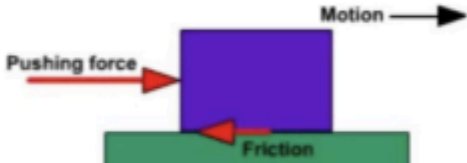





# Caroline Haslett Primary School: Autumn 2 Forces Year 5

What should I already know?	
• Know what a <b>force</b> is and be able to explain that a push and pull are types of <b>forces</b> .	
• That when <b>forces</b> are applied to an object they allow them to move or stop moving.	
• The strength of the <b>force</b> determines how far and fast an object moves.	
• <b>Friction</b> is the <b>resistance of motion</b> when there is contact between two <b>surfaces</b>	
• The <b>force</b> that causes objects to move downwards towards the ground is <b>gravity</b> .	
• That <b>magnets</b> have poles, and that opposite poles <b>attract</b> , while similar poles <b>repel</b> .	

Vocabulary	
attract	If one object <b>attracts</b> another object, it causes the second object to move towards it
friction	the <b>resistance of motion</b> when one object rubs against another
force	the <b>pulling or pushing</b> effect that something has on something else
gear	a part of a machine that causes another part to move because of teeth which connect the two moving parts
gravity	the <b>force</b> which causes things to drop to the ground
lever	a basic tool used to lift or pry things open
motion	the activity of changing position or moving from one place to another
opposite	<b>Opposite</b> is used to describe things of the same kind which are completely different in a particular way. For example, north and south are <b>opposite</b> directions
pulley	a simple machine that makes lifting something easier. A pulley has a wheel or set of wheels with grooves that a rope or chain can be pulled over
repel	When a magnetic pole <b>repels</b> another magnetic pole, it gives out a <b>force</b> that pushes the other pole away
resistance	a <b>force</b> which slows down a moving object or vehicle
spring	a spiral of wire which returns to its original shape after it is pressed or pulled
streamlined	A <b>streamlined</b> vehicle, animal, or object has a shape that allows it to move quickly or efficiently through air or water
surface	the flat top part of something or the outside of it

Investigate!	
• Investigate the amount of <b>friction</b> created by different <b>surfaces</b> . Use measures (such as length and time) to show how far or fast an object travels.	
• Draw diagrams to show how objects move down ramps, through the air and through water, using arrows to show the direction of the <b>forces</b> .	
• Explore the effects of <b>friction</b> on <b>motion</b> and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel	
• Provide examples of when <b>friction</b> is useful.	
• Investigate how <b>surface area</b> affects <b>air resistance</b> and explain the relationship between them.	
• Make parachutes to investigate how <b>air resistance</b> works. Ensure that only one variable is changed while other variables stay the same. Variables may include the objects attached to the parachute, shape of parachute, size of parachute, length of string attached to the object, height of drop, material of parachute. Explain why this is necessary in an experiment.	
• Explore <b>resistance</b> in water by making and testing boats of different shapes	
• Design and make products that use <b>levers, pulleys, gears and/or springs</b> and explore their effects	

