

Science Progression in Forces

Essential characteristics of scientists

- The ability to think independently and raise questions about working scientifically and the knowledge and skills that it brings
- Confidence and competence in the full range of practical skills, taking the initiative in, for example, planning and carrying out scientific investigations
- Excellent scientific knowledge and understanding which is demonstrated in written and verbal explanations, solving challenging problems and reporting scientific findings
- High levels of originality, imagination or innovation in the application of skills
- The ability to undertake practical work in a variety of contexts, including fieldwork
- A passion for science and its application in past, present and future technologies

Year Group	Key Skills	Key Vocabulary
EYFS	• Explore the natural world around them, making observations and drawing pictures of animals and plants • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter	
Year 3/4	• 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	• squeezed • contact • magnetic • attract • repel
Year 5/6	• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • Identify the effect of drag forces, such as air resistance, water resistance and friction that act between moving surfaces • Describe, in terms of drag forces, why moving objects that are not driven tend to slow down • Understand that force and motion can be transferred through mechanical devices such as gears, pulleys, levers and springs • Understand that some mechanisms including levers, pulleys and gears, allow a smaller force to have a greater effect	• centre • resistance • friction • gravity
Year	• Magnetic fields by plotting with compass, representation by field lines	

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- Earth's magnetism, compass and navigation
- Forces as pushes or pulls, arising from the interaction between two objects
- Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces
- Moment as the turning effect of a force
- 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
- Forces measured in Newtons, measurements of stretch or compression as force is changed