

Flow Of Heat LR

Flow of heat. Objective, to understand how heat flows. Here's a steel spoon, which was left for a few minutes in this cup of hot tea.

When we touch the spoon, we feel that it has become hot too. This happens because the heat from the hot tea has been transferred to the spoon. Now here's a cup of hot coffee that was left here for 10 to 15 minutes.

When we touch it, we feel that it has cooled down. In this case, the heat gets transferred from the hot coffee to the surroundings, so we understand that heat always flows from a body at a higher temperature to a body at a lower temperature. Heat can be transferred from one place to another by three different methods, conduction, convection, and radiation.

Let's look at some examples to learn how heat flows by these three processes. Here we see four kids sitting side by side with the first boy holding a ball. In the first example, the boy who is holding the ball passes the ball through the other children to the last boy.

Similarly, heat can also get transferred from molecule to molecule, from a hot end to a cold end. The molecules themselves do not move from one place to another. When heat gets transferred in this manner, the method is called conduction.

In the second example, the boy goes and hands over the ball to the last boy. Similarly, heated molecules themselves can also move to carry heat from a hot region to a cold region. When heat is transferred in this way, the method is called convection.

In the third example, the boy with the ball throws the ball to the last boy. Similarly, heat can also get transferred from one place to another in the absence of any medium. When heat gets transferred in this way, the method is called radiation.

To summarize, heat flows from a body at a higher temperature to one at a lower temperature. Heat can be transferred from one place to another by three different methods, conduction, convection, and radiation.

Summary: Flow of Heat

Heat always flows from a **hotter object to a cooler one**. The transfer of heat happens through **three different methods**:

1. **Conduction** – Heat transfer **through direct contact**, where molecules pass heat to neighboring molecules **without moving themselves** (e.g., a steel spoon in hot tea).
2. **Convection** – Heat transfer **by the movement of heated molecules** from a hot region to a cold region (e.g., warm air rising in a room).
3. **Radiation** – Heat transfer **without any medium**, in the form of waves (e.g., heat from the sun reaching Earth).

Heat energy always moves **from a higher temperature to a lower temperature** until both objects reach the same temperature.

Quiz: Flow of Heat

1. In which method of heat transfer do molecules pass heat without moving themselves?

- ☒ a) Conduction
- ☐ b) Convection
- ☐ c) Radiation
- ☐ d) Evaporation

2. Which of the following is an example of radiation?

- ☒ a) Heat from the sun reaching Earth
- ☐ b) A metal spoon getting hot in tea
- ☐ c) Warm air rising in a room
- ☐ d) Ice melting in a bowl

3. How does heat transfer through convection?

- ☒ a) By the movement of heated molecules from a hot region to a cold region

- ✗ b) By direct contact between two objects
- ✗ c) By electromagnetic waves
- ✗ d) By absorbing moisture from the air

4. What happens when a hot cup of coffee is left on a table for 15 minutes?

- ☒ a) Heat transfers to the surrounding air, making the coffee cooler
- ✗ b) The coffee generates more heat on its own
- ✗ c) The coffee remains at the same temperature
- ✗ d) The surrounding air gets colder