

# STEM Week

**Using magnets to solve problems**



**Engineers help to solve problems**



## Engineers help to solve problems

Do you know what an **engineer** is?

Talk about your ideas.

An engineer is a person who invents, **designs** and builds things.

They use their knowledge of maths and science to help them understand how things work.



an engineer

**Engineers design** all sorts of important things.

machines



Wuppertal train,  
Germany

buildings



“The Gherkin”, England

structures



Millau viaduct, France

Can you think of anything else an engineer might design?



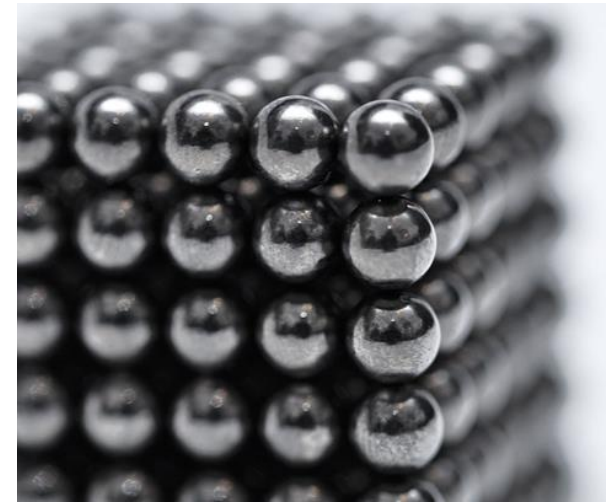
Children's games can be **designed** and produced to make use of magnets.



a magnetic fishing game



a magnetic darts game



magnetic balls





Many household items have magnets inside them.



Fridge magnets help us organise notes and letters.



Fridge doors have magnets in them to keep them closed.



Some drawers have magnets in them to keep them closed.



Many **electronic devices** have small magnets inside to make them work



a microwave



a speaker



a TV



a laptop



a mobile phone

All of these contain magnets.



# Engineers help to solve problems

Men and women become many kinds of **engineers**, to make sure we have clean water, electricity, safe cars and medicines.



a reservoir and dam



an electricity pylon



medicines

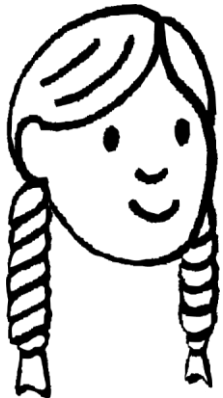
Engineers work all over the world, indoors and outdoors, in labs and in offices.



Important skills for **engineers** include being:

curious

I wonder how birds fly.



Laura

observant

I've noticed that birds' wings are all similar shapes.



Sam

creative

I could design an aeroplane based on the way a bird flies.

