Naughty Nitoo

One day when Nitoo woke up—

HAPPY BIRTHDAY, NITOO!

Thank you, Mom and Dad. Today I'll have a party.

Sure, dear. Invite all your friends.

Nitoo went to his neighbour.

Auntie, today is my birthday. Rinku is invited to the party.

Congratulation, Nitoo! But Rinku can't come to your party.

Why auntie?

She is ill and bedridden.

Oh!

In the evening, all the friends were having great fun.

The music was playing very loud and everybody was dancing.

Nitoo, lower the volume.

Why Didi?

Don't you know Rinku is ill. She won't be able to sleep.

But this day comes only once a year. Yahoo!

Nitoo and his friends partied all night.

After some days.

Tomorrow is the exam and I have to cram so many things.

Suddenly, there was a noise.

Where is this noise coming from?

Oh! This is from Rinku's house. What can I do? Now, I have no right to stop her.

Nitoo had learnt the lesson.

12 Changes in Our Environment

Before We Start, Let's Check

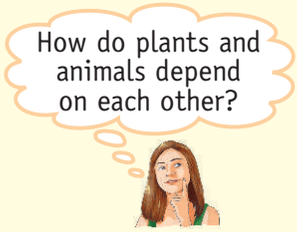
What you already know

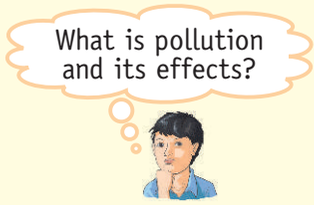
Look at the following pictures. Write whether each animal is a *herbivore*, a *carnivore*, an *omnivore* or a *parasite*.




_____ _____ _____ _____

What you will know





THE ENVIRONMENT

If you look around, you find a lot of things around yourselves—trees, plants, hills, soil, fields, animals, people, buildings, roads and so on. We can classify all these things into two categories—living things and non-living things. These things together form the surroundings in which we live. Everything surrounding and affecting us is known as the **environment**.

We can see that some of the things in the environment are gifts of nature, while the rest of them are made by man. So, we can classify the environment into two types—natural environment and social environment.


natural environment

Natural environment: Things that are made by nature make up the natural environment. Thus, natural surroundings like air conditions, water, land and the atmosphere are part of the natural environment. All the living things like plants, animals and people are also part of the natural environment.


social environment

Social environment: Things that are made by man make up the social environment. It includes roads, buildings, dams, railways, electrical poles and so on. The social environment also includes cultures and lifestyles of human beings.

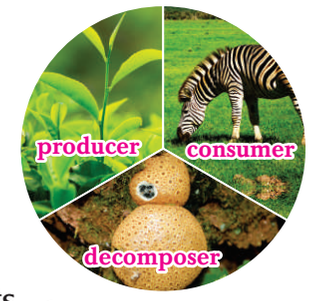
Here, we will study the natural environment only.

COMPONENTS OF THE NATURAL ENVIRONMENT

The natural environment is made up of two components — biotic components and abiotic components.

Biotic environment

The word 'bios' means *life*. Thus, the biotic component of the natural environment is made up of all living beings. So, plants, humans, animals and microorganisms make up the biotic component of the natural environment.



biotic components of the environment

On the basis of their food requirements, we can classify biotic components into three types—producers, consumers and decomposers.

1. Producers: Living things which make their own food are called producers. Green plants make their own food. The process by which they make food is called photosynthesis.

2. Consumers: Living things that depend on others for food are called consumers. They can be divided into four kinds:

Herbivores: Herbivores are animals that eat only plants.

Carnivores: Animals that eat the flesh of other animals. They can be **predators**, which kill other animals and eat their flesh, or they can be **scavengers**, which eat the flesh of dead animals.

Omnivores: Omnivores are animals that eat plants as well as the flesh of animals.

Parasites: They live on other plants or animals and get nourishment from them without killing them.


herbivore


predator


scavenger


omnivore


parasite

3. Decomposers: Some microorganisms feed on dead plants and animals. They convert dead matter into gases, which are released back into the air, soil or water. Such microorganisms are called decomposers.

Abiotic environment

All non-living natural things make up the abiotic environment. It includes sunlight, water, soil, etc.

abiotic components of the environment

Sunlight: It provides energy to every living thing on the earth. It is also the source of heat and light.

Water: Three-fourth of the earth is covered with water. Water is essential for life.

