



The Canons CE Primary School



Year 5 – Forces		
Prior Learning	In Year 5	Future Learning
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. (<i>Forces and Magnets</i>)	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.	
	Key Vocabulary	
	force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears	
Famous Scientists	Common Misconceptions	Possible Evidence to be Secure
- Sir Isaac Newton (1642 – 1727) – formulated the laws of motion - Christopher Cockerell (1910 – 1999) – inventor of the hovercraft - Galileo – gravity (also Earth in Space) - Archimedes - levers	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.	Children can: - demonstrate the effect of gravity acting on an unsupported object - give examples of friction, water resistance and air resistance - give examples of when it is beneficial to have high or low friction, water resistance and air resistance - demonstrate how pulleys, levers and gears work.



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Working Scientifically

National Curriculum Statutory Requirements

1. Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
2. Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate.
3. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
4. Use test results to make predictions to set up further comparative and fair tests.
5. Report and present findings from enquiries, including conclusions, casual relationships and explanations of result, in oral and written forms such as displays and other presentations.
6. Identifying scientific evidence that has been used to support or refute ideas or arguments.

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 seed shape takes the longest time to fall? Which shape parachute takes the longest to fall? Which shape of blu tac has the highest buoyancy? How does the angle of launch affect how far a paper rocket will go? How does the surface area of a container affect the time it takes to sink? How does the surface area of a parachute affect the time it takes to fall to the ground?	Can you label and name all the forces acting on the objects in each of these 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?

Teaching Ideas – How Pupils Could Work Scientifically

Teaching Ideas – Possible Evidence to be Secure

(Bracketed Number = National Curriculum Statutory Requirement Link)

- Investigate the effect of friction in a range of contexts e.g. trainers, bathmats, mats for a helter-skelter. (1, 3) - Investigate the effects of water resistance in a range of contexts e.g. dropping shapes through water and pulling shapes, such as boats, along the surface of water. (1, 3) - Investigate the effects of air resistance in a range of contexts e.g. parachutes, spinners, sails on boats. (1, 3) - Explore how levers, pulleys and gears work. (1, 3) - Make a product that involves a lever, pulley or gear. (5) - Create a timer that uses gravity to move a ball. (5) - Research how the work of scientists such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation. (6)	Children can: - explain the results of their investigations in terms of the force, showing a good understanding that as the object tries to move through the water or air or across the surface, the particles in the water, air or on the surface slow it down (5) - demonstrate clearly the effects of using levers, pulleys and gears. (5)
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