

Energy

Energy is the ability to do work or move something.



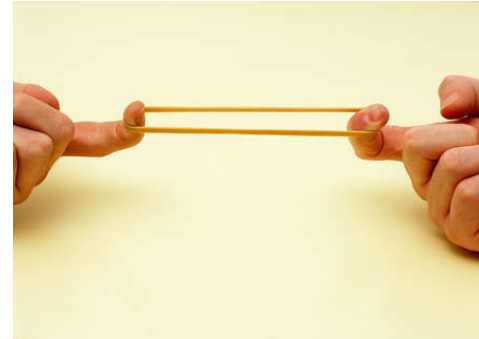
Forms of Energy

Energy is the ability to do work or move something.

There are **2 main groups** of Energy,

1. Stored energy

- **Potential energy**- is ready for action e.g. a stretched elastic band.
- **Nuclear energy**- the nucleus of an atom has a huge amount of energy inside.
- **Chemical energy**- is found in foods, fuels and also stored in batteries.

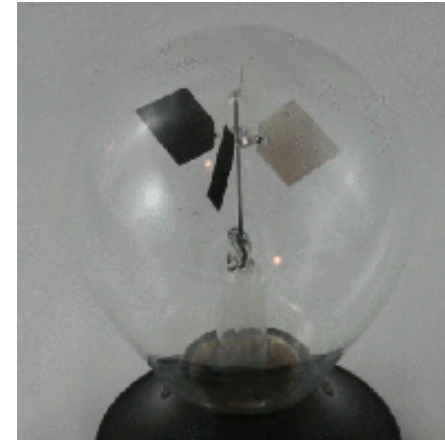


2. Energy in Action

- Kinetic energy- moving energy
- Heat energy- heat particles move
- Light energy- Photosynthesis in plants

Crooke's radiometer moves with light/heat

- Sound energy- make things vibrate (e.g. eardrum)
- Electrical energy- moves in wires
- Magnetic energy- energy from a magnet



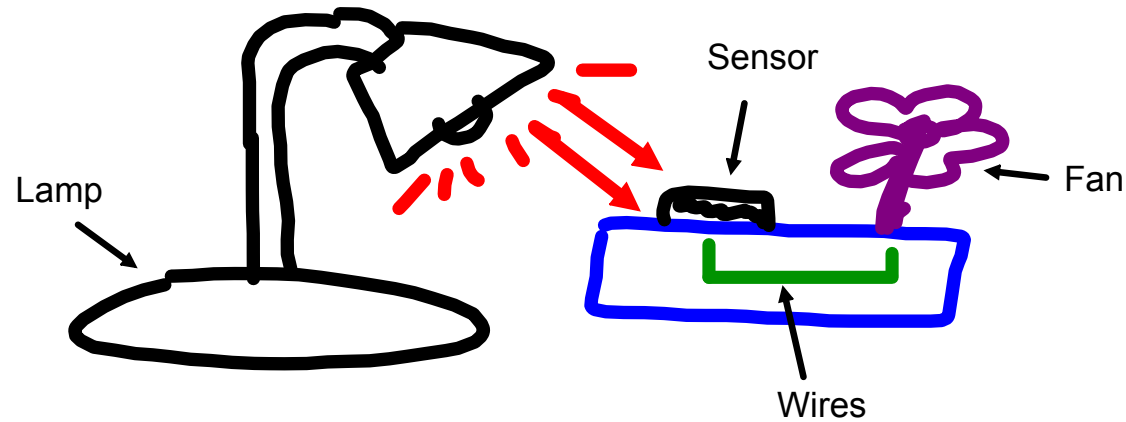
Principle of Conservation of Energy

**Energy cannot be created or destroyed
but can change from one form to another.**

- When energy changes from one form to another this is known as an energy transfer/conversion
- An example is an old electric light-bulb. When switched on, **only 5%** of the energy is used to make light. 95% of the energy is lost as heat and sound!



