

Year 3 and 4 Home Learning

Science Week 5

Thursday

Forces and Magnets

Learning Objective:

To explore how magnetic forces work.

What forces are in action in this picture?



What is moving?

Why is it moving?

What is in contact to create movement?

The skateboard (and therefore the woman on the skateboard) are being pulled along by the dog. In order for the force to create movement there has to be contact between the objects. The woman is standing on the skateboard, holding a lead that is attached to the dog. This allows the pull force to create movement. If the woman and the dog weren't connected, the skateboard wouldn't be moving.



Can you think of
any forces that do not
need contact to make
things move?



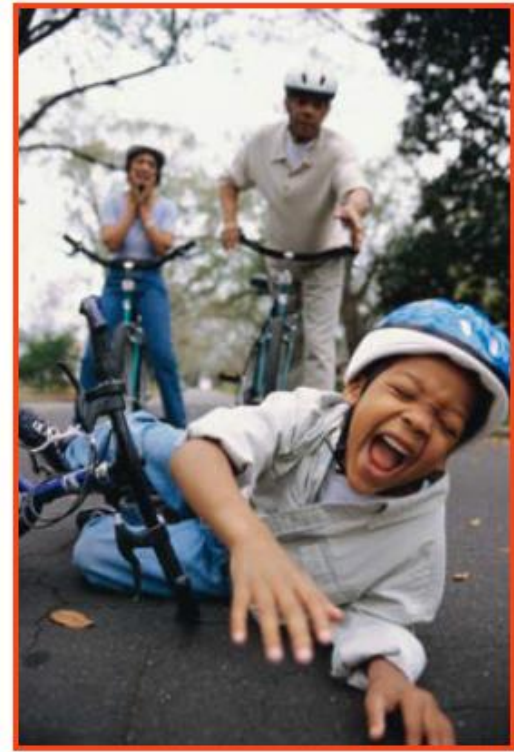
Some forces, such as gravity, do not need contact between two objects to make things move. Gravity is a force that pulls everything towards the centre of the Earth. Without gravity, everything would be weightless.



Gravity is what makes fruits fall from trees.



Gravity is what makes rain fall from the clouds.

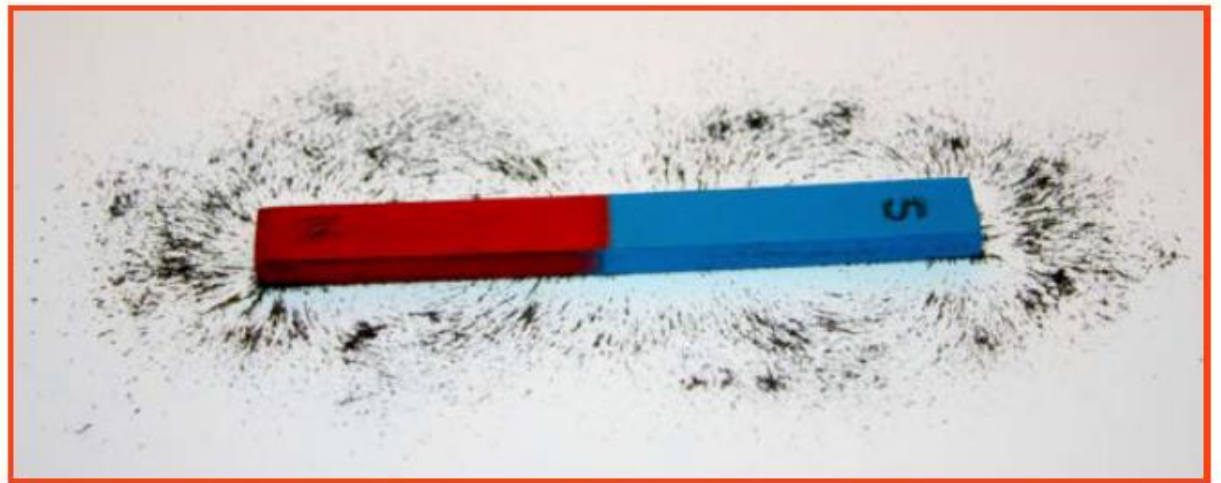


Gravity is what makes you fall downwards.

