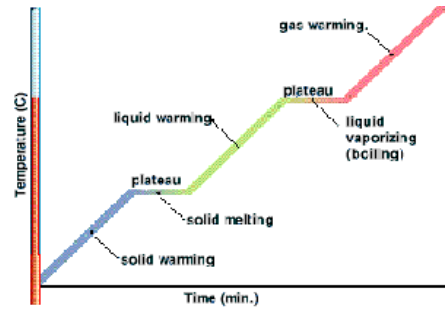
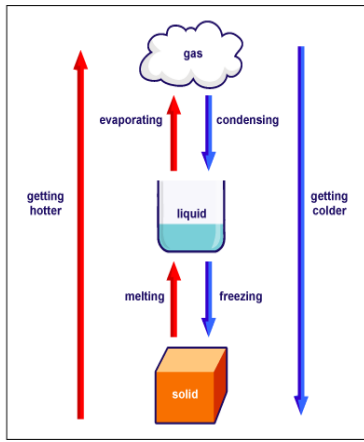


# Heating & Cooling Revision (Year 8) (8I) (Pages 104-114)



Temp for Melting / Freezing & Boiling/Condensing the Same



- Heating & Cooling Curves
- State Changes
  - Melting : Solid to Liquid
  - Freezing : Liquid to Solid
  - Liquid to Vapour
  - Boiling : Liquid to Gas at The Boiling Point
  - Evaporation
  - Condensing : Vapour/Gas to Liquid

Keep Things Warm or Cold for Longer

Fossil Fuels Need To Be Conserved. We Can Use Less Energy By Insulating Our Houses etc

Cavity Wall Insulation, Jackets for the Hot Water Tank, Reduce Draughts & Double Glazing

Insulation

Conduction : Reduce By Using Materials Which are Poor Conductors (Insulators)

Convection : Reduce the Movement of Air by trapping It

Radiation : Reduce by Using Reflective Foil

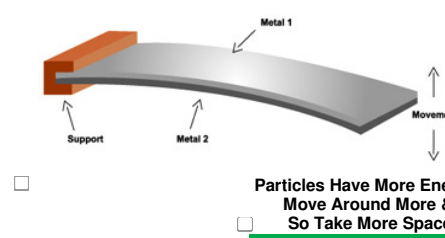
Thermal Expansion

Solids

Particles Vibrate more as they warm up & so Take More Space

Different Metals Expand at Different Rates

Bimetallic Strips



Liquids & Gases

Particles Have More Energy, Move Around More & So Take More Space

Pressure

Pressure In Gases Caused by the Particles hitting the sides of the Container

More Movement with Higher Temperature, More Collisions and so More Pressure

A Measure of How Hot Something Is

Common Scales : Celsius (°C), Fahrenheit (°F), Kelvin (K)

Common Temperatures

Ice Melts at 0°C, Water Boils at 100°C, Body Temp : 37.5°C, Room Temp 21°C

Temperature

Depends on Three Things : Temperature, Mass & the Type of Material

A spark from a sparkler Maybe 1000°C, it contains less Heat Energy Than a Cup of Tea



Heat Energy (Also Called Thermal Energy)

Units : Joules (J)

(1,000J = 1 kilojoule (1kJ))

Heat Energy Moves from Hot to Cold, (Eventually Hot or Cold Objects Reach The Temperature of Their Surroundings)

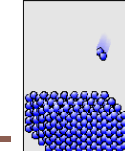
Transfer

Conduction

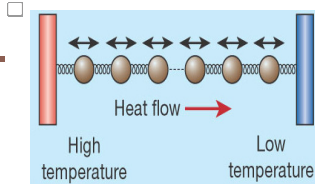
Convection

Radiation

Conduction Mostly Happens in Solids Where the Particles are Closer Together & Cannot Easily Move but can vibrate to Transfer Heat Energy

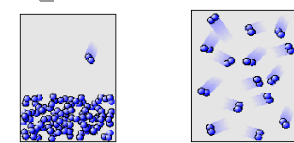


When Heated, the Particles Vibrate More & Pass on the Heat Energy



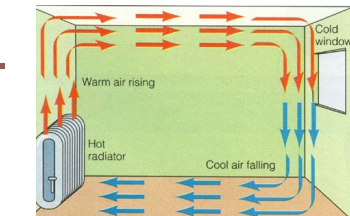
Metals are Good Conductors

In Fluids (Liquids & Gases) Not in Solids (Particles Need to be Free to Move)



Warm Particles Rise (Less Dense), Cold Particles Fall (More Dense)

Room Heating



Can Travel Without a Material (Through a Vacuum or Space)

Absorbed or Radiated Best by Dark (Black) Surfaces



Electromagnetic Radiation (Infra Red)

Reflected By White or Shiny Surfaces