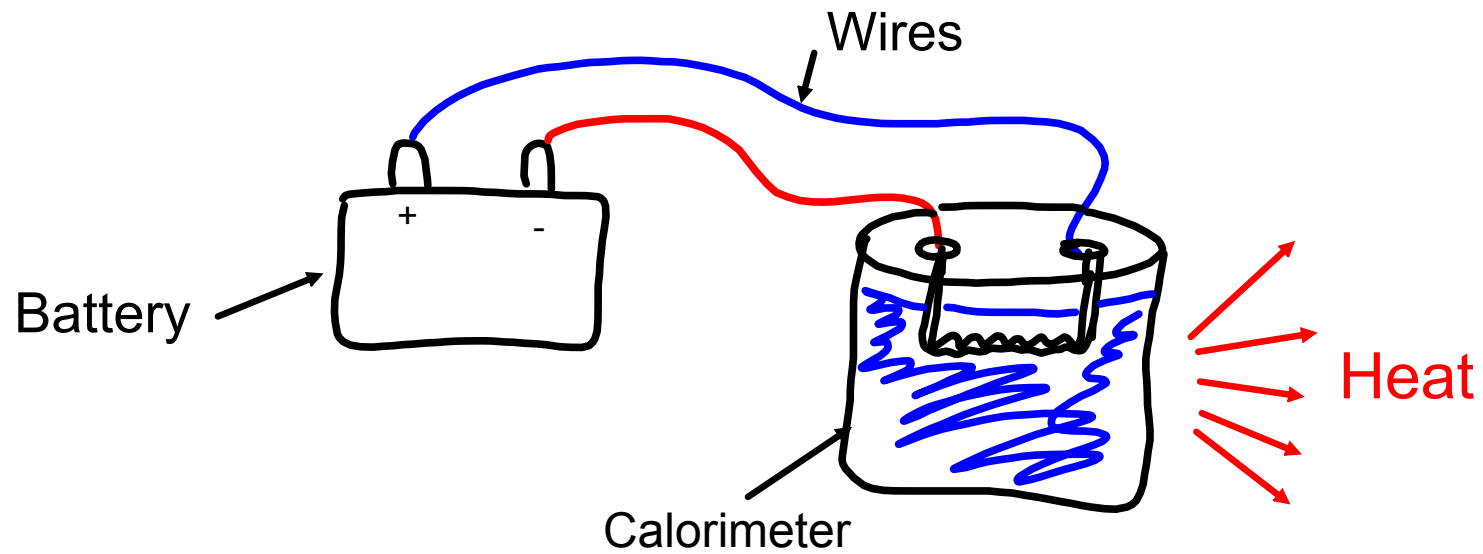
Experiment - 1



There are 3 types of energy in this experiment.
The change from light energy to electric energy is called an **energy transfer**.

Light → Electric (wires) → Kinetic (moving fan)

