Caroline Haslett Primary School - Science Topic: Forces and Magnets Y3

What should I already know?

- The shape of some materials can be changed when they are **stretched, twisted, bent** and **squashed**.
- Know how different toys move.
- Know what a **force** is and be able to explain that a **push** and **pull** are types of **forces.**
- That when **forces** are applied to an object they allow them to move or stop moving.
- The strength of the **force** determines how far and fast an object moves.

Vocabulary

attract	If one object **attracts** another object, it causes the second object to move towards it
bendy	an object that bends easily into a curved shape
friction	the **resistance** of **motion** when there is contact between two **surfaces**
force	the **pulling** or **pushing** effect that something has on something else
gravity	the **force** which causes things to drop to the ground
magnet	a piece of iron or other material which **attracts magnetic** materials towards it
magnetic field	an area around a **magnet**, or something functioning as a **magnet**, in which the **magnet's** power to **attract** things is felt
metal	a hard substance such as iron, steel, gold, or lead
motion	the activity of changing position or moving from one place to another
non-magnetic	an object that is not **magnetic**
opposite	**Opposite** is used to describe things of the same kind which are completely different in a particular way. For example, north and south are **opposite** directions
position	The **position** of someone or something is the place where they are in relation to other things
pull	When you **pull** something, you hold it firmly and use **force** in order to move it towards you or away from its previous **position**
push	When you **push** something, you use **force** to make it move away from you or away from its previous position
repel	When a **magnetic** pole **repels** another **magnetic** pole, it gives out a **force** that pushes the other pole away
resistance	a **force** which slows down a moving object or vehicle
squash	pressed or crushed with such **force** that something loses its shape
stretchy	slightly elastic
surface	the flat top part of something or the outside of it
twist	turn something to make a spiral shape

Investigate!

- Investigate the amount of **friction** created by different **surfaces**. Use measures (such as length and time) to show how far or fast and object travels.
- Compare how different things move and group them.
- Observe how a **magnetic field attracts** iron filings by using a bar **magnet.**
- Investigate how **magnets** are used in everyday life.
- Investigate which materials are **magnetic** and sort between objects that are **magnetic** and those that are **non-magnetic.**
- Investigate if the size of a **magnet** affects how strong it is (using chains of paper clips of varying lengths)
- Investigate if all **metals** are **magnetic.**
- Observe what happens when **magnets** with similar poles are placed next to each. Repeat this for when the poles are different.

What will I know by the end of the unit?

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.

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.

grass gravel carpet concrete sand wood

- 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.

How do **magnets** work?

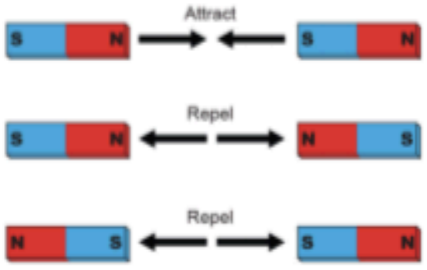
- **Magnets** produce an area of **force** around them called a **magnetic field.**
- When objects enter this **magnetic field**, they will be **attracted** to or **repelled** from the **magnet** if they are **magnetic.**
- When **magnets repel**, the **push** each other away
- When **magnets attract,** they **pull** together.

Which materials are **magnetic?**

- Objects that are **magnetic**, are **attracted** to **magnets.**
- Iron and steel are **magnetic.**
- Aluminium and copper are **non-magnetic.**

How do **magnetic** poles work?

- The ends of a **magnet** are called poles.
- One end is called the north pole and the other end is called the south pole.
- **Opposite** poles **attract**, similar poles **repel**.
- If you place two **magnets** so the south pole of one faces the north pole of the other, the **magnets** will move towards each other. This is called **attraction**.
- If you place the **magnets** so that two of the same poles face each other, the magnets will move away from each other. They are **repelling** each other.



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Working Scientifically	Ask questions about the world around them and explain that they can be answered in different ways. Set up and carry out some simple, comparative and fair tests, making predictions for what might happen. Tests can be set up and carried out by following or planning a set of instructions. A prediction is a best guess for what might happen in an investigation based on some prior knowledge. Take measurements in standard units, using a range of simple equipment eg. data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C) and metre sticks (millimetres, centimetres and metres). Make increasingly careful observations, identifying similarities, differences and changes, and make simple connections Taking repeat readings can increase the accuracy of the measurement. An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features. Gather and record findings in a variety of ways (labelled diagrams, tables, charts and graphs) with increasing accuracy. Data can be used to provide evidence to answer questions. Data can be used to provide evidence to answer questions. Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected. Use suitable vocabulary to talk or write about what they have done, what the purpose was and, with help, draw a simple conclusion based on evidence collected, beginning to identify next steps or improvements.
Forces and magnets	Explain that an object will not move unless a push or pull (force) is applied, describing forces in action and whether the force requires direct contact or whether the force can act at a distance (magnetic force). Compare how things move on different surfaces. Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Observe how magnets attract or repel each other and attract some materials and not others. Magnetic materials are attracted to magnets. 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. All magnetic materials are metals but not all metals are magnetic. The metal iron is magnetic. Investigate and compare a range of magnets (bar and horseshoe) and explain that magnets have two poles (north and south) and that opposite poles attract each other, while like poles repel each other. Predict whether two magnets will attract or repel each other, depending on which poles are facing.