

4. Environmental management



- Ecosystem – A review
- Environment and Eco-system
- Environment Conservation
- Environment management
- Biodiversity hotspots



Can you recall?

1. What is ecosystem? Which are its different components?
2. Which are the types of consumers? What are the criteria for their classification?
3. What may be the relationship between lake and birds on tree?
4. What is difference between food chain and food web?



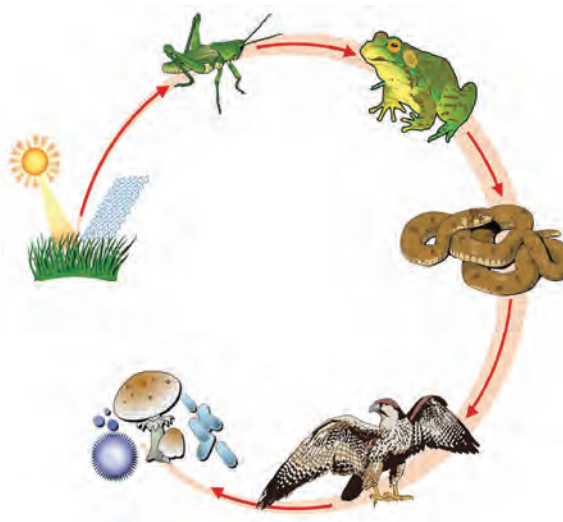
Think and Answer

1. Write the name and category of each of the component shown in picture.
2. What is necessary to convert this picture into food web? Why?

Ecosystem A review

Ecosystem is formed by biotic and abiotic factors and their interactions with each other. Each factor plays very important role in the ecosystem. Producers like plants are important. Herbivores like deer, goats, sheep, cattle, horses, camels, etc. feeding upon producers are also important. Predators like lion and tiger which prevent the overpopulation of herbivores are also equally important. A question may arise in our mind that whether the caterpillars found in nature, organisms present in filthy places, termites, insects present in dung, are really useful? However, those organisms are also important though they are dirty. They are responsible for cleaning the environment.

It means that our existence is due to these factors present around us. Hence, we should care for these factors.



4.1 Food chain



Think:

If fallen foliage in forest, dead trees, and carcasses in and around villages had not been decomposed for years.....



Discuss

‘Jivo Jivasya Jivanam’



Can you recall?