Soil: It contains minerals and moisture which support the life of plants.

Air: Living things breathe air for survival. Air also helps in pollination.

Interdependence of biotic components

Plants and animals are interdependent for survival. Animals depend on plants in the following ways:

- Animals depend on plants for food. Herbivores and omnivores eat plants. Carnivores eat herbivores and omnivores. Therefore, they also indirectly depend on plants for food.
- Animals depend on plants for oxygen, which plants give out during photosynthesis.
- Animals depend on plants for shelter from predators and bad weather.

Plants depend on animals in the following ways:

- Animal waste as well as their dead bodies provide nutrients to the soil. Plants get these nutrients from the soil.
- Plants depend on animals for carbon dioxide, which animals give out in respiration.
- Animals help to disperse seeds of some plants.
- Bees and other insects help to pollinate flowers.

Food chain

We have learnt that plants and animals depend on each other for food directly or indirectly. We can describe this relationship in simple terms as a food chain.

A food chain is the sequence of 'what eats what' to obtain nutrition. For example look at the following food chain.

a food chain

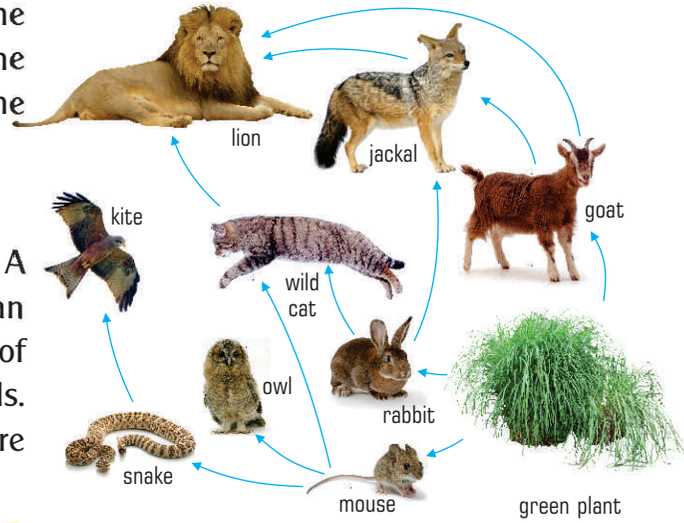
Here, the food chain starts with the sun shining on a plant. The plant uses sunlight for energy to make food. Plants are the base of every food chain.

There are many big and small food chains in the world. In a food chain, every link is important. The breaking of one link in the chain means all the organisms in that link are threatened.

Food web

Plants are eaten by various types of animals. A particular type of plant may be eaten by more than one type of animal. In addition, a particular type of animal may be eaten by different types of animals. A given plant or animal may be found in more than one food chains.

These interconnected food chains form a food web.



a simple food web

POLLUTION

Our lives are greatly affected by the environment in which we live. Any change in the environment affects our lives.

Some environmental changes are caused by nature but most of them are caused by man. Man has always tried to bring changes in the environment to suit his convenience.

Activities such as throwing garbage in water, driving too many vehicles on roads, using pesticides in crop fields, bursting crackers, etc. result in undesirable changes in the environment, thereby causing **pollution**.

Pollution is the addition of unwanted and harmful substances to the environment.

These harmful substance are called **pollutants**. Dust, harmful chemicals, toxic gases, fumes, solid and liquid wastes are examples of pollutants. There are various types of pollution.

Air pollution

Air is said to be polluted when harmful and undesirable substances are mixed with it.

Causes of air pollution

Air pollution can result from both human and natural factors.

- One of the major sources that lead to air pollution is motor vehicles exhaust.
- Excessive emission of gases by industries, power houses and fertiliser plants pollute the air.
- The burning of garbage and setting off fire crackers also add to air pollution.
- Natural events that pollute the air include forest fires, volcanic eruptions, wind erosion, pollen dispersal, etc.

air pollution

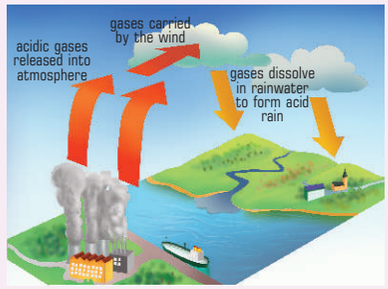
Effects of air pollution

- Air pollution may lead to irritation in the eyes, the nose and the throat. It can cause diseases such as lung cancer, respiratory infections and heart diseases.
- Air pollution can have many negative effects on the environment too. It can lead to acid rain, global warming due to the greenhouse effect and ozone layer depletion.