Another force that doesn't need contact between objects to make things move is magnetism. Magnets are rocks or pieces of metal that have a magnetic field around them. This means they can pull objects towards them or push objects away from them without having to make contact with the other object.



You can't usually see the force around a magnet but if you drop iron filings around one, you can see the magnetic field.





Why
do magnets have
two different
ends?

Each magnet has two poles, a north pole and a south pole. They are called the north and south poles because if a bar magnet is able to rotate, the north pole will always point north and the south pole will always point south.



This is how a compass works. When the needle on the compass spins, the north pole spins towards the north and the south pole spins towards the south. This way, you can use a compass to work out which direction you need to go.



Today you will be exploring what happens when magnets are put together. Will they attract or repel?



What would happen if a north pole was put against a north pole?



What would happen if a south pole was put against a south pole?



What would happen if a south pole was put against a north pole?

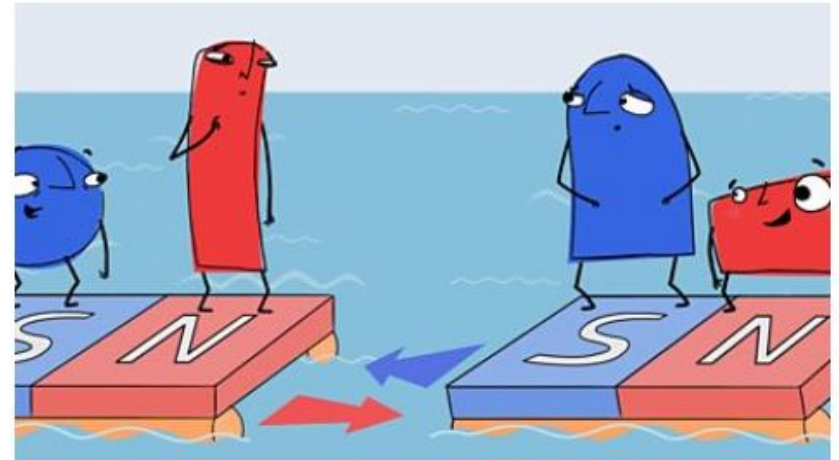
This lesson should have you carrying out an investigation but since you are at home you can research about magnets instead...

Please click on...

<https://www.bbc.co.uk/bitesize/topics/zyttyrd/articles/zpvcrdm>

What is a magnet? >

Learn about the north and south poles of magnets and how we use magnets in everyday life.



Click play on this video.

Magnetic forces

When two magnets are close, they create pushing or pulling forces on one another.

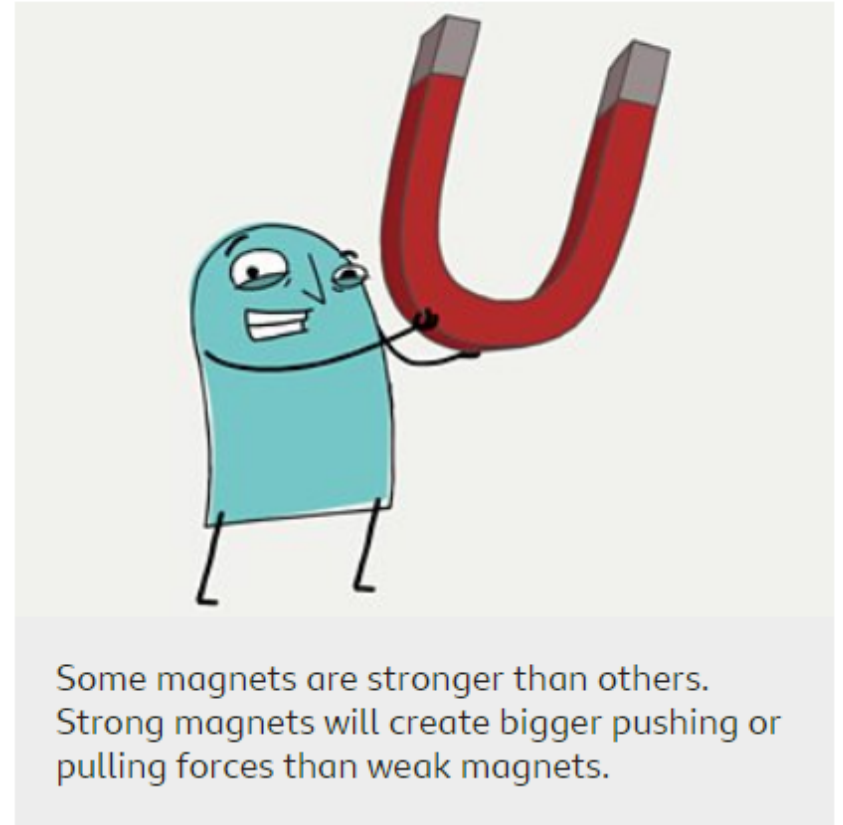
These forces are strongest at the ends of the magnets. The two ends of a magnet are known as the north pole and the south pole.

