

Science: Forces
YEAR 5 Autumn 2



National Curriculum subject content

- ✓ 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

National Curriculum working scientifically

- ✓ planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- ✓ taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- ✓ recording data and results of increasing complexity, using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- ✓ using test results to make predictions to set up further comparative and fair tests
- ✓ reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- ✓ identifying scientific evidence that has been used to support or refute ideas or arguments

Key Vocabulary:

air resistances	a kind of friction that occurs between air and another object
break	the minimum force at which a device breaks when a constantly increasing force is applied to it
cog	a tooth on the rim of a wheel or gear
force	a push or pull that acts upon an object as a result of that objects interactions with its surroundings
friction	a force between two surfaces that are sliding, or trying to slide, across each other.
gear	toothed wheel that works with others to alter the relation between the speed of a driving mechanism
gravity	the universal force of attraction acting between all matter.
lever	a rigid bar resting on a pivot
machine	an apparatus using mechanical power and having several parts
mechanism	a system of parts working together in a machine
pull	a force drawing someone or something in a particular direction
pulley	A pulley is a wheel on an axle or shaft that is designed to support movement and change of direction
push	an act of pushing someone or something in order to move them away from oneself
streamline	a shape that reduces friction drag between a fluid, such as air or water, and an object moving through it
water resistance	type of force that uses friction to slow things down that are moving through water

Sequence of Learning:

Objectives (key knowledge):

Objective 1 To learn how forces act on objects	Objective 2 To learn about the effect gravity has on objects and how gravity was discovered.	Objective 3 To learn about the effects of air resistance	Objective 4 To learn about the effects of water resistance	Objective 5 To learn about the effects of friction.	Objective 6 To explore and design mechanisms
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Sticky Knowledge about materials

Friction between two surfaces can cause static electricity
 On Earth the force of gravity is about 10 Newtons for every one kilogram of mass
 Gravity keeps the Earth and all the planets in our solar system in orbit around the sun.
 Slippery substances, such as oil, reduce the friction between two surfaces. This is known as lubrication.
 A ship floats in water because the force from the water pushing it up (buoyancy) is equal to the force of gravity pulling it down.
 In 1590, Galilei proved that objects fall at the same rate no matter their mass.
 Lever were first used to construct the pyramids in Ancient Egyptian times