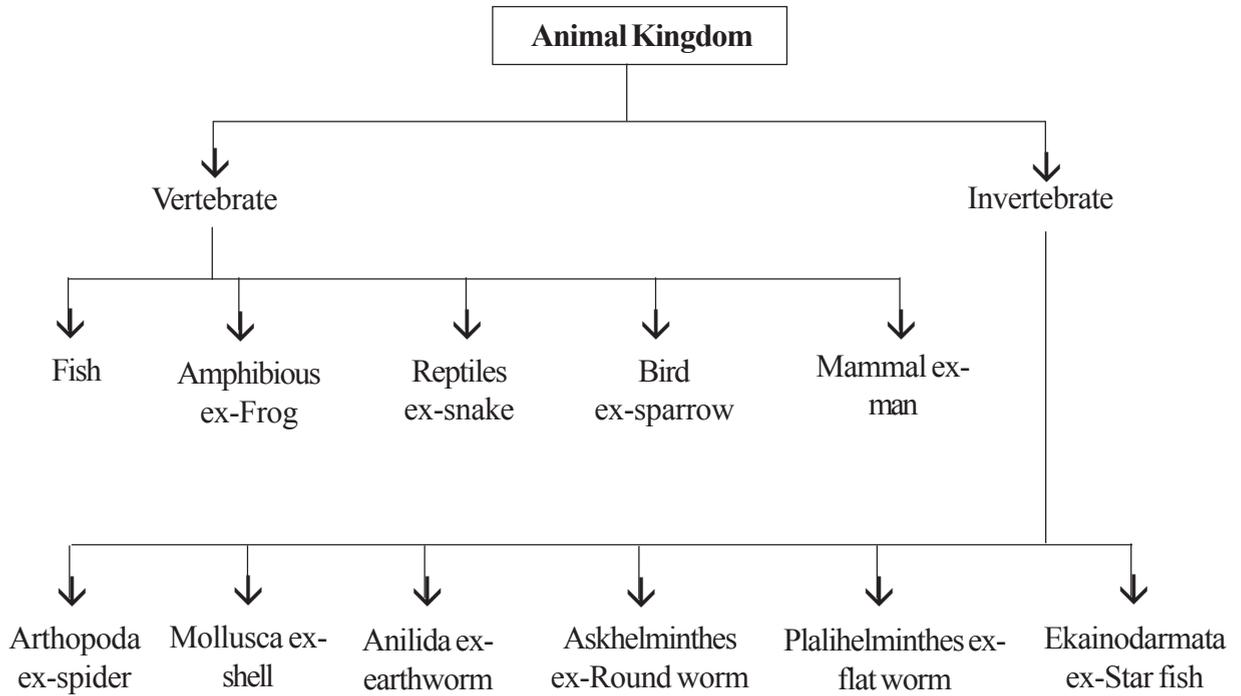
Bio-diversity of any country is taken as one of the natural resources. For the knowledge development of Bio-science and also for the practical importance of conservation of bio-diversity it is not negligible. This chapter is included for giving the clear conception of bio-diversity of a tropical country like India to the learners of primary stage.

Scientists have classified the animal kingdom according to the species. These are as follows :



Other than plant and animal another type of living creature exists. This is neither plant nor animal. This is called Bacteria, these are found in the curd. Again bacteria is the cause for colera, Typhoid diseases. These bacterias are called Monera. These are monocell creature but no nucleus is found within it.

Again that Bacteria, which causes Malaria, has nucleus within this is called protista.



### **5.3.6. The role of matter in formation of environment – The role of matter in building living and non-living animal body**

In this chapter we discussed about the role of matter in building the living and non-living body. If the balance of Salt-Alkali is lost in human body, then what will be the result? – Let us discuss here. The main objective of this chapter is to introduce the learners with different edible salts, compounds and its effect on environment. The main four radicals (C, H, O, N) are found every where. With these four radicals different types of living compounds are made which do not exist on the earth. But different non-living Compounds found. For example, let us consider a tree with green leaf. It takes  $\text{CO}_2$  from air, water and some mineral salt from soil. All these are non-living compound. Tree makes glucose, mixing these compound with the power of sunlight. This is one type of living compound, which we do not get from the Earth. This special power of preparing new compound is the characteristic of living creature. Other than these, tree can make many living compounds – many of these are medicines perfumes, pesticides and others are Burnish.

For construction of human body different metallic ions work in the following ways:

- Iron is very important for preparing the blood of different living creature. Haemoglobin – which is actually the red cell of blood do not work without ferrous.

The main structure of our body is skeleton. It helps walking, running or bending the body. Without calcium ion these are not possible.

The total balance of our body depend on the proper power of sodium and potassium without these sense may go out.

### **5.3.7. Climatic change, cause and effect on environment – result is production of waste materials and risk of human health**

For the awareness development about environment of the upper primary students the above mentioned chapter is included. For reference of class VII text book, the chapter which start from page 227 should be followed by the teachers so that they can guide their students and both of them will realise the subject matter.

In this chapter, clear concept is given about the weather and climate. But climatic changes cause environmental hazard. But it is mandatory to know the reason of climatic change. Here the teacher will explain about the global warming. Pictures of page 230 helps to explain the reasons of global warming. By discussion and interaction method it may be cleared to the learners. Then if they discuss the effects of global warming then the reason of environmental pollutions also will be clear to the learners. Some causes and its effects are given below by a chart :

### The effects of climatic changes

Incident	Effect	Result
Increase of global warming	Exceptionally high increase of CO <sub>2</sub> in the atmosphere	Within 1980-88, India got 18 heat wave, result death of many people
Melting of glaciers and high rise water level of rivers	Erosion of gangotri glacier. Possibility of flood, loss of life and financial loss in the coastal region	Destruction of sundari tree forest of the wide range of sundarbon area under India-Bangladesh jurisdiction. Result is a critical situation of about life of forty lakh people and protection of the tigers. Bio-diversity is in the deteriorating condition, some rare animals are almost extinct.

Teachers are requested to read the rest of the part of this chapter and discuss with the students about the other effects and also discuss about the bio-diversity of other countries.

By following the pages No-245 of class VII books

Now we will discuss about the sources of daily wastage, their nature, ingredients, effect on human body and effect on other animals and the management of all these waste materials. Through the discussion of all these the student's awareness and healthy habit are to be developed by the guidance of the teachers.

Source	Name of the waste particle	Nature of Waste	Influence on human body	Influence on other animals	Management
School	Rubish, stool, urine	solid/liquid	Air pollution and visual pollution		Recycle process
Factory	Impure metal or compound	liquid/gasious	Infectious disease	Migration of local animals	Obey doctors' advice
Pond or Drinking water	Various infection		Hepatyitis		Obey doctors's advice and boil the drinking water
Play ground					
Home					
Hospital					

Following the text book of class VII, teachers are requested to help their students for filling up the above blank tables applying discussion, using LTM and interaction methods of teaching.

## Check your Progress — 2

Direction : Compare the answer key at the end.

(A) Classify the Bio-diversity of West Bengal.

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(B) Give example of the role of matter for building up of living body. Mention at least three examples from your practical experience.

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(C) What do you think about the relation of human health hazard and climatic change? Express your opinion with at least three examples.

