

CLASS-VII

Lesson 4 Changes in Daily Life

Lesson 5 Motion and Force

Lesson 6 Ordinary Machines

Lesson 7 Pressure



4

CHANGES IN DAILY LIFE

Nothing in the world is stable. Everything changes. Many changes are around us, many are far from us. Some changes are readily visible, and some do not appear soon. Some changes are by ourselves and some changes are done by us humans. Some changes can be beneficial for us, while some can also harm us. Can any change be reversed so that the condition before the change can be brought back? There are not many questions like this, which should arise in anyone's mind and others like science must surely arise in the mind.

Let us consider some aspects of change in this lesson by taking some examples.



OBJECTIVES

After reading this lesson you will be able to:

- know about the various changes;
- Understanding the types of changes;



- Differentiate between natural and unnatural changes; and
- Understand the utility of various changes in our daily lives.

4.1 CHANGES

Every day a new day rises, there is evening, there is night and again the new day is out. This has been happening and will continue to happen in the future. The celestial position of the sun and the intensity of light (sunshine) vary every moment. The potter takes the clay and makes the pot from it. The surface of the clay has changed, when the pot is heated on the fires, the soil becomes red and strong. The material of the pitcher may break into pieces but it cannot take the form of clay again. Similarly, when you light a candle, the wax melts slowly, the light keeps on burning, the room becomes light, but gradually the candle becomes smaller and after some time it extinguishes. Have you ever wondered where the candle went? Can we bring it back? These are all changes.



Fig. 4.1 Examples of Changes

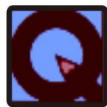


Similarly, let us take examples of some more changes which are happening around us.

1. We soaked a seed of barley or a flower in a wet pot. A plant comes out of it in a few days. The plant gets bigger, fruits and seeds are also formed from the flowers and flowers in it, but after some time, no matter how much water or manure you give it, it dries up and dies.
2. Ice is formed when the water becomes very cold. If the ice is kept open outside, it becomes water again. If you keep this water in a vessel and heat it on the fire, it becomes steam. If this steam passes through a cold place, then it again becomes water. In this way the nature of water, its temperature and its state also changed.
3. Put a small piece of lime in a pot without any water. what will happen? Pulses come in contact with water and heat comes out of them.
4. Take warm milk in a glass. Taste the milk - a little sweet it happens to be. Add a spoon of curd (jaman) to that milk and mix it well. After two to three hours the curd is prepared. The milk is like a thin liquid, curd is thick semi-liquid. The milk is slightly sweet, the curd is sour. Change happened - two types of - taste (sweet to sour - chemical change, liquid to semi-physical change) and thickness! Apart from these, the microorganisms acted on the curd (jaman) to make curd from milk, so it is also a biological change.



Notes



INTEXT QUESTIONS 4.1

Are there any changes in the following conditions or events?

Answer yes / no and put () as the correct option.

- | | |
|--|------------|
| (i) Making wheat by grinding flour. | (Yes / No) |
| (ii) Increase of water in the river. | (Yes / No) |
| (iii) Rain from the clouds. | (Yes / No) |
| (iv) Open the door of the room and close it again. | (Yes / No) |
| (v) Red color of blood. | (Yes / No) |
| (vi) Warming of hands in rubbing of palms. | (Yes / No) |
| (vii) Green color of leaves. | (Yes / No) |
| (viii) Yellowing of leaf on drying. | (Yes / No) |
| (ix) Visibility through the glass. | (Yes / No) |
| (x) Corrosion in iron lying in wet soil. | (Yes / No) |

4.2 CLASSIFICATION OF CHANGES

We have read above about some of the innumerable changes that surround us. What kind of changes are there, what are the scientific aspects in them, let us understand. We can classify changes in many ways. Figure 4.3.

(Biological changes that occur in organisms are both physical and chemical types)

Natural and human-caused changes

- (a) Any change that is happening on its own, that is, no human or other organism has a natural change, such as:



- Water from a river, pond or sea blows as a steam, becomes a cloud of steam and rains as a drop of clouds.
- The eruption of a volcano and the release of fire or lava.
- Earthquakes and buildings collapsing by them.
- Meteorite (falling stars) in the sky.
- Moon's fluctuations every day.
- Lunar eclipse or solar eclipse.
- The formation of a chick (baby) within the hen's egg.
- Falling of the fruit from the tree to the ground.
- When touching a fork, the hand automatically repels to the back.
- The fragrance of a flower when it blooms.

