



The Canons CE Primary School



Year 3 – Forces and Magnets		
Prior Learning	In Year 3	Future Learning
In Year 2 children will be taught to: - squash, bend, twist and stretch certain objects and describe how the material makes the shape change. - identify the suitability of everyday materials for particular uses. (<i>Uses of everyday materials</i>)	In Year 3 children will be taught to: - predict whether two magnets will repel or attract one another, depending on their poles - describe magnets as having two poles - investigate how magnets attract some materials and not others - observe how magnets attract and repel each other - describe how pushes and pulls can alter the movement and speed of an object over a distance - investigate that some forces need contact between two objects e.g. push and pull - describe how objects move on different surfaces - 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.	In Year 5 children will be taught to: - explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object - identify the effects of air resistance, water resistance and friction, that act between moving surfaces - recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. (<i>Forces</i>)
	Key Vocabulary	
	force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole	
Famous Scientists	Common Misconceptions	Possible Evidence to be Secure
- Andre Marie Ampere – founder of electro-magnetism - William Gilbert – theories on magnetism - Hans Christian Oersted (1777 – 1851)	Some children may think: - the bigger the magnet the stronger it is - all metals are magnetic.	Children can: - give examples of forces in everyday life - give examples of objects moving differently on different surfaces - name a range of types of magnets and show how the poles attract and repel - draw diagrams using arrows to show the attraction and repulsion between the poles of magnets.



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Working Scientifically

National Curriculum Statutory Requirements

1. Ask relevant questions and use different types of scientific enquiries to answer them.
2. Set up simple practical enquiries, comparative and fair tests.
3. Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
4. Gather, record, classify and present data in a variety of ways to help in answering questions.
5. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.
6. Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
7. Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
8. Identify differences, similarities or changes related to simple scientific ideas and processes.
9. Use straightforward scientific evidence to answer questions or to support their findings.

Highlighted = main focus during this topic

Teaching Ideas – Different Types of Scientific Enquiry

Comparative and Fair Testing	Identifying and Classifying	Observation Over Time	Pattern Seeking	Research
Which magnet is strongest? Which surface is best to stop you slipping? How does the mass of an object affect how much force is needed to make it move?	Which materials are magnetic?	If we magnetise a pin, how long does it stay magnetised for?	Does the size and shape of a magnet affect how strong it is?	How have our ideas about forces changed over time? How does a compass work?

Teaching Ideas – How Pupils Could Work Scientifically

Teaching Ideas – Possible Evidence to be Secure

(Bracketed Number = National Curriculum Statutory Requirement Link)

- Carry out investigations to explore how objects move on different surfaces e.g. spinning tops/coins, rolling balls/cars, clockwork toys, soles of shoes etc. (2, 3, 4)
- Explore what materials are attracted to a magnet. (2)
- Classify materials according to whether they are magnetic. (4)
- Explore the way that magnets behave in relation to each other. (2, 3, 4)
- Use a marked magnet to find the unmarked poles on other types of magnets. (3)
- Explore how magnets work at a distance e.g. through the table, in water, jumping paper clips up off the table. (2, 3, 4)
- Devise an investigation to test the strength of magnets. (2)

Children can:

- use their results to describe how objects move on different surfaces. (7)
- use their results to make predictions for further tests e.g. it will spin for longer on this surface than that, but not as long as it spun on that surface (7)
- use classification evidence to identify that some metals, but not all, are magnetic (4, 8)
- through their exploration, show how like poles repel and unlike poles attract, and name unmarked poles (8)
- use test data to rank magnets. (7)