ACID RAIN

Acid gases such as sulphur dioxide are produced when fossil fuels like coal and oil are burnt in factories, etc. These gases rise up very high in the air. Sometimes, they combine with the water droplets that make up clouds which causes acid rain.

When acid rain falls over an area, it can kill trees and animals. It also damages soil and harms lakes and rivers.



formation of acid rain

GREENHOUSE EFFECT

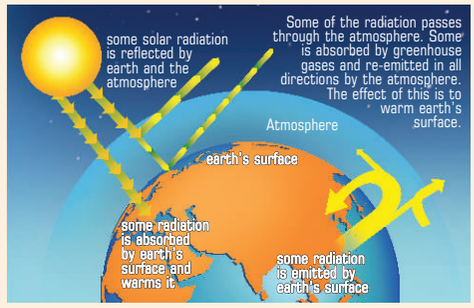
a greenhouse

A greenhouse is a house for plants. It is made of glass with glass walls and a glass roof. It is used to grow plants which cannot grow in extremely cold conditions.

Sunlight shines in and warms the plants and air inside a greenhouse. The heat is trapped inside by the glass. As the heat cannot escape, it becomes warm inside and remains warm even at night.

The earth's atmosphere does the same thing as a greenhouse. Unlike a greenhouse, the earth does not have a layer of glass over it. Some gases such as carbon dioxide in the atmosphere do what the glass roof of a greenhouse does. They stop some of the heat from escaping into space. These gases are called greenhouse gases.

Besides carbon dioxide, major greenhouse gases are methane, ozone, nitrous oxide and water vapour.



the greenhouse effect

This natural process between the sun, the atmosphere and the earth is called the greenhouse effect because it works the same way as a greenhouse.

An increase in the level of greenhouse gases in the atmosphere is causing a rise in the surface temperature of the earth. This is called **global warming**.

melting of glaciers

The earth has already warmed by 1°F over the past 100 years. But now the situation is very alarming. If the temperature keeps on increasing as before, ice caps and glaciers will soon melt. This will lead to the rise of water level in the seas and oceans and major flooding of coastal areas. So, it may cause a very dangerous situation for us.

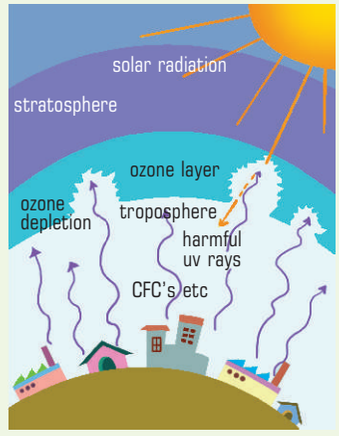
Therefore, it is our duty to stop polluting the atmosphere with greenhouse gases, otherwise there would be destruction all around.

OZONE LAYER DEPLETION

We have read that the atmosphere is divided into several layers. In the layer named stratosphere, there is a thin layer of a gas called ozone.

The ozone layer is very important because it stops too many of the sun's ultraviolet rays (UV rays) from getting through to the earth. These rays can cause skin cancer and may also harm plants and animals. A group of gases called CFC reacts with ozone. This causes the ozone layer to break up and become unable to absorb UV rays.

CFC is used in refrigeration, air conditioners, spray cans, fire extinguishers and in manufacturing foam, though it is now banned in most of the countries.



ozone layer depletion

Land pollution

Land is said to be polluted when the earth's land surface is destructed by natural or human activities.

Causes of land pollution

Land pollution occurs mainly because of human activities, although some natural events also cause land pollution.


land pollution

- The main cause of land pollution is improper dumping of solid wastes such as polythene bags, aluminium foil, glass bottles, cans, hospital waste, etc.
- The use of insecticides and pesticides by farmers is also responsible for land pollution. These chemicals get mixed with the soil and pollute it.
- Fuel leakages from automobiles pollute land.
- Mining can directly destroy land or create large holes in the ground which causes erosion.
- Nuclear plants dump harmful radioactive materials beneath the earth to avoid any casualty.
- Deforestation is another major cause of land pollution. Cutting down trees means that land is exposed to direct sunlight and rain resulting in soil erosion and land degradation.