Same poles repel

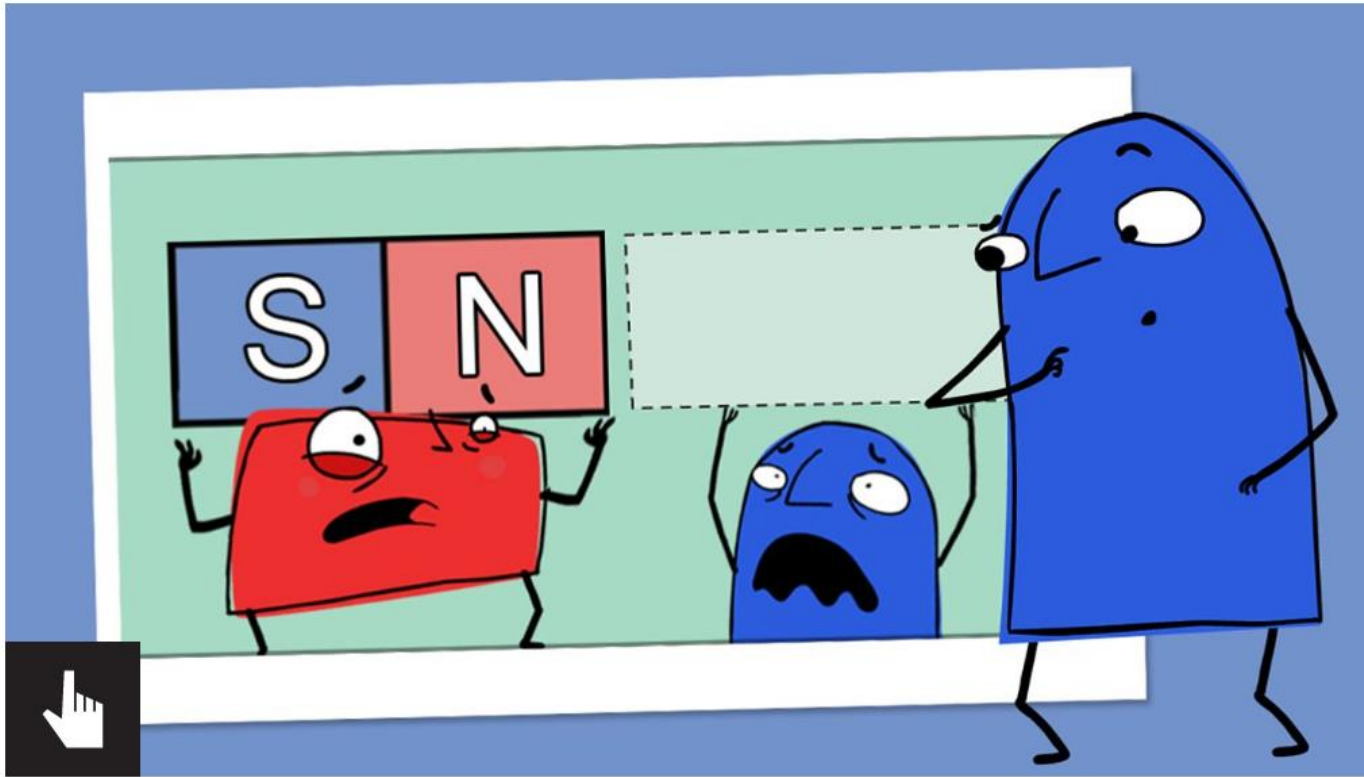
If you try to put two magnets together with the same poles pointing towards one another, the magnets will push away from each other. We say they repel each other.

