

# MAGNETS

## GETTING THE FACTS STRAIGHT

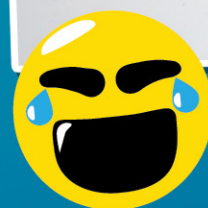
First things first, what exactly is a magnet? Magnets are usually made of metal iron or another material that is high in iron like steel. They can be made in various shapes, with all of them having the same ability to pull things towards themselves. The invisible force is called magnetism.

## WHAT IS A MAGNETIC FIELD?

A magnet has the ability to cause a pushing and pulling force on other objects that it isn't actually touching. Magnetic fields are able to cut through paper. A great example is your fridge at home holding up your excursion notice with a magnet. A magnetic field can also penetrate through magnets materials such as iron.



**Mini Experiment:**  
See how a magnetic field penetrates through other magnetic materials by using a magnet to pick up a chain of paperclips!



## ALL ABOUT THE POLES

Magnetism is concentrated around the poles which are the ends of the magnet. A magnet has two poles, called the north pole and the south pole. And no Santa Claus does not live on a magnets north pole.

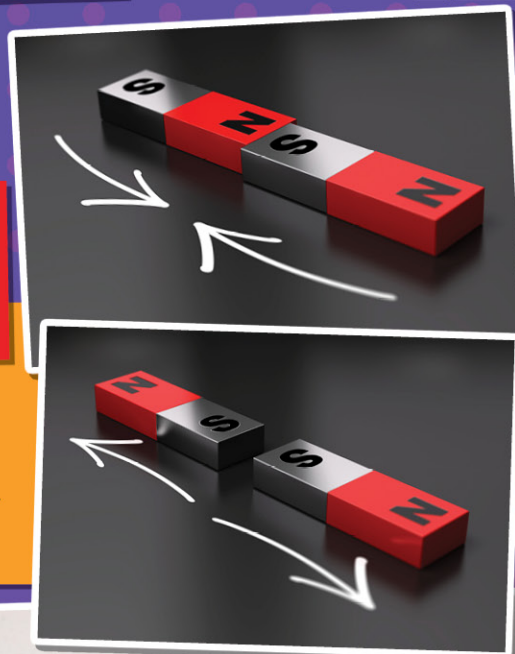
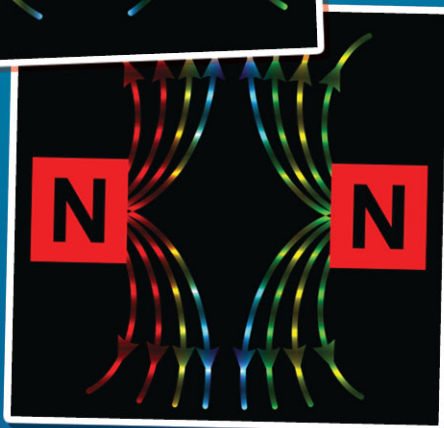
## SAME SAME BUT DIFFERENT

The two poles may look the same but they act and behave surprisingly different. If you put one pole of a magnet near to another pole of a different magnet you may feel a pulling force or you could feel a repelling force. Try it out! Can you make the two repelling poles touch?

Magnets only attract (pull) metals that are made of or contain iron.

A magnet creates an invisible area of magnetism all around it called a magnetic field.

Every magnet will repel identical poles, while different poles will pull towards each other.

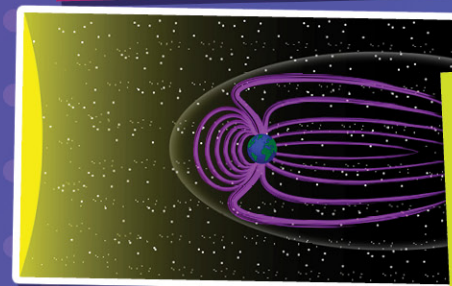


## WHAT ON EARTH!

Magnets point to the north or south because the Earth is packed with molten rocks rich in magnetic materials such as iron. Because of the Earth acting like a giant magnet, its magnetic field stretches out into space and can affect the things around it. A great example of this would be the amazing northern lights.

