

Subject	Year 8 Physics content Autumn Term	How to support students' learning
Forces and Motion 2	<p data-bbox="293 140 521 167"><u>Forces and Springs</u></p> <ul data-bbox="293 177 1272 355" style="list-style-type: none"> <li>• State why objects would stretch from an original position</li> <li>• Calculate the extension of a spring</li> <li>• Draw a scatter graph of force against extension</li> <li>• Describe the link between the extension of a spring and the force applied to it</li> <li>• Explain the mathematical relationship between force and extension</li> </ul> <p data-bbox="293 400 633 427"><u>Pressure in Solids and Fluids</u></p> <ul data-bbox="293 437 1061 802" style="list-style-type: none"> <li>• Recall the units for pressure</li> <li>• Recall the formula for pressure</li> <li>• Calculate the pressure of an object on a solid surface</li> <li>• Rearrange the formula to find the force or area of an object.</li> <li>• Explain the effects of pressure in some everyday situations</li> <li>• Understand what a fluid is (in physics)</li> <li>• Define density and the formula</li> <li>• Describe how pressure changes in water</li> <li>• Use density to determine if an object will float or sink</li> <li>• Describe how pressure changes with altitude</li> </ul> <p data-bbox="293 847 551 874"><u>Forces and Moments</u></p> <ul data-bbox="293 884 770 1137" style="list-style-type: none"> <li>• Understand what a lever is used for</li> <li>• Recall the parts of a lever</li> <li>• State the principle of moments</li> <li>• Calculate the moment of a force</li> <li>• Explain the advantages of a lever</li> <li>• Rearrange the equation to find force or distance</li> <li>• Explain how levers work using scientific language</li> </ul> <p data-bbox="293 1182 562 1209"><u>Newton's Second Law</u></p> <ul data-bbox="293 1219 1272 1473" style="list-style-type: none"> <li>• Recall the equation linking force, mass and acceleration</li> <li>• Know the units of acceleration</li> <li>• Plot a graph of force against acceleration</li> <li>• Identify common pieces of equipment and understand their scientific purpose</li> <li>• Round numbers to a specified number of decimal places</li> <li>• Rearrange <math>F=ma</math> to find mass or acceleration.</li> <li>• Calculate mass using the gradient of the force / acceleration graph</li> </ul>	<p data-bbox="1344 140 2040 204">This video is an excellent resource that summarises all the lessons in this topic. <a href="#">BBC bitesize forces - KS3 - YouTube</a></p> <p data-bbox="1344 284 2132 456">Think of all the places springs are uses – they are essential for our everyday life. How they behave when stretched and compressed is summarised here. There is also a video and game to play <a href="#">Hooke's law - Forces and movement - KS3 Physics - BBC Bitesize - BBC Bitesize</a></p> <p data-bbox="1344 501 2085 635">There are some independent learning booklet available online <a href="https://thepolesworthschool.com/wp-content/uploads/2020/06/KS3-Year-8-Science-Independent-Learning-Booklets-Pressure.pdf">https://thepolesworthschool.com/wp-content/uploads/2020/06/KS3-Year-8-Science-Independent-Learning-Booklets-Pressure.pdf</a></p> <p data-bbox="1344 679 2092 778">You can carry out your own experiment at home to investigate water pressure. Here are some instructions: <a href="#">Water Pressure Experiment - YouTube</a></p> <p data-bbox="1344 823 2047 922">This video is a summary of how moments can be useful for everyday objects <a href="#">GCSE Science Revision - Moments and Levers - YouTube</a></p> <p data-bbox="1344 967 2105 1101">Encourage students to watch this video which will remind them how to calculate resultant forces and understand the motion of the object <a href="#">Resultant Force - GCSE Physics - YouTube</a></p> <p data-bbox="1344 1145 2007 1318">You can try some of your own experiments at home to investigate Newton's 2<sup>nd</sup> Law. Here is a guide to several experiments. <a href="#">Science Project on Gravity and Motion for Third Graders (sciencing.com)</a></p>

<p>Waves 2</p>	<p><u>Sounds and the Ear</u></p> <ul style="list-style-type: none"> <li>Recall the main parts of the human ear and a microphone</li> <li>Describe the parts of the ear involved in hearing</li> <li>Explain simply the function of different parts of the microphone</li> <li>Compare the ear and microphone</li> </ul> <p><u>Ultrasound</u></p> <ul style="list-style-type: none"> <li>Define ultrasound using frequency and hearing ranges</li> <li>State the human hearing range in Hertz</li> <li>Describe the uses of ultrasound</li> <li>Explain how ultrasound is used for specific examples (cleaning / physio)</li> <li>Use ultrasound (echoes) in calculations of speed</li> </ul> <p><u>Images and Lenses</u></p> <ul style="list-style-type: none"> <li>Know that light travels in straight lines</li> <li>Construct basic ray diagrams of reflection and refraction</li> <li>Understand the role of lenses in forming images (not in eye) (e.g. focal point is where the image is formed)</li> <li>Use a pinhole camera to form an image</li> <li>State and describe the main structures in the eye</li> <li>Recall that convex lenses are found in the eye</li> <li>Describe what happens to light when it hits the retina (photochemical effects)</li> <li>Compare the eye to a telescope (lenses) and camera (CCD chip for photochemical effects)</li> </ul> <p><u>Colour</u></p> <ul style="list-style-type: none"> <li>Know that white light is made up of different colours – name the colours</li> <li>Understand that the colour light appears is related to frequency</li> <li>Describe what happens to light as it passes through a prism</li> <li>Explain that objects appear the colour of light they reflect, and all other colours are absorbed</li> </ul>	<p>Find out how the ear works by watching this video:  <a href="https://www.bbc.co.uk/bitesize/topics/zgdmsbk/articles/zkdkmfr">https://www.bbc.co.uk/bitesize/topics/zgdmsbk/articles/zkdkmfr</a></p> <p>Learn how microphones work – some tricky words but the concept is actually not too difficult!  <a href="https://studyrocket.co.uk/revision/gcse-physics-edexcel/triple-electromagnetic-induction/applications">https://studyrocket.co.uk/revision/gcse-physics-edexcel/triple-electromagnetic-induction/applications</a></p> <p>This webpage covers what ultrasound is, uses and how to use it in speed calculations. <a href="http://evolvingsciences.com">Ultrasound and Echoes (evolvingsciences.com)</a></p> <p>Follow the instructions on this website to carry out your own refraction experiment at home.  <a href="http://coolscienceexperimentshq.com">Light Refraction Science Experiment (coolscienceexperimentshq.com)</a></p> <p>If you want to go further this booklet contains GCSE level information on lenses: <a href="http://physicsandmathstutor.com">Notes - 6.3 Lenses - WJEC (Eduqas) Physics GCSE (physicsandmathstutor.com)</a></p> <p>Video explaining how pinhole cameras work and how to draw ray diagrams: <a href="https://www.youtube.com/watch?v=hhWVJ4SmkFO">https://www.youtube.com/watch?v=hhWVJ4SmkFO</a></p> <p>Experiments with colour available as worksheets of instructions to download: <a href="#">STEM</a></p> <p>Introduction to colours in light:  <a href="https://www.bbc.co.uk/bitesize/topics/zw982hv/articles/zryrkhv">https://www.bbc.co.uk/bitesize/topics/zw982hv/articles/zryrkhv</a></p> <p>Understand why your red t-shirt looks red! Use this website:  <a href="https://www.sciencelearn.org.nz/resources/47-colours-of-light">https://www.sciencelearn.org.nz/resources/47-colours-of-light</a></p>
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