

Box 1: Keywords

Word	Definition
conduction	A way in which energy is transferred through solids, and to a lesser extent, liquids and gases
convection	The transfer of energy by the movement of particles of gases or liquids
energy store	The energy held in an object such as food or a hot object
fuel	Substances that can be burnt to release energy
joules	The unit of energy, symbol J
Law of conservation of energy	Energy cannot be created or destroyed, only transferred
power rating	The number of watts (or kW) that tells you the rate at which an electrical appliance transfers energy
radiation	The transfer of energy as a wave
temperature	A measure of how hot or cold something is, measured in degrees Celsius, using a thermometer
work	A way of transferring energy that does not involve heating. It involves a force.

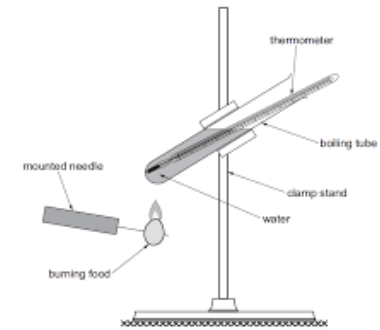
Box 2: Key skills

Safely carry out a practical; use scientific language; apply scientific knowledge to explain data; perform calculations; use SI units correctly; convert units.

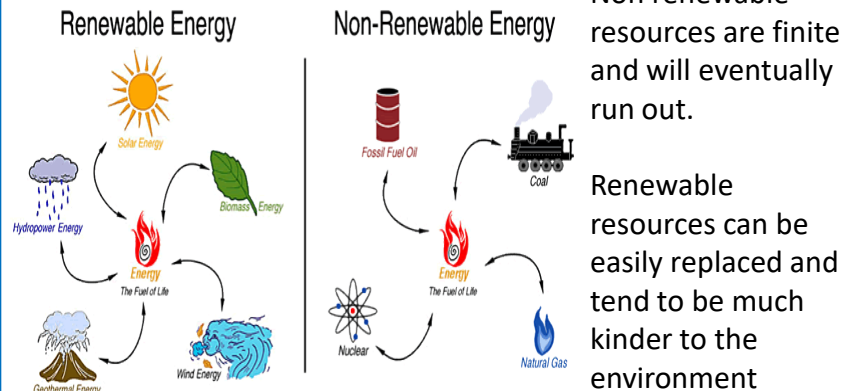
Box 3: Food and fuels

A **fuel** is something that is burned to produce **energy**. Our bodies obtain energy from the food that we eat (released by the process of **respiration**)

Energy is measured in **joules (J)** or **kilojoules (kJ)**



Box 4: Energy resources

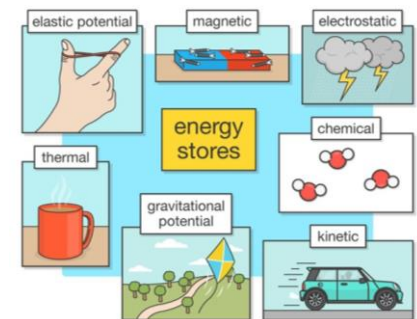


Box 5: Energy stores and Conservation of energy

Energy cannot be created or destroyed, only transferred.

The total amount of energy remains the same but not all transfers are useful.

Energy is transferred between stores by electric current, light, sound or forces (mechanically)

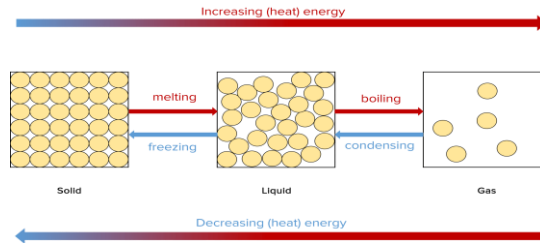


Box 6: Energy and temperature

Thermal energy is not the same as **temperature**.

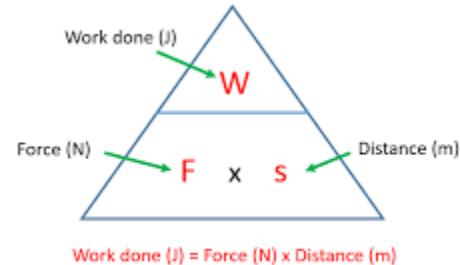
Temperature is measured in degrees **Celsius (°C)** using a **thermometer** or **temperature sensor**.

When you heat a substance up, the movement and arrangement of particles changes.



Box 8 Work Done and energy transfers

Energy can also be transferred using a force – this is **work**.

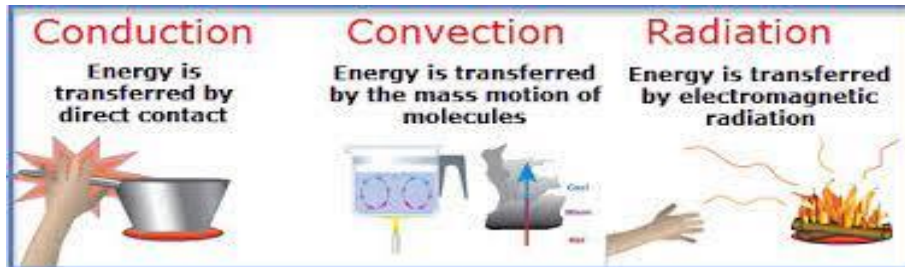


A **lever** will reduce the energy needed to open a tin of paint; the distance between the force applied and the point of action is increased so less force is needed, less **work** is done.

Box 7: Conduction; convection and radiation

Conduction of thermal energy occurs in **solids**; metals are good conductors; other solids such as wood are poor conductors – they are insulators.

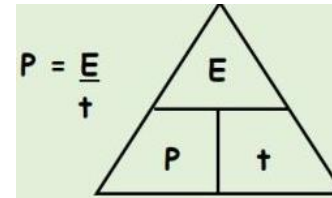
Energy is transferred in a metal between **vibrating particles** and/or **free electrons**



Convection happens in **fluids** (liquids and gases). When the fluid gets hotter, the particles move faster and are slightly further apart; the fluid becomes **less dense** and **risers** and cooler, denser fluids takes its place – this is a **convection current**.

Radiation does not need particles and so can travel through a vacuum. Infrared radiation is given out by all objects – how much depends on the colour and nature of the surface of the object.

Box 9: Energy and Power



The **power** of an appliance tells us how much **energy** is transferred per second. The units are **watts (W)**
You can calculate your power by timing how long it takes to do work.

Box 10: Pathway

Previous knowledge: KS2
Temperature

Future links: KS4

Energy stores and transfers; energy resources; conservation of energy

Careers:

Architects; heating engineers; car designers; chefs; athletes; theme park designers; mechanical engineers; space probe designers

Box 11: Cross curricular links