



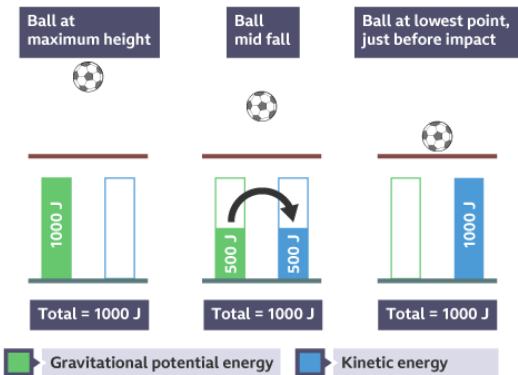
Year 7 Energy

Keyword	Definition
Conduction	The process in which thermal energy is transferred in solids.
Convection	The process in which thermal energy is transferred in fluids.
Energy dissipation	Energy which is not transferred to a useful energy store and is wasted to its surroundings.
Energy resources	Systems that can store large amounts of energy. It can be divided into two categories; renewable and non-renewable resources.
Energy stores	There are many stores of energy, men get ck will help us remember them.
Energy transfers	Energy cannot be created or destroyed, but it can be transferred by mechanical working, electrical working, heating and radiation.
Fluid	A liquid or a gas.
Infra red radiation	An electromagnetic wave which transfers thermal energy
Insulator	Material that does not conduct.
Joules	The unit for energy (J)
National grid	The network which connects power stations to our homes to supply them with electricity..
Power	The rate at which energy is transferred, measured in joules per second (J/s)
Useful energy	Energy transferred to the store you want it to be in.
Wasted energy	Energy which is not transferred to the energy store (it is transferred to the surroundings).
Watts	The unit for power.

Energy stores

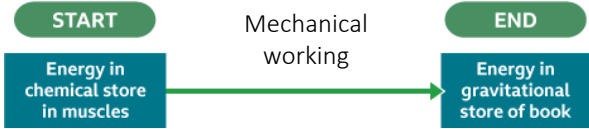
Energy can not be created nor destroyed but it can be stored and transferred. Energy is measured in Joules.

Energy stores are **magnetic, electrostatic, nuclear, gravitational potential, elastic potential, thermal, chemical and kinetic.**

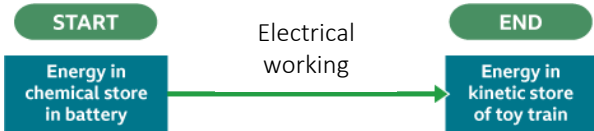


Energy pathways (transfers)

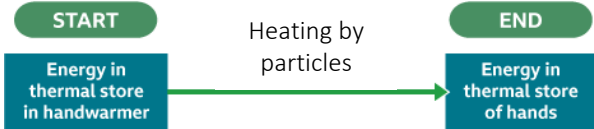
Energy can be transferred by:
Mechanical working – work done by forces.



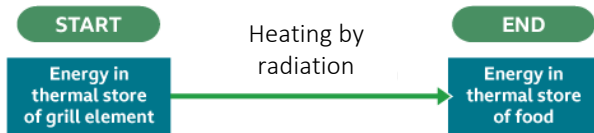
Electrical working – work done when a current flows.



Heating by particles– when energy is transferred between hotter and colder areas.

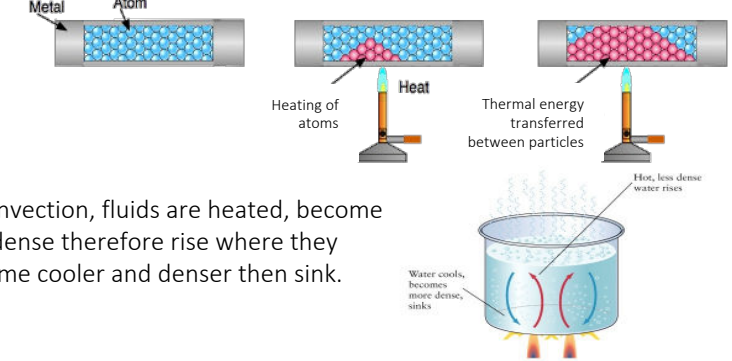


Heating by radiation – when energy is transferred as a wave.