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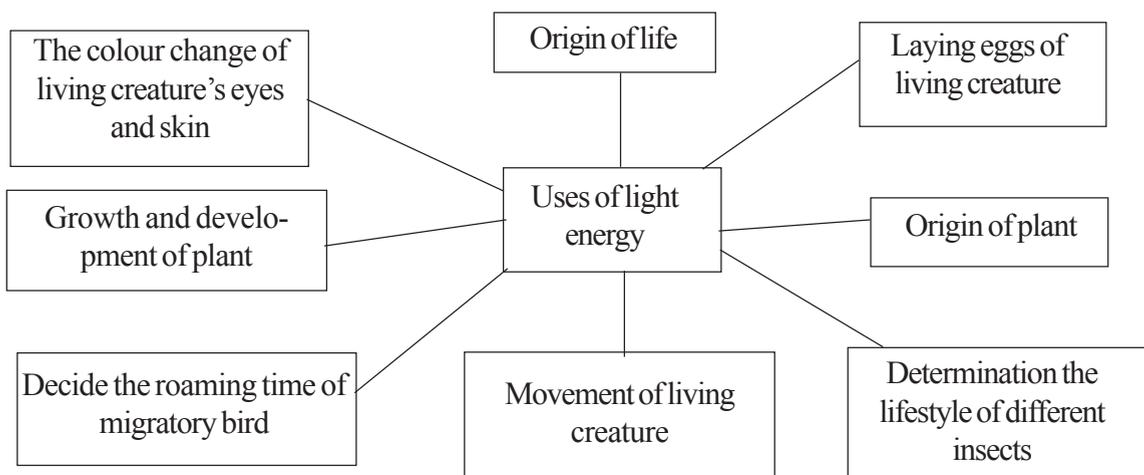
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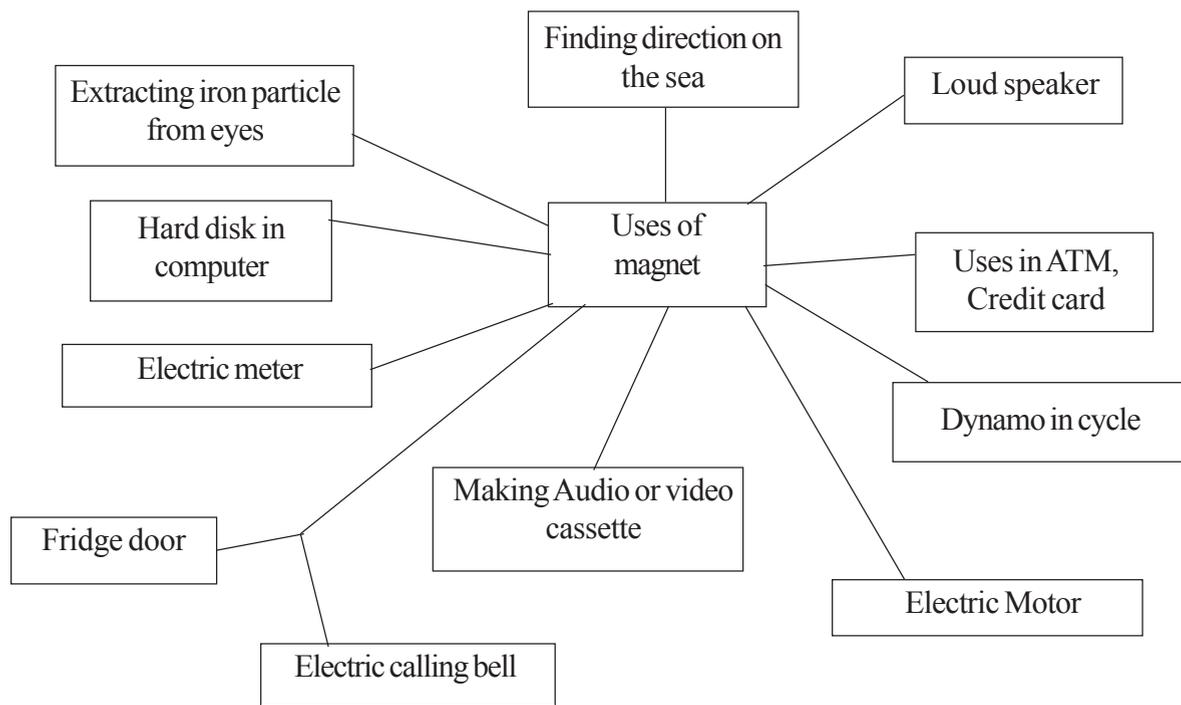
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### 5.3.8 Physical environment — heat, light, magnet and uses of Eco-friendly powers

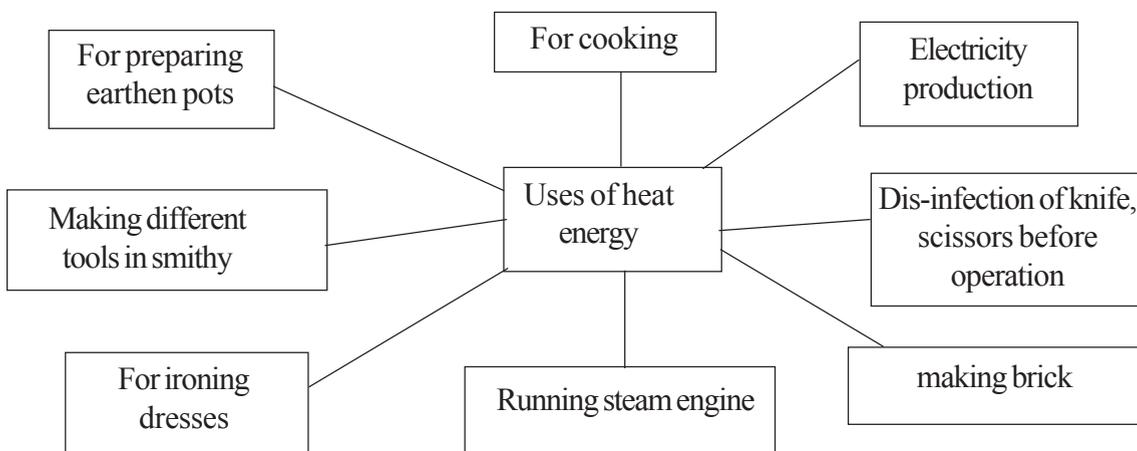
In this chapter, necessary concepts of heat, light, magnet, electricity and their sources and uses in daily life – are discussed. Because our livelihood depends on few conventionat powers. At first let us see the effect of light. The sources of light are:— The Sun, The Moon, stars, planets, forest fire, artificially produced electric light, kerosene, Candle light, light from firefly.



Use of magnetic energy— There are various uses of magnet in our daily life. The teachers will make their students interested in following the text book of class VII, page 38 - 47. There are two types of magnets in our environment. These are (1) Natural magnet and (2) Artificial magnet. An iron rod is transformed into a magnet after wrapping it with copper wire with electricity flowing through it. It is called electro magnet. The uses of magnet in our daily life are as follows :—

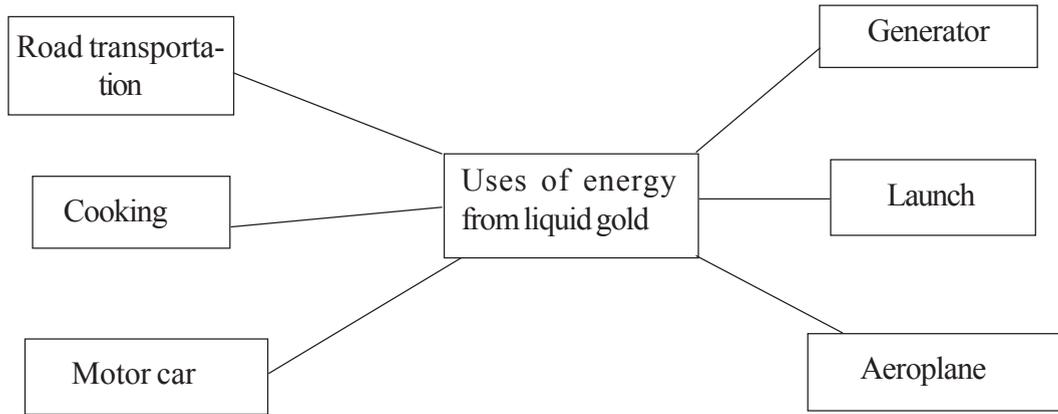


Uses of Heat energy— Following page 1-14 of class VII text book teachers will help their students to make their concept clear.

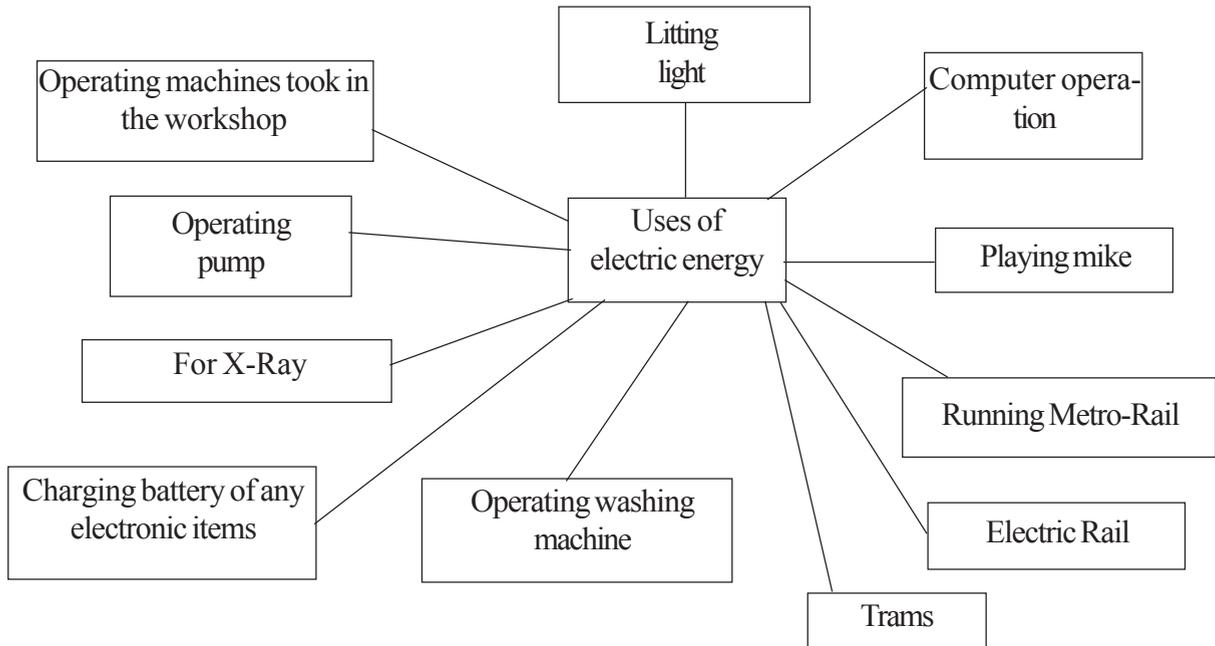


This is an environment friendly energy. The teacher will follow the examples and pictures from the book for explaining this.

