

Changes Around Us

- From morning till night, we observe many changes around us. For example, sudden change in the weather, rainfall, flowering of plants, germination of seeds, ripening of fruits, drying of clothes, change of day into night, melting of ice, evaporation of water, burning of fuels, cooking of rice, formation of curd from milk, rusting of iron, burning of fireworks, etc. Based on these examples, changes can be classified in the following ways:

- Slow and fast changes
- Desirable and undesirable changes
- Periodic and non-periodic changes
- Reversible and irreversible changes
- Physical and chemical changes

(i) Slow and fast changes: Slow changes take place over days, months or years. For example, rusting of iron nails, germination of seeds, ripening of fruits, etc.

Fast changes occur within a short span of time. For example, spinning of a top, burning of a matchstick, curdling of milk by adding lemon juice, etc.

(ii) Desirable and undesirable changes: The changes that are beneficial or desirable for us are called desirable changes. For example formation of curd from milk, formation of manure from cow dung and dead plants. But there are some changes that may be undesirable or harmful. These are called undesirable changes.

For example-the burning of a factory, flooding of a river, rotting of food stuff, etc.

- A change may be desirable at one time but undesirable at some other time. For example, the burning of a fuel (wood, coal) to produce heat is a desirable change. However burning is an undesirable change, when a house or a factory is burnt
- A change may be desirable for someone and undesirable for others. The cutting of trees may be desirable for someone who needs wood but undesirable for others because it disturbs the balance in nature.

(iii) Periodic and non-periodic changes: Changes that occur again and again after a fixed interval of time and their recurrence can be predicted are called periodic changes. For example - winter, summer, autumn, spring and rainy seasons recur each year, the waxing and waning of the moon nights recur each month, generation of high and low tides in the sea, etc.

Changes that do not repeat themselves at regular intervals of time and cannot be predicted are called nonperiodic changes. For example - train accidents, the occurrence of earthquakes, landslides, sneezing, etc.

(iv) Reversible and irreversible changes: If a change can be reversed, it is called a reversible change. For example, ice changes into water on heating whereas on cooling water changes back to ice. Similarly, when we put a weight on a rubber band or a spring, it stretches; but when we remove the weight, it comes back to its original shape. If a change cannot be reversed, it is called irreversible change. For example, when coal is burnt, it changes into ash and smoke and we cannot get back coal from ash and smoke. Ageing, changing of milk into curd are some other examples.

(v) Physical and chemical changes

- Changes in which the size or shape of the object changes but the substances of which they are made remain the same and no new substances are formed are called physical changes. For example, breaking a wooden stick, cutting or tearing a piece of paper, breaking a piece of chalk and breaking a glass tumbler. In all these cases, size or shape of the objects change. However these are still wood, paper, chalk and glass.
A change in which new substances are formed is called a chemical change. For example, when paper burns, carbon dioxide, water vapour and ash are produced. None of them have properties of paper.
- The same substance may undergo a physical as well as a chemical changes depending upon the conditions. The tearing of a sheet of paper in different pieces is a physical change, whereas burning it is a chemical change.

SOME OTHER IMPORTANT FACTS

- A change may be classified in more than one type. For example, formation of curd is a desirable, chemical, slow and irreversible change.
- Some changes can be controlled (they can be sped up, slowed down or prevented). For example, we can slow down or prevent spoiling of food.
- There are some changes which cannot be controlled. For example changes of day and night, the phases of the moon, tides in the sea and change of the seasons, etc.