



Forces — Friction, Gravity and Magnets! Year 4 Science at Home

You can help! Your child is learning about invisible forces that affect every object. You can help them spot these forces everywhere in daily life!

Why are we learning this? Forces in remote community life

Forces are at work all around us every day — and understanding them matters in practical ways. Gravity keeps us on the ground and makes water flow downhill. Friction helps our car tyres grip the road in the wet season — but makes it harder to drag a boat down the beach. Magnets are used in recycling, in medical equipment at the clinic, and in many tools. Understanding these forces helps your child make sense of how the world works.

My child will learn to:

✓ Understand gravity

Know that gravity is a force that pulls all objects towards Earth.

✓ Explore magnetism

Investigate how magnets attract and repel objects from a distance.

✓ Understand friction

Describe how friction between surfaces slows things down or stops them.

✓ Describe force effects

Use arrows to show the direction and size of forces acting on objects.

Big ideas to know:

Gravity

Gravity is a pulling force. It pulls every object towards the centre of Earth. It is why things fall when you drop them and why water flows downhill. Gravity acts on everything, all the time.

Friction

Friction is a force between two surfaces that are in contact. It slows things down. Rough surfaces have more friction than smooth ones. Friction is useful — it stops us slipping!

Magnetism

Magnets exert a force on other magnets and on iron and steel — without even touching them. Two magnets can push (repel) or pull (attract) each other depending on which poles face each other.

Year 4 Physics

Physics (Forces)

Everyday Forces

Gravity



pulling DOWN
(Gravity is a *pull* towards Earth's center.)
Weight is the force of gravity.

Friction
(e.g., polished floor, rough pavement)

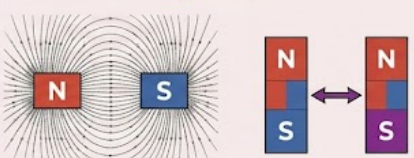
Static Friction **Kinetic Friction**



Friction force opposes motion
(Friction works in the *opposite direction*.)
Greater friction = more effort needed!

 Force of Gravity  Friction  vs 

Magnetism



attract (pull together) **repel** (push apart)

(Magnetism is a *non-contact* force.)
Compass needles use magnetic fields.

Magnetism  **Non-Contact Forces** 



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Comparing three forces

Force	What it does	Everyday example
Gravity	Pulls objects towards the centre of Earth — a constant pulling force	Things fall when dropped. Water flows downhill. Keeps us on the ground.
Friction	A force between surfaces that slows or stops movement	Tyres grip the road. We do not slip when we walk. Brakes slow a bike.
Magnetism	A pushing or pulling force that acts without touching	Fridge magnet holds paper. Compass needle points north. Scrapyard magnets lift cars.

Think Like a Scientist — Force Investigator

Slide a book across a smooth floor, then across carpet. Which surface has more friction? How do you know? Now drop two objects of different sizes from the same height — which hits the ground first?

Key question: "Why does the book slow down? What force is doing that? What would happen in space where there is much less gravity?" These are the questions scientists ask!

You will need: (Materials)

- Heavy book and a sheet of paper
- Fridge magnets (2)
- A ball or small object
- Smooth floor and carpet or mat for comparison
- Paper and pencil for recording

Experiments to try:

1. Drop a heavy book and a piece of paper from the same height — which falls faster? Scrunch the paper into a ball and try again!
2. Slide objects over different surfaces — which has the most friction?
3. Test which objects a fridge magnet will attract and which it will not
4. Hold two fridge magnets together — can you feel them push apart?
5. Roll a ball on smooth floor vs carpet — where does it stop sooner?

Questions to ask your child

1. What force is pulling that object towards the ground?
2. Why does your foot not slide when you walk? What force helps you?
3. Which surface has more friction — the smooth floor or the mat? How do you know?
4. Does the magnet work through a piece of paper? What about through water?
5. Why do some things stick to the fridge magnet and others do not?
6. What would happen if there were no friction when you tried to pick up a glass?
7. Why do shoes have different patterns on the soles? What does that tell you about friction?

Fridge magnets and ordinary household objects are all you need to explore magnetism! Test what the magnet attracts (iron, steel) vs what it does not (aluminium, plastic, wood).

Key words to know:

Gravity	A force that pulls objects towards the centre of Earth — what makes things fall
Friction	A force between two surfaces in contact that resists movement and slows things down
Magnetism	A force that can attract or repel — acts at a distance without touching
Attract	To pull towards — magnets attract iron and steel, and each other (opposite poles)
Repel	To push away — magnets repel each other when the same poles face each other
Force	A push or pull that can change an object's motion, speed or shape
Contact force	A force that requires physical contact between objects — like friction

Key words to look up

Gravity · Friction · Magnetism · Attract · Repel · Force · Contact force

What school will check

Your child needs to identify how forces can be exerted on objects and describe the effect of frictional, gravitational and magnetic forces on the motion of objects.

Try it at home!

Put a fridge magnet on the table. Can you push another magnet along the table without them touching? Try to get them to attract and then repel by flipping one around. What do you notice?