

Year 3 – Forces and magnets	Main Outcomes: <ul style="list-style-type: none"> • Compare how things move on different surfaces. • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Observe how magnets attract or repel each other and attract some materials and not others. • 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. • Describe magnets as having two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing. 	Focus: Science – physics
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What should I already know?
Not studied until year 3.
What I will do
I will have weekly or blocked science lessons. In lessons, I will be taught a skill and I will gain knowledge and understanding through the process of scientific enquiry (observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources).
<u>Possible lines of enquiry</u> <ul style="list-style-type: none"> • Observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing). • Explore the behaviour and everyday uses of different magnets (for example, bar, ring, button and horseshoe). • Compare how different things move and group them. • Raise questions and carry out tests to find out how far things move on different surfaces. • Gather and record data to find answers to their questions. • Explore the strengths of different magnets and find a fair way to compare them. • Sort materials into those that are magnetic and those that are not. • Look for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another. • Identify how these properties make magnets useful in everyday items and suggest creative uses for different magnets.

Vocabulary	Meaning
attract(ion)	move towards each other
contact	touch each other
fair test	a test that controls all but one variable when attempting to answer a scientific question
force	a push or a pull
gravity	a force that pulls everything down toward the centre of the Earth. Gravity also pulls any object with mass toward each other, e.g. the Earth and the Moon or the Moon and the Sun
investigate	to observe or study by close examination and systematic enquiry
magnet	a rock or a piece of metal that can pull certain types of metal toward itself
magnetic	a material that is attracted to a magnet
magnetism	the force of a magnet
measure	quantify the length, weight, capacity (volume), time, etc of something
non-magnetic	a material that is <u>not</u> attracted to a magnet
pole	the end of a magnet ; a magnet has a North pole (N) and a South pole (S)
pull	a force that changes the direction of an object towards you
push	a force that changes the direction of an object away from you
repel (repulsion)	when two magnets push apart
results	where you report what happened in an experiment
table	a way of presenting information or data using rows (horizontal) and columns (vertical)
theory	an idea that can be tested

Resources
Hamilton Science planning: forces and magnets https://www.hamilton-trust.org.uk/science/year-3-science/forces-and-magnets-amazing-magnets/ (all planning also saved on SharePoint).

Knowledge to understand		Skills to learn	
A force is a push or a pull .	Forces can make an object <ol style="list-style-type: none"> 1. speed up (or start moving) 2. slow down (or stop moving) 3. change direction 4. change shape 		
Things move differently on different surfaces.	Rough surfaces (e.g. roads) slow down moving objects quickly. Smooth surfaces (e.g. ice) don't slow down moving objects much.		
Gravity and magnetism can act without contact.	Some forces need contact between two objects, but magnetic forces and gravity can act at a distance.		
Some materials are magnetic and others are non-magnetic .	Examples of magnetic materials are iron and steel. They are attracted to either pole of a magnet . Examples of non-magnetic materials include brass, aluminium and wood. They are not attracted to magnets.		
Magnets have two poles .	Magnets have a North pole (N) and a South pole (S). Opposite poles attract (move towards each other). Like (same) poles repel (move away from each other).		
			<ul style="list-style-type: none"> ➤ asking relevant questions and using different types of scientific enquiries to answer them ➤ setting up simple practical enquiries, comparative and fair tests ➤ making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers ➤ gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ➤ recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables ➤ reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ➤ using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ➤ identifying differences, similarities or changes related to simple scientific ideas and processes ➤ using straightforward scientific evidence to answer questions or to support their findings. <p>Cross-curricular (maths)</p> <ul style="list-style-type: none"> ➤ statistics: interpret and present data using bar charts, pictograms and tables ➤ measurement: measure, compare, add and subtract: lengths (m/cm/mm) ➤ measurement: estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds and minutes
			Equipment to become familiar with
			<p>A range of different magnets (for example, bar, button compass, disk, horseshoe, marbles, pole, ring and wand).</p> <p>Cameras (to record results).</p> <p>Sand timers and stop watches.</p>

Evidence of Learning	How will I know what I've learnt?
Science books Photos Videos Pupil conferencing Teaching and learning observations Learning walks Data analysis	<p>See KS2 teacher assessment exemplification for science</p> <p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/763065/2018_key_stage_2_teacher_assessment_exemplification_science.pdf</p> <p>See also Hamilton Science_Assessment_Y3 (saved in planning folder on Sharepoint).</p> <p>KS2 quizzes:</p> <p>https://gcequiz.com/quiz/ks2-science-quizzes</p> <p>https://churchfieldsjunior.com/test-your-skills-science/</p>