Different poles attract

If you put two magnets together with different poles pointing towards one another, the magnets will pull towards each other. We say they attract each other.



Some magnets are stronger than others. Strong magnets will create bigger pushing or pulling forces than weak magnets.



Press the hand button on this screen



And play the game

The activities are set out into **Bronze** and **Silver** (most children do this) and **Gold** (this is an extra research challenge)

Bronze

Name: _____

Date: _____



What happens when the north and south poles of magnets are put together? Use magnets to copy the pictures below and find out!

What happens when north poles are put together?



- The north poles attract each other.
- The north poles repel each other.
- Nothing happens when north poles are put together.

What happens when south poles are put together?



- The south poles attract each other.
- The south poles repel each other.
- Nothing happens when south poles are put together.

What happens when a north pole and a south pole are put together?



- The north and south poles attract each other.
- The north and south poles repel each other.
- Nothing happens when north and south poles are put together.

I have found out that when poles that are the same are put together they...

I have found out that when poles that are different are put together they...

Silver



What happens when the north and south poles of magnets are put together? Use magnets to copy the pictures below and find out!

What happens when north poles are put together?



What happens when south poles are put together?



What happens when a north pole and a south pole are put together?



I have found out that when poles that are the same are put together they...

I have found out that when poles that are different are put together they...

Gold



Today you will be exploring what happens when magnets are put together. Answer the questions below and then draw each example you test.

What do you think will happen when like poles (poles that are the same) are put together? _____