The commonality among all the examples given above is that all these are happening on their own or happened at any one time. In all this, there was no deliberate work done by man. Inadvertently, even after touching the hand with a fork, deliberate work was not done to repel the hand, but it happened due to the natural tendency of the body i.e. in the natural form. It is just like the food eaten, digests in the stomach, digestion of food is a natural change. If the same conditions are created outside the body, then the same result will come out.

(b) Any change which is not by itself, but by human activity, is called human-caused change, such as:



- The conversion of clay into pot by potter.
- Build houses with brick, stone and lime.
- To make tunnels and roads by cutting mountains.
- Extracting khoya from milk and making sweets by it.
- Making kites by adding bamboo sticks and paper in a special way.
- Making jaggery, sugar or loaf sugar from sugarcane juice.
- To inflate the balloon.
- To make phulwadi and crackers using sulfur potash etc.

Recurring and Non-Recurring Changes

(a) Changes that occur repeatedly after a certain time or interval are called recurring changes. You can predict such changes. Just like 14 days after every Amavasya, full moon is there and 14 days after that Amavasya comes and will always continue. See some examples of these:

- The seasons change - monsoon after summer, autumn after monsoon, then pre-winter, then winter, then spring and summer again.
- The pendulum of the clock moves right-left at the specified time. And like this, the swing on the tree goes back and forth.
- The heartbeat continues to happen continuously.
- Many birds come to India every year in winter and go back as soon as winter ends. This influx continues.



(b) Non-recurring changes, on the contrary, are those that can happen at times such as earthquakes. Let us take some examples of these.

- Leaves falling from the tree rust in iron and candles burning and end are examples of non-recurring changes.

Are these recurring changes?

You eat food, is chewing food in the mouth a recurring change? No, neither does it chew the same bite every time, nor do it only after a regular time.

Many functions of the body occur daily, such as the formation of some chemicals, which make us sleep at almost the same time every day.

Reversible and irreversible changes

(a) Reversible or reversible changes are those changes which come back to the first stage when circumstances change. These can also be called reversible changes. Let's take some examples of these:

- Ice can be made by cooling the water, ice becomes water when it is heated, steam is formed when the water is boiled, water can be formed again when the steam is cooled.
- The wax can be melted to form a candle, the same candle can be melted to make wax again.
- When you pull the rubber of a slingshot it becomes long, as soon as you stop pulling it, it becomes small again.

Give examples of any other two changes that can be reversed.



Notes

(b) Irreversible or non-reversible changes are those changes which cannot be brought back to the former state if circumstances change. These are also called non-reversible changes. Let's take some examples of these:

- burning candle turns such, that we cannot bring the same original candle back in any way.
- In the process of turning milk into curd, the sweetness of milk turns into sourness of curd. Can you make milk back from curd in any way? No. This is an irreversible change.
- Sowing seed makes a plant, the same plant cannot be turned into a seed.
- While boiling the hen's egg it turns hard. It cannot be changed back into thin yolk and whitewash.

You write two other changes that cannot be reversed.

Think

“रहिमन धामा प्रेम का, मत तोडो चटकाय,

टूटे से फिर ना जुड़े, जुड़े गांठ पड़ जाय।

Tell

What is the change between breaking the thread and then joining it?



Physical and chemical changes

(a) Physical changes: For example, whenever the appearance of an object changes but the substance remains the same as it was before, this change is called physical change. After cooling the water, its external form changes from liquid to solid state, but still it is water. Let's take some more examples of physical change:

- (i) Tear the paper into 2, 4 or 8 pieces, even though we cannot make the same type of paper again with those pieces, still the same basic material in each piece is still paper.
- (ii) You can make a shirt, pajama or a handkerchief by cutting the cloth and stitching it. The appearance of the fabric may have changed, but in every form, the cloth is still there.
- (iii) Take a little water in a bowl and dissolve one teaspoon of salt in it. Leave it in the sun for a few days, the water will blow away and the salt will again come in the form of particles. The basic thing i.e. salt is still the same. Dissolving salt in water is a physical change.

