



# Science

## Forces and Magnets



# scrapyard challenge

# Aim

- I can sort magnetic and non-magnetic materials.

# Success Criteria

- I can explain that magnets produce a force that attracts some materials.
- I can use a magnet to separate items that are magnetic and non-magnetic.
- I can name some magnetic materials and some non-magnetic materials.

# Who Is Right?

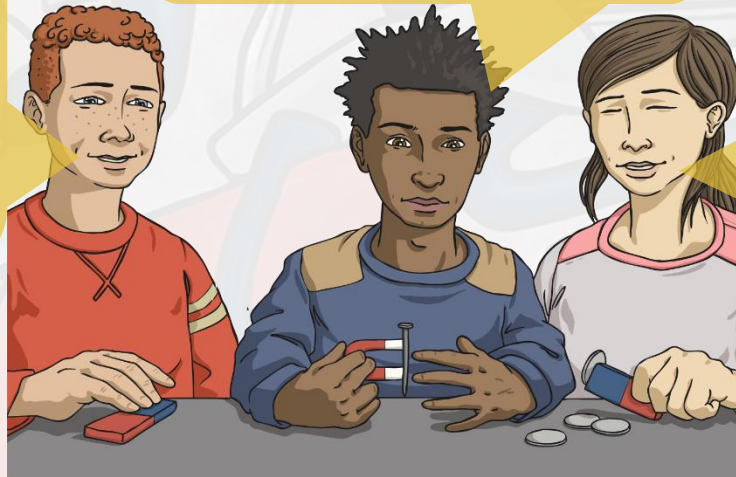


These children are using a magnet to pick up different objects. They are talking about what magnets are and how they work. Which child's ideas do you agree with?

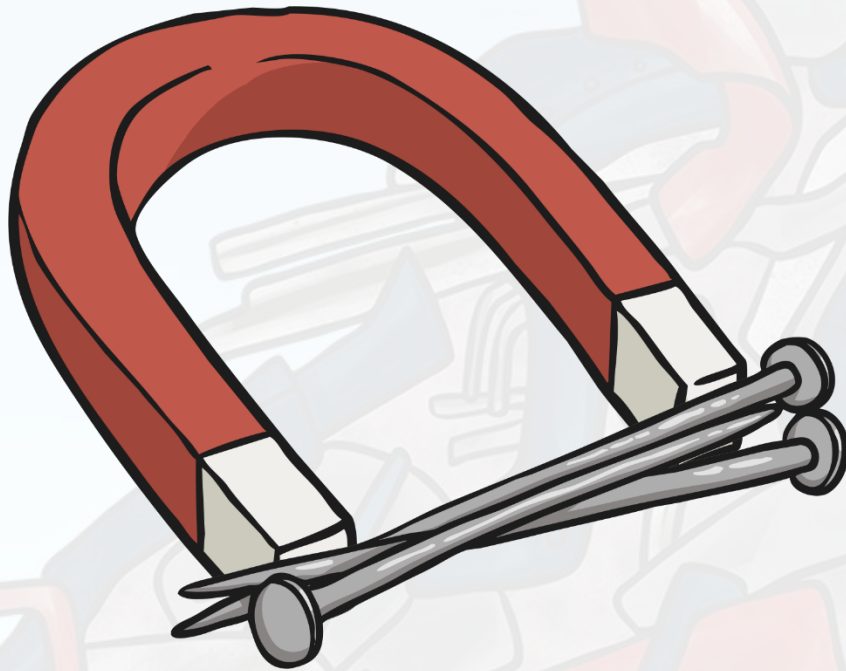
I think the magnet is sticky. It has some special glue on it to make things stick to it. This is how we can pick things up using the magnet.

I think the magnet produces a force to pull the different objects onto it.

I think magnets are special objects that connect to any other object.