1. Which are different trophic levels in food chain?
2. What is energy pyramid?



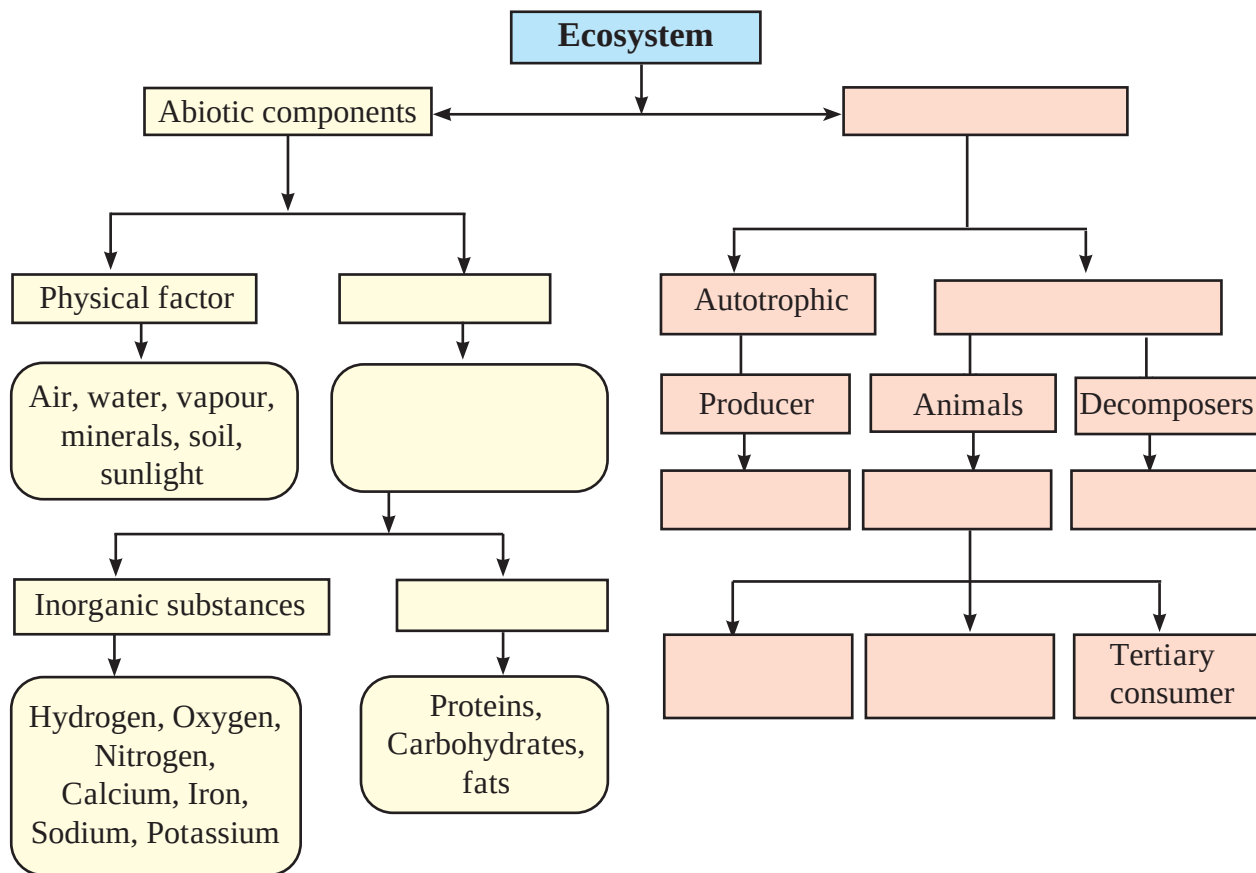
Let's Think

A bird building nest on a tree feeds upon the fishes in nearby pond. Whether this bird is part of both i.e. tree as well as pond ecosystem?



Complete the chart

Fill up the blank boxes and display the completed chart in classroom.



Paddy is cultivated on large scale in various states of South India. Paddy fields are frequently attacked by grasshoppers. Similarly, frogs are also present in large number in the mud of paddy fields, to feed upon grasshoppers and snakes are also present therein to feed upon their favourite food- frogs.

However, if frog population declines all of a sudden,



Let's Think

1. What will be the effect on paddy crop?
2. Number of which consumers will decline and which will increase?
3. What will be overall effect on that ecosystem?



Can you tell?

1. What is environment?
2. What is included in environment?

Relationship between Environment and Ecosystem

Environment is a broad concept. Physical, chemical and biological factors affecting the living organisms in any possible way is collectively called as environment. In short, environment is the condition in surrounding. It includes many biotic, abiotic, natural and artificial factors. There are two main types of environment. One is natural environment and other is artificial environment.

Natural environment consists of air, atmosphere, water, land, living organisms, etc. Continuous interactions occur between biotic and abiotic factors. Their interactions are very important. Artificial environment is also affecting the natural environment directly or indirectly. Basically, environment consists of two basic factors- 1. Biotic factors, 2. Abiotic factors. The science that deals with the study of interactions between biotic and abiotic factors of the environment is called as ecology. Basic functional unit used to study the ecology is called as ecosystem.

Environment consists of many ecosystems. We have studied some ecosystems in earlier classes. A small pond is an ecosystem whereas the Earth is largest ecosystem. In brief, biotic and abiotic factors occupying a definite geographical area and their interactions collectively constitute the ecosystem.



Can you recall?

Which cycles are operated in environment? What is their importance?

Environmental balance is maintained through continuous operation of various natural cycles like water cycle, carbon cycle, gaseous cycles like nitrogen cycle, oxygen cycle, etc. Environmental balance is also maintained due to various food chains of ecosystem.

Human existence is totally impossible without the existence of nature. Hence, it is basic responsibility of human being to preserve the nature without disturbing its balance. It is said that we have got this Earth planet on lease from our future generations and not as an ancestral property from our ancestors. Hence we should not forget to conserve it for ourselves and for future generations.

