




Scientific Skills Progression

*Note: It is expected that children and adults should use the vocabulary from previous year groups as they progress and where appropriate.

By the end of ...	<h3 style="text-align: center;">FORCES, MAGNETS AND MOTION</h3> <div style="text-align: center;">  </div>	Year group taught in
Key Stage 2	<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 based on 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. <p>Vocabulary children should use: force, push/pushing, pull/pulling, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, non-magnetic material, poles, north pole, south pole</p>	Year 3
	<ul style="list-style-type: none"> • 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. <p>Vocabulary children should use: magnetic force, contact force, magnet, attract, repel, air resistance, water resistance, newtons, friction, gravity, levers, pulleys, gears, surface</p> <p>Vocabulary adults should use: mechanisms</p>	Year 5



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Key Stage 3	<p>Forces</p> <ul style="list-style-type: none"> • Describe forces as pushes or pulls, arising from the interaction between two objects • Use force arrows in diagrams, adding forces in one dimension, identifying <i>balanced</i> and unbalanced forces • Recognise a moment as the turning effect of a force • Recognise forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water • Recognise that forces are measured in Newtons • Investigate changes to measurements of stretch or compression as force is changed • Explain the force-extension linear relation, with Hooke's Law as a special case • Recognise work done and energy changes on deformation • Identify non-contact forces: gravity forces acting at a distance on Earth and in space, forces between magnets and forces due to static electricity. <p>Balanced forces</p> <ul style="list-style-type: none"> • Recognise opposing forces and equilibrium: weight held by stretched spring or supported on a compressed surface. 	Year 7, 8 or 9
	<p>Forces and motion</p> <ul style="list-style-type: none"> • Recognise that forces are needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only) • Recognise that change of motion depends on direction of force and its size. <p>Describing motion</p> <ul style="list-style-type: none"> • Recall the meaning of speed and recognise the quantitative relationship between average speed, distance and time (speed = distance ÷ time) • Represent a journey on a distance-time graph • Describe relative motion: trains and cars passing one another. 	
	<p>Magnetism</p> <ul style="list-style-type: none"> • Describe magnetic poles, attraction and repulsion • Investigate magnetic fields by plotting with compass, representation by field lines 	



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	<ul style="list-style-type: none"> • <i>Recognise the Earth's magnetism, explain how the compass works and its use in navigation</i> • <i>Investigate the magnetic effect of a current, electromagnets, D.C. motors (principles only).</i> 	
	<p>Pressure in fluids</p> <ul style="list-style-type: none"> • <i>Recognise that atmospheric pressure decreases with increase of height as weight of air above decreases with height</i> • <i>Describe changes to pressure in liquids, increasing with depth; Explain up thrust effects, floating and sinking</i> • <i>Describe pressure measured by ratio of force over area – acting normal to any surface.</i> 	