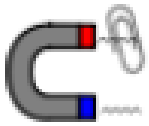
Maple Tree Primary School
Year 3: Science– Forces and Magnets

What should I already know?
• The shape of some materials can be changed when they are stretched, twisted, bent and squashed. • 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.

What I will know by the end of this unit:
• 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.**

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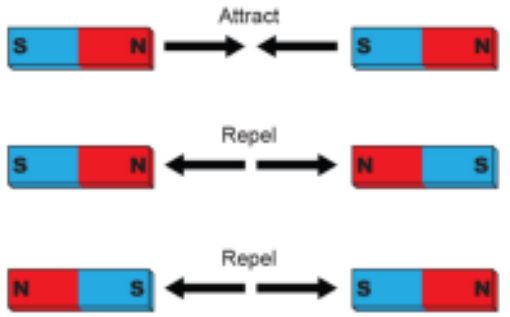
Investigate!

- 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.

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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Key Vocabulary	
magnet	A **magnet** is a material that can sometimes **attract** (**pull**) and sometimes **repel** (**push**) other **magnetic** materials.
metal	**Metals** are materials that are usually hard and shiny, such as iron and aluminium.
magnetic	If a material is **magnetic**, it can be **attracted** or **repelled** by a **magnet**.
magnetic force	A **magnetic force** is a **non-contact force** produced by a **magnet**.
poles	The **poles** of a **magnet** are the two points where the **magnetic force** is strongest: the north pole and south pole.
attract	If a **magnet attracts** an object, it causes the object to move towards it.
repel	If a **magnet repels** an object, it causes the object to move away from it.

Key Vocabulary	
force	A **force** is a **push** or **pull**.
push	A **push** is a **force** that often moves an object further away.
pull	A **pull** is a force that often moves an object closer.
contact force	A **contact force** is a type of **force** that occurs between two or more objects that are touching.
non-contact force	A **non-contact force** is a type of **force** that occurs between objects that are not touching.
friction	**Friction** is a type of **contact force**. It occurs between two touching surfaces that are either trying to move or are already moving across each other.