Environmental Conservation



Can you tell?

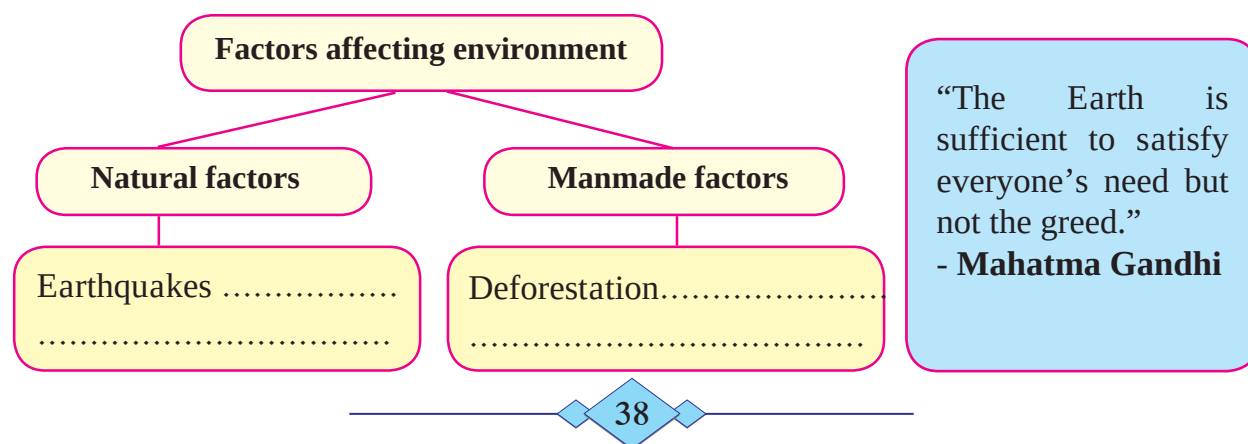
1. Which factors affect the environment? How?
2. What will happen if number of consumers in environment goes on increasing gradually?
3. What will be the effect of industry established on river bank on the river ecosystem?

When some natural factors of environment and some artificial polluted factors harm the environment, it creates imbalance between various factors of the environment and ultimately affects the existence of biotic factors.



Observe and fill the information

Observe the environment around you. Complete the following flow chart.



At present, many environmental problems have been arisen due to effect of various natural and artificial factors on the Earth. Environmental pollution is one of those main factors. Generally, contamination of any material is its pollution. Unnecessary and unacceptable change in the surrounding environment due to natural events or human activities are called as environmental pollution. i.e. direct or indirect changes in physical, chemical and biological properties of air, water and soil which will be harmful to humans and other living beings is environmental pollution. Various reasons like population explosion, fast industrialization, and indiscriminate use of natural resources, deforestation, and unplanned urbanization are responsible for environmental pollution.



Can you recall?

1. Which are the types of pollution?
2. What do we mean by natural and artificial pollution?



Pollution is a broad concept. Various types of pollutions like that of air, water, sound, soil, thermal, light, pollution occur around us. Ultimate adverse effect of all these is on existence of all the living organisms and out of this, environmental conservation has become the need of hour.

4.2 Fog and pollution in city- A problem



Complete the Chart

We have studied the air pollution, water pollution and soil pollution in detail in earlier classes. Based on that, complete the following chart.

	Air pollution	Water pollution	Soil pollution
Compo-nents	Gases : CO ₂ , CO, Hydrocarbons, Sulphur, NO _x , Hydrogen sulphide, etc. Solid : dust, ash, carbon, lead, asbestos, etc.		
Source		Industrial wastes, Domestic waste, Sewage, Chemicals discharged from Industries, Pesticides used in agriculture.	
Effect			Soil erosion, Retarded growth of plants/ crops, Nutritional deficiency etc.
Control Measure			



Do you know?

Radioactive pollution: Radioactive pollution can occur due to two reasons as natural and artificial. UV and IR radiations are natural radiations whereas X-rays and radiations from atomic energy plants are artificial radiations. Chernobyl, Windscale, and Three Miles Island mishaps are the major mishaps of the world till present. Thousands of people have been affected for long term due to these accidents. Some of the effects of radiations are as follows-

1. Cancerous ulceration occurs due to higher radiations of X-rays.
2. Tissues in the body are destroyed.
3. Genetic changes occur.
4. Vision is adversely affected.



