

Year 3 – Forces – The Power of Forces

What it looked like last year (Year 2 – as part of everyday materials)

- Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

What it looks like next year (Year 5)

- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.
- Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.
- Recognise that some mechanisms, including levers, pulleys and gears allow a smaller force to have a greater effect.

Vocabulary (definitions)

force – the push or pull on an object that causes it to change velocity.

velocity – how fast something moves.

magnetic force - the power that pulls materials together.

magnetic material – materials that are attracted to a magnet.

magnetic poles – the ends of the magnet (north and south)

strength metal iron steel

bar magnet ring magnet button magnet

horseshoe magnet contact force non-contact force

attract repel

Sequence of Learning

1. Look at different ways objects can be moved.
2. Investigate how air makes a windmill move.
3. Investigate how objects move on different surfaces.
4. Explore a range of materials for their magnetic properties.
5. Investigate how strong a magnet is.
6. Investigate the effect two magnets have on each other.

Cultural Capital

- To be able to compare how things move on different surfaces.
- To be able to notice that some forces need contact between two objects, but magnetic forces can act at a distance.
- To be able to observe how magnets attract or repel each other and attract some materials and not others.
- To be able to 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.
- To be able to describe magnets as having two poles.
- To be able to predict whether two magnets will attract or repel each other.
- The real life knowledge that links is: grouping and classifying and carrying out comparative and fair tests.
- The jobs it can be used in are: Engineering, Aeronautics, Physicist,

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Principles of Teaching Science.

- E**xploring – when we look at how things work in the world
- Q**uestioning – when we question what will happen
- U**nderstanding – when we use scientific language to explain
- I**nvestigating – when we can explore and are hands on
- P**redicting – when we use our previous knowledge to say what we think will happen.

Pushes



Pulls



Forces will change the motion of an object.
They will either make it start to move, speed up, slow it down or even make it stop.

The driving force
pushes the bicycle,
making it move.



Friction pushes on
the bicycle, slowing
it down.

Grass

Gravel

Sand

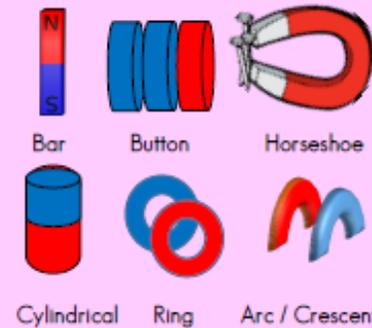
Road

What is a magnet?

A magnet is a special object which produces an area of magnetic force around itself called a magnetic field

If a metal object enters this magnetic field, they will be attracted towards the magnet and end up sticking to it. (Non-metallic objects such as wood, plastic or fabric would not be attracted to it.)

Here is a range of different magnets:

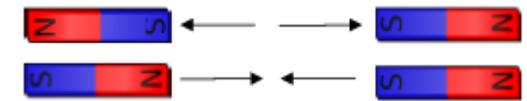


FUN FACTS ABOUT MAGNETS

- The most powerful magnet in the universe is a star called 'Magnestar'.
- Animals can be affected by magnetic pulls. Birds and turtles navigate by them and sharks are repelled by them!
- Earth's core is said to be filled with iron and nickel (metals which give it a magnetic field).

Magnetic Poles

When two magnets are close, they create pushing or pulling forces on one another. These forces are strongest at the ends of the magnets. The two ends of a magnet are known as the north pole (N) and the south pole (S).



Magnetic ✓



These objects contain iron, nickel or cobalt. Not all metals are **magnetic**.

Non-magnetic ✗



These objects do not contain iron, nickel or cobalt.