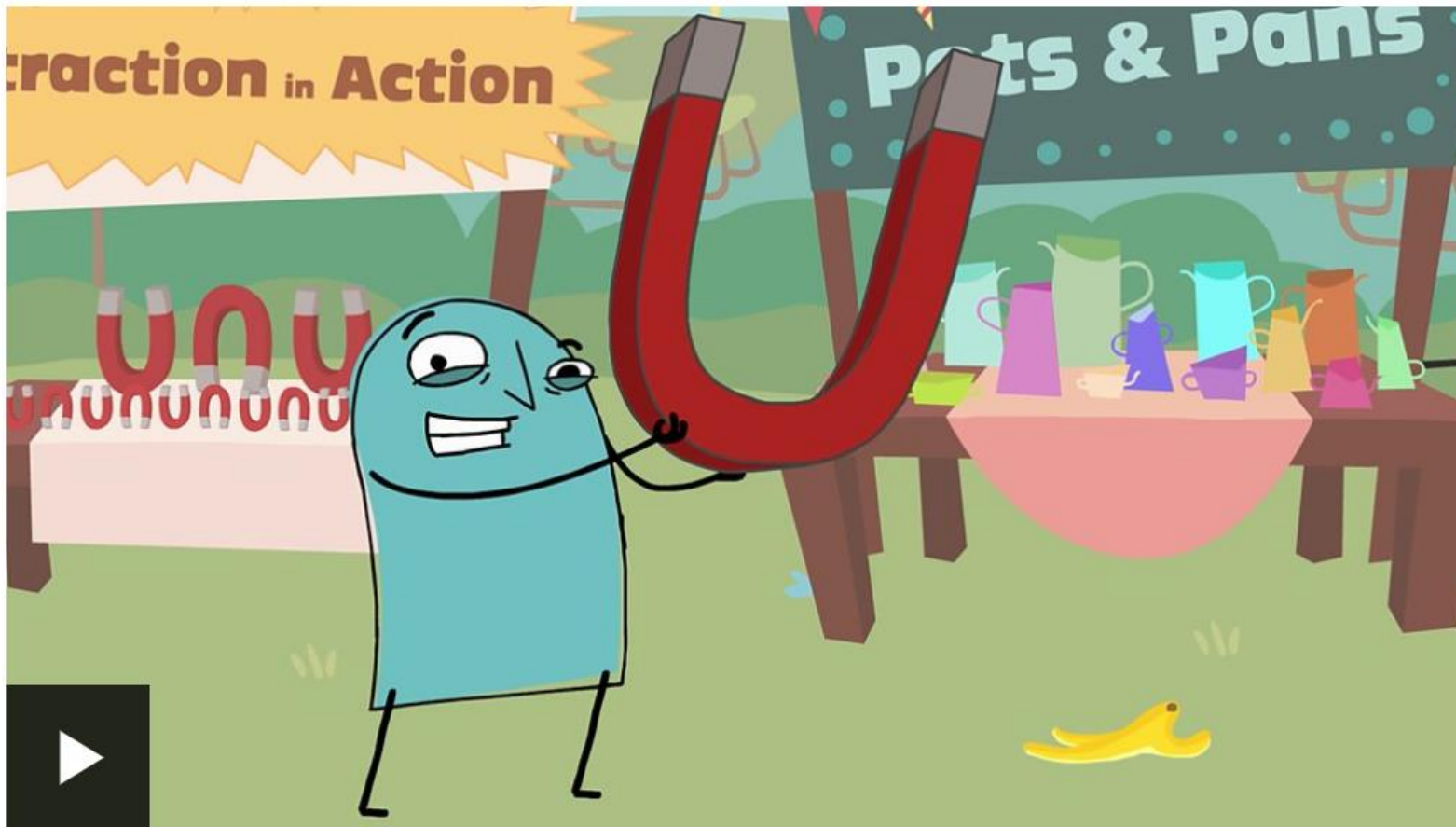
What do you think will happen when opposite poles are put together? _____

Draw a diagram for each test and describe what happened for each example:

North pole to north pole:	South pole to south pole:
North pole to south pole:	<u>Conclusion:</u> What happens when like poles are put together? What happens when opposite poles are put together?