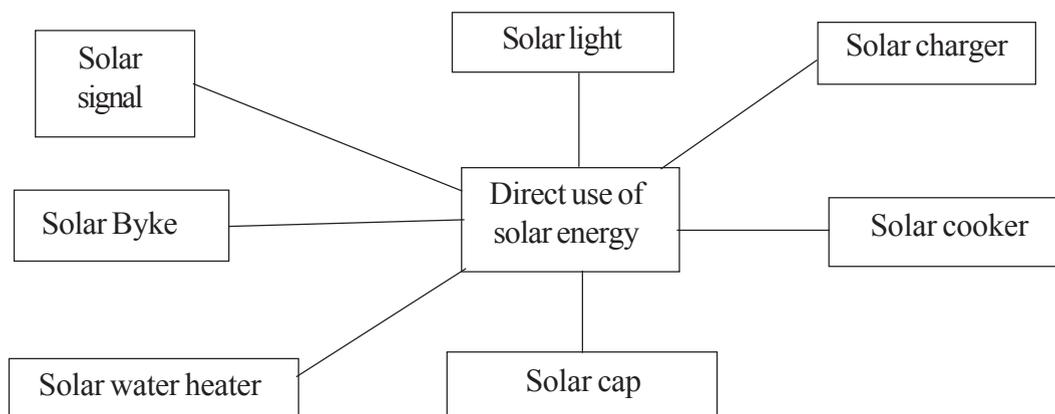
Another environment friendly energy is : —



Now we will discuss about the uses of environment friendly popular energy. Reference is from class VII text book.



Now the teacher will explain the reason of using solar energy and will highlight the different ways of using solar energy.



Less conventional but environment friendly other energies are large size wind mill, bio-gas etc. Scientists are continuously trying to invent more environment friendly energies for human welfare.

### 5.3.9 Environmental Hazard — Plant hazard and conservation, Endangered animals and conservation and fuel hazard and conservation

A large region covered with wood is called a forest. We get more or less 5000 things for our daily use which we get from wood. But due to heavy-population growth

The areas of forest is diminishing continuously. So, UNO have declared the year 2011 as International Forest year for awareness development. Now let us see how men get benefit from forest.

(a) Control weather (b) Control heat and water cycle on the earth crust. (c) Helps for the shelter of wild animals, (d) Control the soil erosion and flood. (e) production of wood for furniture and different industry (f) control the underground water level (g) sources of fuel (h) sources of medicine for different pernicious diseases.

### Forest Fire and Loss of Environment

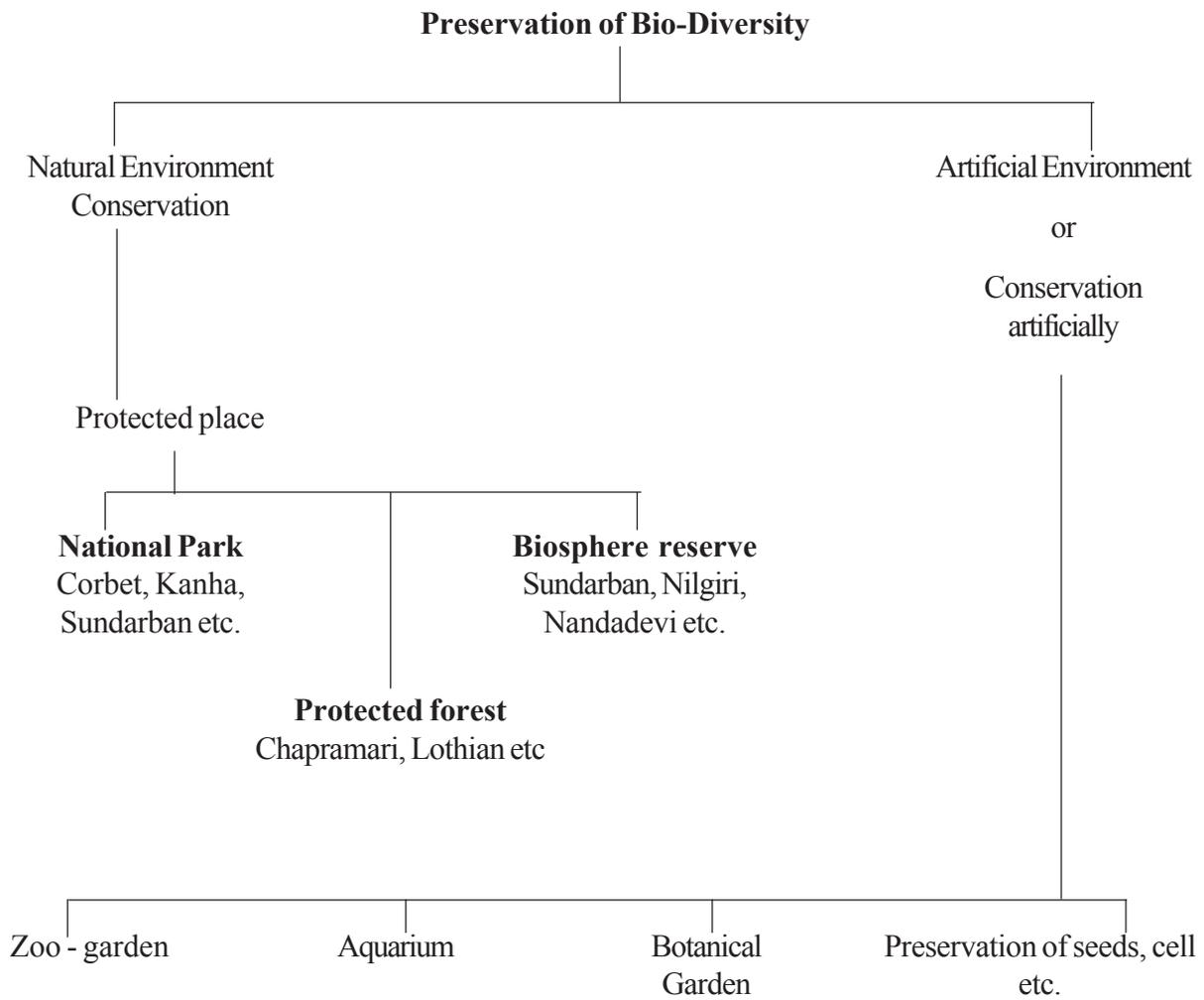
When a forest catches fire by natural source it is called forest fire.

- When a forest fire destroys the trees, the atmospheric temperature gradually rises up.
- After forest fire, parts of burnt trees mix with water and water pollution starts.
- During forest fire a large number of wild animals die and air pollution starts.

At present due to over population demand of land rises, which results in decreasing the area of forest. So, the balance of environment disturbs. Now the preservation of forest is an urgent necessity. We should follow the following conditions :—

- (a) To protect the felling down trees in the forest.
- (b) To grow new forest by planting more saplings.
- (c) To control grazing in the forest.
- (d) Same species of trees should be planted after cutting the matured trees.
- (e) Proper care should be taken for protection of trees from disease.

Hazards and conservation of endangered animals :— Due to over population, bio-diversity diminishes. Different types of activities of man endangers animals. These are (a) excess use of resource (b) destruction of shelter of wild animals (c) creating environmental pollution (d) changes of weather (e) hunting (f) commercial use of different parts of the body of wild animals.



Hazard and conservation of fuel : —

In the modern human society over population, developing life style, civilization etc, cause fuel hazard. To over come this hazard, the awarness of fuel conservation begins. Following are the ways for this purpose :

- (a) Saving fuel by using advanced cooking oven.
- (b) High production of bio-gas and production of pellet by the dried domestic waste.
- (c) Use of non-conventional energy in wide range like solar energy, wind energy, tidal energy etc.
- (d) Avoid wastage of extra fuel.
- (e) Awarness of people for conservation of coal.
- (f) More geological investigation for preservation of mineral oil
- (g) To apply modern techniques for extraction of oil from underground.
- (h) Use alternative fuel oil.
- (i) Appropriate measure is to be taken for controlling the wastage.

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### **5.3.10. Environment and Public health**

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Environment hazard and physical health is inter-related. After invention and use of metal, man uses copper, iron, aluminium, murcurry and nickel etc. The living and non-living compound of all these metals enter into the human body through food or drinks from the environments. And man suffers from various diseases.

In West Bengal, under the surface of different districts like Maldah, Murshidabad, North and South 24 Parganas there are layers of harmful minerals. These effect directly human body through underground water, which cause many types of non curable skin diseases.

In the districts of Bankura, Birbhum, Maldah, some minerals of Flurinel exist. Long use of tube-well water cause different types of diseases of teeth. There are some occupational diseases which are as follows :—

- (a) Work in workshop — Cracks in the foot bones
- (b) Soil Ploughing — Pain in back bone
- (c) Cooking & sitting in front of oven — Pain in knee
- (d) Continuous writing — pain in hand and shoulders.

Other Physical causes which create diseases on professional ground : —

- (a) Electric — getting shock
- (b) Heat — Burning
- (c) Cold — Snowbite
- (d) Sound — Deaf
- (e) Radiation — Anaemia

Following class VII textbook page 256-262 teachers may help their students in more detail.

### 5.3.11. Environmental Policies

The meaning of principle is discipline. As the earth is the shelter of all living creatures to live in a healthy manner, so there should be a principle, management and directives to maintain this environment in a good condition.

