## Key Vocabulary

**Force**: A push or a pull in a particular direction.

**Push**: Exert a force on something to move it away.

**Pull**: Exert a force on something to move it closer.

**Surface**: The outside part of something.

**Magnet**: An object that produces a magnetic field.

**Magnetic**: The power to attract or repel without touch.

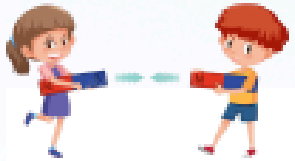
**Attract**: Pull something to you without contact.

**Repel**: Push something away without contact.

**Magnetic poles**: North & South

# Forces & Magnets

## Core Concepts



### MAGNETIC MATERIALS

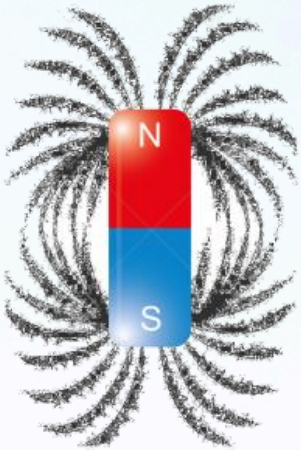
- Magnets can attract other magnets but they can also attract magnetic materials.
- The magnetic materials are always metals but only a few metals are magnetic.
- Iron is magnetic, so any metal with iron in it will be attracted to a magnet. Steel contains iron, so a steel paperclip, for example, will be attracted to a magnet.

Michael Faraday (1791-1867)

**Faraday** was an **English scientist** who discovered much about **magnetism** and **forces**, and many **electrical devices** today came about because of his work.

DID YOU KNOW?

*Albert Einstein kept a picture of Faraday on his wall!*

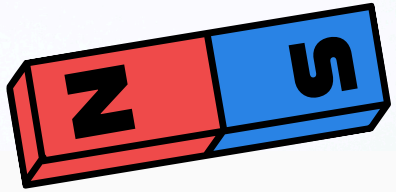



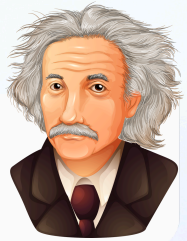

North & South Poles

I'm puzzled: Will it **attract**?

Crayon
Paper clip
Plastic ruler
Paper plane
A screw
Scissors An
orange

Tip: Look on the other side of this **Knowledge Organiser**!



## Key Questions

### FORCES

- What is a force, and how can it affect an object?
- Can you name some examples of forces in action around you?
- What is the difference between a push and a pull?
- How does friction affect the movement of objects?

### MAGNETS

- What materials are attracted to magnets?
- How can you find out if an object is magnetic?
- What happens when two magnets are brought close to each other?

### INVESTIGATIONS

- How can you test which materials are magnetic?
- How can you use a magnet to move an object without touching it?
- Can you design an experiment to find out which magnet is the strongest?

### EVERYDAY USES

- Where might you find magnets being used in everyday life?
- Why is friction useful in some situations but not in others?

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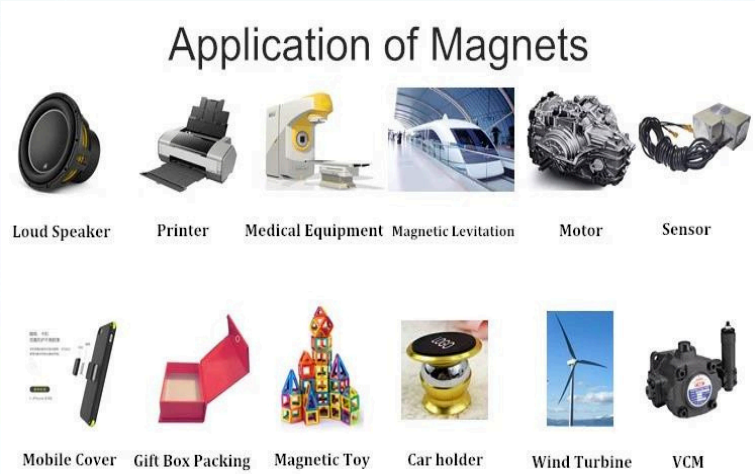
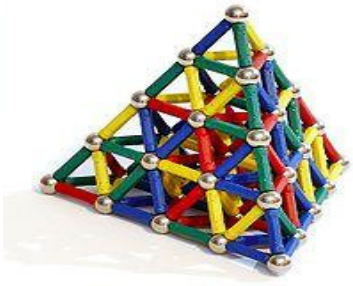
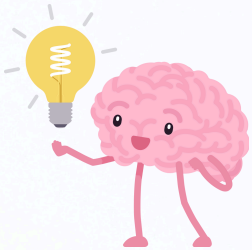
# Forces & Magnets



Why do the balls stick to the plastic tubes?

Think about what is inside the tubes!



### My Reflections

What new investigations or experiments would you like to try in our next science topic?

What went well in your learning about forces and magnets, and what could you do even better next time?

## Learning Objectives

I will understand how animation works.

I can plan and create a stop-frame animation with a clear story.

I may be able to use software tools to enhance animations with additional media.

I can evaluate my animations and suggest improvements.

## Self-Assessment

**I can explain that forces are pushes and pulls.**

**I can describe how forces change the motion or movement of an object.**

**I can give examples of forces making objects start to speed up, slow down, or stop.**

**I can explain how pushing the pedals of a bike makes it move and why harder pedaling makes it go faster.**

**I can describe how pulling the brakes on a bike causes it to slow down and stop.**

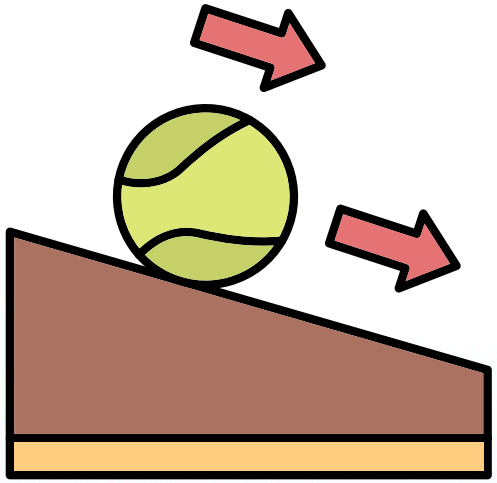
How do different **surfaces** affect the **motion** of an object?

**Forces** act in **opposite** directions to each other. When an object moves across a surface, **friction** acts as an **opposite** force.

**Friction** is a **force** that holds back the **motion** of an object. Some **surfaces** create more **friction** than others which means that objects move across them

On a ramp, the **force**that causes the object to move downwards is **gravity.**

Objects move differently depending on the **surface**of the object itself and the **surface**of the ramp.



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# Pushes, Pulls & Friction

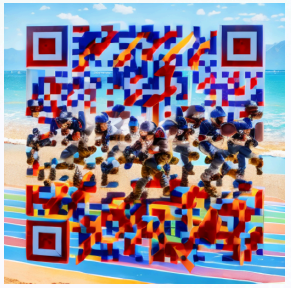
"Nothing in life is to be feared,
it is only to be understood.
Now is the time to understand more,
so that we may fear less."

- Marie Curie

We can't see **forces**, but we can see the effects they have on objects.

Forces can make objects:

- **move**
- **change speed to be faster or slower**
- **change direction**
- **change shape**



**Would you push or pull this dog's toy?**

**Would you push or pull this swing?**

**Would you push or pull this sledge?**


Air resistance is a type of friction.

Air resistance allows parachute jumpers to fall slowly and safely.