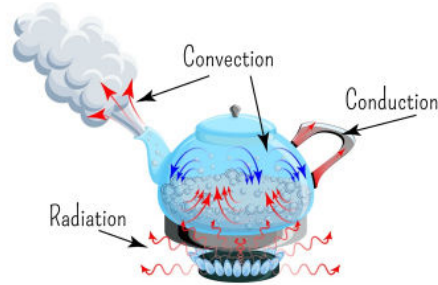
Thermal energy

The hotter the object, the more energy it has in its thermal energy store. In conduction, energy is transferred from particle to particle within a solid.



In convection, fluids are heated, become less dense therefore rise where they become cooler and denser then sink.

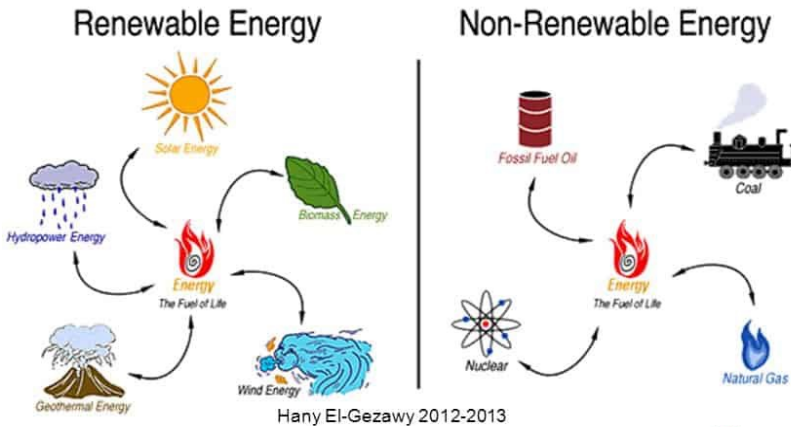
The diagram below shows how energy can be transferred in heating a kettle



Energy resources (sources)

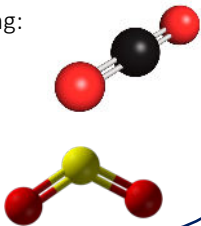
Non-renewable – a resource which cannot be replaced as fast as it is being used.

Renewable – a resource which can be replaced at, or faster, than the rate which they are used.

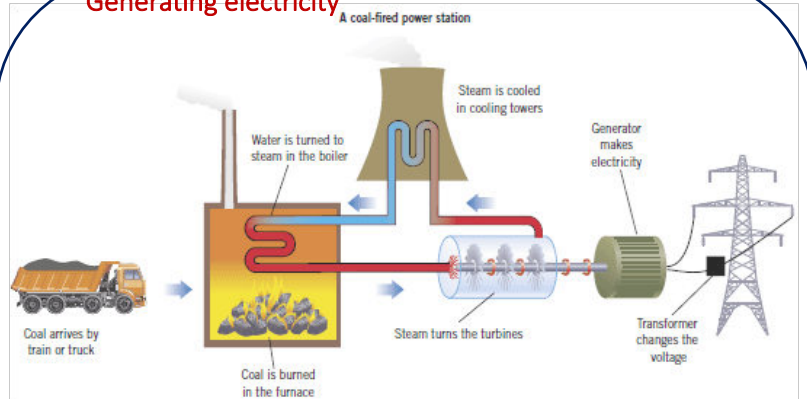


Burning of fossil fuels releases pollutants including:

- Carbon dioxide which is a greenhouse gas and contributes to global warming
- Sulfur dioxide and nitrogen oxides which both cause acid rain.



Generating electricity



The power of a device (measure in watts) and how long it is used for (measured in seconds) are needed to calculate energy used.

Energy companies measure energy use in kilowatt hours (kWh) using meters. Hours are used instead of seconds as devices can be left on for long periods of time and kilowatts are used instead of watts because of the large amounts of energy transferred.

Energy companies have a set price per kWh. They calculate the energy bill using the following equation:

$$\text{Total cost} = \text{amount of energy used (kWh)} \times \text{cost per kWh}$$



Useful YouTube links:



[What is energy?](#)



[Renewable energy](#)



[Generating electricity](#)

Skills:

Practical: Identifying variables

Application: Using hazards symbols, identifying hazards and risks.

Maths: Calculating averages, drawing scales and plotting points.

Analysis: Analyse information and ideas to develop experimental procedures.

Extended response: Identifying trends in data and writing conclusions.

Useful and wasted energy

There is always the same amount of total energy before and after a transfer. This is conservation of energy. Dissipation is a term that is often used to describe ways in which energy is wasted. Any energy that is not transferred to useful energy stores is said to be wasted because it is lost to the surroundings.