<https://www.bbc.co.uk/bitesize/topics/zyttyrd/articles/zw889qt>

Try these out... Click on play



Magnetic metals

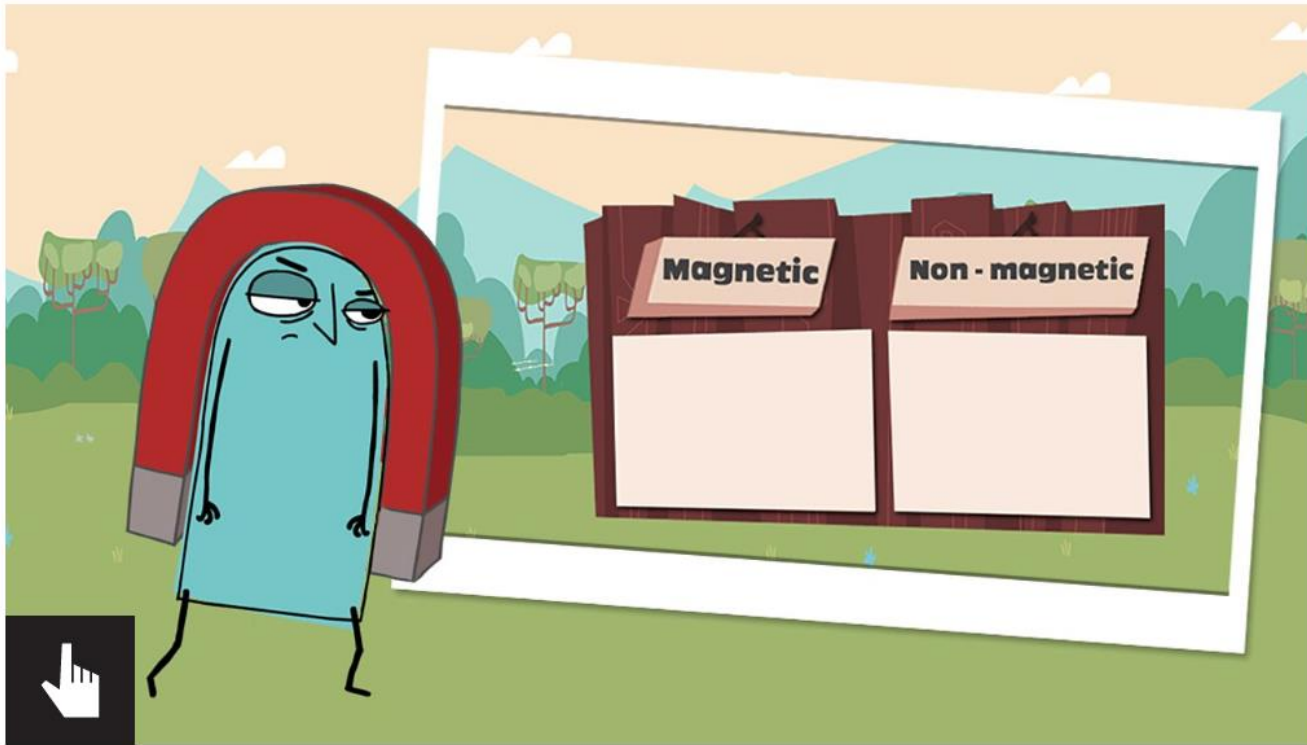
Magnetic materials are always made of metal, but not all metals are magnetic.

Iron is magnetic, so any metal with iron in it will be attracted to a magnet. Steel contains iron, so a steel paperclip will be attracted to a magnet too.

Most other metals, for example aluminium, copper and gold, are NOT magnetic.



Two metals that aren't magnetic are gold and silver. They are often used for making jewellery, including crowns for instance.



Press the hand button on this screen

And play the game

What have you learnt about magnets?

Tell someone in your house 5 facts about magnets..

Answers **Bronze**

Name: _____

Date: _____



What happens when the north and south poles of magnets are put together? Use magnets to copy the pictures below and find out!

What happens when north poles are put together?



- The north poles attract each other.
- The north poles repel each other.
- Nothing happens when north poles are put together.

What happens when south poles are put together?



- The south poles attract each other.
- The south poles repel each other.
- Nothing happens when south poles are put together.

What happens when a north pole and a south pole are put together?



- The north and south poles attract each other.
- The north and south poles repel each other.
- Nothing happens when north and south poles are put together.

I have found out that when poles that are the same are put together they...

repel

I have found out that when poles that are different are put together they...

attract

Silver



What happens when the north and south poles of magnets are put together? Use magnets to copy the pictures below and find out!

What happens when north poles are put together?



repel

What happens when south poles are put together?



repel

What happens when a north pole and a south pole are put together?



attract

I have found out that when poles that are the same are put together they...

repel

I have found out that when poles that are different are put together they...

attract

Gold






Today you will be exploring what happens when magnets are put together. Answer the questions below and then draw each example you test.

What do you think will happen when like poles (poles that are the same) are put together? _____

What do you think will happen when opposite poles are put together? _____

Draw a diagram for each test and describe what happened for each example:

<p>North pole to north pole:</p>  <p>repel</p>	<p>South pole to south pole:</p>  <p>repel</p>
<p>North pole to south pole:</p>  <p>attract</p>	<p><u>Conclusion:</u></p> <p>What happens when like poles are put together?</p> <p>repel</p> <p>What happens when opposite poles are put together?</p> <p>attract</p>