

✓ O C A B U L A R Y

- forces
- gravity
- pull
- push
- air resistance
- water resistance
- friction
- moving surfaces
- movement
- mechanisms
- levers
- pulleys
- gears
- Isaac Newton
- Newton meter/ force meter
- weight

By the end of this unit, you will be able to discuss how forces and gravity are linked. You should have been able to test air and wind resistance as well as friction in fair tests. You will have an understanding of how some mechanisms can use a smaller force to do a job.

**Important information**



Prior learning

Lower down the school, you learnt that forces change the motion of an object. They will either make it start to move, speed up, slow it down or even make it stop. You will have also looked at pushes and pulls.

**Key Knowledge**

Different **surfaces** create different amounts of **friction**. The amount of **friction** created by an object moving over a **surface** depends on the roughness of the **surface** and the object, and the **force** between them.

The driving **force** pushes the bicycle, making it move.

**Friction** pushes on the bicycle, slowing it down.

You will also have investigated magnets. This year, we revisited the properties of materials and you tested different materials to work out if they were magnetic or non-magnetic.

Key Knowledge		Magnetic ✓	Non-magnetic ✗
<p>Like <b>poles</b> <b>repel</b>. Opposite <b>poles</b> <b>attract</b>.</p>	<p>The needle in a compass is a <b>magnet</b>. A compass always points north-south on Earth.</p>	<p>These objects contain iron, nickel or cobalt. Not all metals are <b>magnetic</b>.</p>	<p>These objects do not contain iron, nickel or cobalt.</p>
<p>A <b>magnetic field</b> is invisible. You can see the <b>magnetic field</b> here though. This is what happens when iron filings are placed on top of a piece of paper with a <b>magnet</b> underneath.</p>			

In this half term, we will be looking more at gravity, air and water resistance as well as looking at mechanisms such as levers and pulleys.

**Summer 1 - Science – Forces**

**Year Five and Six**

**By the end of this unit, you will be able to discuss how forces and gravity are linked. You should have been able to test air and wind resistance as well as friction in fair tests. You will have an understanding of how some mechanisms can use a smaller force to do a job.**

	Learning objective/Learning question	What you will learn	Learning Review
1	<p>I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p> <p>How did Isaac Newton discover gravity?</p>	<p>You read about Isaac Newton and how he discovered his theory about gravity. You will complete a reading comprehension that should help develop your understanding of gravity. After that, you will watch a video about weight, force, mass and gravity. It should explain the difference between mass and weight.</p> <p>You will be introduced to how a Newton meter/force meter can be used to measure the weight of different items.</p>	
2	<p>I can identify the effects of friction that act between moving surfaces</p> <p>Which surface caused the least amount of friction and reduced the amount of force needed to pull the weighted match box.</p>	<p>Using a force meter, you will compare pulling a weighted match box along different surfaces in a fair test. You will make a prediction and record the results. You should be able to explain how friction affects the force of the object being pulled.</p>	
3	<p>I can identify the effects water resistance</p> <p>What did you learn about water resistance by completing the plasticine test?</p>	<p>You will look at the definition of water resistance. You will create different plasticine shapes and investigate their water resistance in a fair test.</p>	
4	<p>I can identify the effects of air resistance</p> <p>What did you learn from your experiment?</p>	<p>You will look at the definition of air resistance and will discuss resistance in relation to speed, shape and size. The class will be split into 3 different groups to investigate either 1) air resistance and weight 2) air resistance and shape, or 3) air resistance and size. You will collect and present your data. You may make some comparisons between your design and that of your peers. You will be able to explain your results using scientific vocabulary.</p>	
5	<p>I can recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect</p> <p>Which mechanism do you think made it easiest to exert a force with a smaller effort?</p>	<p>You will compare different mechanisms including levers, pulleys and gears and have an understanding of how these can allow a smaller force to have a greater effect.</p>	
6	<p>I can research some STEM careers related to forces.</p> <p>Can you name three jobs that have links to forces?</p>	<p>You will use the NUSTEM career tool to list some jobs that require an understanding of forces. We will focus on an automotive engineer as in DT, you are going to use some elements of force and electronics to create your own moving vehicle.</p>	