



Temperature and Heat

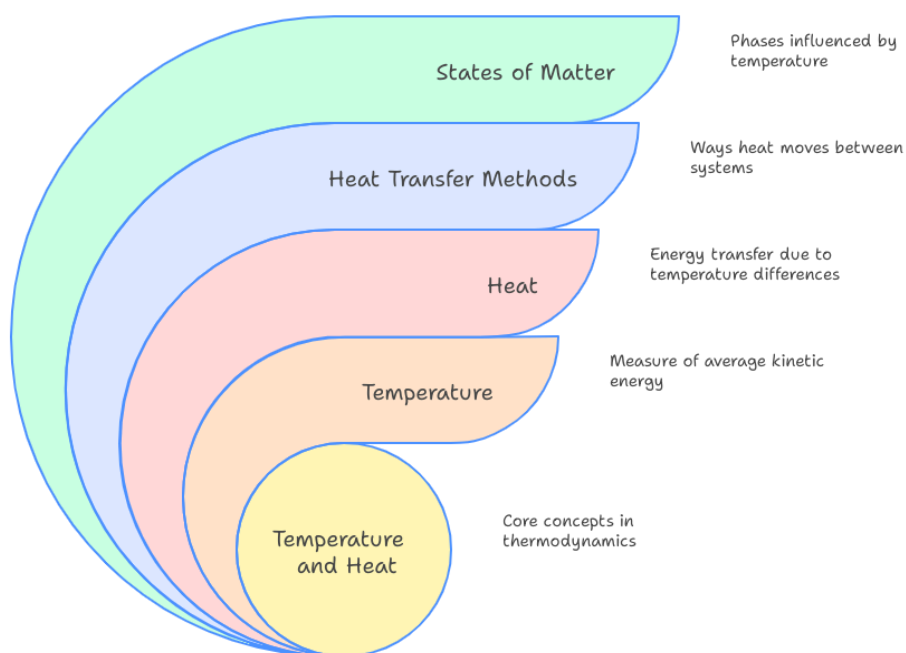
I Word focus

- Temperature
- Heat
- Thermometer
- Conduction
- Convection
- Radiation
- Conductor
- Insulator

II KWL

III Concept map

Temperature and Heat Concepts



IV Q and A

1. Differentiate between conduction, convection, and radiation. Explain each with examples.

Feature	Conduction	Convection	Radiation
Medium Required	Solid	Liquid or Gas	No medium (can occur in a vacuum)
How Heat is Transferred	Through direct contact of particles	Through movement of fluid (hot rises, cold sinks)	Through electromagnetic waves
Speed	Slow	Moderate	Fastest of the three
Example	Heating a metal rod—heat moves from hot to cold end	Boiling water—hot water rises, cool water sinks	Feeling the sun's heat even in space
Use in Daily Life	Cooking on metal pan	Ceiling fans spreading warm/cool air	Solar panels, feeling warmth near a bonfire

2. What are the different types of thermometers? Describe mercury, alcohol, and digital thermometers.

Thermometers are used to measure temperature. There are different types for different uses:

1. Mercury Thermometer

- Contains mercury (a metal that expands with heat).
- Used for accurate readings in labs and clinics.
- Hard to read, dangerous if broken (toxic).

2. Alcohol Thermometer

- Contains colored alcohol.
- Used in cold places—alcohol works better at low temperatures.
- Safer and less toxic than mercury.
- Used in meteorology and labs.

3. Digital Thermometer

- Uses sensors and a small screen to show the temperature.
- Fast, accurate, and safe.
- Used in homes, hospitals, and industries.
- Battery-powered and easy to use.

3. How do you read a conventional thermometer? Write the steps and important precautions.

Steps to Read a Conventional Thermometer:

1. Shake the thermometer gently to bring the liquid below 35°C.
2. Place the bulb of the thermometer under the tongue or in the armpit (for clinical use).
3. Wait for at least 1–2 minutes.
4. Take out the thermometer and hold it at eye level.
5. Read the temperature at the top of the liquid column (usually mercury or alcohol).

Precautions to Take:

- Always clean the thermometer before and after use (especially for clinical thermometers).
- Handle with care—it is made of glass and can break.
- Never use a damaged or cracked thermometer.
- Do not touch the bulb directly—it can affect the reading.
- Store in a protective case after use.

4. Explain the applications of conduction, convection, and radiation in daily life.

Heat transfer is part of everyday life. Here are real-life examples of each method:

Conduction:

- Ironing clothes—the iron transfers heat to the fabric.
- Cooking on a metal pan—heat moves from the stove to the pan to the food.
- Holding a hot cup—the heat moves from the cup to your hand.

Convection:

- Boiling water—the hot water rises, cold water moves down, forming currents.
- Sea breeze—during the day, hot air over land rises and cool sea air moves in.
- Room heater—hot air rises and spreads warmth around the room.

Radiation:

- Sun heating the Earth—no medium needed.
- Sitting near a fire—you feel heat without touching it.
- Solar cookers and solar panels use heat from sunlight directly.

5. Numericals