Effects of land pollution

- Polluted soil decreases soil fertility and hence there is less crop production.
- Deforestation leads to imbalance in the water cycle which affects climate patterns.
- People living near polluted land tend to have more diseases.
- Land pollution results in loss of habitat for animals and plants.

THE 3R'S

There are three ways you can eliminate waste and protect the environment — Reuse, Reduce, Recycle.

Reuse: Reusing means using something again rather than throwing it away. For example, old clothes can be used as cloth napkins.

Reduce: Reducing means cutting down on the amount of waste that is produced. The best way to reduce is to buy only those items which you really need. So reduce the usage of electricity, water, fossil fuels, polythene bags and plastics.

Recycle: Recycling means using used useless things to make brand new products. All the used and discarded things made of paper, glass and some metals can be recycled.

Water pollution

Water pollution is the contamination of water in water bodies such as rivers, lakes, ponds, oceans and even underground water.

Causes of water pollution

water pollution

- Dumping of household wastes into water bodies
- Harmful toxic chemicals from factories drained into water bodies
- The washing down of fertilisers and pesticides from agricultural fields into the water bodies
- Oil spills from cargo ships or underwater storage tubes in the sea
- Contamination of water bodies due to acid rain

Effects of water pollution

- Water pollution kills life that depends on water bodies.
- Water pollution disrupts the natural food chain.
- Oil spills in water causes many animals to die. Oil does not dissolve in water, so it causes suffocation in fish and birds.
- Humans can get diseases like hepatitis by eating seafood that is poisoned or contaminated.
- Drinking polluted water can cause cholera, typhoid, diarrhoea, etc.
- Swimming in polluted water can cause skin diseases.
- Water pollution may also cause flooding due to accumulation of solid wastes which further causes soil erosion.

Noise pollution

Noise is defined as an unpleasant sound. So, noise pollution is an excessive and annoying degree of noise at a particular place.

Causes of noise pollution

The causes of noise pollution can be both man-made and natural.

noise pollution

- Noise from household appliances like grinders, vacuum cleaners, washing machines, coolers, etc.
- Noise from loudspeakers used in social and religious events.
- Noise from machines in factories, at construction sites, etc.
- Noise from vehicles, horns, sirens, etc.
- Noise from thunder, rain, hailstorms, animals, etc. are natural causes of noise pollution.

Effects of noise pollution

Being exposed to noise pollution can have some serious effects on our health, such as:

- A temporary loss of hearing
- An increased blood pressure
- Ringing of ears
- An inability to concentrate, headaches
- An inability to sleep
- A slow recovery from a sickness

Words to Remember

environment	–	the surroundings or conditions in which a living being lives
biotic	–	relating to living things
abiotic	–	relating to natural non-living things
producers	–	living things that make their own food
consumers	–	living things that depend on others for food
decomposers	–	microorganisms that breakdown dead and decaying plants and animals
food chain	–	a linear sequence where a small animal is the food for a larger animal which in turn is the food for an even larger animal
food web	–	a network of interrelated food chains
pollution	–	the contamination of the environment by substances that are harmful to living beings
pollutants	–	something dirty or harmful that has got mixed in the environment
acid rain	–	rain that has become dirty and harmful because of chemicals
greenhouse effect	–	the situation when the atmosphere becomes thick with gases which trap the heat of the sun, making the earth warmer
global warming	–	gradual heating of the earth's surface, oceans and the atmosphere

Points to Recall

- Everything surrounding and affecting us is known as the environment.
- The environment can be natural or social.
- The natural environment is made up of two components — biotic components and abiotic components.
- All living beings constitute the biotic component of the natural environment.
- Biotic components can be classified into producers, consumers and decomposers.
- Sunlight, water, soil and air are the major abiotic components.
- Plants and animals depend on each other for their survival.
- A food chain describes the sequence in which a living thing eat another living thing and becomes the food of yet another living thing.
- A food web is a network of food chains.
- Due to various natural and man-made activities, the environment is getting polluted every day.
- There are four major types of pollution: air pollution, land pollution, water pollution and noise pollution.
- Acid rain, global warming and ozone layer depletion are some of the harmful effects of air pollution.
- There are three ways to eliminate waste: Reduce, Reuse, Recycle.
- Water pollution affects not only marine life but also humans.
- Excessive noise pollution can have some serious effects on our health.