# What Is a Magnet?

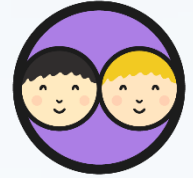


A magnet is a special type of object. It produces an area of magnetic force around itself, called a **magnetic field**.

If certain materials enter this magnetic field, they will be attracted to the magnet. This will cause the materials to be pulled towards the magnet.

**Try it!** Move a magnet slowly towards a steel paper clip. As the paper clip enters the magnetic field around the magnet, it will 'jump' towards the magnet.

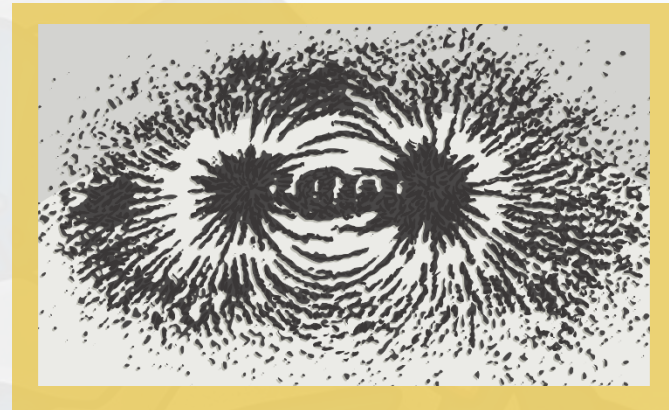
# Seeing the Magnetic Field



A magnetic field is the area around a magnet that produces a pulling force on certain materials. The magnetic field is invisible, so we can't see it.

Try this activity to detect where a magnet's magnetic field is, and what shape it is:

- Place a bar magnet in the centre of a tray, and place a piece of paper on top of the magnet.
- Sprinkle a few iron filings onto the paper from a few centimetres above it.
- Keep sprinkling small amounts of iron filings onto the paper until you can see the lines of the magnetic field.



You should see a pattern similar to this!

# Magnets at the Scrapyard



At a scrapyard, metals can be separated by using magnets. The metal materials travel along a conveyor belt and are separated by a giant turning magnet. The picture shows another magnet you might see at a scrapyard. There is a huge plate magnet at the base of the crane. Metals that are magnetic are pulled towards this powerful magnet. Non-magnetic metals are not.

# Magnets at the Scrapyard

The magnets in the scrapyard sorted the **magnetic** materials from the **non-magnetic** materials.

Magnetic materials are attracted to magnets. This means the material will be pulled towards a magnet.

Non-magnetic materials are not attracted to magnets. This means the material will not be pulled towards a magnet.

**But which materials are magnetic and which ones aren't?**





# Magnetic Materials




Imagine that you are in charge of a scrapyard like the one in the clip you have just watched. You have a big jumble of materials to sort out, and you need to separate the **magnetic** materials from the **non-magnetic** materials.

Use a magnet to attract materials, and remove them from the pile.

Any materials that are left in the pile are non-magnetic.

Record your findings on your **Magnetic Materials Activity Sheet**.

 **Magnetic Materials**

Sort the mixed materials into those that are magnetic and those that are non-magnetic.

Magnetic	Non-magnetic

What sorts of materials are magnetic?

Are all metals magnetic?

# Magnetic Materials Bingo



You will have a Magnetic Materials Bingo Activity Sheet with 12 boxes on it. 6 boxes say 'Magnetic' and 6 boxes say 'Non-magnetic'.

The aim is to move around the classroom, finding a different person to fill in a material in each box. Once you have filled in materials in all 12 boxes, you should shout, 'Bingo!' The first person to do so is the winner!

Make sure each person you ask writes a different material and signs their name or initials on your sheet. **Remember, you will also be asked to fill in materials for others at the same time!**

Magnetic Materials Bingo			
Name: _____			
Magnetic	Magnetic	Non-magnetic	Magnetic
Magnetic	Non-magnetic	Magnetic	Non-Magnetic
Non-Magnetic	Magnetic	Non-Magnetic	Non-Magnetic

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