

Chapter – 6: Changes Around Us

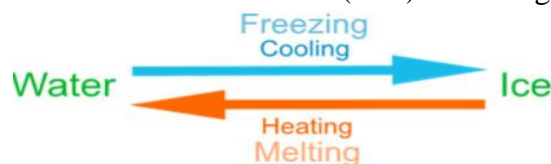
- Many things around us
- These things – have some properties – state, position, shape, size, etc
- Whenever – some property changes – change takes place
- During changes – many alterations happen
- Ice – melts to form water – change of state
- Imp. changes around us –
 - Formation of curd
 - Cooking of food
 - Burning of fuels
 - Drying of clothes
 - Rusting of iron
 - And the list goes on
- Some changes – beneficial – some harmful
 - Ripening of food – beneficial – try to make it faster – artificial methods
 - Spoiling of food – harmful – try to slow it down – refrigeration
- Change – does not happen automatically – always a cause – making it happen
 - Ice – does not melt on its own – heat melts it to form water
 - Change – ice to water – cause – heat
- Many ways – making change – apply heat, light, electricity – even mixing things
 - Add sugar to water – sugar dissolves – form sugar solution

Classification of Changes

- Change happens – new substance formed
- Cause of change – removed – new substance goes back to original form (sometimes)
- Change – is reversed – reversible change
- Change – is not reversed – irreversible change

Reversible Changes

- Change – reversed to original stage
- Ice – solid – heat it – melts to form water – freeze (cool) it – changes to ice again



- Examples of reversible changes – melting of ice, boiling of water, melting of wax, stretching of rubber band, etc
- Boil water – changes to steam – cool the steam – changes back to water
- Stretch a rubber band – external force – length increases – remove the force – length changes back to normal
- Dissolve salt in water – salt disappears – boil the water – water evaporates – salt left behind
- Blacksmith – heats the iron – iron softens – hammers it to shape it – cools down – iron hardens

Expansion (on heating) is reversible

- Object – heated – increases in size – expansion
- This hot object – cools down – decreases in size – contraction
- Uses –
 - Fixing of iron rim on wooden wheel
 - Iron rims – smaller than wooden wheel
 - Iron rim – heated – expands – fits over wooden wheel
 - Cold water – poured down – iron rim cools down – contracts
 - Fixing of iron blade on wooden handle
 - Iron blade of spade – there's a ring – heated – expands
 - Wooden handle – slide in easily
 - Cold water – poured down – iron ring cools down – contracts

Irreversible Changes

- Change – cannot be reversed to original state
- Burn a piece of paper – changes to ash and smoke – cannot be combined back to form paper
- Examples of irreversible changes – burning of fuels, making of curd, formation of flower, ageing of humans and animals, etc
- Wheat – grinded – changes to flour – cannot change back to wheat
- People – grow up – ageing – cannot change back to children
- Toy – breaks down – cannot change back to original toy
- Plaster of Paris (POP) – white powder – turns solid on adding water – cannot change back to powder
- Water added to cement – turns to solid mass – cannot change back to cement

Reversible and Irreversible Changes Involving Same Materials

- Folding and cutting of paper –
 - Fold a sheet of paper – make a toy plane – unfold it – obtain original paper
 - Cut a sheet of paper – cannot combine them to obtain original paper
- Rolling and baking a roti –
 - Take some dough – roll it to make roti – can be converted back to dough
 - Bake the rolled-out roti – on a *tawa* – cannot change back to dough
- Shaping and baking a clay pot –
 - Take some wet clay – shape it into a pot – potter's wheel – can be changed back to wet clay
 - Bake the shaped pot – in an oven – cannot change back to wet clay
- Inflating and bursting a balloon –
 - Take a balloon – blow some air into it – balloon inflates – release the air – balloon deflates
 - Blow some air again – tie its mouth – burst the balloon with needle – cannot change back to original balloon
- Melting and burning of wax –
 - Take some solid wax – heat it – turns to molten (liquid) wax – let it cool – changes back to solid wax
 - Take a wax candle – measure its length – light it – after some time (10-15 minutes) – candle melts – lots of gases, smoke, fumes produced – measure it again – cannot combine all by products to form original candle