Transfer to Heat

Transfer of Heat

Heat is transferred from a body at a higher temperature to a body at a lower temperature. This transfer occurs in three ways:

i. **Conduction**

ii. **Convection**

iii. **Radiation**

i. Conduction

Conduction is the process by which heat is transferred from the hotter end of an object to the colder end without the actual movement of particles. It occurs mainly in solids.

ii. Convection

Convection is the transfer of heat in liquids and gases by the movement of particles. Warmer particles move up, and cooler particles move down, forming convection currents.

Convection in Water

Water is a poor conductor but transfers heat by convection.

When heated from below, hot water rises and cold water sinks, forming convection currents.

> **Example:** Heating water in a vessel.

Convection in Air

Air transfers heat by convection.

> **Example:** Heaters are placed near the floor; hot air rises, and cold air sinks, heating the room uniformly.

Land and Sea Breezes:

Sea Breeze: During the day, land heats up faster than water. Warm air rises, and cool sea air moves in to take its place.

Land Breeze: At night, land cools faster. Warm air over the sea rises, and cool air from land moves to replace it.

iii. Radiation

Radiation is the transfer of heat without a medium, through electromagnetic waves.

Examples:

- Heat from the Sun reaches Earth through radiation.
- Feeling warmth from a fire without direct contact.

Properties of Radiation:

- No medium is required.
- Travels in all directions as heat waves.
- Dark surfaces absorb more heat; shiny surfaces reflect heat.

Thermos Flask: Preventing Heat Loss A thermos flask reduces heat transfer by conduction, convection, and radiation:

Conduction: Glass and cork are poor conductors; vacuum prevents conduction.

Convection: The stopper and vacuum prevent heat loss.

Radiation: Silvered inner walls reflect heat, minimizing loss.