Use your brain power

Why is it said that pollution control is important?

Need of environmental conservation

General public is not aware about the rules of environment conservation. There should be large scale participation of the people in environment conservation. It will be possible to answer the environmental problems only if environmental protection-conservation becomes an effective public movement. For this purpose, values like positive attitude and affection towards environment, knowledge about it, etc. should be inculcated among the children since their childhood. This will help to make the future generations more aware about environmental conservation and protection. So as to achieve this, it is necessary to increase the awareness through education.

Today, all the developed, developing and underdeveloped countries have accepted the responsibility of environmental protection. Their efforts are in that direction. They have defined the future plans about environmental protection and have constituted the necessary laws.

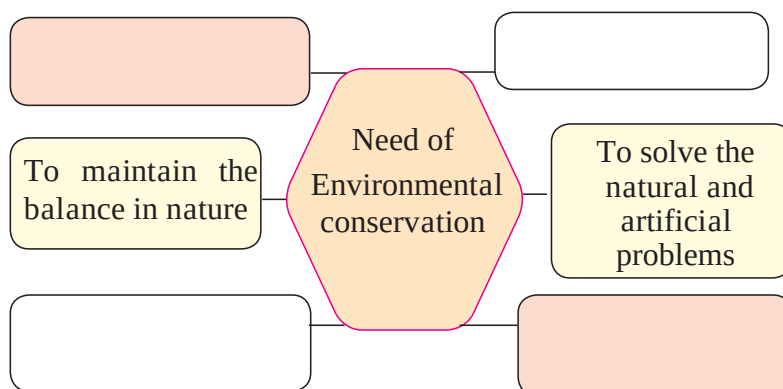
A peek into the history

In 1972, United Nations Environment Program (UNEP) has been established in a conference arranged on human and environment in which environmental problems were discussed. Afterwards, in India, a separate environmental department had been established after through discussion on environmental problems. Ministry of environment and forests is involved in planning, inducting and increasing awareness about environment and forest through various programs since 1985.



Complete the Chart

Nowadays, we are observing the environmental degradation everywhere. Complete the flow chart given besides with the help of environment.



Environmental Conservation. Our social responsibility

Since existence of human, there is interrelationship between human and environment. Human stepped on the Earth long after formation of Earth. On the Earth, human being proved its superiority as compared to other animals with the help of characters like intelligence, memory, imaginary ability, etc. Human established domination over the nature. Human utilized all the natural resources as much as possible. In an attempt to live a satisfactory life, human kept on snatching from the nature as much as possible and this led to increase in problems. From this entire scenario, we can understand that human has crucial role in maintaining the environmental balance. If human has disturbed the environmental balance, then human itself only can conserve and improve the quality of nature. Many times, general public is unknown that its activities are harmful to environment and thereby unknowingly many activities happen.



Search

How do butterflies contribute to environmental balance?



Do You Know?

Laws enacted about environmental conservation:

Forest Conservation Act, 1980.

The land reserved for forest conservation has been prohibited to use for any other purpose by this law. Ex. Permission of central government is compulsory for mining activities. Any person who disobeys this law is entitled to imprisonment for 15 days.

Environmental Conservation Act, 1986.

Purpose of this act is to control the pollution and punish the persons or institutes harming the environment. Any person or factory is prohibited by this act from releasing the pollutants in atmosphere beyond a permissible limit. The person breaching this rule is entitled for either five year imprisonment or fine up to Rs. 1 lakh. National Green Tribunal has been established in 2010 for effective implementation of environment related laws.



Let's Discuss

Collect the information about Chipko Movement and discuss between two groups of your class about its importance in present situation.



Internet is my friend

1. Sound Pollution (Control & Prevention) Rule, 2000.
2. Biomedical Waste (Management & Handling) Rule, 1998.
3. E-waste (Management & Handling) Rule, 2011.



Always remember

As per wildlife protection Act 1972

As per clause 49 A, trading of rare animals has been completely banned.

As per clause 49 B, use of articles prepared from skin or organs of wild animals has been banned.