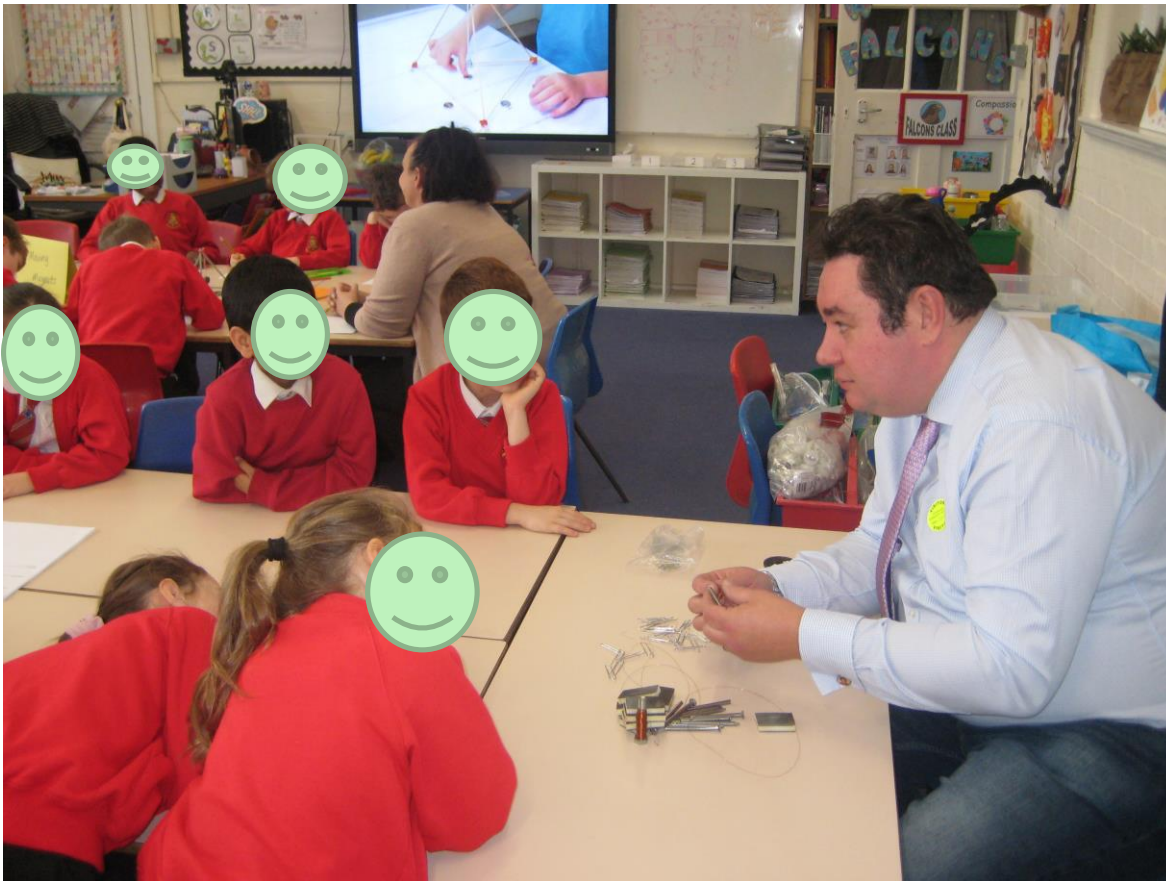


Alex





Today we investigated magnets and made our own electro magnet, and compass!



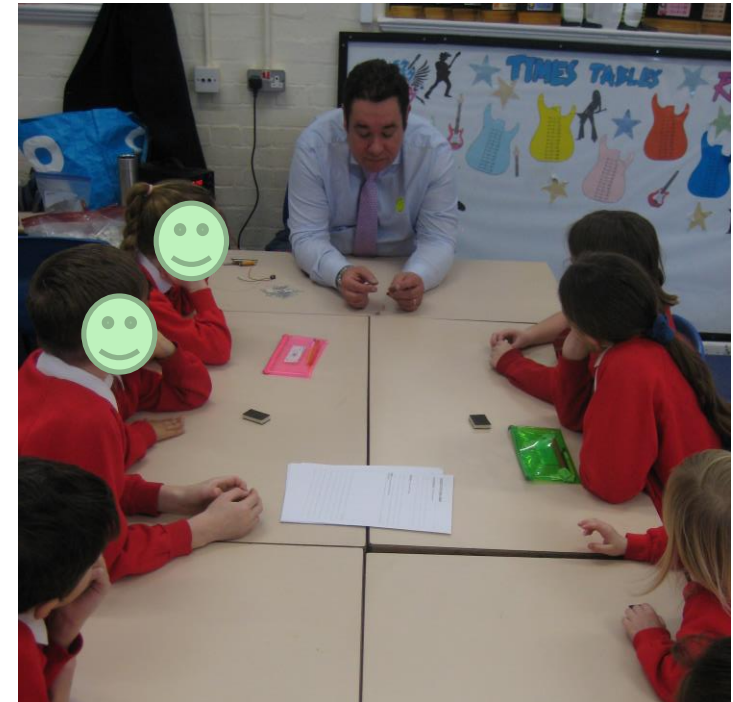
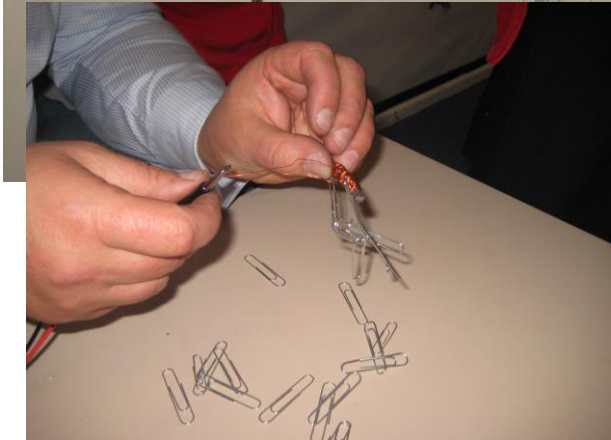
Ralph, an aviation engineer, came today in and showed us how to make electro magnets with a steel nail and copper wire - we even got to take it home!



