

## Year 5 Science Curriculum

[Working scientifically links](#)   [Rubric/PCMD opp.](#)   [Key Vocabulary](#)

### Forces

**What's the big picture?** Recap Year 3 Forces knowledge organiser - children to generate own questions for investigation

**Prior learning:**

Compare how things move on different surfaces. (Y3 - Forces and magnets)

Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3 - Forces and magnets)

Observe how magnets attract or repel each other and attract some materials and not others. (Y3 - Forces and magnets)

Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. (Y3 - Forces and magnets)

Describe magnets as having two poles. (Y3 - Forces and magnets)

Predict whether two magnets will attract or repel each other, depending on which poles are facing. (Y3 - Forces and magnets)

National Curriculum Principles	Objectives	Knowledge and key Vocabulary	Reading opportunities	Technology
Children can explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object	I know what gravity is and its impact on our lives	A <b>force</b> cause an object to start moving, stop moving, speed up, slow down or change direction. <b>Gravity</b> is a <b>non contact force</b> . Everything is pulled to the Earth by gravity. This causes unsupported objects to fall.  <b>Children to research Sir Issac Newton and create a double page spread.</b>	The Enormous Turnip (Katie Daynes)  Leonardo's Dream (Hans de Beer)  The Aerodynamics of Biscuits (Clare Helen Welsh)	
To identify the effects of air resistance, water resistance and friction, that act between moving surfaces	I can identify and know the effect of air resistance, water resistance and friction	Air resistance, water resistance and friction are <b>contact forces</b> that act between moving surfaces. The object may be moving through the air or water, or the air and water may be moving over a stationary object.  Children to know that <b>air resistance</b> is a type of <b>friction</b> caused by air pushing against a moving object. <b>Water</b>		

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		<p><b>resistance</b> is a type of friction caused by water pushing against a moving object. Friction is a force that acts between 2 sources or objects that are moving across each other. Friction can be helpful and unhelpful. Children to give examples of each.</p> <p>Children to draw a labelled diagram of objects in <b>motion</b> and the forces acting on them eg boat, car, football (project link)</p>		
<p>To recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect</p>	<p>I can explain how levers, pulleys and gears allow a smaller force to have a greater effect</p>	<p>Children to know and understand the terms <b>levers, gears and pulleys</b> and that they are simple <b>machines/mechanisms</b> to help move or lift.</p> <p>Levers, pulleys and gears allow a small force to have a greater effect. A lever rests on a <b>pivot</b>.</p> <p>Children to build catapults to show effect of levers.</p> <p>Children to know that gears change the <b>speed</b> of a force or <b>direction</b> of a motion. <b>Connected gears</b> always turn in opposite directions.</p> <p>Pulleys mean less force is needed to lift objects. Link to how gears (bike or clocks) and pulleys are used in real life.</p> <p>Children to compare force needed to lift objects using different simple machines.</p> <p>Children to create a double page spread</p>		

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### Famous scientists

Isaac Newton - gravity

Galileo - gravity

### Common misconceptions

Some children may think:

- the heavier the object the faster it falls, because it has more gravity acting on it
- forces always act in pairs which are equal and opposite
- smooth surfaces have no friction
- objects always travel better on smooth surfaces
- a moving object has a force which is pushing it forwards and it stops when the pushing force wears out
- a non-moving object has no forces acting on it
- heavy objects sink and light objects float.

### Enquiry ideas

<u>Comparative tests</u>	<u>Identify and classify</u>	<u>Observations over time</u>	<u>Pattern seeking</u>	<u>Research</u>
How does the angle of launch affect how far a paper rocket will go	Can you name and label all the forces acting on an object in different situations?	How long does a pendulum swing for before it stops?	Do all objects fall through water in the same way?	How do submarines sink if they are full of air?
How does the surface area of an object affect the time it takes to sink?				