As per clause 49 C, disclosure of the stock of artefacts made from rare wild animals is compulsory.

The big story of a small man



Jadav Molai Payeng is a highly capable person in Assam. Born in 1963, he is working as a forest worker since the age of 16 years. Once, large number of snakes died in the flood of Brahmaputra River flowing by the village. As a preventive measure, Molai planted 20 bamboo plantlets. In 1979, the local Social Forestry Department began a social afforestation project on 200 hectares of land. 'Molai' was one of the few forest workers who were looking after that project. Molai continued to plant the trees even after completion of the project. As a result of his continuous work of planting and caring for the trees, the barren area witnessed the forest cover over the 1360 acres.

Today, this jungle in Kokilamukh of Jorhat district of Assam is the result of the hard work for 30 years. He has been awarded with the prestigious 'Padmashree' award by government of India for this unparallel work. Now, it is well known as 'Molai Jungle'. Many people come together to destroy the forest, **but a single person, if determined, can establish a new forest!**

Environmental Conservation and Biodiversity

Most harmful effect of the environmental pollution occurs on the living organisms. Have you seen some examples of this in your area? Our living world had been richly diverse. It consisted of varieties of plants and animals. However, we are not able to see some specific animals about which we had listened from our earlier generations. Who is responsible for this?

Biodiversity is the richness of living organisms in nature due to presence of varieties of organisms, ecosystems and genetic variations within a species. Biodiversity occurs at three different levels.

Genetic Diversity

Occurrence of diversity among the organisms of same species is genetic diversity. Ex. Each human being is different from other. Possibility of wiping out the species arises if there is decrease in the diversity within the species whose members involve in sexual reproduction.

Species Diversity

Innumerable species of organisms occur in the nature. This is called as species diversity. Species diversity includes various types of plants, animals and microbes.

Ecosystem Diversity

Many ecosystems are present in each region. Ecosystem is formed through the interaction between plants, animals, their habitat and changes in the environment. Each ecosystem has its own characteristic animals, plants, microbes and abiotic factors. Ecosystems are also of two types are natural and artificial.

There should be positive attitude of human being towards the environment for welfare of entire living world. For this purpose, following roles are important. You can be a conservator, organizer, guide, plant-friend, etc. Describe about the role you wish to perform and your plans for that role.



4.3 Sacred grove

More than 13000 sacred groves have been reported in India. Where are such sacred groves in Maharashtra? Make a list and visit with your teachers.

Sacred Groves

The forest conserved in the name of god and considered to be sacred is called as sacred grove. These are in fact 'sanctuaries' conserved by the society and not by the government forest department. As it has been conserved in the name of god, it has special protection. These clusters of thick forests are present not only in Western Ghats of India but in the entire country.



Enlist and discuss

Some symbols are given below. Find the meaning of those symbols in relation to environment conservation. Make a list of other such symbols.



Stick here a symbol known to you.

How can biodiversity be conserved?

1. Protecting the rare species of organisms.
2. Establishing national parks and sanctuaries.
3. Declaring some regions as 'bioserves'.
4. Projects for conservation of special species.
5. Conserving all plants and animals.
6. Observing the rules.
7. Maintaining record of traditional knowledge.

Till now, we have studied the rules and regulations about environmental conservation and protection, in this lesson. Many people in the society are voluntarily coming together to perform this noble work. Many institutes at state, national and international level are involved in this work.

Voluntary Organizations

1. Bombay Natural History Society, Mumbai.
2. CPR environment group, New Chennai.
3. Gandhi Peace Foundation, Environment Cell, Delhi.
4. Chipko Centre, Tehri Garhwal.
5. Centre for Environment Education, Ahmadabad.
6. Kerala Science Literature Council, Trivandrum.
7. Indian Agro Industries Foundation, Pune.
8. Vikram Sarabhai Community Science Centre, Ahmadabad.

