# 6th – Changes Around Us

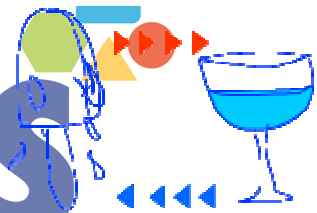
**Changes around Us:**

| | | | |
|---|---|---|---|
| Cooking of food | Rusting of iron | Burning of paper | Changes in weather |
| Alteration of day and night | Germination of seed | Change of state of matter | Breaking object into pieces |

Reversible Change: **When a change can be reversed easily, it is called reversible change. Examples: Melting of ice, folding of paper, water turning into vapour, inflation of balloon, etc.**

- The three physical states of water i.e. solid (ice), liquid(water) and gas (water vapour) are reversible and can be changed from one state to another by heating or cooling.
- **Irreversible Change**: When a change cannot be reversed, it is called irreversible change. Examples: Cooking of food, growth in a living being, burning of paper, etc.
- Milk gets spoiled when not refrigerated, particularly in summers. This is called curdling or souring of milk, which is an irreversible change.
- Cooking of food is an irreversible change because we cannot get back the ingredients in their original form.
- **Fast changes**: Changes that occur quickly is called Fast changes e.g burning of match stick, burning of fire cracker, Evaporation of petrol, burning of magnesium ribbon.
- **Slow Changes**: Changes that occur slowly is called slow change like growth of nail, rusting of iron.

Changes can also be divided into following two types:



- **Physical Change**

1. When no new substance is formed after the change, it is called physical change.
2. Physical changes are usually reversible.
3. Examples: Melting of ice, melting of wax, etc.
4. Burning of candle is a physical change because melted wax solidifies on cooling. However, when a candle burns, the wax is undergoing two changes at the same time: First, it melts and second, it burns. Always the melted wax burns.

- **Chemical Change**

1. When a new substance is formed after the change, it is called chemical change.
2. Chemical changes cannot be reversed by simple physical means.
3. Many chemical changes are irreversible.
4. Examples: Burning of candle, rusting of iron, etc.

| Physical Change | Chemical Change |
|---|---|
| Composition of substance remains same. No new substance is formed. | Composition of substance is changed. New substance is formed. |
| Change in shape, size, or physical state occurs | New substance have new shape, Physical state. |
| Chemical properties remain same. | Different physical and chemical properties. |
| These are reversible | These are irreversible. |
| Eg: melting of ice, heating of iron | Eg: burning of wood, rusting of iron |

1. **Causes of Change: There are various causes of change.**

**2.** Force: **Force can bring changes in certain things.**

- For example; when you blow air in a balloon, the force of air inflates the balloon.
- When a potter applies force on a lump of soil, he gives shape to the lump.
- When a goldsmith hammers a piece of gold, he makes intricate designs on it.
- When a ball of dough it pressed with the rolling pin, it turns into flat bread; which is ready to cook.

3. **Temperature:** Certain things expand on heating and contract on cooling. There are many materials that expand (i.e. increase in size) on heating and contract (i.e. decrease in size) on cooling. Fixing of an iron rim on a bullock-cart wheels. The iron rime is made slightly smaller in size than the wooden wheel. The ironsmith heats this iron rim uniformly. On heating, it expands and becomes somewhat bigger in size. This hot iron rim is now easily put around the wooden wheel. Water is poured over the hot iron rim to cool it. On cooling, the hot rim contracts (shrinks) and fits tightly around the wooden wheel. Similarly, wooden handles are fitted tools such as spades and ploughs which for digging soil.

1. When ice is kept on room temperature, it melts and turns into water.
2. When candle begins burning, its wax melts because of higher temperature.
3. When a piece of paper is burnt, it turns into a new substance because of heat.
4. Ironsmith uses heat to change a lump of iron into useful items.
5. Iron is heated till it becomes red hot and then is beaten to give it a particular shape. Spade, knife, sickle, etc. are made from iron in this way.

<u>Relevance of Reversible changes in Daily Life</u>:

1. Working of Blacksmith: A blacksmith changes a piece of iron into different tools. For that, a piece of iron is heated to red hot. This also softens it. It is then beaten into the desired shape. It is a reversible change.
2. Expansion and contraction of metals: Metals expand on heating and contract on cooling. This expansion and contraction of a metal is a reversible change. Small gaps are left between the rails that form the parallel lines of a railway track. These gaps are called expansion gaps. These gaps allow the rails expand in hot weather. If there are no gaps or gaps are too small the lines can bend.
3. Fixing wooden handles on tools: While making agricultural tools the metal ring is heated before fixing the wooden handle. On heating the metal ring expands. When the ring become bigger size the wooden handle fix easily. When the metal ring cools, it contract and the handle fits in tightly.
4. Fixing metallic rim on a wooden wheel: The fixing of metallic rim to the wooden base of the wheel of bullock cart can be done in the similar manner. The metallic rim used is slightly smaller in diameter than the wheels .On heating the rim expands. And can easily lie on the wheels. When the rim cools, it contract and press tightly on to the wheels.

<u>Burning of a candle is a chemical change whereas melting of wax is a physical change.</u> When wax melts, it flows down and solidifies again. So, it is a reversible and temporary change. Thus, melting of wax is a physical change. On burning a candle, wax burns to produce wax vapour and carbon dioxide. It produces heat and light and candle becomes smaller on burning. New substances are formed energy is released during the burning of candle. It cannot reversed and it is a permanent change. Thus, burning of candle is a chemical change.





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