

# Year 5 – Forces

ALP Trust Science 2020

## Side 1 Prior Learning

### Key Scientific Words

Key Word	Definition (Meaning)
Attract	When a magnet pulls a magnetic material or another magnet towards it
Repel	When a magnet pushes another magnet away from it
Magnetic materials	Magnetic materials are attracted to magnets
Iron	A metal that is a magnetic material
Steel	A mixture made using iron
Magnet	A substance that can attract magnetic materials
Bar magnet	A magnet shaped like a bar
Magnetism	A non-contact force
Magnetic field	The area around a magnet that affects magnetic materials
North pole	One end of a magnet
South pole	One end of a magnet
Compass	A magnet that is free to move – pointing north

### Key Knowledge

**Forces** are pushes, pulls or twists

Objects move differently on different surfaces. **Rougher** surfaces cause objects to **slow down** and **stop** most quickly

**Contact forces** need to touch the thing that they are affecting. **Magnetism** is a non-contact force. This means **magnetic forces** can act at a distance.

Magnets attract **magnetic materials**. **Iron** is a magnetic material. Mixtures, like **steel**, that include a magnetic material, are also be attracted to a magnet. You can **make a magnet** from a piece of iron.

Substances that are not magnetic material are **not attracted to magnets**. Wood and plastic are examples of materials that are not magnetic materials. Most metals, like **aluminium**, are not magnetic and will not be attracted to a magnet.

Magnets can be **useful**. Magnets can be used to sort iron and aluminium cans for recycling. Only the iron cans are attracted to the magnet.

The two ends of a bar magnet are called the **north pole** and **south pole**.

A north pole and a south pole **attract** each other.



Two north poles or two south poles will **repel** (push each other away) each other.



The space around a magnet where it can affect magnetic materials and other magnets is called its **magnetic field**. The **Earth** has a **magnetic field**.

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## Side 2 Current Learning

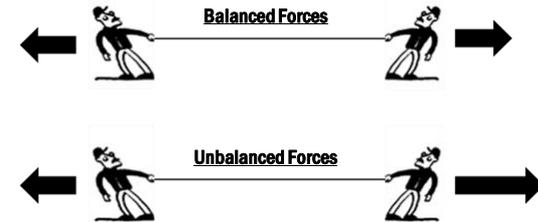
### Key Scientific Words

Key Word	Definition (Meaning)
<b>Contact force</b>	Something that needs to be in contact with an object before it can affect it
<b>Non-contact force</b>	A force that can affect something from a distance
<b>Newton meter</b>	A piece of equipment used to measure forces
<b>Newton (N)</b>	The unit of measurement for force
<b>Weight</b>	The pull (force) caused by gravity
<b>Balanced forces</b>	When forces work in opposite directions are equally as large
<b>Unbalanced forces</b>	When forces work in opposite directions are not equally as large
<b>Gravity</b>	The force of attraction between any two objects
<b>Speed</b>	How fast something is moving
<b>Metres per second (m/s)</b>	A unit of measurement for speed
<b>Friction</b>	A force that tries to slow things down when two things rub against each other
<b>Lubricant</b>	A substance used to reduce friction
<b>Air resistance</b>	A force that tries to slow things down that are moving through air
<b>Water resistance</b>	A force that tries to slow things down that are moving through water

### Key Knowledge

We cannot see **forces** but can measure them. We can use a **newton meter** (force meter) to measure forces. The units for measuring force are **newtons (N)**.

When forces work in opposite directions and are equally as large – they are **Balanced**. When forces work in opposite directions and not equally as large – they are **Unbalanced**.

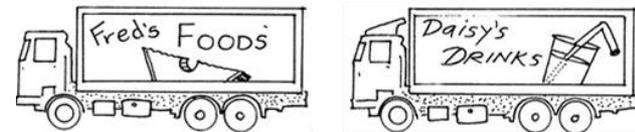


**Friction** is a force that acts between moving surfaces. Friction can slow things down, wear things away, produce heat and produce sound. Friction is a **contact force**. There must be **contact** before friction can affect an object.

**Friction is sometimes helpful. For instance**, your shoes grip the floor because of friction. **However, Friction is not always helpful. For instance**, friction can make bicycles harder to pedal.

Friction can be increased by using **rough surfaces** and **increasing the weight of an object**. Friction can be reduced by using **smooth surfaces**, or by **lubrication (A substance used to reduce friction)**

**Air resistance** and **water resistance** are types of friction caused by objects moving through air or water. The amount of air or water resistance can be reduced by giving an object a smooth, **streamlined** shape.



**Gravity** is the force of attraction between two objects. **Unsupported objects** fall towards the Earth because of the force of gravity acting between the Earth and the falling object.

To measure how **fast** something is travelling you need to measure the **distance it travels and the time taken**.

**Average (mean) speed = distance travelled ÷ time taken**

Speed can be measured in **metres per second (m/s)**

### Levers, Pulleys and Gears

Levers, Pulleys and Gears are examples of mechanisms. They allow a smaller force to have a greater effect