(b) Chemical Changes: Conversely, when the appearance of an object changes or does not change, but the substance changes, that change is called chemical change. For example, making curd by milk, the sweetness of milk (lactose sugars) turns into sourness (lactic acid). These two chemicals are different types so it is a chemical change. Let us take some more examples of chemical changes:



- (1) In the burning of a candle, the wax melts and burns, and gases like () are dissolved in the air. It is also a chemical change.



Fig. 4.2 Burning candle

- (2) There is rust in the iron of the nail lying in the soil. Rust is different from iron.



Fig. 4.3 Rusted Nail

- (3) Raw mango which is sour (acidic), after keeping it in the soil for a few days it becomes soft and sweet (sugary).
- (4) Cut the apple, potato or eggplant in the middle and leave it open . Within a few hours the chopped white surface becomes brownish black.

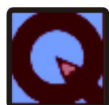


Fig. 4.4 Sliced apple

- (5) Take a little filtered (transparent) lime water in a glass, blow a tube in it, it becomes milky; its chemical substance has changed.



Notes



INTEXT QUESTIONS 4.2

- Both the seedlings and the child grow in size. What are the different changes in it:
 - Physical or chemical
 - Reversible or non-reversible
 - Natural or man-made
- The child drinks milk, eats fruits and eats pulses, by which blood, bones, muscles etc. gets developed. Explain what are the different changes in it :
 - Physical chemical
 - Reversible or non-reversible
 - Natural or human-caused

4.3 BIOLOGICAL CHANGES

As mentioned above, the plant produced from the seed made green leaves, when it grew big red-yellow-blue flowers grew on them and then grew fruit. Plant food was made up of water and salts from the earth and carbon dioxide gas taken from the air. But do not know how many types of substances have been made up in the plant. The formation of such substances can occur only in living plants. Similarly, the development of bones, blood etc.



from milk or food can happen only in a living body, a human cannot make it from life-less objects. Such changes occur only in organisms and are called biological changes. Many biological changes are physical changes and most are chemical changes.

Slow and Rapid Change

Slow and rapid change is comparable in a way. For example, suppose a human, an airplane, a rail and a horse are running or flying with their full velocity. Now you think which one of these is changing its location the fastest? Whose speed is less than that? Who will be in third place? And who is the slowest among them?

Now you can easily guess which are slow and rapid changes - Let's take another example, light a sparkler and a candle of equal length at the same time. Both will start burning, chemical changes are also taking place in both. Explain, which chemical change is most rapid? Surely your answer will be sparkling. Similarly, now you do an activity and see how the change is.

Good Changes or Bad Changes!

Calling the changes good or bad varies from different points of views. As we burn crackers, flower pots, sparklers on the night of Diwali, the children become happy, everyone's heart gets swayed, the joy in the release of firecrackers is a change that feels good. But the same change in which the smoke and poisonous gases containing the pollutants which are polluting the air will be called bad. In this way, if the food items like lentils, chapatis and vegetables are left unnoticed it gets rot, which are



often thrown away. This change due to the effect of bacteria etc. will be called undesirable 'bad' change. But when the dung and leaves are pressed into the pit it becomes compost by the effect of these bacteria, then that change will be called a desirable change, ie good. The forests are cut down, fields or barns are built or houses are built for the people to live, this is a kind of desirable / good change for humans. But the change in the form of destruction of trees and forests is also bad. The houses of birds and animals are destroyed, the balance of nature is disturbed, the weather is affected, etc. It mainly depends on how you understand..

Can any change be stopped

You wonder if we can stop the sun rising and setting? No, it is wrong to think. Likewise, can milk spoilage be prevented? Yes, it can be prevented. It can be prevented from spoiling by keeping it in the cold or by freezing it as ice. Can burning wood or burning candles be prevented from burning? Certainly! How, you tell yourself.

- **Can rust be prevented from iron nail?**

Yes, grease it well, grease it with Vaseline and paint it over it. Iron will lose contact with oxygen in air and will not rust.

- **Can aging be prevented?**

No, but changes in old age can be avoided a little with good food, prevention of diseases, proper exercise and relaxation etc.