International Environment Organizations

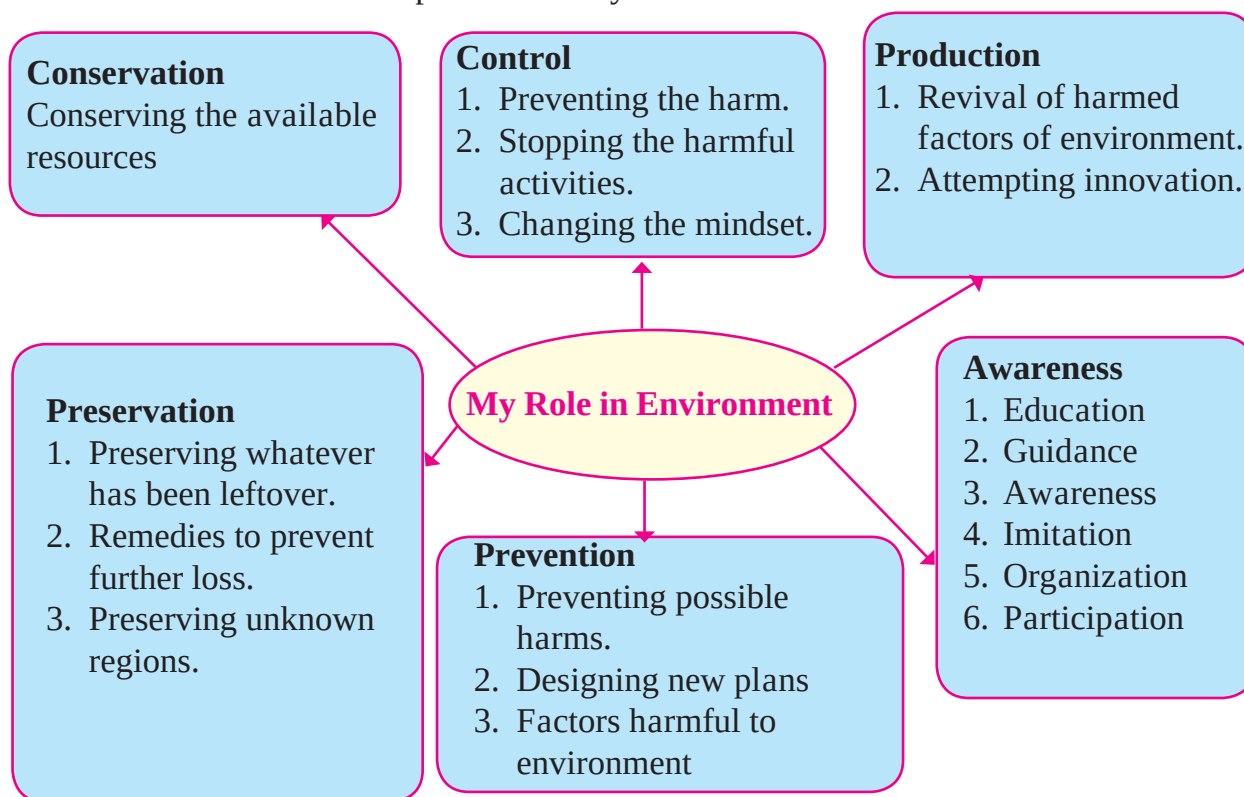
1. International Union for Conservation of Nature (IUCN), Gland VD, Switzerland.
2. Intergovernmental Panel on Climate Change (IPCC), Geneva.
3. United Nations Environment Program, Geneva.
4. World Wildlife Fund, New York.
5. Bird Life International, Cambridge.
6. Green Climate Fund, Songdo, S. Korea

Green Peace is world's largest organization engaged in environmental activities. More than 25 lakh people from 26 different countries are members of this organization. Collect more information about the work of above mentioned organizations.



Think and Answer

Attempts at various levels are performed for conserving environment. Role of the person is defined as per these levels. Some roles are given below. Which role would you like to perform? Why ?



Hotspots of Biodiversity

34 highly sensitive biodiversity spots are reported all over the world. Such areas had once occupied 15.7% area of the Earth. At present, 86% of the sensitive areas are already destroyed. Presently, only 2.3% area of the Earth has been left over with sensitive spots. It includes 1,50,000 plant species which are 50% of the world count.

As far as India is considered, out of 135 species of animals, 85 species are found in the jungles of eastern region. About 1,500 endemic plant species are found in western ghat. Out of the total plant species in the entire world, 50,000 are endemic. Collect more information about locations of these hotspots present in the world.

