

Heat is a form of energy due to particle movement. Temperature measures how hot or cold an object is.

When there is a difference in temperature heat energy **always** moves from a hot place to a cooler place.

There are **three ways** heat energy can be transferred: Convection, Conduction and Radiation.

Heat moves through fluids (liquids and gases) by **convection**.

Convection is caused by particle movement; **hot particles rise and cold particles fall**.

Heat energy can flow from one end of a metal to the other by **conduction**.

With conduction of heat **particles vibrate** passing heat from one particle to the next.

A material that allows heat to pass through it easily is called a **conductor**. A material that does not allow heat to travel through it easily is called an **insulator**.

Matt black surfaces are best for **absorbing and emitting** heat.

Shinny surfaces **reflect** heat best.

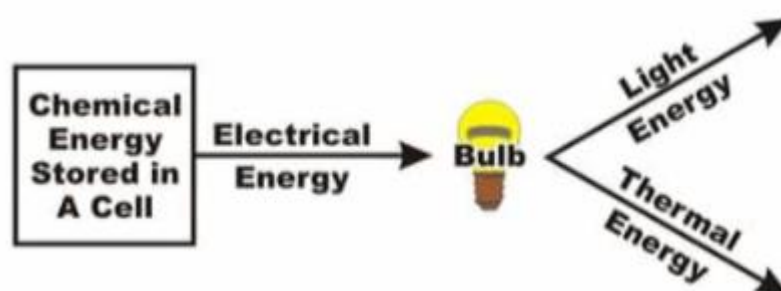
Infra-red is the name used for heat transferred by radiation.

Infra-red radiation is an **electromagnetic wave**.

Air trapped in a material makes it a particularly good insulator.

Heat energy lost from homes costs money. **Insulation** can help reduce this heat loss.

Energy Transfer Diagram



Energy is the ability to do work.

Energy is measured in joules (J)

The 5 forms of energy in action are heat, light, electrical, kinetic, and sound.

The 4 forms of potential energy are chemical, gravitational, elastic and nuclear

Energy cannot be destroyed. Energy is transferred from one form into another.

Food, batteries and fuels contain stored chemical energy.

We depend on electrical energy to power many of the appliances in our homes.

Appliances which produce heat use most electricity.

I can save electricity/money at home by, switching off appliances, not boiling excess amounts of water and using energy efficient light bulbs.

Fossil fuels are coal, gas and oil.

We need to find alternative means of generating electricity.

The wind can be used to turn turbines on wind turbines to make electricity.

Electricity can be generated from the waves and tides.

Energy captured from the sun, wind and waves is called renewable energy as it will not run out.

Advantages of renewable energy sources are they produce free, clean and renewable energy

Disadvantages of renewable energy are they can be expensive to set up, can damage natural habitats, are eye sores and are unreliable

Fossil fuels are burned in traditional power stations to generate electricity.

Traditional power stations produce most of our electricity.

Electricity is produced in traditional power stations by;

Burning fossil fuels to boil water. This produces steam. The pressure of the steam spins turbines which drive generators to produce electrical energy.

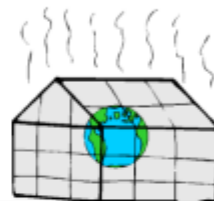
Carbon emissions are produced by burning fossil fuels

Traditional power stations produce carbon emissions

Cars, aeroplanes and cows also produce carbon emissions

Carbon emissions are causing

Climate change



Climate change is caused by carbon emissions clogging up our atmosphere and not letting heat (infrared radiation) escape

Effects of climate change include ice caps melting, rising sea levels and more extreme weather

Fossil Fuels are running out

$$\% \text{ Energy Efficiency} = \frac{\text{useful output energy}}{\text{Total input energy}} \times 100\%$$