

# Calcot Schools Knowledge organiser—Science

**Topic: Forces and Magnets**

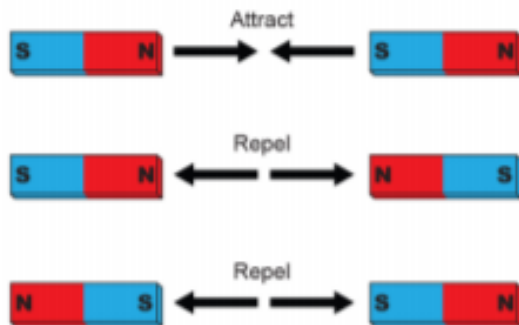
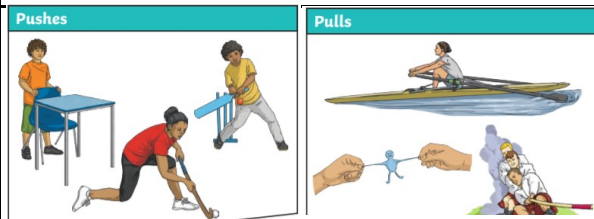
**Phase**

**Strand:**


Prior knowledge from previous year groups:

- The shape of materials can be changed by stretching, bending, twisting and squashing.
- Know how different toys move.
- Know that a push and a pull are types of forces.
- The strength of a force will determine how fast the object is moving.

**What will the children know by the end of the unit?**



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<p><b>What are forces?</b></p>	<ul style="list-style-type: none"> <li>• <b>Forces are pushes and pulls.</b></li> <li>• These <b>forces</b> change the <b>motion</b> of an object.</li> <li>• They will make it start to move or speed up, slow it down or even make it stop.</li> <li>• 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.</li> <li>• When the cyclist <b>pulls</b> the brakes, the bike slows down and eventually stops.</li> </ul>
<p><b>How do magnets work?</b></p> 	<ul style="list-style-type: none"> <li>• <b>Magnets</b> produce an area of <b>force</b> around them called a <b>magnetic field</b>.</li> <li>• 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>.</li> <li>• When <b>magnets repel</b>, the <b>push</b> each other away</li> <li>• When <b>magnets attract</b>, they <b>pull</b> together.</li> </ul>
<p><b>Which materials are magnetic?</b></p>	<ul style="list-style-type: none"> <li>• Objects that are <b>magnetic</b>, are <b>attracted</b> to <b>magnets</b>.</li> <li>• Iron and steel are <b>magnetic</b>.</li> <li>• Aluminium and copper are <b>non-magnetic</b>.</li> </ul>
<p><b>How do magnetic poles work?</b></p>	<ul style="list-style-type: none"> <li>• The ends of a <b>magnet</b> are called poles.</li> <li>• One end is called the north pole and the other end is called the south pole.</li> <li>• <b>Opposite poles attract</b>, similar poles <b>repel</b>.</li> <li>• 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>.</li> <li>• 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.</li> </ul>

**Friction**

Different surfaces create different amounts of friction. The amount of friction created by an object depends on the roughness of the surface and the object and the force between them.

**Vocabulary:**

force	The pushing or pulling effect something has on something else
Friction	A force that acts between two objects that are moving or trying to move across each other
attract	To come together
Repel	To force away
Magnetic	Can be attracted to a magnet
Magnet	A piece of iron material with (two poles) that attracts magnetic materials towards it
Surface	The flat top layer or part of something outside it

**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.