

**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.

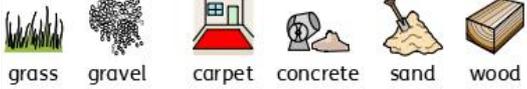
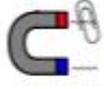
**Vocabulary**

attract	If one object <b>attracts</b> another object, it causes the second object to move towards it
bendy	an object that bends easily into a curved shape
friction	the <b>resistance</b> of <b>motion</b> when there is contact between two <b>surfaces</b>
force	the <b>pulling</b> or <b>pushing</b> effect that something has on something else
gravity	the <b>force</b> which causes things to drop to the ground
magnet	a piece of iron or other material which <b>attracts magnetic</b> materials towards it
magnetic field	an area around a <b>magnet</b> , or something functioning as a <b>magnet</b> , in which the <b>magnet's</b> power to <b>attract</b> 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 <b>magnetic</b>
opposite	<b>Opposite</b> is used to describe things of the same kind which are completely different in a particular way. For example, north and south are <b>opposite</b> directions
position	The <b>position</b> of someone or something is the place where they are in relation to other things
pull	When you <b>pull</b> something, you hold it firmly and use <b>force</b> in order to move it towards you or away from its previous <b>position</b>
push	When you <b>push</b> something, you use <b>force</b> to make it move away from you or away from its previous position
repel	When a <b>magnetic</b> pole <b>repels</b> another <b>magnetic</b> pole, it gives out a <b>force</b> that pushes the other pole away
resistance	a <b>force</b> which slows down a moving object or vehicle
squash	pressed or crushed with such <b>force</b> 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 <b>forces</b> ?	<p><b>Forces</b> are <b>pushes</b> and <b>pulls</b>.                  These <b>forces</b> change the <b>motion</b> 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 <b>pushes</b> down on the pedals of a bike, it begins to move. The harder the cyclist pedals, the faster the bike moves.                  When the cyclist <b>pulls</b> the brakes, the bike slows down and eventually stops.</p>
How do different <b>surfaces</b> affect the <b>motion</b> of an object?	<p><b>Forces</b> act in <b>opposite</b> directions to each other.                  When an object moves across a surface, <b>friction</b> acts as an <b>opposite</b> force.  <b>Friction</b> is a <b>force</b> that holds back the <b>motion</b> of an object.                  Some <b>surfaces</b> create more <b>friction</b> than others which means that objects move across them slower.</p>  <p>grass gravel carpet concrete sand wood</p> <p>On a ramp, the <b>force</b> that causes the object to move downwards is <b>gravity</b>.                  Objects move differently depending on the <b>surface</b> of the object itself and the <b>surface</b> of the ramp.</p>
How do <b>magnets</b> work?	<p><b>Magnets</b> produce an area of <b>force</b> around them called a <b>magnetic field</b>.                  When objects enter this <b>magnetic field</b>, they will be <b>attracted</b> to or <b>repelled</b> from the <b>magnet</b> if they are <b>magnetic</b>.                  When <b>magnets</b> <b>repel</b>, the <b>push</b> each other away                  When <b>magnets</b> <b>attract</b>, they <b>pull</b> together.</p> 
Which materials are <b>magnetic</b> ?	<p>Objects that are <b>magnetic</b>, are <b>attracted</b> to <b>magnets</b>.                  Iron and steel are <b>magnetic</b>.                  Aluminium and copper are <b>non-magnetic</b>.</p>
How do <b>magnetic</b> poles work?	<p>The ends of a <b>magnet</b> are called poles.                  One end is called the north pole and the other end is called the south pole.  <b>Opposite</b> poles <b>attract</b>, similar poles <b>repel</b>.                  If you place two <b>magnets</b> so the south pole of one faces the north pole of the other, the <b>magnets</b> will move towards each other. This is called <b>attraction</b>.                  If you place the <b>magnets</b> so that two of the same poles face each other, the magnets will move away from each other. They are <b>repelling</b> each other.</p> 