

Forces & Magnets

Pushes, pulls, friction & magnetism



1. What is a force, and how do pushes and pulls make things move?

A **force** is a push or a pull that can start, stop, speed up, slow down or change the direction of movement.

- A push moves something away from you; a pull moves it towards you.
- Forces can also change the shape of an object.

3. How can we test how far a toy car travels on different surfaces?

We release the car from the same height and measure the distance it rolls.

- We keep the car, ramp and starting height the same — only the surface changes.
- Measuring in centimetres lets us compare surfaces fairly.

The Test	Surface	What it looks like	Distance travelled (cm)			
			Test 1	Test 2	Test 3	Average
• We used the same car and the same ramp. • We started the car from the same place each time. • We changed the surface. • We measured how far the car travelled.	1. Carpet		23 cm	25 cm	24 cm	24 cm
	2. Paper		32 cm	34 cm	33 cm	33 cm
	3. Tile		48 cm	50 cm	49 cm	49 cm
	4. Bubble wrap		15 cm	16 cm	14 cm	15 cm

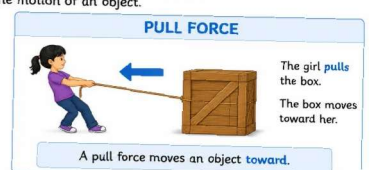
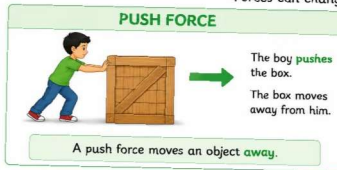
5. What are magnetic poles, and how do they attract or repel?

Every magnet has a **north pole** and a **south pole**.

- Opposite poles (N-S) **attract**; same poles (N-N or S-S) **repel**.
- A compass needle is a small magnet that lines up with the Earth's poles.

Push and Pull Forces on an Object

Forces can change the motion of an object.



2. What is friction, and how does surface type affect it?

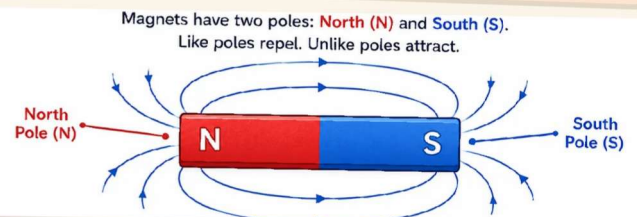
Friction is a force that slows things down when two surfaces rub together.

- Rough surfaces cause more friction than smooth surfaces.
- A toy car rolls further on a smooth floor than on carpet.

4. Which materials are magnetic?

Magnets attract some metals, mainly **iron, steel, nickel and cobalt**.

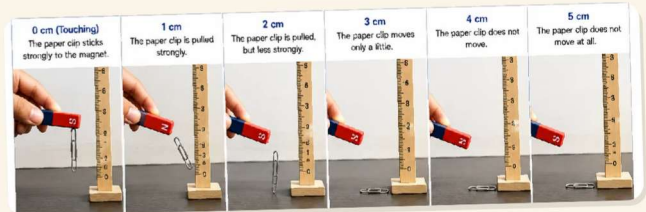
- Most other materials — wood, plastic, glass, gold — are not magnetic.
- Magnets act at a distance, without touching the object.



6. Greater Depth: does magnet strength change with distance?

A magnet's pull gets **weaker** the further away it is from a magnetic object.

- We can test this by measuring the furthest distance a magnet can still attract a paperclip.
- Stronger magnets attract paperclips from further away.



7. TAPS: How do we write up our strongest-magnet test?

FAIR TEST

Our TAPS test: **which magnet in our collection is the strongest?** It's a **fair test** — we change only the magnet and keep the object it's pulling, the distance and the method the same.

- Question → **prediction** → variables (change / keep same / measure).
- Materials → **method** → carry out the test → **results** → **conclusion**.

STRONGEST MAGNET TEST RESULTS

Magnet ID	Magnet Type	Number of Paper Clips Held (Total)	Lift Test (Weight Lifted)	Hold Test (Hangs for 10 Seconds)	Overall Strength (1 = Weakest, 5 = Strongest)
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KEY VOCABULARY

force push pull friction surface magnet magnetic attract repel north pole south pole compass fair test predict conclusion

SKILLS I'LL USE

- Set up a simple fair test
- Measure distance in centimetres
- Record results in a table
- Compare magnetic & non-magnetic materials
- ★ GD: explain evidence using ideas about forces