

Gawber Primary School Science Small Steps

PHYSICS	FORCES	Year 6
Science Knowledge End Points:	- 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.	
Small Steps / Learning Goals:	- To know that all forces are either pushes or pulls. - To know that gravity is an invisible 'pull' force. - To know that all unsupported objects will fall towards the ground, due to the gravitational pull of Earth. - To communicate their research findings about the different theories on gravity. - To know that friction occurs when two objects rub against each other. - To know that air resistance and water resistance are both kinds of friction. - To explain that air resistance is a force that it caused by air. The force acts in the opposite direction to an object moving through the air, e.g. a falling parachute. - To explain that water resistance is a force that is caused by water; the force acts in the opposite direction to an object moving through the water, e.g. a moving boat. - To know that friction can be reduced – explains how a streamlined object is designed or built with a smooth shape so that it moves with less resistance through air or water, e.g. a rocket or a submarine. - To know that friction can be reduced by adding a lubricant, e.g. oil in a car engine, oil on bicycle gears. - To know that friction can be increased, e.g. by having a thicker / deeper tread on bicycle tyres. - To recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect. - To give examples of levers used in everyday life, e.g. bottle opener, a screwdriver used to open a paint tin, scissors, oars on a boat, a shoehorn - To know that a lever helps you lift or move something heavy. - To give examples of pulleys used in everyday life, e.g. a crane, a roller blind. - To know that a pulley helps you raise, lower or move a load. - To give examples of gears used in everyday life, e.g. on a bicycle. - To know that a gear can increase speed, increase force or change direction. - To recognise the significance of the work of scientists in this field, e.g. Galileo Galilei and Isaac Newton	
Key Vocabulary:	Force, gravity, Air resistance, water resistance, friction, surfaces, force diagrams, Mechanism, levers, pulleys, gears, Newton	
Enquiry Skills:	<u>Ideas for each Enquiry Type:</u> Comparative and Fair Tests: How does the angle of a launch affect how far a paper rocket will go? How does the surface area of an object affect the time it takes to sink? Identify and Classify: Can you label and name all the forces acting on the objects in each of these situations?	<u>Working Scientifically:</u> - To explore falling paper cones / cupcake cases or gyrocopter and the impact of gravity - To design and make a variety of parachutes and carry out fair tests to determine which designs are the most effective (RAF STEM challenge)

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	Observation over time: How long does a pendulum swing for before it stops? Pattern Seeking: Do all objects fall through water in the same way? How does the surface area of a parachute affect the time it takes to fall? Research: How do submarines sink if they are full of air?	• To explore resistance in water by making and testing submarines • To design and make products that use levers, pulleys, gears and/or springs and explore their effects.
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