At the first stage of civilization, man used to observe some ritual systems for protecting the environment by worship the forest or god of fire etc. Later on when the progress in trade and commerce, industry and science started then different type of bad effect started in the environment. But then and there man started to rectify their fault and start to prepare rules for protection of environment.

The first point of environmental principle is that — every man has right to live independently in the clean and healthy atmosphere maintaining his own society and culture. In National level different environment related organizations are

1. Environment, forest and wild animal ministry, Govt. of India :—
  - Formation of environment and wild life ministry in 1980
  - In 1995 expansion of activities of this dept. These activities are :—
    - (a) Scrutiny and conservation of wild life and plant.
    - (b) Pollution control and prevention.
    - (c) Aforestation and recover the fallow land
    - (d) To help in research work on environment.
    - (e) To develop the public awarness on environment.
    - (f) Financial help to the environmental revolutionaries.

2. Other Govt. and Private organization at national level : —

- (a) Central soil salinity research institute, kerala
- (b) Tata energy research Institute
- (c) State Pollution control Board
- (d) National wasteland management committee.
- (e) National Dairy Development Board
- (f) National environment engineering research institute.
- (g) Bombay Natural History Society
- (h) Advisory board on energy.

**Check your progress – 3**

Direction : Compare answer key given at the end.

(A) Mention one environment friendly energy and write its multipurpose uses.

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(B) Why the conservation of plant, endangered animals and fuel are necessary?

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(C) How does environment influence public health? Write in brief.

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D) State the environmental principle which are observed in our countries.

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### 5.3.12 Let us sum up :-

A brief discussion on environmental study has been done here for the students of class - VI to VIII

At first discussed about the plants and living creatures around us and their interrelations.

After that, some incidents are happening continuously around us permanently or temporarily which are to be looked into.

After that the Bio-diversity and its classifications have been discussed.

Then we discussed about living and non-living matters and their role in formation of living body.

In the next chapter discussion is done about the changing climate of the earth, its reason and effect on our environment, what types of wastage are produced, risk of human life and risk of public health.

In the next chapter we discussed physical environs and environs friendly energy's uses.

Then we discussed the environmental hazard and the ways for conservation of plants, animals and fuel and growing awarness to public.

A compulsory discussion is done with the above all topics — i.e. the environment and public health. The learners of upper-primary level are the future of our country. So when they will have awarness about this then only the projects selected for public health development will be sighted.

At last for protecting and maintaining the good environment, some principles are discussed here. At last some govt. and private organizations are highlighted and their purposes are also discussed.

### 5.3.13 Exercise

Direction : – Answer the following questions within 150 words : —

- (a) What are the objectives making the EVS subject of class VI-VII as compulsory?
- (b) Mention the plants and animals around your areas and find out their inter-relations.
- (c) Discuss in brief the role of living and non-living matters in formation of living creatures.
- (d) What are the relations between the change of climate and risk in human life?
- (e) What are environment friendly energies? Discuss their uses in brief.
- (f) What do you mean by environment hazard? Write in brief the methods of conservation.
- (g) How do the environment influence public health?
- (h) Write in short a description on the environmental principles in our country.

### 5.3.14 Answer hints to check your progress

1.
  - a) Mention three major objectives.
  - b) Apply your own experience for example.
  - c) Give example which are appropriate for upper primary students based on their experiences of daily life.
2.
  - a) Take help from local experience.
  - b) Classify the matters and apply own experience
  - c) The causes of change of climate in relation with the changes of environs which influence human body. Write in your own words.
3.
  - a) It is better if you mention environ friendly energy from outside textbook.
  - b) Describe the conservation of these three for balancing the environs
  - c) Collect information about the occupations of your local people and relate their diseases which they suffer from.
  - d) What is environmental principles that you try to understand and realise. Write these in brief.

# Unit – 6

## Evaluation in Environmental Science

### Structure :

- 6.1 : Introduction
- 6.2 : Techniques of evaluation
- 6.3 : Tools of evaluation
- 6.4 : Knowledge of C.C.E. in EVS with reference to NCF – 2005 and NCFTE – 2009
- 6.5 : Summary
- 6.6 : Exercise
- 6.7 : Check your progress

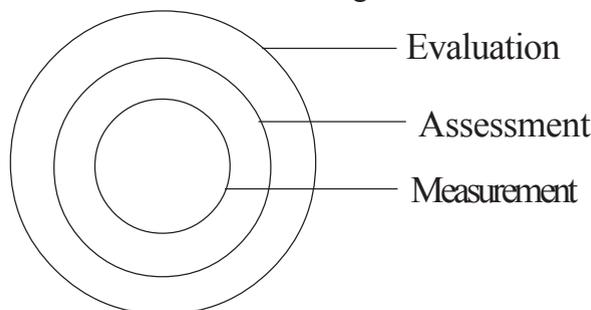
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### 6.1 : Introduction :

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The word ‘Evaluation’ is important in modern education. Primarily, the meaning of the word is to evaluate the behavioural performance of a person. This behavioural performance is the development of person’s knowledge, attitude, attention, interest, personality. Due to wide change in the field of education, the importance of evaluation has been increased and at the same time its complexity has been developed. So, for simplicity, this evaluation process has been divided into three parts– a) Measurement b) Assessment, c) Evaluation.

- a) **Measurement** : This is the first stage of evaluation. In this stage, special characteristics of a person are measured separately.
- b) **Assessment** : This is the second stage of evaluation. Its conception is greater than measurement. Here interpretation is made on the measured scores obtained in earlier stage. This stage is the preceding stage of final evaluation.
- c) **Evaluation** : In this stage the conception about the development of the person’s cognitive, mental, emotional, physical and all-round features are got. At this stage, the information obtained from the Assessment Stage is taken as final form. Three stages are shown in the picture :



So, the three stages are mathematically related as –

Evaluation = Measurement + Assessment.

In EVS, Assessment is used instead of Evaluation, without considering the wider concept of evaluation.

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## 6.2 : Techniques of Evaluation :

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Before knowing the techniques of Evaluation, it is better to know about the place of Evaluation in the field of Education.

According to Benjamin Bloom, objectives of education, learning experience and Evaluation– These three are interrelated. He has considered these factors as the three Apexes of a triangle, at the top apex ‘objectives of education’, ‘Learning experience’ and ‘Evaluation’ on the other two apexes. He has named the triangle as ‘Triangle of Evaluation’.

Now let us discuss about ‘The techniques of evaluation’.

The techniques are special type of methods by which students’ physical, mental, educational, social, emotional qualities and personality are measured. According to the characteristics of those qualities, the techniques are classified into four categories–

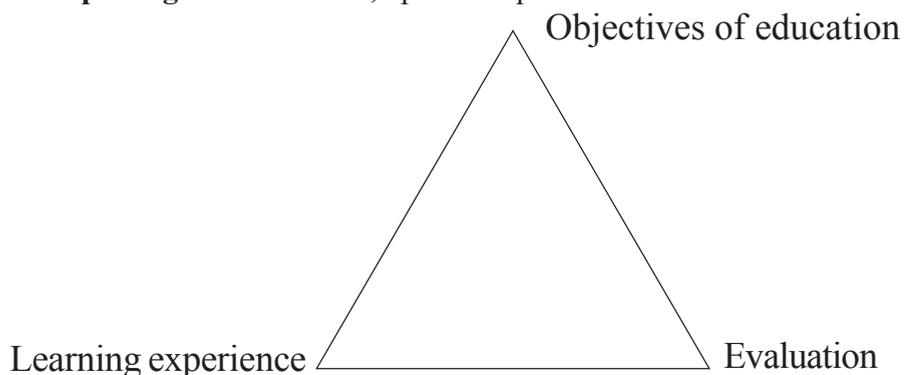
- i) Testing
- ii) Observation
- iii) Self Reporting
- iv) Projective technique

**i) Testing :** According to Garrett : “A test is merely a series of tasks which are used to measure a sample of a person’s behaviour of a time”.

So, in testing evaluation, certain types of activities are used in the performance of evaluation.

**(ii) Observation :** After knowing the behaviour of any person, when efforts are made to know the person directly, the technique is known as ‘observation’. In this method, a person in working stage, is observed to know his thought, skills, intelligence and other behaviour.

**(iii) Self Reporting :** In this method, a person expresses his behaviour or characteristics answering some



questions by himself. In general, the questions are in the form of person's liking and dis-liking, fear, hope and aspiration, sexual affairs etc. With these answers, it is known how the student adjusts with the environment or needs and hence his attitude, interest, personality etc. are evaluated.

**(iv) Projective Test :** In this technique, some words, meaningless pictures, incomplete sentences are presented before a person. Then the person is asked to give reactions. After that, the reactions are measured to know his various characteristics.

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### **6.3 : Tools of Evaluation :**

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For implication of the four techniques of evaluation, specific activities are required. These activities as a whole are called as 'Tools of evaluation'. Different tools are used for different techniques. So, the tools are named in various ways. Now let us discuss about the tools of above mentioned four techniques of evaluation.

For the test technique, the tools are primarily divided into two categories – a) Educational tests b) Psychological tests.

- a) Tools of the educational tests include oral tests, written tests, diagnostic test.
- b) Psychological tests include intelligence tests, Personality tests.

