

Classes IX - X

Aims:

1. To develop an understanding of eco-systems and their interrelations.
2. To develop an awareness about the utilization, overexploitation of natural resources.
3. To recognize the need for keeping pollution under control in order to maintain the quality of life.
4. To develop the ability to identify, analyse and reflect upon different environmental concerns.
5. To acquire skills to collect, analyze and interpret data and information relating to environmental problems.
6. To develop skills for effectively tackling problems related to the local environment.
7. To adopt practices that help in promoting balance in nature by making judicious utilization of resources and materials.
8. To acquire leadership qualities through participation in specifically designed activities.
9. To develop love, affection, sensitivity and a sense of responsibility towards all living beings.
10. To participate in activities and programmes for protecting, preserving and conserving the environment and its resources.
11. To appreciate and respect legal provisions for protection of animals and plants.
12. To imbibe the essence of environmental values and ethics in order to live in harmony with nature.

CLASS IX

There will be one paper of two hours duration carrying 80 marks and Internal Assessment of 20 marks.

The theory paper will have two sections:

Section A (Compulsory) *will contain short answer questions covering the entire syllabus.*

Section B *will consist of questions, which will require detailed answers. There will be a choice of questions in this section.*

THEORY – 80 Marks

1. Understanding Ecosystem

- (a) Types of ecosystem - forest, grassland, desert, aquatic, coastal, marine.
- (b) Interaction between biotic and abiotic factors in an eco-system.
- (c) Energy flow and its importance, cycles of nutrients in terrestrial and aquatic (fresh water and marine) ecosystems, nature's mechanism in maintaining balance.
- (d) Destruction of ecosystem due to changing patterns of land use; factors responsible for this - population growth, migration, industrialization and urbanization, dwelling units, transport, encroachment on water bodies, forests and agricultural land, shifting cultivation, facilities for tourism, pilgrimage, recreation and adventure; construction of large dams, war and mining.
- (e) Impact of ecosystem destruction - loss of habitat, stress on resources.
- (f) Conservation of ecosystem - alternative practices including indigenous conservation practices, planning for proper land use.
- (g) Role of Environmental Impact Assessment (EIA) in maintaining the quality of the environment.

2. Depletion of Resources

- (a) Natural resources: - air, water, soil, metals, minerals, forests and fuels.
- (b) Causes of depletion of resources - over-use/irrational use, non-equitable distribution of resources, technological and industrial development, population growth.
- (c) Impact of resource depletion - imbalance in nature, shortage of materials, struggle for existence; slackening of economic growth.
- (d) Practices for conservation of resources - search for alternatives, promotion of renewable resources.

3. Waste generation and management

- (a) Sources of waste - domestic, industrial, agricultural, commercial and other establishments.
- (b) Classification of waste - bio-degradable, non-biodegradable; toxic, non-toxic, bio-medical.
- (c) Impact of waste accumulation - spoilage of landscape, pollution, health hazards, effect on terrestrial, aquatic (fresh water and marine) life.
- (d) Need for management of waste.
- (e) Methods of safe disposal of waste - segregation, dumping, composting, drainage, treatment of effluents before discharge, incineration, use of scrubbers and electrostatic precipitators.
- (f) Need for reducing, reusing and recycling waste.
- (g) Legal provisions for handling and management of waste.

4. Environmental Values and Ethics

- (a) Human rights, fundamental duties and value education.
- (b) Women and Child Welfare.

INTERNAL ASSESSMENT – 20 Marks

Students are required to complete one case study and one project from the list given.

The activities suggested below are neither exhaustive nor prescriptive. Teachers may design their own set of activities keeping in view the overall objectives of teaching and learning of Environment Education at this stage. They will have to make use of local flora and fauna and the available resources and facilities and take cognizance of local environmental problems. The learners should be encouraged to initiate action on their own.

Suggested list of assignments

1. Visit a few establishments in the locality, such as motor repair workshops, kilns, pottery making units, fish and vegetable markets, restaurants, dyeing units. Find out the types of wastes and methods prevalent for their disposal. On the basis of the information collected, suggest measures to improve the environmental conditions.
2. Prepare a report on the changing patterns of land use during the last five years in the village, city, region and state through collection of information from different sources about the area of land utilized for:
 - housing,
 - markets, hospitals, schools and other facilities,
 - construction of roads, and
 - industries.