Interaction in changes

You must have noticed that when we add water on non-extinguished lime, there is a chemical reaction in it. Calcium oxide (lime) interacts with water which results in calcium hydroxide (lime water). Similarly, when the bird flies in the air, the wings push the air but the wind resists it and the bird gets momentum. The bird's body and air interact while flying. While filling the water by pulling the rope from the well, it is seen that the rubbing of the rope is marked on the sides of the well's stone. The rope gets rubbed, but the stone also gets rubbed slowly, then it is said that in this instance of change, there is an interaction between the stone and the rope.



ACTIVITY 4.1

What you need to do: dissolve water in sugar.

How to do it: Take two glasses and fill each one with half a glass of water. Now put one tablespoon of sugar in both. The sugar will sit down. It will also start to dissolve a bit. Shortly thereafter, dissolve sugar in a glass by stirring with a spoon. Did sugar dissolve in this glass faster than other glass? Yes of course. What did we do in this? We intensified the interaction between water and sugar so it got dissolved quickly.

Similarly, take extra cold water in one glass and hot in another. Add equal quantity of sugar in both and leave it as is.

See in which (in cold or hot) sugar dissolves quickly and why?

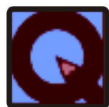


Energy in changes

You should also know that energy is used in changes. Such as:

- (i) Energy was used to make pieces of paper.
- (ii) Energy is used in boiling the water to make steam or cooling it for freezing the ice .
- (iii) Trees grow, animals and birds grow older than their children, energy is used in it.
- (iv) Energy is used to stir the sugar faster in the water with the spoon to get it dissolved.
- (v) While sweating when the air flows, it provides coolness, in this the energy is used in it, etc.

Can you count such other changes in which the direct release or use of energy is shown.



INTEXT QUESTIONS 4.3

Take a wet cloth (such as a handkerchief):

1. Soak in the sun
2. Dry it in the shade,
3. Dry it gently with your hands in the sun.

Tell me what is the change from wet to dry, physical or chemical? Explain that:

- i. Under which circumstances will wet handkerchief dry at the slowest speed? And
- ii. Under what circumstances will the wet handkerchief dry first (fastest)?



4. Explain which of the following changes are biological and which are non-biological:

- (i) Increasing the size of a small crystal in a saturated (extremely thick) sugar solution
- (ii) Yeast making the dough rise (hint: it contains the action of bacteria)
- (iii) The chapati kept on the heat will turn out fluffy.
- (iv) On chewing boiled rice, its faded taste changes to a bit sweet.
- (v) On rainy days, sometimes sprouts come out of the potatoes.

4.4 DESTRUCTIVE NATURAL CHANGES

You have read about many types of changes. Some we can control, but some natural changes are such that we have no control on them. Such natural changes, which cause massive destruction, are called destructive natural changes. Have you ever wondered why drought happens? Why do the floods come? How does a cyclone become a storm? How does an earthquake occur? What does a bursting volcano look like? Let's get to know about these devastating natural changes.

Drought

As is clear from the name itself, drought occurs when there is no rainfall in an area or much less than normal. The water of rivers and ponds dries up, the land dries up and starts cracking.



Fig. 4.5 Drought

Causes: The main causes of drought are less rainfall or drought, large scale cutting of trees (forest erosion) for road construction, building construction or industry.

What is the result: The crop gets dried up and destroyed, humans and animals start dying due to the lack of water, starvation starts spreading and the fertile soil gets drying and cracking up.

Some natural changes can be disastrous such as drought, flood, cyclone, storm, earthquake, volcano etc.



ACTIVITY 4.2

Get information about previous droughts which happened.

Talk to your elders at your home and get information about drought happened in previous years. Also, try to find out what measures people used to avoid drought in the olden days?

Today we are again adopting the ancient technique of rainwater harvesting to avoid drought. This means collecting rainwater and using it in your home and fields when needed.



Floods

There are many areas in our country where floods occur every year. These are mainly states like Bihar, Assam, West Bengal, and Uttar Pradesh etc. When the water in the river rises so much that its banks become weak and the water flows out with a strong current, it is called a flood.



Fig. 4.6 Flood scene

There are many reasons for floods, the main ones being excess rain and cutting of trees. Because of trees the soil's ability to absorb water increases.