**The observation technique includes the tools :**

- a) Anecdotal Record
- b) Checklist
- c) Creative Activity
- d) Sociometry
- e) Rating Scale

**The third type of technique 'Self Reporting Technique' includes the tools :**

- a) Interview
- b) Questionnaire
- c) Diary
- d) Autobiography

**The fourth and the final Technique 'Projective Technique' includes the tools :**

- a) Associative type
- b) Constructive type
- c) Choice type
- d) Expressive type

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## **6.4 : Knowledge of C.C.E. in EVS with reference to NCF – 2005 and NCFTE – 2009**

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Full name of CCE is Continuous and Comprehensive Evaluation. In the context of NCF– 2005 and NCFTE – 2009, the discussion of C.C.E in EVS may be discussed in the following ways :

- Evaluation : Some essential concepts
- New curriculum and ‘continuous and comprehensive evaluation’ : Formative evaluation and summative evaluation
- Accepted structure of evaluation
- Indicators of evaluation, Rubrics and Grades.
- Documents of Comprehensive Continuous development
- Some questions and their answer related to evaluation.

### **Evaluation : some essential concepts**

- Evaluation is not a discrete matter from teaching method. After independence, this matter is again and again reflected in the commissions relating to educational matters, outline of curriculum and overall Right to Education Act – 2009.
- Evaluation is not merely the evaluation of students’ performance, it is the evaluation of curriculum and related learning.
- Evaluation exerts on students and teachers, when the Curriculum is covered at the end of any educational session. Then the importance of evaluation becomes less and it is treated as a subject apart from the curriculum. Instead of it, Continuous Comprehensive evaluation is helpful in diagnosing weakness of students and these weaknesses empower the students through remedies.
- CCE gives clear ideas about children’s understanding knowledge and the ability to apply the same (RTE Act 2009).
- clear reflecting should be obtained about the students’ problem solving power and active participation in individual or group activities.
- There should be wider space for expressing enquires, analytic powers, creativity of the learners in learning methods and evaluation process.

### **New curriculum and continuous comprehensive evaluation**

In continuous comprehensive evaluation, students’ continuous developments are continuously observed and recorded throughout the academic session. So, in new curriculum, Formative and Summative Evaluation are included.

Formative Evaluation : This type of evaluation happens both in inside and outside of classroom during learning period. For this evaluation, five indicators are considered. These indicator are used for students’ comprehensive development. It is to be remembered that the indicators have been considered on the basis

of national curriculum framework 2005, Right to Education 2009 and constructivist approach. Teachers will use these indicators both in inside and outside classroom during teaching-learning process.

**The indicators are :**

1. Participation
2. Questioning and Experimentation
3. Interpretation and Application
4. Sympathy and Cooperation
5. Aesthetic and Creative Expression

**Summative :** In new curriculum, three Summative Evaluations have been placed. First one, from first to second week of April, Second one, from last week of July to first week of August and lastly third one, from last week of November to first week of December have been arranged.

For Summative evaluation, two special things are to be kept in mind–

- (i) In question papers, the philosophy of open-ended question framing works. (At least  $\frac{1}{3}$  of the question should of this type.)
  - (ii) Nature of questions should be of expressing analytic power and creative power of the students. Teachers should remember these thoughts. Except these, it is to be remembered that students' retention level of the acquired knowledge should be measured.
- It is to be remembered that, although formative and summative evaluations are different, yet they are complementary to each other. Formative evaluation is diagnostic in nature and summative evaluation is judgemental in nature. So, it is completely unscientific to unite obtained grades or numbers of two types of evaluations.
  - Specific Rubrics and Grades are given in the evaluation report card, so that the students can get clear and transparent conception about themselves.
  - Proper arrangements are to be maintained for examinees' teaching exercise and thereby for getting real learning.
  - It is essential to determine teaching disabilities of the examiners.
  - It is helpful in determining Primary level teaching methods and Teaching Aids are to be made practical and appropriate to the children.
  - It is helpful in the arrangement of Teaching Process.
  - It is guided for remedial Teaching and evaluation.

## **Indicators of Evaluation, Rubrics and Grades**

### **Rubric of Indicators**

#### **Indicator No. 1 : Participation**

- A : Actively taken part and having qualities of leadership.
- B : Actively taken part through exchange.
- C : Taken part, but not much interested in exchange.
- D : Not interested in taking part.

#### **Indicator No. 2 : Questioning and Experimentation**

- A : Able to prepare learning oriented question and interested in experimentation.
- B : Able to prepare learning oriented question but not interested in experimentation.
- C : Not able to prepare learning oriented question but interested in experimentation.
- D : Prepares question but not oriented in learning or learning experimentation.

#### **Indicator No. 3 : Interpretation and Application**

- A : Ability to interpret the related concept with example and to apply.
- B : Ability to interpret the related concept with example and not to apply.
- C : Ability to interpret the related concept partly but not to apply.
- D : Has memorised only the related concept.

#### **Indicator No. 4 : Empathy and Co-operation**

- A : Actively empathetic to known and unknown person
- B : Actively empathetic to known person but only empathetic to unknown person
- C : Empathetic to known person
- D : Not empathetic to known and unknown person

#### **Indicator No. 5 : Aesthetic and creative expresstion**

- A : Aesthetic and creative (Inside and outside classroom)
- B : Aesthetic and creative (Inside classroom)
- C : Aesthetic but not creative (Inside and outside)
- D : Unable for Aesthetic and creative expression (Inside and outside classroom)

## 6.5 Summary :

In EVS three words have been discussed in connection with evaluation–measurement, Assessment and Evaluation. Measurement is the quantitative qualities towards the special characteristics of a person. Primarily, Assessment is the stage of interpreting the scores obtained by measurement process. At the final stage evaluation acts at the developmental stages of a person’s cognitive, mental, emotional, physical and all-round qualities. Assessment is treated as the preceding stage of evaluation. So, in many cases, these two concepts are treated as synonymous.

There are 4 techniques of evaluation or assessment– i) Testing ii) Observation iii) Self-reporting iv) Projective. There are so many tools for each technique. The tools are discussed in each technique.

After that, continuous and comprehensive evaluation is discussed in the light of NCF–2005 and NCFTE – 2009.

### Design for continuous Comprehensive Evaluation (CCE) (I – VIII)

Class Capsule	Formative	Summative	Formative	Summative	Formative	Summative
I & II	10	10 (Time-20 Minutes)	20	10 (20 Minutes)	20	30 (1 Hour)
III, IV & V	10	10 (Time-20 Minutes)	20	20 (40 minutes)	20	50 (1 Hour 30 Minutes)
VI, VII & VIII	20	15 (Time-20 Minutes)	20	25 (50 Minutes)	20	70 (2 Hour 30 Minutes)

### Total marks for each indicator/Subject

Class Capsule	Formative	Summative	Percentage	
			Formative	Summative
I & II	50	50	50%	50%
III, IV & V	50	80	38%	62%
VI, VII & VIII	60	110	35%	65%

### Distribution of Marks

Class Capsule	Total marks for Assessment	Formative	Summative	Percentage	
				Formative	Summative
I & II	450	250	200	56%	44%
III & V	650	250	400	38%	62%
IV	800	250	550	31%	69%
VI	1100	300	800	27%	73%
VII & VIII	1300	300	1000	23%	77%

Grading Scale for Formative Assessment	Grading scale for summative Assessment seven point Grading system	
	Marks	Grade
A = 75 – 100%	Below 25	D
B = 50 – 74%	25 – 44	C
C = 25 – 49%	45 – 59	C+
D = Below 25%	60 – 69	B
	70 – 79	B+
	80 – 89	A
	90 – 100	A+

In the light of constructivist approach 5 indicators of Evaluation have been selected on the principles of NCF – 2005 and NCFTE – 2009. By these indicators evaluation on the students' abilities may be performed inside and outside of classroom. On this thought the evaluation process has been done. The indicators are :

- i) Participation
- ii) Questioning and Experimentation
- iii) Interpretation and Application
- iv) Empathy and Co-operation
- v) Aesthetic and Creative expression.

Here also Formative and Summative evaluations are discussed. Although there is a difference between these two types of evaluation, yet they are complementary to each other. In nature Formative evaluation is diagnostic and summative evaluation is judgemental type.

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**6.6 : Exercise : Answer the questions (each within 50 words) :**

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1. What is the difference between ‘Measurement’ and ‘Evaluation’?
2. What do you mean by Evaluation triangle?
3. What are the techniques of Evaluation?
4. What are the tools of Evaluation techniques?
5. What is self-reporting technique of evaluation?
6. What is the full name of CCE? What are its functions?
7. What are Formative and summative evaluations?