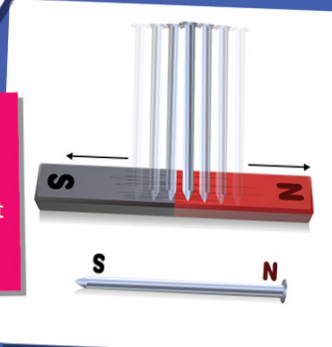
## A COMPASS

A simple compass is a magnetised metal needle mounted in such a way that it can spin freely. If you hold a compass flat, the needle will turn until one end points north and the other end points south. But to know which end is which, you must use the Sun in the sky that rises in the east and sets in the west.



The Earth's magnetic field stretches out into a region called the magnetosphere.

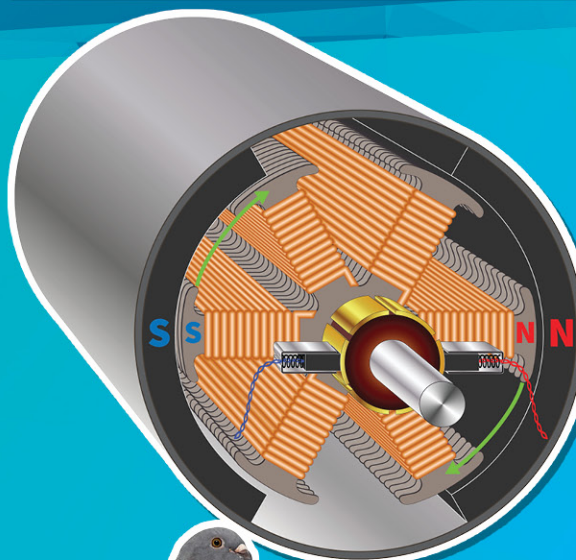
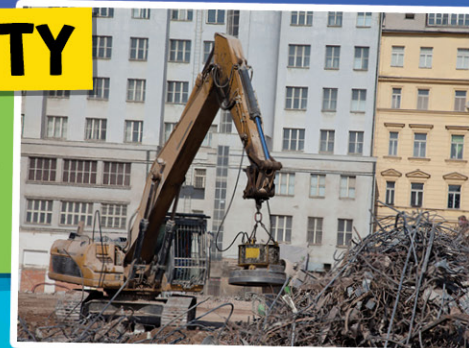
**Mini Experiment:** If you run a magnet over an unmagnetised object a few times, you can convert it into a magnet as well. Try this with an iron nail.



## MAGNETS AND ELECTRICITY

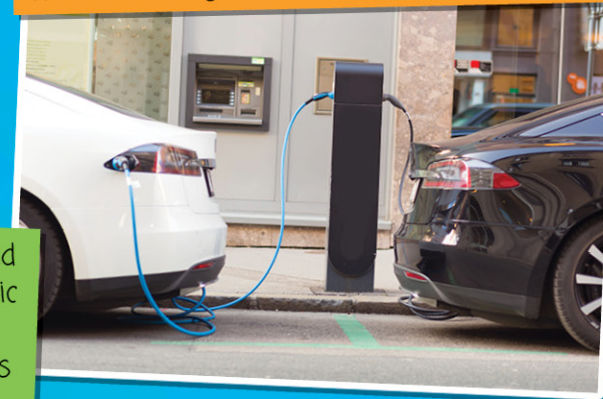
### ELECTROMAGNETS

An electromagnet is a type of magnet that uses an electrical current to produce its magnetic field. The advantage of an electromagnet is that the magnetism can be turned on and off with the flick of a switch, this can be very useful in a range of industrial, medical, scientific and other settings.



### ELECTRIC MOTORS AND GENERATORS

Electric motors generate a magnetic field by running an electric current through a central coil, this coil is opposed to separate permanent magnets within the electric motor, causing movement or spinning that runs the motor. Generators work in a similar fashion, just in reverse. A physical force rotates the central coil inside the magnetic field, creating an electrical output.



Some animals are believed to be sensitive to magnetic fields, homing pigeons ability to navigate appears to be linked to Magnetite found in the animal's beaks.