3. To identify economically and environmentally-friendly alternatives in order to deal with the scarcity of resources such as fuels in the locality.
4. Visit a nearby hospital or health center and collect information about diseases caused due to the prevailing environmental conditions.
5. Plan and execute awareness campaigns through community participation on major environmental problems at the local and/or national levels, like deforestation, energy conservation, air pollution due to automobiles and noise pollution.
6. Disseminate information through bulletin boards/school magazines about the impact of construction of large dams, natural disasters like floods, droughts or cyclones on the ecosystem.
7. List different types of industries in the States and collect information about the types of raw materials used, modes of their procurement and disposal of wastes generated. Classify these industries as polluting or environment friendly and suggest possible ways of reducing pollution caused by these units.

CLASS X

There will be one paper of two hours duration carrying 80 marks and Internal Assessment of 20 marks.

*The theory paper will have **two** sections:*

***Section A (Compulsory)** will contain short answer questions covering the entire syllabus.*

***Section B** will consist of questions, which will require detailed answers. There will be a choice of questions in this section.*

THEORY – 80 Marks

1. Restoring Balance in Ecosystem

- (a) Need for adopting control measures to check for spoilage of landscape.
- (b) Need for conservation and management of water - integrated watershed management, recharging of ground water including rain water harvesting, development of appropriate technology.
- (c) Conservation and management of forests, grasslands, semi-arid ecosystems.
- (d) Conservation and management of ocean resources - marine and coastal eco-systems, importance of coral reefs.
- (e) Conservation and management of soil - alternate cropping, judicious use of inputs like water, fertilizers, pesticides; use of manure, bio-fertilizers and bio-pesticides; plantation and conservation of grasslands to check soil erosion; forest conservation including Joint Forest Management (JFM), afforestation including social forestry and agro-forestry.
- (f) Measures to conserve wild life - national parks, sanctuaries and bio-reserves; breeding programmes for endangered species; preventing poaching, hunting and bio-piracy; enforcement of legal provisions.
- (g) Application of bio-technology.
- (h) Public awareness programmes concerning conservation of water, soil, air, forests and other resources.
- (i) Relevance of indigenous practices.
- (j) Tribal culture and its linkages to forest resources and their conservation.

2. Pollution

- (a) Types of pollution - air, water (fresh and marine), soil, radiation and noise.
- (b) Sources of pollution and major pollutants; oil spills.

- (c) Effects of pollution on - environment, human health and other organisms.
- (d) Abatement of pollution.

3. Issues of the Environment

- (a) Decline in forest, agricultural and marine productivity and its effects on the economy.
- (b) Resettlement and rehabilitation of people.
- (c) Energy crisis - urban and rural sectors.
- (d) Greenhouse effect and global warming.
- (e) Climatic changes.
- (f) Acid rain.
- (g) Ozone layer depletion.
- (h) Disaster – natural and manmade; disaster management and its mitigation.

4. Striving for a Better Environment

- (a) Use of efficient and eco-friendly technology.
- (b) Sustainable use of resources.
- (c) Adoption of indigenous practices; sacred groves.
- (d) Consumer education - consumer rights, making correct choices while buying different items; food adulteration.
- (e) Community participation for ecological restoration and conservation.
- (f) Protection of wild life; cruelty to animals.
- (g) Enforcement of acts, laws and policies.
- (h) Some success stories - use of CNG, *Chipko* Movement, water harvesting, Silent Valley and the like.

INTERNAL ASSESSMENT – 20 Marks

Students are required to complete one case study and one project from the list given

The activities suggested below are neither exhaustive nor prescriptive. Teachers may design their own set of activities keeping in view the overall objectives of teaching and learning of Environment Education at this stage. They will have to make use of local flora and fauna and the available resources and facilities and take cognizance of local environmental problems. The learners should be encouraged to initiate action on their own.