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**6.7 : Clues to answer :**

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In answering the above mentioned questions, you may take the help of following hints :

<b>Q.No.</b>	<b>Hints</b>
1., 2.	6.1 sub unit
3.	6.2 ”
4., 5.	6.3 ”
6., 7.	6.4 ”

# Unit - 7

## Process-based skill enhancing teaching-learning Plan – Pre-Internship and Internship

### Structure :

- 7.1. Introduction
- 7.2. Objectives of lesson unit
- 7.3. Process based skill enhancing teaching learning
- 7.4. Process based teaching-learning skill
- 7.5. Steps of Process Based Teaching-Learning
- 7.6. Lesson Plan
- 7.7. Types of Lesson Plan
- 7.8. Lesson plan introduced by West Bengal Primary Education Board
- 7.9. Example on Lesson Plan
- 7.10. Conclusion
- 7.11. Exercise
- 7.12. Check your Progress

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### 7.1. Introduction

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According to NCF 2005 and RTE 2009, in order to make classroom teaching joyful and successful planning is necessary to develop trainee teacher's teaching-learning skills. To improve CCE (Continuous and comprehensive evaluation) and PBLT (Processbased teaching-learning) this chapter has been written for Pre-Internship and Internship period. From this chapter they will know about PBLT and understand the areas of planning's execution.

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### 7.2. Objectives of lesson unit

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#### After studying this unit, you will -

- Get ideas about practice teaching or internship in teaching-learning process.
- Understand about teaching-learning skills and lesson plan, that happen simultaneously to improve teach's professional knowledge and skills.
- Know about the causes and objectives of PBLT and also about the nature of skills.
- Know about five skills, the process to achieve the process based teaching-learning ability.
- Both the teacher and students will understand about the structure, necessity and types of lesson plan.

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### **7.3. Process based skill enhancing teaching-learning**

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In child centric educational process teacher plays a pivotal role. According to RTD and CCE, an important method to make students' learning process successful is process based skill enhancing teaching-learning. Through this method we can understand students' learning abilities, if they can apply these acquired abilities in real life, if students' viewpoint and mentality is changing and their ethics develop or not. Students get chance to apply their identifying student's weak points. Teacher can improve students' educational quality. In order to improve educational quality, teacher's professional teaching-learning activities should be changed.

#### **Practice Teaching/Internship :**

Now-a-days teacher's training process has become very important socially. In each level, modern curriculum and new process are being included. As a result teaching process is suffering in teacher's training system. Because two types of preparation are necessary for teachers to teach before and after joining in service—

- (a) Pre-service teacher training
- (b) In-service teacher training

In teachers' training, practice-teaching is very much significant. The objectives are :

- Increase necessary ability for teaching profession
- Acquire linguistic ability and various teaching process with the subject based knowledge.
- How a trainee will make a lesson plan independently.
- Trainee-teacher will know about how he/she will complete teaching within the given time.
- Training is given in order to achieve teaching related process bases skills.
- Trainee teacher's ability to observe, imagine and knowledge about time management are improved.
- Give enough opportunities to achieve the aim through proper use of social activities, co-curriculum activities, sufficient laboratory and teaching-learning materials.

In order to analyse these objectives the following topics can be selected —

- Professional knowledge of teachers
- Interest in profession
- Professional skill
- Principles and values of profession

## **Professional knowledge and competence of teachers :**

In order to increase professional knowledge and competence of teachers two contemporary subjects are :

- (a) Process-Based Teaching-Learning skill
- (b) Lesson-Plan

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### **7.4 . Process-Based Teaching-Learning skill**

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In NCF 2005 and RTE 2009, process-based Teaching-learning has been taken as an experiential endeavour in order to make the teaching process interesting and joyful in school. West Bengal Government takes the initiative by making the structure of PBLT with the help of CCE and the instructions of modern curriculum 2013.

#### **Cause of applying PBLT :**

In many researches it has been found that students show less interest in learning in school and the reason behind it is the process of screaming. In most cases it happens because of the lack of sufficient infrastructure and teacher's inability to make the teaching process interesting and attractive.

#### **Objectives of PBLT :**

- (a) Increase the ability to observe.
- (b) Student's active participation in learning.
- (c) Ability to collect and analyse data with the help of the result of assessments/exams.
- (d) Increase tendency to solve problems by taking reasoning and scientific steps.
- (e) Evaluate students by taking continuous and comprehensive evaluation through works-sheets and improve student's expected outcomes.
- (f) Create appropriate environment for group activities.
- (g) Teach lesson by using audio-visual teaching-learning materials of lower price.
- (h) Encourage students to think about environmental and social context out of their syllabus for their all round developments. For this purpose debate competition, play, publishing of wall magazine should be organized.

### **Nature of Process-Based Teaching Learning Skill :**

Process-based Teaching Learning is a kind of peer-group learning for a short spare of time. This skill is used in order to develop and improve the teaching-skill of trainee-teachers. Here a trainee teacher plays the role of another trainee teacher. If any fault can be found after teaching, other trainee teachers will discuss for his/her improvement. After this, the trainee teacher will join others to give feedback when other trainee teacher will teach them as a teacher. In this way all the Teaching-Learning cycle goes on until all the trainee teachers achieve their expected behavioural outcomes. As a result the trainee teacher will be able to apply his behavioural skill in real classroom subsequently.

In Process-Based Teaching Learning time is limited (10-15 minutes) and a short unit is taken as a topic these practice is given much importance and the situation is totally countered.

### **Concept of ProcessBased Teaching-Learning :**

Process-Based TeachingLearning helps trainee teachers to achieve skills followed in real classroom situation and learn teaching related other skills.

It helps to observe and analyse teaching related problems.

It gives the trainee teachers' opportunities to participate in teaching-learning process as a teacher, a student and also an observer.

- Complexity of teaching method can be reduced by PBLT.
- Individual teaching activities being a part of a peer group.
- Teaching skills can be controlled through feedback.
- It gives opportunities to practice again and again with the help of vedio film that record teacher's criticism and execution of activities.

### **Components of PBLT :**

1. **No. of Students** - 5–10
2. **Time of teaching** - 10 minutes.
3. **Presentation of subject** - On the basis of unit division.
4. **Acquisition of teaching** - learning skill - Process-Based Teaching Learning Skill is a new chapter in the syllabus. It has been included for the qualitative improvement of teaching learning activities. This method is taken as a modern teaching- learning process which helps to achieve skills through integration. On

the basis of CCE and Constructivism West Bengal Primary Education Board has included five skills in D.El.Ed. Syllabus. These five skills are :

- (a) Skill of Integration through correction of subjects.
- (b) Skill of Introduction Child Centric Lesson.
- (c) Skill of Encouraging questioning by the lessons.
- (d) Skill of Encouraging observation by the lessons.
- (e) Skill of Integrating performing Art in learning.

**5. Feedback :** In order to the change student’s behaviour feedback sheet (per group) and signatures of trainee teachers who have participated, are necessary.

**6. Laboratory :** For practicing teaching-learning process we need a suitable and controlled atmosphere. That’s why Laboratory is necessary for Process-Based Teaching Learning.

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## **7.5. Steps of Process-Based Teaching Learning**

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We can divide PBLT in the three steps/stages :

- (a) Preparation Stage
- (b) Stage of Presentation and Practicing
- (c) Stage of Evaluation and Re-evaluation

**(a) Preparation Stage**

● At this stage teacher will explain the teaching skill to the trainee teachers. He will also explain the aims of achieving skills and how trainee teachers’ behaviour will be changed after learning.

● Trainee teacher will prepare a lesson plan so that he/she can present the ‘Skill’ within a very short time. The structure of the lesson plan is given below. The trainer teacher will prepare lesson plan with its help.

Name of Skill	:	
Behavioural Component	:	
Place	:	Name of the Institution :

Class :  
 No of Trainee Teachers :  
 Time : 6-10 minutes  
 Subject :  
 Topic :  
 Today's Lesson :

Name & roll no. of Trainee teacher (as a teacher) :

Topic	Teacher's Activity	Students' Activity	Behavioural Component

**(b) Stage of Presentation and Practice :**

At this Stage the Trainee teacher teaches a small group of students (5-10 student) following lesson plan made on the basis of one skill. A teacher educator and the poor group will observe this. He/she will teach spontaneously on the basis of behavioural component. All the Trainee teachers will present and practice these skills subsequently.

**(c) Stage of Evaluation and Re-evaluation :**

Trainee teacher will record data according to the behavioural components in the observation sheets Teacher educator will give 'Feedback' on the basis of the presentation of a lesson. In this way he will identify the faults of the Trainee teacher and then the Trainee teacher will replan the lesson. Then the Trainee teacher will again practice the lesson among the small group. In this way the cycle will go on until he/she will achieve the teaching process entirely.

**Skill and Behavioural Component of PBLT**

Teacher will arrange the teaching learning process according to the needs and abilities of the students. The teaching learning process will continue with the help of observation, work sheet, data of class activi-

ties, check list, portfolio etc. The skill and behavioural component of PBLT are made by the teacher on the basis of NCF 2005, constructivism. We already know that the various stages of ICON MODEL (Intertextualisation Construction Model) are—(i) observation, (ii) Contextualisation, (iii) Apprenticeship, (iv) Collaboration, (v) Interpretation and Construction, (vi) Multiple Interpretation, (vii) Multiple Manifestation.

On the basis of the above discussion learning environment is prepared for the construction of knowledge and development of skills during teaching learning process.

**1. Skill :** Skill of Integration through correlation of Subjects.

**Behavioural Component :**

- (i) Integration through correlation of Subjects by the students.
- (ii) To reline instance from the student.
- (iii) To cite a proper example by the student
- (iv) Generalization.

