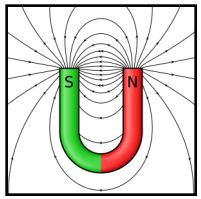
Knowledge Organiser - Year 3 - Science: Forces and Magnets



Magnetism is an invisible force. Magnets are objects that produce magnetic fields (a force) that attract metals like iron, nickel and cobalt. The magnetic field's lines of force exit the magnet from its north pole and enter its south pole.

Key Vocabulary

Alloy	A metal made by combining two or more different metals, to give it greater strength and to stop it being damaged by the weather.
Attract	A physical force pulling an object closer to the magnet.
Bar magnet	A rectangular shaped magnet.
Cobalt	A hard silvery-white magnetic metal used as an alloy in batteries, pottery painting and zips and metal buttons.
Compass	An instrument containing a magnetized pointer which shows the direction of magnetic north.
Compound	Something made from more than one substance.
Horse shoe magnet	A magnet that has been curved around so that its poles are next to each other in the shape of a horse shoe.
Iron	A strong, hard magnetic silvery-grey metal often used to make buildings and is the main metal in the alloy steel.
Magnetic Field	A region of space near a magnet in which a magnetic force acts on any other magnet or magnetic metal.
Magnetic North	The direction in which the north end of a compass needle or other freely suspended magnet will point to in response to the Earth's magnetic field.
Nickel	A silvery-white, magnetic metal used in Lithium batteries and coins. Often mixed with other metals (an alloy) to increase its strength.
Poles	Each magnet has two poles at the ends, the north and south pole. This is where the lines of magnetic force exit and enter the magnet.
Pulling	To bring something closer using a force.
Pushing	To use force to move something further away.
Repel	A physical force pushing an object away from the magnet.

Working Scientifically

Pupils can compare how different things move and group them; raising questions and carrying out tests to find out how far things move on different surfaces, and gathering and recording data to find answers to their questions; exploring the strengths of different magnets and finding a fair way to compare them; sorting materials into those that are magnetic and those that are not; looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another; identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets.

Key Question: How does a magnetic force work?

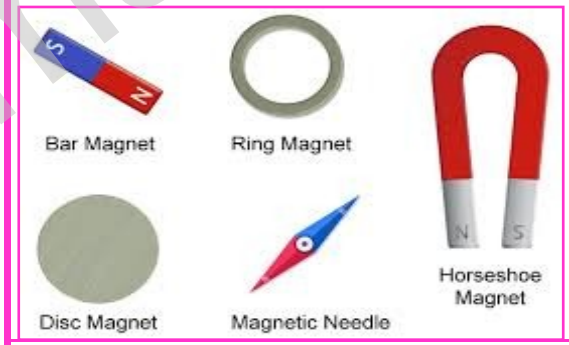
If you try to move an object across a surface, the force of friction will try to slow it down. Different surfaces create different amounts of friction depending on the roughness of the surface or the object. Slippery surfaces have less friction and are easier to push things across. Sometimes you want good grip (a high level of friction) so that you do not fall.

Wax on the Skis and wheels on a trolley both reduce the friction to make it easier to move across a surface.

How do objects move on different surfaces?

Ice skates and the tread on bicycle tyres make the athletes not slip on the surface they are performing on. They improve grip.

Which everyday materials are attracted to a magnet?
There are in fact only three pure metals that are magnetic; iron, nickel and cobalt, but other alloys (mixtures of metals) that contain enough of any of these three metals will also be attracted and repelled by a magnet. For example, steel is attracted to a magnet because it contains a lot of iron.



Magnets can be a variety of shapes and sizes and have different uses and strengths because of this. You can also get electromagnets which can be turned on and off using electricity. These have many practical uses, e.g. door locks, motors, speakers, electric bells as well as in scrap yards to pick up heavy scrap metal.

Some forces need contact between two objects, but magnetic forces can act at a distance.

If you put two magnets together with different poles pointing towards one another, the magnets will pull towards each other. We say they attract each other.

If you try to put two magnets together with the same poles pointing towards one another, the magnets will push away from each other. We say they repel each other.

Like poles attract, opposite poles repel.