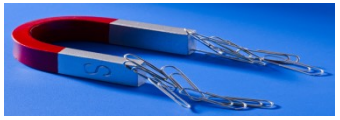
Lower Key Stage 2 - Forest Academy
Knowledge Organiser – Forces and Magnets

Prior learning:

- To find out how the shape of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

You will now learn:

- To compare how things move on different surfaces.
- To notice that some forces need contact between two objects, but magnetic forces can act at a distance.
- To observe how magnets attract or reple each other and attract some materials and not others.
- To compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.
- To describe magnets as having two poles
- To predict whether two magnets will attract or repel each other, depending on which poles are facing.



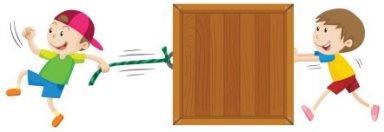
What are forces?

Forces are **pushes** and **pulls**.

These **forces** change the **motion** of an object. They will make it start to move or speed up, slow it down or even make it stop.

*For example, when a cyclist **pushes** down on the pedals of a bike, it begins to move. The harder the cyclist pedals, the faster the bike moves. When the cyclist **pulls** the brakes, the bike slows down and eventually stops.*

A force is a push or a pull.



How do different surfaces affect the motion of an object?

Forces act in opposite directions to each other. When an object moves across a surface, friction acts as an opposite force.

Friction is a force that holds back the motion of an object.

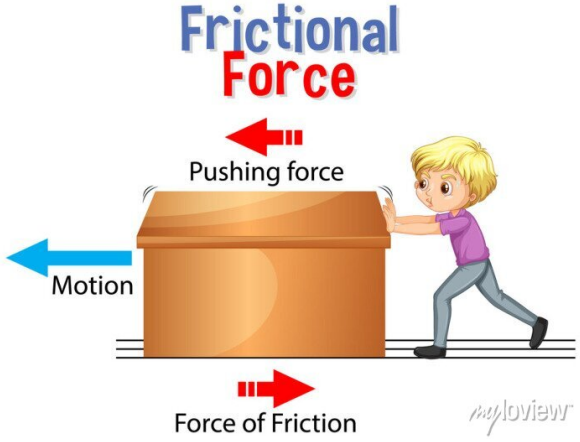
Some surfaces create more friction than others which means that objects move across them slower.

On a ramp, the force that causes the object to move downwards is gravity.

Objects move differently depending on the surface of the object itself and the surface of the ramp

Key Vocabulary

force	The scientific word for the pulling and pushing effect.
friction	The force that makes it difficult for things to move when they touch each other.
motion	Moving from one place to another.
accelerate	Speeding up.
decelerate	Slowing down.
balanced force	When two forces are equal and there is no motion.
magnet	A piece of iron or other material which attracts some metals towards it.
magnetic	Something that acts like a magnet
pole	Pole North and South ends of a magnet.
attract	The force of one object pulling another object **towards** it.
repel	The force of one object pushing another object **away** from it.
magnetic field	The area around a magnet where the magnetic forces work.



Magnetic forces

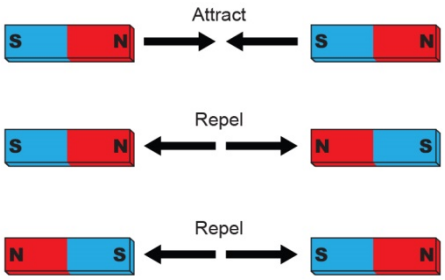
Magnets produce an area of force around them called a **magnetic field.**

When objects enter this **magnetic field**, they will be **attracted** to or **repelled** from the magnet if they are magnetic.

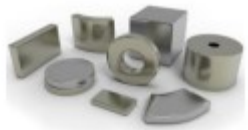
When two magnets are close, they create pushing or pulling forces on one another.
These forces are strongest at the ends of the magnets. The two ends of a magnet are known as the north pole and the south pole.

Same poles repel
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.

Different poles attract
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.



Magnets



All magnets are made of a group of metals called the ferromagnetic metals. These are metals such as **nickel** and **iron.**

Earth's Magnetic Field

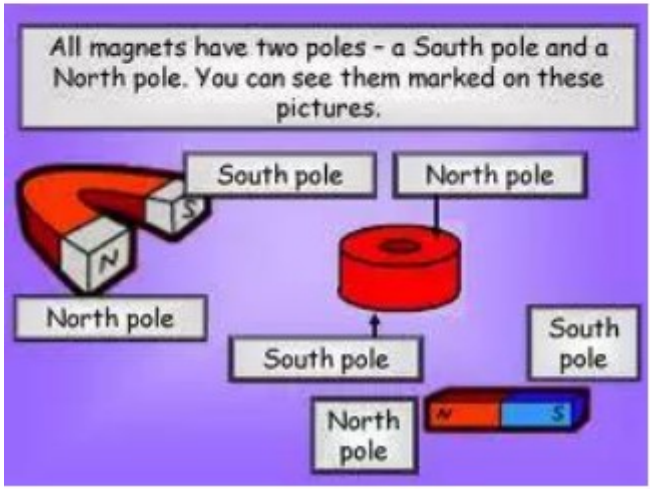
Earth's **magnetic field** acts like an invisible shield around Earth that protects it from dangerous things, like radiation from the sun.

You might say it's Earth's super power. It's also called a magnetosphere, the most remote part of a planet's atmosphere. Earth's magnetic field's power begins at Earth's core.

Magnetic Materials

Magnetic materials are always made of metal, but not all metals are magnetic.

Magnetic	Non-Magnetic
Iron Steel Nickel	Aluminium Copper Gold Silver These are the only metals that are not magnetic



Famous Scientist

William Gilbert founded the scientific study of magnetism. He discovered that our planet has two magnetic poles; he defined these poles correctly and established that the earth behaves like a giant magnet.