**2. Skill :** Skill of Introducing child centric lesson Behavioural component :

- (i) Student's active participation.
- (ii) Encouraging expression of opinions on specific learning experience
- (iii) Student's interaction with each other and also with teacher.
- (iv) Conclusion or decision made by students.

**3. Skill :** Skill of Encouraging questioning by the learners Behavioural Component :

- (i) Allowing learners to question/Enquire.
- (ii) Allowing flexibility in questioning.
- (iii) Ensuring appropriateness in questioning.
- (iv) Ensuring relevance in questioning.

**4. Skill :** Skill of Encouraging observation by the learners

- (i) Exposing learners to observable situations.
- (ii) Allowing learners to review and reflect on the observed phenomena (as per the requirement of the situations)

- (iii) Allowing learners to relate effects to causes/causes in effects.
- (iv) Allowing learners to apply their observations and thinking on similar situations.

**5. Skill : Skill of Integrating performing Art with the Learning situations :**

- i) Encouraging active participation in the lesson through performance
- ii) Encouraging creativity through performance.
- iii) Encouraging dramatisation of the lesson/learning situations to real life situations.

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## **7.6. Lesson Plan**

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A teacher may be experienced and active. But his/her teaching process will not be successful and interesting if he/she does prepare a lesson plan. That's why a teacher should make a lesson plan before going to teach.

**Necessity of Lesson Plan :**

- We can control the classroom environment and make the teaching process successful with the help of lesson plan.
- Teacher will be able to achieve the objectives of teaching through lesson plan.
- Teacher can apply teaching learning materials (TLM) to make the teaching process interesting.
- Teacher can apply theories in classroom through lesson plan.
- It saves time and energy.
- Teacher can represent the topics serially by using exact method.

**Necessity Components to construct lesson plan :**

(i) Teacher must have a clear concept about the philosophical view point or the basis of which the aims of lesson plan will be achieved.

(ii) Teacher should know various objectives mentioned in instructions to increase the activity of teaching-learning process. We all know that education has some general and specific objectives. The general objectives are wide and vast. These objectives are made on the basis of philosophy. These objectives are :

- (a) A person's all round development.
- (b) To make him/her a good citizen.

- (c) To develop his/her ethics/values.
- (d) To help him/her to pass leisure time.
- (e) Each subject has concept based objectives. By passing these objectives one can achieve it.

Teacher executes the teaching-learning process on the basis of his specific instructional objectives is very important to a teacher.

(iii) Concept about TLM used in classroom :

Teacher must have idea about – TLM which she/he will use in the classroom. He/she will prepare low-cost-no cost-activity/experiment design according to student's class and age.

Subject-Knowledge : Teacher must have a clear concept about the subject that she / he will teach. He/she will divide the topics into a few small sub-units and then prepare a lesson plan on the basis of any one sub-unit than can be taught within 35-40 minutes.

### **Concept of child Psychology :**

Teacher will be aware of the age and ability of each student on the basis of which she/he will represent the topic.

### **Knowledge about process and technique :**

Teaching techniques are selected, planned and constructed by the teacher. If a teacher accomplish any activity on the basis of some process then it is called method. When a teacher represent informations serially in order to integrate student's mental process with the experience got from outside, it is called methods of teaching. Approach of teaching is the viewpoint on which teachers and students exchange their opinions. So, these three concept — technique, approach and method bring expected changes in a student that help him/her to develop personality. These three are interrelated.

A technique is implementational, which actually takes place in a classroom. It is a particular stratagem used to accomplish an immediate objective. Sometimes techniques are used to apply methods. It also means pupil-pupil interaction and also pupil-teacher interaction. So teacher must have to know about these three concepts before teaching.

For instance, questioning is an important component for exchanging opinions. It can be used as both approach and technique of teaching. It can also be used to expose student's or teacher's interior knowledge.

Teacher can do many experiments in the classroom. Students can also execute these experiments as a group. What have you done? What have you seen? — after saying this teacher can write this on the blackboard and also can call the students to write. All of these are different types of technique of teaching.

We can say from the above discussion that teacher will use lecturing, demonstration, narration, use of blackboard, Experimenting, questioning in teaching student-centric or subject/topic-centric. Teacher can use these techniques, methods and approaches during practice-teaching or internship.

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## 7.7. Types of Lesson Plan

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These are various types of lesson plan. Followings are worth-mentioning.

1. Herbert's Five Step Approach.
2. Bloom's Evaluation Approach.
3. ICON Model.

### 1. Herbert's Five step Approach :

This is a primitive concept. Herbert's five steps are :

- (a) Preparation
- (b) Presentation
- (c) Comparison and abstraction
- (d) Generalization
- (e) Application / Adaptation

The structure of a lesson plan has been given below on the basis of these five steps :

#### Lesson Plan

Name of School :	Subject :
Class :	Unit :
No of Students :	Sub-units :
Average Age :	Today's Lesson :
Name of Trainee Teacher :	
Time :	
Date :	
General Objectives :	
Specific Objectives :	
Teaching-learning Material :	
Previous Knowledge :	



Evaluation :

Home work :

**(3) Lesson plan on ICON Model :**

Name of school :	Subject :	Period :
Class :	Unit :	
Name of Trainee Teacher :	Sub-units :	
Date :		
Time :		

**Today's Lesson :**

**Behavioural Learning Abilities :**

1. Remember -
2. Understand -
3. Apply -
4. Analyse -
5. Evaluate -
6. Creative -

Previous Knowledge :

Summary of Content :

**Technique of Teaching**

Teacher can encourage arinspore students by using ICON Model. Through this method student will understand the main theme of the topic.

<b>Steps</b>	<b>Steps of learning abilities</b>	<b>Role of Teacher</b>	<b>Question/example</b>
Observation			
Contextualization			
Cognitive apprenticeship			

Collaboration			
Interpretation & Construction			
Multiple Interpretation			
Multiple Manilestation			

Work Sheet :

Evaluation :

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### **7.8. Lesson plan introduced by West Bengal Primary Education Board**

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On the basis of CCE and Constructioism WBPEB has introduced a lesson plan in D. El. ED. syllabus in the workshop held in 14.2.13.

Name of the School :	Subject :
Class :	Unit :
No. of Students :	Sub-units :
Average Age :	Today's Lesson :
Name of the Trainee Teacher :	
Time :	
Date :	

**Objectives** - (a) Specific objectives (b) General Objectives

**Teaching-learning materials** - (i) General (ii) Other

**Stage of Preparation :**

Topic/ Content	Role of Teacher	Rationale	Students' Activity	Time	Reaction of Students
Classroom arrangement & enquiring previous knowledge					

**Stage of Presentation/Post Presentation :**

Topic/ Content	Role of Teacher	Rationale	Students' Activity	Time	Reaction of Students

**Work Sheet**

1st group

2nd group

3rd group

4th group

5th group

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## 7.9. Example on Lesson Plan

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School :

Subject : Environmental Science

Teacher's Name :

Unit : Formation of cloud

Class — III

Today's lesson : Whole Unit

Time — 40 minutes

### Objectives

**Special :** The learners will be able to

- Know how the cloud is formed.
- Know the name the floating particles of air.
- Acquire skills for performing experiment by their own hands.

**General :** The learners will be able to

- Enhance their interest in reading environmental science
- Remember the whole matters.
- Enhance curiosity about the various particles floating in the air.

### Teaching Aids

**Special :**

- A piece of ice and a dry glass pot.
- A chart containing pictures of cloud formation process along with coloured particles floating in air.
- One indicator rod

**General :** General Teaching Aids — Chalk, duster, board etc.

### Preparation Stage

Subject Matter	Teacher's Role	Rationality	Learners' Activity and Interaction	Time Alloted	Learners' Reaction
Initial statement	class arrangement and exchange of well-come with the learners	creation of attention and motivation	use of language and group answers	1 Minute	Showing of adequate respect to the teacher
Testing of previous knowledge & declaration of to-day's lesson.	giving assistance and taking care. Testing of learners' previous knowledge and asking some questions for creation of interest to the to-day's lesson.	Enhancing previous knowledge and correcting wrong concepts.	The learners will try to give correct answers.	4 Minute	External expression of learners' previous knowledge.

### Presentation Stage

Subject Matter	Teacher's Activity	Rationality	Learners' Activity and Interaction	Time Alloted	Learners' Reaction
Experiment with a piece of ice	The piece of ice will be kept into the dry glass pot and the whole	Enhancing the learners' interest	The learners will attentively observe what their teacher is performing	10 minutes	Enhancement of learners' observation & interest

<p>and a dry glass pot.</p>	<p>arrangement will be kept open to all. When little drops of water will be formed on the outer space of the glass pot, then the questions will be put to the learners — ‘from where the drops of water come?’ If the learners are unable to give the answers then they will be helped in understanding.</p>		<p>and will give their answers on discussing within themselves. They will try to understand the cause of coming drops of water.</p>		
<p>Showing of charts on the sources of water &amp; dust particles</p> <p>ii) How the rain falls from the cloud. iii) How the water drops are floated</p>	<p>Showing the charts with indicator stick the following matters are to be made under stand clearly :</p>	<p>Creation of enthusiasm</p>	<p>The learners will hear the teacher’s statement carefully and attentively. They will know how the cloud and rainfalls are</p> <p>i) How the cloud is</p>	<p>10 minutes</p>	<p>They will be able to know how the cloud is formed around the dust particles happend.</p>

along with the dust particles in the air medium.					
Use of board	Drawing a circle on the board, different elements of air are to be made understand with various coloured chalks.	For creation of self-confidence among the learners.	The learners will know the different elements of atmosphere with enthusiasm and will write on the board of the class-room.	10 minute	Various elements of the atmosphere are to be marked.