Exercises

A. Tick (✓) the correct option.

1. Which of the following is not a part of the natural environment?
   (a) river ☐ (b) lake ☐ (c) canal ☐ (d) stream ☐
2. Which of the following is a biotic component of the environment?
   (a) sunlight ☐ (b) forest ☐ (c) air ☐ (d) soil ☐
3. The burning of fire crackers adds to _____.
   (a) air pollution ☐ (b) land pollution ☐ (c) noise pollution ☐ (d) all of these ☐
4. Which of the following is not a greenhouse gas?
   (a) oxygen ☐ (b) carbon dioxide ☐ (c) methane ☐ (d) ozone ☐

5. Which of the following may cause noise pollution?

(a) loudspeaker (b) thunder (c) siren (d) all of these

B. Write 'T' for true statements and 'F' for false ones.

1. Carnivores include both predators and scavangers.
2. Plants are the base of every food chain.
3. Water pollution can lead to acid rain.
4. The ozone layer stops the heat of the sun from escaping into space.
5. Drinking polluted water can cause diseases like hepatitis.

C. Answer in one or two words only.

1. What is a network of food chains called? _____
2. What do we call the substances that pollute the environment? _____
3. Name one gas responsible for acid rain. _____
4. Do mining activities also pollute land? _____
5. Name the process by which new products are made from used products. _____

D. Answer in one sentence only.

1. What is the difference between carnivores and parasites?
2. What is the function of decomposers?
3. Which natural events pollute the air?
4. How do nuclear plants pollute land?
5. What is noise pollution?

E. Answer in a few sentences.

1. How do plants depend on animals for survival?
2. Write four causes of air pollution.
3. Explain the phenomenon of global warming caused by the greenhouse effect.
4. What are the causes and effects of ozone layer depletion?
5. What do you understand by 3R's?

Creative Skills

BRAINSTORM

1. You may have seen different colour litter bins in your locality. What do their colours mean?
2. Why does a scrap dealer *(kabadiwala)* buy old newspapers and other used items from houses?
3. Which of the following countries contribute more to global warming and why — the USA or Sri Lanka?

Tell Your Teacher

Read the following activities. Tell your teacher what right or wrong thing the children are doing.

- It is winter and trees are shedding leaves. Reena observes her gardener raking fallen leaves. The gardener wants to burn them. Reena stops him and asks him to bury them instead.
- Yash and his family go to a nearby lake for picnic. Yash and his elder sister Sukirti enjoy a boat ride. Yash eats potato chips and then throws the wrapper in the lake. Sukirti scolds him and picks up the packet from the lake.
- Raj goes to a nearby grocery store to buy a loaf of bread. The shopkeeper gives him bread in a polythene bag. Raj refuses the polythene bag and asks for a paper bag instead.
- Payal and her four friends live in the same neighbourhood. All of them go to the same school. They have decided that instead of using separate vehicles to go to school, all of them will go in a single car daily.

FIND OUT

What is eutrophication? How is it harmful to marine life?

_____

_____

What is visual pollution? What are its examples?

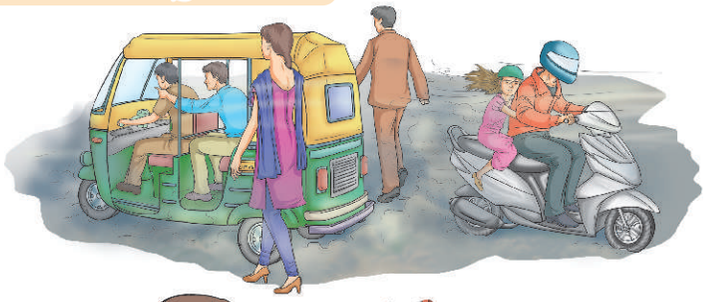
_____

_____

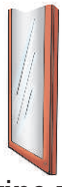
Project

The Rock Garden is a unique sculpture garden in Chandigarh. Find out more about it. Why is it popular all over the world? What is unique about it? Who created it and when? Take help from books, magazines, the Internet, etc. Write your findings in the form of a report. Show it to your teacher.

Activity Time



1. Go on a two wheeler ride in a crowded area in the evening.



2. After coming back, wipe your face with a tissue.

3. Observe the tissue.

What do you notice?
Why does the colour of the tissue turn grey or black?