

## Year 7: Physics

|                                                  | Autumn 1                                                                                                                                                                                                                                                                                                                                | Autumn 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Spring 1                                                                                                                                                                                                                                                                                                                                           | Spring 2 | Summer 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Summer 2 |
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|                                                  | Forces + Electricity                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Electricity + Space                                                                                                                                                                                                                                                                                                                                |          | Space + Global Warming                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |
| <b>Content:</b> What will students know          | Students will learn what forces are and how they affect real life scenarios. They will explore friction and weight in greater detail and understand how we can carry out experiments in science. They will look at key experimental concepts such as variables, methodology, health and safety, drawing graphs and writing conclusions. | Students will learn what charge is and how and why charge moves. They will learn what the key terms of potential difference, current and resistance are and how they all impact how a charge moves. Students will learn how we can use moving charges and learn to build and analyse simple series and parallel circuits. They will also see the impact that electricity has on our everyday lives through building fruit batteries and using circuits to relay messages with Morse code. | Students will gain an understanding of humanities place in the immediate solar system and learn what the key components of it are. Students will learn about space exploration from the past and start to evaluate its current use and where it is going in the future. Students will also learn about how the moon and sun effects life on earth. |          | This is the module that students will do for several lessons at the end of the year. They will learn about humanities need for energy and will gain an understanding of where humans get your energy from. Students will learn the pros and cons of different energy sources and will be introduced to the concept of the carbon cycle as well as the need to balance stores and emitters of carbon. Students will finish by carrying out a small presentation project on a single impact of greater carbon emissions. |          |
| <b>Skills:</b> What will students be able to do. | Students will learn how to carry out experiments in science and how to use forces to explain how objects move and interact.                                                                                                                                                                                                             | Students will learn how to set up electrical based experiments from diagrams and how to use different meters to analyse their circuits. Students will also start to describe different uses of electricity and will be able to draw circuit diagrams for these uses.                                                                                                                                                                                                                      | Students will learn how to describe features of the solar system and how it interacts. Students will also learn how to justify going to space and will learn how to work in a team to create their own space colony.                                                                                                                               |          | Students will be able to describe how global warming is caused due to humanities need for energy and learn how to carry out research                                                                                                                                                                                                                                                                                                                                                                                   |          |

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|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | skills into an area of their choice.                                                                                                                                                                                                                      |
| <b>Other:</b> Literacy/ Numeracy/ Ethos | <p><b>Literacy:</b> Learn the names for forces and key experimental terminology.</p> <p><b>Numeracy:</b> Calculate density and speed. Understand the need for units in everyday life and use some complicated ones.</p> <p><b>Ethos:</b> TO introduce students to how physics explains how the world works and that there are simple relationships to explain it. It is experimental heavy to start introducing to students the need for experiments in science.</p> | <p><b>Literacy:</b> Learn key words of potential difference, current, resistance, charge.</p> <p><b>Numeracy:</b> Simple analysing of circuits and small introduction into algebra.</p> <p><b>Ethos:</b> Start introducing 'models' to students and allowing them to take the theory regarding electricity into real world uses.</p> | <p><b>Literacy:</b> Learn mnemonics as a way to remember. Learn the names of different solar system objects as well as understand key terms such as 'year', 'orbit', 'seasons', 'planets' and 'moons'. Students will also learn how to answer 'justify' questions.</p> <p><b>Numeracy:</b> Gain a brief understanding of scale factors when looking at the solar system.</p> <p><b>Ethos:</b> To show students their place in the universe and allow them to ask questions.</p> | <p><b>Literacy:</b> Learn definitions for key words such as carbon, emitter, absorber, energy.</p> <p><b>Numeracy:</b> None.</p> <p><b>Ethos:</b> To give students an introduction into one of the greatest challenges that humanity currently faces.</p> |
| <b>Assessment</b>                       | End of topic assessment on Forces as well as an informal assessment on carrying out an experiment. Students will have a marked homework on balanced forces.                                                                                                                                                                                                                                                                                                          | End of topic assessment as well as a graded homework on how a torch works or how the lights in the home work.                                                                                                                                                                                                                        | End of topic test on Space. Multiple marked Educake's throughout module and a graded Badger homework task. Also, a chance for peer assessment with a 'Space colonisation' project.                                                                                                                                                                                                                                                                                              | End of Year assessment on Forces, Electricity, Space.<br><br>Marked presentation on one impact of climate change.                                                                                                                                         |