### Stage after Presentation

Subject Matter	Teacher's Activity	Rationality	Students' Activity and Interaction	Time Allotted	Learners' Reaction
Skill based evaluation through work-sheet — sheets will be distributed to the students (group-wise) after forming a few groups among the students. After that, they will be asked to fill the work-	Some questions will be set for testing the to-day's lesson and some work	Development of structural knowledge	The students will be able to give answers and they will fill the work-sheets correctly.	5 minutes	Testing of concept about subject matter.

sheets. It last the work- sheets will be corrected.					
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### 7.10. Conclusion

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Now the reasonable word ‘Internship’ is used in place of ‘Practice Teaching’. The system of practice teaching must be more wide, applicable and realistic so that the trainee-teachers can apply their lesson plan in real classroom situation in school. This will help both the pre-service and in-service teacher. It will help in-service teachers to improve their knowledge, interest and attitude. In this way the teaching process can be improved.

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### 7.11. Exercise

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Answer the following questions. Word limit for each question is 50 words.

- a) What is practice-teaching or internship in teaching-learning process?
- b) What is the full name of PBTL? State its objectives.
- c) What is the full name of ICON? State the name of its steps systematically.
- d) State the five skills of D.El.Ed. curriculum which are accepted in the work-shops of 13.02.13 and 14.02.13 organised by WBBPE.
- e) Write down the name of Herbert’s five step method.

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### 7.12. Check your Progress

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Answer the above mentioned questions for checking your progress :

- a) \_\_\_\_\_
- b) \_\_\_\_\_
- c) \_\_\_\_\_
- d) \_\_\_\_\_
- e) \_\_\_\_\_

# Unit - 8

## Project

### Activity Method

#### Example : Water observation

##### Introduction

- i) Important factors of environment.
- ii) Materials very essential for living of Plants and Animals.
- iii) Drinking water has been polluted for industrialisation and urbanisation.
- iv) Crisis of drinking water.
- v) Water ecological trouble.
- vi) In the extinguishing way of water living various plants and animals.
- vii) Number of Snails, Earth-worms, Frogs are becoming less or they are extinguished from the environment. So, ponds, big tanks, lakes, pools, rivers etc. are to be maintained properly for the improvement of environment. And, that is why the water-lands are to be restored and this is an important task.

##### Subject matter of the Project :

- i) On going to the banks of water-lands, various matters are to be observed scientifically.
- ii) Various characteristics of plants and animals living in the water-lands are to be observed.

##### Importance of the Project :

- i) One important part of environmental investigation is the observation of water.
  - ii) A clear picture is obtained about the dependence of plants, animals and Human being on the water-lands.
  - iii) The obtained information from the observation helps us in maintaining the water-lands from the pollution.
- N.B :  $P^H = -\log[H^+]$ . This is the negative logarithm of the density of Hydrogenion of a solution.  $p^H$  of water or the polluted materials producing acidity and temperature of water are to be observed primarily.

##### Objectives of Project :

- Acquisition of knowledge about ecology of water-lands.
- Checking the sources of water-pollution and arranging prevention.
- To make conscious the people about water-lands.
- To maintain the balance of environment of that areas.

**Method or Planning of Project :**

- ⇒ In the presence of the teacher, in-charge of the project, all the participants should reach to a water-land.
- ⇒ Keeping the water in plastic pouch or jar made of glass, the process of water observation is performed.
- ⇒ A table of various aquatic creatures like fish, crab, snail, frog, snake, lerva of mosquito etc is to be prepared after identifying them.

The temperature of water would be measured by thermometer and p<sup>H</sup> of water would be determined by p<sup>H</sup> paper. The sources of water pollution and the presence of water polluted materials are to be noted. The water oriented creatures are to be collected by putting a long net attached to the top end of a long rod.

**Collection of information :**

Colour of water : Greenish

Plants and trees located on the bank of water-land : The leaves of small & big trees which fall on the water surface — Mango, Rose-apple, coconut various flower - plants etc.

**Statement about the various Plants and Animals residing in the water-land :**

plants & Animals	Place of location	Characteristics
1. Prawn	with water hyacinth	The body is covered with parted hard cover and there is portion like a saw on the frontside
2. Snail	at the bottom of the water-land	The soft fleshy body covered with divided hard cover.
3. Crab	within water and soil	The body is hard and oval shaped.
4. Toad	near the bank of The water-land	The skin is smooth and yellowish green, stripe spots, without pills.
5. Moss, fungus, small water-plants floating various aquatic algae	on the water surface near the bank of the water-land in the floating situation	Green, most of them are not seen in naked eye

**p<sup>H</sup> of water and its nature :**

p <sup>H</sup>	Nature of water
0 – 6.9	Acidic
7	Neutralised
7.1 – 14	Alkaline

**Colour of water-land, its relationship with fish and productivity of food.**

Water Colour	Probable Cause	Fish & Food productivity
Transparent	Free from microbe and Moss less	Very low
Green Colour	Green Moss	Medium
Greenish Brown	Microscopic creatures present	Abundant quantity
Deep Brown	Heumus and Pit soil oriented	Very low

**Table for temperature (for living organisms)**

- |  |   |
|--|---|
| 1. When the water becomes greater than 20°C, the water is warmth     | In the temperature, much aqueous plants grow. Except it amphibions creatures, insects, reptiles, and fishes present |
| 2. When the temperature is 12°C and below it, the water becomes cold | In this temperature fish and insects stay less in number.   |

★★ **Analysis of Information** : Analysing all obtained information, a clear picture of nature of water and aqueous ecology are received. Seeing the colour of water, the presence of animals & plants is determined.

**Inference** : When the temperature becomes higher than 20°C, there are plenty of aqueous plants, fish, reptiles, ambions, creatures in the water. p<sup>H</sup> = 6.9 indicates that due to bathing of cows, buffalos etc. washing of dresses in the water, p<sup>H</sup> reaches to this level.

## Limitations

The limitations of this project are as follows :

- If the water-land becomes larger, the observation becomes difficult.
- Depending on the degree of pollution, it is to be determined whether the water is harmful to health or not.
- Due to presence of heavier metals like lead, mercury etc. the degree of pollution become higher. Then test is to be done in high quality Research centre full of high quality instruments (Exp. AAS, AFS).

AAS => Atomic Absorption Spectro-Photometer

AFS => Atomic Fluorescent Spectro-Photometer

N.B.  $p^H$  meter may be used in this case.

**Assignment  
Session (2015 - 2017)**

**2-year D.El.Ed. Course (ODL) for Para and Residual**

**In - Service Primary Teachers**

**Subject : Environmental Studies ;**

**Full Marks : 30**

5 Sets of Assignments are given below. you will be given one set of Assignments which have to be submitted within stipulated date. you have to write the assignments in your own handwriting. Do not use photocopy or computer generated materials.

Each assignments — Set has three parts (a, b, & c). Answer of first two parts i.e. (a, b) will be within 250 words (7 marks each) and last part i. e. (c) within 500 words (16 marks).

Assignments of each set are compulsory.

**Set - I**

1. a) Discuss about ‘Multi-disciplinary aims’ and ‘Utilitarian aims’ of Environmental Science in brief. 7
- b) Explain with diagrams the solar and Lunar Eclipse. 7
- c) Mentioning the class of the learners of upper - Primary School, help them in preparing a list of Plants and animals prevailing around the school and then find out their inter - relationship. 16

**Set - 2**

2. a) Discuss, how the main elements of climate influence on human environment. 7
- b) What is meant by ‘child - centric education’? State the characteristics of ‘child centric education.’ 7
- c) What is meant by ‘Local Field study’ method? Describe the steps of ‘Local Field study’ method. Selecting a topic from class VIII of ‘Paribesh - o - Biggan’ state how this method may be applied in Practice. 16

**Set - 3**

3. a) State about the aims and objectives of Environmental Science in brief. 7
- b) What is meant by Project method? Discuss in brief the steps of this method. 7
- c) What are the Causes of Day and Night? Describe the effects of Day - Night on the changes of our environment, appropriate to the students of Upper-Primary Classes. 16

**Set - 4**

4. a) What are the Eco - friendly Powers? State their uses in brief in Tabular form. 7
- b) What is 'Scaffolding'? State the application of Vygotsky's Theory. 7
- c) What do you mean by 'Lesson Planning'? Following the Lesson - Plan Model of WBBPE, Prepare a Lesson - Plan on a unit of class III of 'Paribesh Biggan.' 16

**Set - 5**

5. a) What are improvised Teaching - Learning Materials ? State the preparation of two such Materials. 7
- b) State about 'Measurement', 'Assessment' and 'Evaluation' in Education. Discuss the relationship existing among them. 7
- c) What is ' Problem solving method ? Discuss the steps of this method. Describe how a unit of class VII of ' Paribes - o - Biggan' can be taught by this method. 16