What will I know by the end of the unit?	
What are <b>forces</b> ?	<ul style="list-style-type: none"> <li>• <b>Forces</b> are pushes and pulls.</li> <li>• These <b>forces</b> change the <b>motion</b> of an object.</li> <li>• They will make it start to move or speed up, slow it down or even make it stop.</li> <li>• For example, when a cyclist pushes down on the pedals of a bike, it begins to move. The harder the cyclist pedals, the faster the bike moves.</li> <li>• When the cyclist pulls the brakes, the bike slows down and eventually stops.</li> <li>• <b>Friction</b> is a <b>force</b> - it is the <b>resistance of motion</b> when one object rubs against another.</li> </ul>  <ul style="list-style-type: none"> <li>• Other <b>forces</b> that create <b>resistance of motion</b> include <b>water resistance</b> and <b>air resistance</b>.</li> </ul>
What is <b>gravity</b> and <b>air resistance</b> ?	<ul style="list-style-type: none"> <li>• <b>Gravity</b> is the <b>force</b> that pulls objects to the centre of the Earth.</li> <li>• <b>Air resistance</b> pushes up on the parachute, <b>opposing</b> the force of <b>gravity</b>. This makes the parachute land more slowly.</li> </ul> 
What is <b>water resistance</b> ?	<ul style="list-style-type: none"> <li>• <b>Water resistance</b> is the <b>friction</b> that is created between water and an object that is moving through it.</li> <li>• Some objects can move through water with less <b>resistance</b> if they are <b>streamlined</b>.</li> </ul> 
What are examples of <b>mechanisms</b> ?	<ul style="list-style-type: none"> <li>• <b>Levers</b> allow us to do heavy work with less effort. For example, trying to pick up a large heavy box is difficult, however if a <b>lever</b> is used it becomes much easier to move it.</li> <li>• <b>Pulleys</b> also allow us to do heavy work - objects are attached to ropes and <b>pulley</b> wheels, and so instead of lifting heavy object upwards, we can pull on the <b>pulley</b> rope downwards.</li> <li>• <b>Gears</b> are toothed wheels. Their 'teeth' can fit into each other so that when the first wheel turns, so does the next one. This allows <b>forces</b> to move across a <b>surface</b>.</li> <li>• <b>Springs</b> can be stretched by pulling them or squashed by pushing them. The greater the <b>force</b> pulling or pushing the <b>spring</b>, the greater the force the <b>spring</b> uses to move back to its normal shape.</li> </ul> 

## Caroline Haslett Primary School - Science Topic: Forces Year 5

<p><b>Working scientifically</b></p>	<p>The results are information, such as measurements or observations, that have been collected during an investigation.          A conclusion is an explanation of what has been discovered using evidence collected. Use relevant scientific vocabulary to report on their findings.          Answer questions and justify their conclusions based on evidence collected.          Identify improvements, further questions and predictions.</p> <p>Questions can help us find out about the world and can be answered using a range of scientific enquiries.          Ask a wide range of relevant scientific questions that broaden their understanding of the world around them and identify how they can answer them.</p> <p>A method is a set of clear instructions for how to carry out a scientific investigation.          A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding.          Plan and carry out a range of enquiries, including writing methods, identifying variables and making predictions based on prior knowledge and understanding.</p> <p>Specialised equipment is used to take measurements in standard units eg. data loggers plus sensors, such as light (lux), sound (dB) and temperature (°C); timers (seconds, minutes and hours); thermometers (°C), and measuring tapes (millimetres, centimetres, metres). Take increasingly accurate measurements, in standard units, using a range of chosen equipment.</p> <p>An observation involves looking closely at objects, materials and living things. Accurate observations can be made repeatedly or at regular intervals to identify changes over time. Within a group, decide which observations to make, when and for how long, and make systematic and careful observations.          Use them to make comparisons, identify changes, classify and make links between cause and effect. Data can be recorded and displayed in different ways, including tables, bar and line charts, classification keys and labelled diagrams.          Gather and record data and results of increasing complexity, selecting from a range of methods (scientific diagrams, labels, classification keys, tables, graphs and models).          The results are information, such as measurements or observations, that have been collected during an investigation.          A conclusion is an explanation of what has been discovered using evidence collected. Use relevant scientific vocabulary to report on their findings, answer questions and justify their conclusions based on evidence collected.          Identify improvements, further questions and predictions.</p>
<p><b>Forces and magnets</b></p>	<p>Gravity is a force of attraction. Anything with a mass can exert a gravitational pull on another object. The Earth's large mass exerts a gravitational pull on all objects on Earth, making dropped objects fall to the ground.          Explain that objects fall to Earth due to the force of gravity.</p> <p>Friction, air resistance and water resistance are forces that oppose motion and slow down moving objects.          These forces can be useful, such as bike brakes and parachutes, but sometimes we need to minimise their effects, such as streamlining boats and planes to move through water or air more easily, and using lubricants and ball bearings between two surfaces to reduce friction.          Compare and describe, using a range of toys, models and natural objects, the effects of water resistance, air resistance and friction.</p> <p>Mechanisms, such as levers, pulleys and gears, give us a mechanical advantage. A mechanical advantage is a measurement of how much a simple machine multiplies the force that we put in. The bigger the mechanical advantage, the less force we need to apply.          Describe and demonstrate how simple levers, gears and pulleys assist the movement of objects.</p>