What are the consequences of flood?

Flooding all around causes the damaging of crops, collapsing of houses and drowning which leads to the loss of life of both humans and animals, and the outbreak of diseases like cholera increases.

How to prevent floods?

Large dams are built on the rivers to prevent excess water from rain. When required, water is released slowly in controlled quantities, so that the areas which are below do not get flooded.

However, if a flood is expected, people are warned and taken to safer places. Rehabilitation programs are also being encouraged.



Fig. 4.7 Dam on rivers

Cyclonic

A cyclone is a severe storm that moves from sea to coast. When the air above the sea rises up on heating, it rotates with the rotation of the earth. That is why it is called a cyclone. Its speed can be up

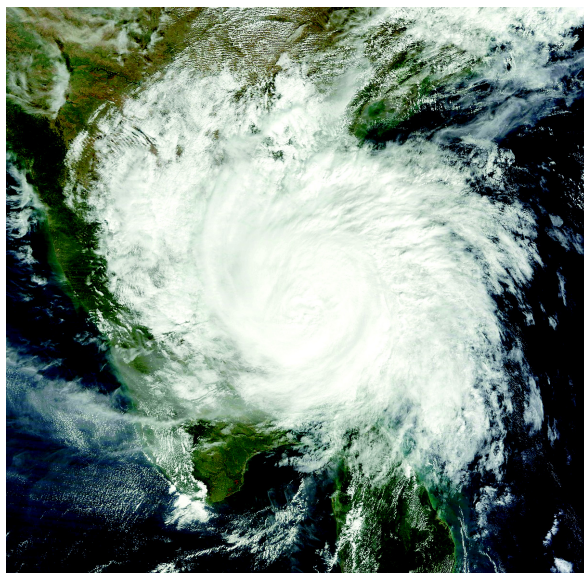


Fig. 4.8 Cyclone



Notes



to 100 km per hour. There is a cool zone in the middle of the storm, which is called Hurricane Axis. Coastal states in our country like West Bengal, Orissa, Tamil Nadu, Andhra Pradesh etc. are affected every year by this storm.

Impact:

Moving towards the coast, the storm uproots trees coming in the way, electric poles, houses and buildings etc. In the coastal areas, there is a noticeable flood of saltwater from the sea, which destroys the fertility and, there is a huge loss of life and property.

Earthquake

Our country is so vast that in some places there are droughts, others there are floods, and even earthquakes are there. You all must have heard about the massive earthquake in Ahmedabad



Fig. 4.9 Earthquake devastation

on 26 January 2001. If not, find out about it at home or by talking to your teacher.

Why does an earthquake occur?

The upper surface of the Earth is weak at some places. When an earthquake occurs, the earth rises above from these weak places and gets drowned elsewhere. It will be clear from the picture given below.

The intensity of an earthquake is measured on the Richter scale from 1 (less) to 10 (more). This measuring instrument is called seismograph.

Impact

Homes and buildings collapse, roads, bridges, etc. are broken, electric poles fall, water pipes break. Also, there is a massive loss of life and property.

Volcano:

You must have heard about the volcano, but may not have seen it. That is because there is no active volcano in our country. But

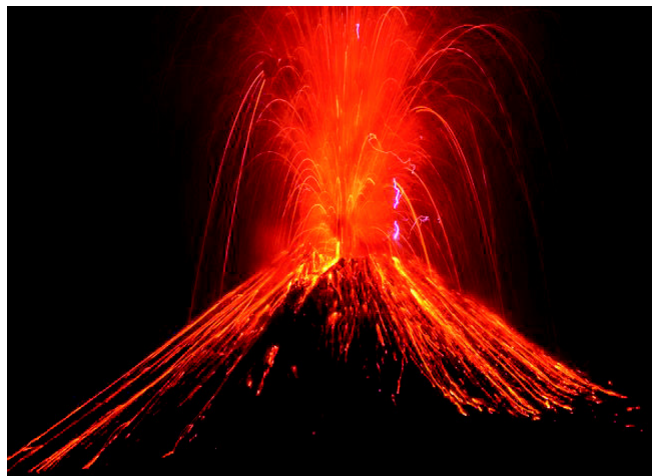


Fig. 4.12 Volcano



Notes



on hearing the name of the volcano, the image of a mountain spewing fire and lava comes to mind.