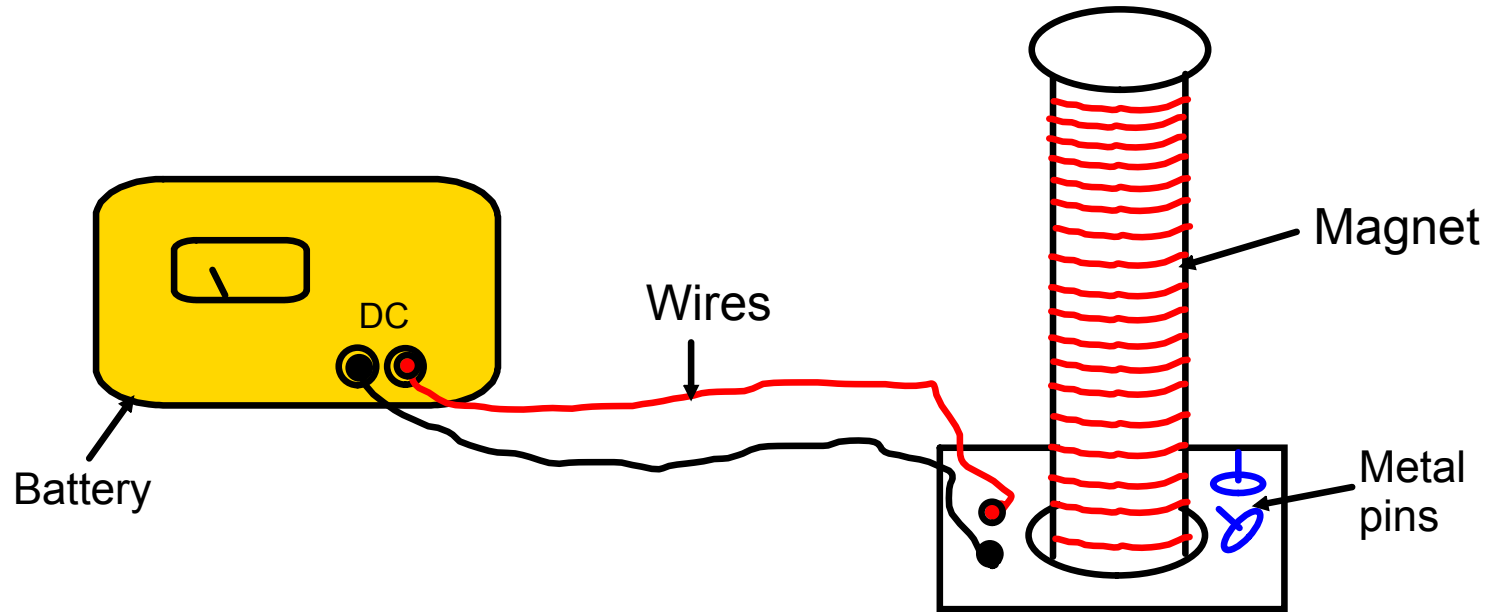
Experiment - 2



Starting Temperature = 20° Celcius
Finishing Temperature = 86° Celcius

Chemical → Electrical → Heat

Experiment - 3



Chemical → Magnetic → Kinetic

Sources of Energy

Sun - is the main source of energy on the Earth.

Green plants trap sunlight and make glucose by photosynthesis.

Heat from the sun keeps us warm.

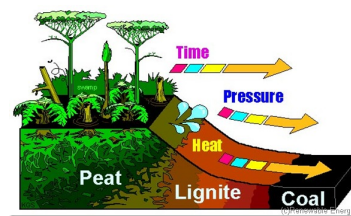
Wind and Waves can be used to make electricity.

Solar panels can be used for electricity also.

Fossil fuels - made millions of years ago from dead animals & plants.

Examples are oil, gas, coal and peat. They are **non-renewable**.

This means that they cannot be replaced easily.



Nuclear - is a non renewable source that gives a lot of energy.

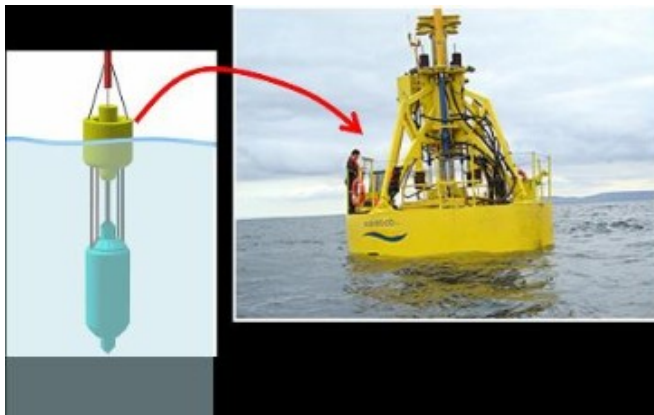
They can be dangerous if they break however. e.g. Japan at the moment.

Renewable sources -

These will never be used up.

These types of energy are expensive to set up but then they are cheap to run.

Example - Wind turbines and Wave motion can be turned into electricity also.



Wave Bob



Nuclear Energy

We use reactors to split atoms of Uranium.

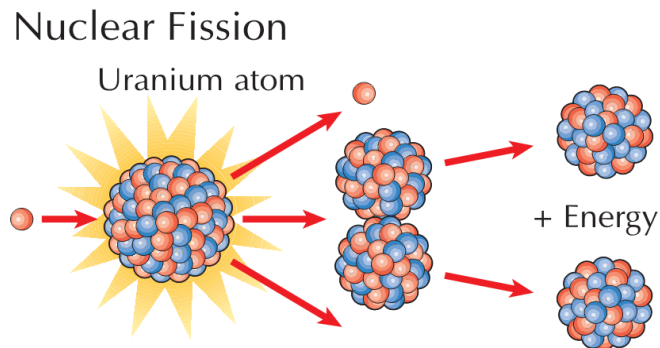
This releases huge amounts of energy.

1kg of Uranium creates the same energy as 3 million kg of coal.

This is known as nuclear **fusion**.

Nuclear **fusion** is what happens on the sun.

Hydrogen + Hydrogen \longrightarrow Helium



Other Sources

Hydrogen can be put into **cars** now instead of petrol. Water is split in half by solar energy to make Hydrogen. This could be the fuel of the future for lots of things.



Ireland's Energy Needs

Ireland is next to the **Atlantic** ocean which provides plenty of energy from wind and waves. We should be building rafts of wave machines and wind turbines to catch all this energy.

Biomass - is growing plants as a fuel.

Geothermal - is using heat from the ground.

Conserving Energy

We use insulation to stop heat escaping from our houses.
If the heat stays in the house longer we can turn off the heat and save energy.

Heat rises and most is lost through the roof and walls.
Insulating the attic is very important.
The walls, windows, floors and doors also need to be insulated.

How to save energy -

Insulate immersion heaters and pipes.
Insulate attics.
Use draft excluders at doors, etc.
Fill walls with insulation.
Thick carpets and curtains keep in heat.