## Year 8: Physics

|                                                  | Autumn 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Autumn 2 | Spring 1                                                                                                                                                                                                                                                                                                                                                                                         | Spring 2 | Summer 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Summer 2 |
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|                                                  | Energy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          | Magnets                                                                                                                                                                                                                                                                                                                                                                                          |          | The Universe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |
| <b>Content:</b> What will students know          | Students will learn about the importance of energy and heat in their daily lives. They will learn about the main energy stores, and the Law of Conservation of Energy applied to a range of systems. Students will carry out a number of investigations to embed their experimental skills from Year 7.                                                                                                                                                                                                                                                                                |          | Students will learn about magnets and how they can pick up certain materials and not others. Students will be introduced to the idea of a force field and how to draw field lines around magnets using investigation. Students will learn how electricity leads to magnetism and vice versa, starting to understand how they are intertwined. Students will learn some uses of electromagnets.   |          | Students will build on from Year 7, but learn more about humanities place in the universe at large. Students will understand how past theories get disproved (such as astrology!) and how future theories might get proved. Students will build on from space exploration in Y7 but go one further with learning about aliens, the big bang, exoplanets, astrology, and will finish by making their own Helicopter.                                                                                                                                      |          |
| <b>Skills:</b> What will students be able to do. | Students will learn how diagrams can help aid scientific explanation of key processes such as conduction, convection and radiation. Students will also learn how to plan their own investigation. Students will develop their experimental skills with a particular focus on variables & graphs.                                                                                                                                                                                                                                                                                       |          | Students will learn how to investigate magnets using a range of different material. They will also learn how to describe the links that electricity and magnetism have with one another as well as explaining how several items around the house make use of them.                                                                                                                               |          | Students will be able to describe several theories from the past as well as several theories in the present. They will also learn the importance of science in explaining how to disprove theories such as astrology, and will develop numeracy skills by looking at advanced equations such as Drake's Equation.                                                                                                                                                                                                                                        |          |
| <b>Other:</b> Literacy/ Numeracy/ Ethos          | <b>Literacy:</b> Comprehension task on historical understanding of energy. Definitions of conduction, convection and radiation. Meaning of key 'working scientifically' vocabulary.<br><b>Numeracy:</b> Students will learn how to use numbers correctly in scientific experiments such as use of significant figures, decimal places and averages as well as how to identify anomalies.<br><b>Ethos:</b> To give students exposure to one of the most fundamental topics in science whilst also giving it real world context so that they can start seeing the importance of science. |          | <b>Literacy:</b> Key definitions of domains, fields, force and electromagnetism. Comprehension task on magnetic fields and mole rates to give students exposure to science in the news.<br><br><b>Numeracy:</b> Using averages in science.<br><br><b>Ethos:</b> To allow students to get a hands-on experience when investigating magnets and how they have such a huge impact on everyday life. |          | <b>Literacy:</b> Definitions for different stages in a lifecycle of a star as well 'new' scientific terms such as astrobiology and exoplanets.<br><br><b>Numeracy:</b> Students will learn the difference between weight and mass and how to calculate it. Students will also learn about key concepts such as light years and will build on Year 7 work on units. They will study the Drake Equation.<br><br><b>Ethos:</b> To stretch student's imagination of the universe and to show students what the cutting edge of science currently looks like. |          |
| <b>Assessment</b>                                | End of topic test on Energy Stores. Multiple marked Educakes throughout module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |          | End of topic test on Magnets. Multiple marked Educakes throughout module.                                                                                                                                                                                                                                                                                                                        |          | Not all students will finish this module but for those that have, they may sit an end of topic assessment.                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |

## Year 9: Physics

|                                                  | Autumn 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Autumn 2 | Spring 1                                                                                                                                                                                                                                                                                                                                                                                                  | Spring 2 | Summer 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Summer 2 |
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|                                                  | Sound Waves                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          | Light Waves                                                                                                                                                                                                                                                                                                                                                                                               |          | Wave Interactions & Radioactivity                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |
| <b>Content:</b> What will students know          | Students will learn about waves that they can and can't hear in sound waves and all the different areas of the world that they are involved in. From ultrasound, echolocation, musical instruments and birds. Students will be introduced to key ideas regarding all waves which includes key terms such as wavelength, amplitude, frequency and wave speed.                                                                                                               |          | Students will learn about waves that they can and can't see in light waves and all the different areas of the world that they are involved in. From X-Rays, satellite communication, filters and sunburns due to UV. Students will be learnt about the similarities and differences between sound and light and will solidify their knowledge from the first module regarding sound.                      |          | Students will bring together their knowledge from the first two modules and look at how they interact with the world around us. Through reflection, refraction and diffraction. Students will also learn about the wave equation and how everything they have learnt can be applied to tsunamis, earthquakes, virtual reality and the human eye.                                                                                                                              |          |
| <b>Skills:</b> What will students be able to do. | Students will be able to draw graphs of sound and be able to describe sounds based off of their frequency and wavelength. Students will also be able to describe how sounds are all around us in the world and how we can use sound to do a multitude of applications.                                                                                                                                                                                                     |          | Students will further their knowledge of waves by applying it to the waves that we can and can't see. They will be able to describe a number of different applications in the world around us as well as being able to describe the similarities and differences between different sections of the electromagnetic spectrum.                                                                              |          | Students will be able to describe how all waves around is interact through reflection, refraction and diffraction. Students will be able to use the wave equation and will learn how to use a ripple tank to explore the wave equation in more detail.<br><br>At the end of the year students will look at the "big picture" ideas of radioactivity, and how it can be dangerous. This will lead into the first lesson of Y10 by looking at the particle nature of radiation. |          |
| <b>Other:</b> Literacy/ Numeracy/ Ethos          | <p><b>Literacy:</b> Students will learn key definitions of vocabulary about waves.</p> <p><b>Numeracy:</b> Students will be introduced to a logarithmic scale but will not do this to any depth. Students will also learn how we can visual a sound by using graphs.</p> <p><b>Ethos:</b> This module is to showcase physics as a way of exploring how the world works. The first lesson allows students to learn by play and the rest of the module then explains all</p> |          | <p><b>Literacy:</b> Students will learn key definitions of vocabulary about waves as well as comprehension skills through News articles both written and visually.</p> <p><b>Numeracy:</b> Students will consolidate their learning from the maths curriculum and start to put large and small numbers into standard form. Students will also be introduced to the idea of using prefixes in science.</p> |          | <p><b>Literacy:</b> Students will be able to define key wave interactions.</p> <p><b>Numeracy:</b> Students will be introduced to the wave equation and, as an extension, how this can be derived from a simple demonstration linking it with <math>\text{speed} = \text{Distance} / \text{Time}</math>.</p> <p><b>Ethos:</b> This module acts as a summary of the previous two modules and shows to students how even though we can hear and see</p>                         |          |

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|                   | the phenomena that they came across in this first lesson.                                | <b>Ethos:</b> this module builds on the first module but takes it a step further by showing to students that there are a huge number of applications in the world that can be explained through knowledge about waves. | different waves: they all interact very similarly theoretically and in the world around us.                |
| <b>Assessment</b> | End of topic assessment on sound waves as well as multiple marked homework's on Educake. | End of topic assessment on light waves as well as multiple marked homework's on Educake.                                                                                                                               | End of Year assessment on Sound, Light and Interactions. As well as multiple marked homework's on Educake. |

Updated Nov 2022 – ADE

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