

Subject	Year 8 Physics content Autumn Term	How to support students' learning
Forces and Motion 2	<u>Forces and Springs</u> • State why objects would stretch from an original position • Calculate the extension of a spring • Draw a scatter graph of force against extension • Describe the link between the extension of a spring and the force applied to it • Explain the mathematical relationship between force and extension <u>Pressure in Solids and Fluids</u> • Recall the units for pressure • Recall the formula for pressure • Calculate the pressure of an object on a solid surface • Rearrange the formula to find the force or area of an object. • Explain the effects of pressure in some everyday situations • Understand what a fluid is (in physics) • Define density and the formula • Describe how pressure changes in water • Use density to determine if an object will float or sink • Describe how pressure changes with altitude <u>Forces and Moments</u> • Understand what a lever is used for • Recall the parts of a lever • State the principle of moments • Calculate the moment of a force • Explain the advantages of a lever • Rearrange the equation to find force or distance • Explain how levers work using scientific language <u>Newton's Second Law</u> • Recall the equation linking force, mass and acceleration • Know the units of acceleration • Plot a graph of force against acceleration • Identify common pieces of equipment and understand their scientific purpose • Round numbers to a specified number of decimal places • Rearrange $F=ma$ to find mass or acceleration. • Calculate mass using the gradient of the force / acceleration graph	This video is an excellent resource that summarises all the lessons in this topic. <a data-bbox="1344 212 1765 239" href="#">BBC bitesize forces - KS3 - YouTube 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 data-bbox="1344 392 2119 456" href="#">Hooke's law - Forces and movement - KS3 Physics - BBC Bitesize - BBC Bitesize There are some independent learning booklet available online <a data-bbox="1344 533 2067 635" 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 You can carry out your own experiment at home to investigate water pressure. Here are some instructions: <a data-bbox="1344 751 1803 778" href="#">Water Pressure Experiment - YouTube This video is a summary of how moments can be useful for everyday objects <a data-bbox="1344 895 2011 922" href="#">GCSE Science Revision - Moments and Levers - YouTube Encourage students to watch this video which will remind them how to calculate resultant forces and understand the motion of the object <a data-bbox="1344 1074 1836 1101" href="#">Resultant Force - GCSE Physics - YouTube You can try some of your own experiments at home to investigate Newton's 2nd Law. Here is a guide to several experiments. <a data-bbox="1344 1254 2016 1318" href="#">Science Project on Gravity and Motion for Third Graders (sciencing.com)

Waves 2	<u>Sounds and the Ear</u> - Recall the main parts of the human ear and a microphone - Describe the parts of the ear involved in hearing - Explain simply the function of different parts of the microphone - Compare the ear and microphone <u>Ultrasound</u> - Define ultrasound using frequency and hearing ranges - State the human hearing range in Hertz - Describe the uses of ultrasound - Explain how ultrasound is used for specific examples (cleaning / physio) - Use ultrasound (echoes) in calculations of speed <u>Images and Lenses</u> - Know that light travels in straight lines - Construct basic ray diagrams of reflection and refraction - Understand the role of lenses in forming images (not in eye) (e.g. focal point is where the image is formed) - Use a pinhole camera to form an image - State and describe the main structures in the eye - Recall that convex lenses are found in the eye - Describe what happens to light when it hits the retina (photochemical effects) - Compare the eye to a telescope (lenses) and camera (CCD chip for photochemical effects) <u>Colour</u> - Know that white light is made up of different colours – name the colours - Understand that the colour light appears is related to frequency - Describe what happens to light as it passes through a prism - Explain that objects appear the colour of light they reflect, and all other colours are absorbed	Find out how the ear works by watching this video: https://www.bbc.co.uk/bitesize/topics/zgdmshk/articles/zkdkmfr Learn how microphones work – some tricky words but the concept is actually not too difficult! https://studyrocket.co.uk/revision/gcse-physics-edexcel/triple-electromagnetic-induction/applications This webpage covers what ultrasound is, uses and how to use it in speed calculations. Ultrasound and Echoes (evolvingsciences.com) Follow the instructions on this website to carry out your own refraction experiment at home. Light Refraction Science Experiment (coolscienceexperimentshq.com) If you want to go further this booklet contains GCSE level information on lenses: Notes - 6.3 Lenses - WJEC (Edugas) Physics GCSE (physicsandmathstutor.com) Video explaining how pinhole cameras work and how to draw ray diagrams: https://www.youtube.com/watch?v=hhWVJ4SmkF0 Experiments with colour available as worksheets of instructions to download: STEM Introduction to colours in light: https://www.bbc.co.uk/bitesize/topics/zw982hv/articles/zryrkhv Understand why your red t-shirt looks red! Use this website: https://www.sciencelearn.org.nz/resources/47-colours-of-light
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