What is a volcano?

When the Earth bursts and the hot, molten lava and gas comes out, it is called a volcano. There are hot, molten stones in the center of the Earth which is called as magma. Wherever the upper surface of the Earth is weak, this magma exits with great pressure.



ACTIVITY 4.3

What you need to do: Try to make a volcano.

What you need: plasticine or plaster of Paris, cotton, color, board

How to do the: With the help of plasticine or plaster of Paris, make a flat shape on the board.

Make a hole at its crest.

Paint the red / orange / black color over the cotton wool and paste it on the hole to give the impression of lava and smoke coming out.

Conclusion: This is how the model of the volcano was prepared.

Effects

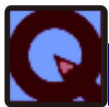
- Air pollution is increased by carbon dioxide and other gases released from the volcano. At the same time, global warming also increases.

- When sulfur dioxide gas mixes with vapor in the air, acid rain occurs.
- When lava cools and freezes, the soil that forms as a result of it is very fertile, such as the black soil of the southern plateau in India.

**Notes**

Natural Disaster Management

You have yet to read how destructive nature can sometimes be and in such situations there is a huge loss of life and property. When disaster occurs, immediate relief is provided to the people. A crisis management group has been formed by the government, which oversees these situations. Relief operations are started with the help of local institutions. It takes a lot of money and other resources to rehabilitate people and rebuild buildings. People from all parts of the country send food, money, clothes, bedding, blankets, tents, medicines, etc. to the victims. Debris removal and reconstruction of fallen buildings is done at a rapid pace so that the affected people can lead a normal life as soon as possible.



INTEXT QUESTIONS 4.4

1. What are destructive natural changes? Give two examples.
2. Give any two measures for flood prevention.
3. Describe any two harmful effects of volcanoes.



Notes



WHAT HAVE YOU LEARNT

- Nothing is stable around us. A change in the form / shape, color / position etc. of an object is called a change.
- Changes can be classified into the main six types of natural and man-made, recurring and non-recurring, reversible and irreversible, physical and chemical, dense and rapid, biological and good or bad natural changes.
- Energy is required for change.
- Droughts, floods, cyclones, earthquakes and volcanoes etc. are destructive natural changes.



TERMINAL QUESTIONS

1. State whether the following is true or false:
 - (i) There is no role of forest planting in the occurrence of drought and floods. ()
 - (ii) In the middle of a cyclone there is a cool zone. ()
 - (iii) Flooding can be prevented by building dams on rivers. ()
 - (iv) In an earthquake, some parts of the earth rises up. ()
 - (v) Air pollution increases when volcanoes erupt. ()
2. To avoid drought
Suggest two measures to be taken in your home or village. ()
3. Describe with the picture how a cyclone is formed. ()



4. Describe the good and bad effects of volcanic eruption. ()
5. How will you help your affected people in times of natural disaster? ()
6. How does air pollution increase when a volcano erupts? ()
7. Below are some situations described whether that are changes or not:
 - (i) While reading this book you are looking from one word to another and second to third.
 - (a) Is this a change? Yes / no
 - (b) If there is a change then which is the object? Is it words or eyes
 - (ii) Is the switching on and off of light bulbs a change? Yes / No
 - (iii) Is there a change in picking up the glass on the table and keeping it exactly in the same place? Yes / no
 - (iv) Is there a change by lifting the glass from one side of the table and placing it on the other side? Yes / no



ANSWERS TO INTEXT QUESTIONS

4.1

1. (i) Yes, (ii) No, (iii) Yes, (iv) No, (v) Yes, (vi) Yes, (vii) No (viii) Yes, (ix) No, (x) Yes

**4.2**

1. (i) Chemical, (ii) Non-reversible, (iii) Natural
2. (i) Chemical, (ii) Non-reversible, (iii) Natural

4.3

1. (i) Inorganic, (ii) Biological, (iii) Abiotic (iv) Biological, (v) Biological

4.4

1. Natural changes that cause loss of life and property.
Floods, volcanoes, cyclones, droughts, earthquakes (any two)
2. Dams on rivers, planting trees etc.
3. Destruction of public goods, destruction of crops, etc.