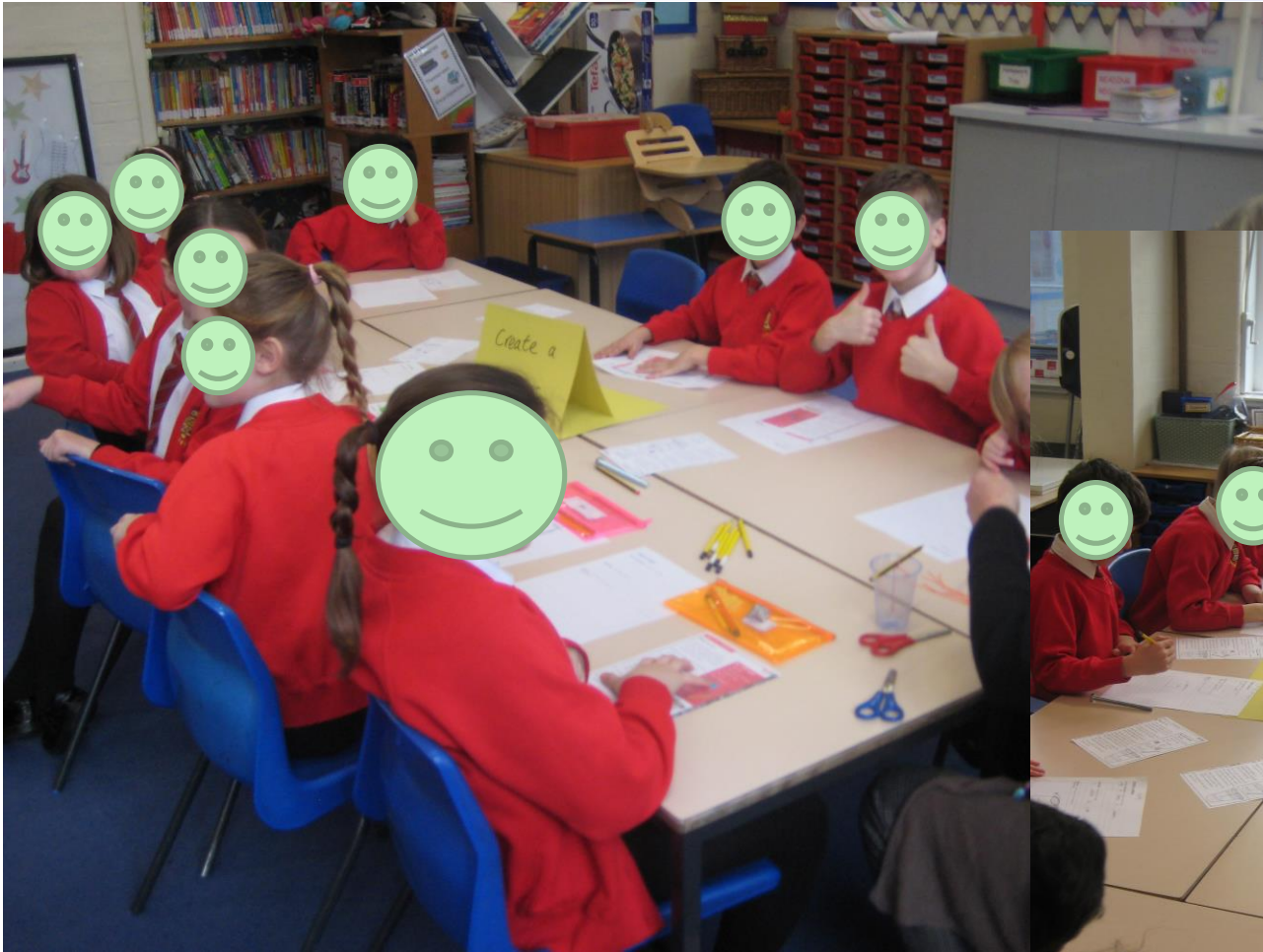
# Electro Magnet



Explanation







We made  
Compasses by  
rubbing needles  
with magnets

## Make a Compass

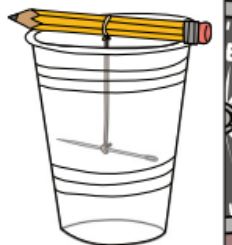
SCIENCE

### What to do:

1. Use a magnet to stroke down the needle towards the point. Stroke like you would brush hair.
2. Repeat this up to 50 times to magnetise the needle.
3. Test the needle is magnetised by trying to pick up a paperclip.
4. Tie one end of a piece of string or thread around the middle of the needle and the other end around the middle of the pencil.
5. Place the pencil across the top of the cup with the needle hanging below.
6. The pointed end should point north.

