Topic: Forces and Magnets

Year: 3 | **Strand: Physics**

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
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.