Suggested list of assignments

1. Organize a discussion/ debate on issues of environment, such as pollution of air, water and soil, depletion of resources, disposal of plastics and urbanization.
2. Collect data from owners/drivers of private/commercial vehicles through interview-cum-discussion method and prepare a report. Information may be sought on: -
 - frequency of checking air pressure;
 - maintenance of vehicles;
 - types of horns fitted in vehicles and frequency of their use;
 - frequency of checking pollution;
 - average driving hours per day;
 - state of driver's personal health.
3. Collect data from different households through interview-cum-discussion method. Discuss and suggest ways and means for saving electricity and fuels. Information may be collected on:
 - types and quantity of fuel used per month in the kitchen;
 - amount of electricity used per month or the fuel used for generator or any other sources used for lighting;
 - amount of fuel used per month in car, motor cycle, scooter, tractor;
 - measures/steps taken for saving fuel and electricity.
4. Find out the sources of pollution of water bodies in the locality and determine the quality of water.
5. Prepare plans for the beautification of the school campus or a park in the locality. Identify suitable plants and trees, undertake plantation and look after them. (This may be introduced as a class/group activity as a part of *van mahotsva* or eco-club programme.)
6. Visit a water treatment plant, sewage treatment plant or garbage dumping or vermi composting sites in the locality and study their working.
7. Collect information about global environmental issues and problems and communicate your findings through appropriate modes (like posters, charts, collages, cartoons, handouts, letters, street plays, etc. to all concerned.
8. Participate in eco-clubs and activities like debates, quizzes, exhibitions, essay competitions on the themes related to environmental concerns and problems. Synthesize information gathered from books, journals, magazines and internet.

EVALUATION

The project work is to be evaluated by the subject teacher and by an external examiner. The external examiner shall be nominated by the Principal and may be a teacher from the faculty, **but not teaching the subject in the relevant section/class**. For example, a teacher of Environment Science of Class XI may be deputed to be the external examiner for Class X Environmental Education project work.

The internal examiner and the external examiner will assess the candidate's work independently.

Award of marks (20 marks)

Subject Teacher : 10 marks

(internal examiner)

External examiner: 10 marks

The total marks obtained out of 20 are to be sent to the Council by the Head of the School.

The Head of the School will be responsible for the entry of marks on the mark sheets provided by the Council.

Teaching-Learning Strategies

Teaching-learning needs to be so designed that it facilitates enhancement and concretization of understanding, refinement of habits, attitudes, values and skills. Besides, linkages between theory and practice need to be strengthened. This would ensure learners' proactive role in addressing environment related problems. The strategies may involve the following:

- Providing opportunities for the application of knowledge gained and understanding acquired.
- Providing opportunities through simple projects to identify environmental problems which catch the student's attention.
- Encouraging independent handling of projects and activities.
- Providing opportunities for critically analyzing data and information collected on environmental issues.
- Encouraging nature study using the case study approach.
- Involving learners in surveys pertaining to environment related problems/ phenomena.
- Involving learners in community based environment improvement programmes.
- Arranging excursions and visits and preparing reports.
- Organizing brainstorming sessions to identify areas of action.
- Encouraging self-learning through hands-on experiences.
- Utilizing group activities for nurturing leadership qualities.

INTERNAL ASSESSMENT IN ENVIRONMENTAL EDUCATION - GUIDELINES FOR MARKING WITH GRADES

Criteria	Preparation	Investigation/Gathering Data	Analysis/Inference	Solutions Alternatives/Innovations	Presentation
Grade I (4 marks)	Follows instructions with understanding; modifies if needed. Background information correct. Level of awareness high.	Is able to ask correct questions. Knows whom to ask, when and how. Can deal with more than one variable.	Analyses systematically. Can see sequences or correlation. Can segregate fact from opinion.	Innovative ideas presented. Alternatives suggested.	Accurate. Feasible, neat, well labelled diagrams. Index and references given.
Grade II (3 marks)	Follows instructions step-by-step. Awareness is good. Background information correct.	Is able to ask questions and identify whom to ask, when and how. Can handle two variables only.	Makes observations correctly. Analysis fair.	Alternatives presented. Innovative but not practical.	Accurate. Neat, well labelled diagrams. Index and references given.
Grade III (2 marks)	Follows simple instructions only. Awareness basic. Background information sketchy.	Needs help with the investigations. Has suggestions but cannot decide.	Observation - help needed. Needs guidance to see correlations or sequence.	Obvious solutions presented. Not innovative.	A bit disorganised, but neat and accurate. Either index or references missing.
Grade IV (1 mark)	Follows some instructions but confused. Has to be made aware. Background information incorrect in places.	Needs to be told what questions to be asked, whom to ask or where to gather the data from.	Detailed instructions required to draw inferences. Charts have to be made.	Thinks of solutions under guidance.	Poorly organised. Some points missing. Index and references missing.
Grade V (0 mark)	Confused about instructions. Has to be made aware. Needs help with background information.	Gets stuck at every step. Questionnaire has to be formulated.	Even with help, analysis is not clear. Takes teacher's word for it.	Solutions not forthcoming.	Overall impression very poor. Not very accurate.