### You will need:

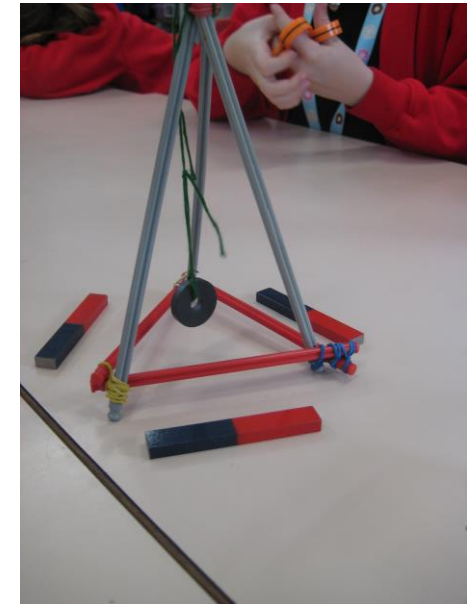
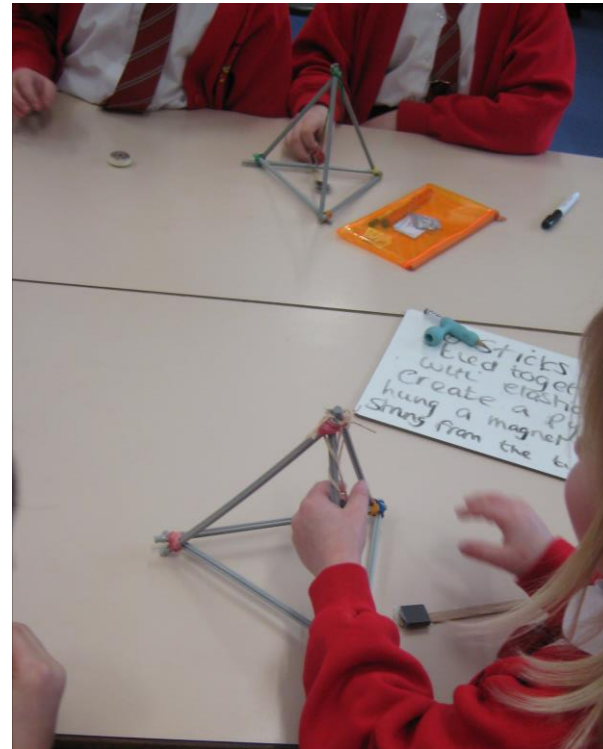
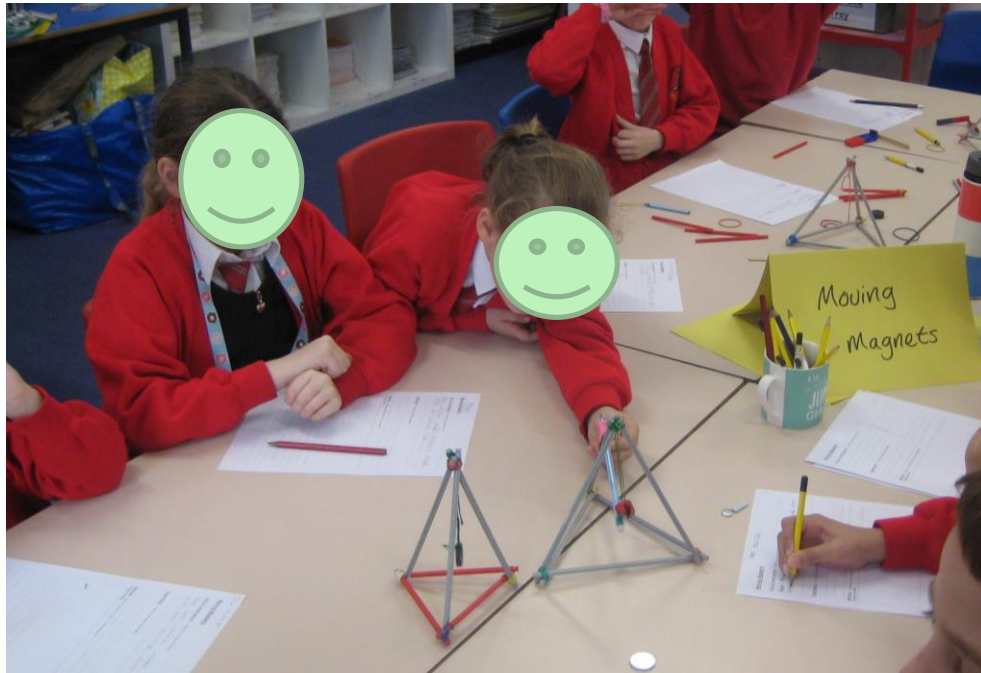
- Needle
- String or thread
- Plastic cup
- Pencil
- Bar magnet



# Magnetic forces in action



Explanation



We investigated magnets and how they can move through the forces of repel and attract