Three Endangered Heritage Places of the Country

The Western Ghat spread over the states of Gujarat, Maharashtra, Goa, Tamilnadu and Kerala has been endangered due to mining industry and search for natural gas. Habitats of Asiatic lion and wild bison of this region have been under threat.

Manas sanctuary of the Assam is under threat due to dams and indiscriminate use of water. Tiger and rhino of that region are under threat.

Sunderban sanctuary of West Bengal is reserved for tigers. However, the tiger population and overall local environment is seriously challenged by dams, deforestation, excessive fishing, trenches dug for same, etc.



Recall a little

Collect the names of extinct birds and animals of India and tell those names to others.

Classification of Threatened Species

1. Endangered Species

Either number of these organisms is declined or their habitat is shrunk to such an extent that they can be extinct in near future if conservative measures are not implemented. Example, Lion tailed monkey, lesser florican.

2. Rare Species

Number of these organisms is considerably declined. Organisms of these species being endemic may become extinct very fast. Example, Red panda, Musk deer.

3. Vulnerable Species

Number of these organisms is extremely less and continues to decline. Continuous decline in their number is worrisome reason. Example, Tiger, Lion.

4. Indeterminate Species

These organisms appear to be endangered but due to their some behavioural habits (like shyness) there is no definite and substantial information. Example, Giant squirrel (Shekhru).



4.4 Lion-tailed Monkey



4.5 Red Panda

Specialty of the Day

22nd May: World Biodiversity Day
Survey the plants and animals in your area. Maintain a record about their characteristics.



Do you know?

International Union for Conservation of Nature (IUCN) prepares the 'Red List' that contains the names of endangered species from different countries. Pink pages of this book contain the names of endangered species while green pages contain the names of previously endangered but presently safe species.



Always remember

Always Remember

Let us remember.... Let us behave accordingly.....

1. Destroying a plant is to destroy everything.
2. Practice afforestation to conserve environment.
3. Forest is Wealth.
4. Environmental protection is value education.
5. Provident use of paper is prevention of deforestation.
6. To practice the environmental protection is to development of human society.
7. Pure air, pure water is key to healthy life.



Think

World Wildlife Fund (WWF) published a survey in 2008. According to it, about 30% of animal species have become extinct over the period of 35 years (1975 – 2005). What will happen in future if this continues as it is?

Exercise

1. Reorganize the following food chain. Describe the ecosystem to which it belongs.
Grasshopper – Snake – Paddy field – Eagle – Frog.
2. Explain the statement- 'we have got this Earth planet on lease from our future generations and not as an ancestral property from our ancestors.'
3. Write short notes.
 - a. Environmental Conservation.
 - b. Chipko Movement of Bishnoi.
 - c. Biodiversity.
 - d. Sacred Groves.
 - e. Disaster and its management.
4. How will you justify that overcoming the pollution is a powerful way of environmental management?
5. Which projects will you run in relation to environmental conservation? How?
6. Answer the following.
 - a. Write the factors affecting environment.
 - b. Why does the human beings have important place in environment?
 - c. Write the types and examples of biodiversity.

- d. How the biodiversity can be conserved?
- e. What do we learn from the story of Jadav Molai Peyang?
- f. Write the names of biodiversity hot spots.
- f. Which are the reasons for endangering the many species of plants and animals? How can we save those?

7. What are the meanings of following symbols? Write your role accordingly?



Project:

Make a presentation on pollution of Ganga and Yamuna Rivers and effects of air pollution on Tajmahal.



-: A Pledge for Life :-

I am aware that the diversity on the Earth is for the existence of me, my family and the entire mankind. I am aware about the responsibility of conserving and protecting the rich diversity. I am aware about the fast declining number of wildlife, plants and animals. I am accepting the responsibility of judicious use of natural resources and management of biodiversity.

I pledge for adopting the following principles for happy and satisfactory life of all organisms on the Earth.

I will always try for conservation and sustainable management of natural resources.

I will make the change that I am expecting.

I will be committed for safety of entire life on the Earth.

I will educate the people about benefits of conservation and co-existence.