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| **Year 9 Curriculum Map : Physics** | | | |
|  | **Autumn** | **Spring** | **Summer** |
| **Assessment Objectives** | **AO1** - Demonstrate knowledge and understanding of: scientific ideas; scientific techniques and procedures (40%)  **AO2** - Apply knowledge and understanding of: scientific ideas; scientific enquiry, techniques and procedures. (40%)  **AO3** - Analyse information and ideas to: interpret and evaluate; make judgements and draw conclusions; develop and improve experimental procedures. (20%) | | |
| **Unit Length** | **Topic:** P7 Forces 2 – 14 lessons. | **Topic:** P8 Waves 2 – 12 lessons. | **Topic:** P9 Particles 1 – 11 lessons. |
| **Key Learning Outcomes** | 1. How do objects of different weights float? 2. How does pressure change in space and on different planets? 3. In what way are force and distance related to energy? 4. How do levers and seesaws work? 5. What are elastic objects? 6. Progress assessment 7. Reteach and DIRT 8. How does the force on spring affect its extension? 9. How is speed shown on a graph? 10. What are newton’s laws? 11. What affects the stopping distance of a car? 12. What are the safety features of cars? 13. End of Unit assessment. 14. Reteach and DIRT | 1. What is the electromagnetic spectrum (EMS)? 2. How does light behave when in contact with reflective surfaces? 3. How does light behave when passing through different mediums? 4. Progress assessment 5. Reteach and DIRT 6. Why is visible light made up of different colours? 7. How do cameras work? 8. Why do we have seasons? 9. Progress assessment 10. Reteach and DIRT. | 1. What are the states of matter? 2. How can we change the states of matter? 3. How does the amount of energy change when heating and changing states of matter? 4. Progress assessment 5. Reteach and DIRT 6. Energy change required practical 7. Density 8. How do we measure the density of objects? 9. What is pressure and how can it change? 10. Progress assessment 11. Reteach and DIRT |
| **Prior knowledge** | Year 7   * Forces as pushes and pulls, arising from the interaction between two objects * Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces * Non-contact forces: gravity forces acting at a distance on Earth and in space, forces between magnets and forces due to static electricity * The force of gravity changes across the universe which is made of groups, galaxies and solar systems. * Speed and the quantitative relationship between average speed, distance and time * The representation of a journey on a distance-time graph * Relative motion: trains and cars passing one another * Forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only) * Change depending on direction of force and its size.   YEAR 5  Is able to describe how some forces act upon stationary and moving objects (e.g. friction, air resistance, water resistance etc.)  Is beginning to understand how levers, pulleys and gears allow a small force to have a greater effect.  YEAR 3  Can demonstrate an understanding of how different surfaces affect how objects move across them.  Demonstrates an understanding of friction as a force acting between two objects in contact and magnetic force as a force acting at a distance.  YEAR 2  Shows an understanding in the difference between push and pull forces.  Is able to describe the direction of movement associated with push and pull forces.  Shows an understanding of the effect of gravity on objects.  Is beginning to understand friction as a force that acts to slow down a moving object. | **P4 – Waves 1 (year 8)**   * Waves on water as undulations which travel through water with transverse motion; these waves can be reflected and add or cancel – superposition. * The similarities and differences between light waves and the waves in matter * Light waves travelling through a vacuum at the speed of light which can be used to calculate a light year. * Frequencies of sound waves, measured in hertz (Hz); echoes, reflection and absorption of sound * Sound needs a medium to travel, the speed of sound in air, in water, in solids * Radiation reaches us from the sun because it can pass through the vacuum of space. It is absorbed, emitted and reflected based on the colour and surface. * Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal   Auditory range of humans and animals | **Year 7 C1 - Particles**   * The properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure * Similarities and differences, including density differences, between solids, liquids and gases * Changes of state in terms of the particle model * conservation of material and of mass, and reversibility, in melting, freezing, evaporation, sublimation, condensation * Brownian motion in gases * Diffusion in terms of the particle model * Diffusion in liquids and gases driven by differences in concentration |
| **CEIAG**  **Specific careers links** | Scientific research  Medicine  Engineering  Oceanographer | Meteorologist.  Astro naught  Seismologist. | Particle physicist  Research analyst  Metallurgist. |
| **RRSA** | Article 14: Freedom of thought, belief and religion  Article 24: Health and the Health services  Article 28: Right to education  Article 29: Goals of education  Article 27: Adequate standard of living | Article 14: Freedom of thought, belief and religion  Article 24: Health and the Health services  Article 28: Right to education  Article 29: Goals of education  Article 27: Adequate standard of living | Article 14: Freedom of thought, belief and religion  Article 28: Right to education  Article 29: Goals of education  Article 27: Adequate standard of living |
| **Cross curricular links** | Geography – Different Ocean depths.  Chemistry – States of matter.  Technology – Car, submarine and spacecraft design.  Space – Pressure on different planets and in the vacuum of space.  Biology – Effect of increased and decreased pressure on the body. | Numeracy- Maths  Seismic waves – Geography.  7 colours of religion RE | Biology – Diffusion  Physics – Particle model and gas pressure  Maths – Numeracy and graph analysis |
| **Useful websites/videos** | <https://www.cnet.com/news/what-happens-to-the-unprotected-human-body-in-space/> - Pressure in space.  <https://www.telegraph.co.uk/travel/cruises/news/inside-symphony-of-the-seas-worlds-largest-cruise-ship/> - Cruise ship  <https://sciencing.com/can-oceans-pressure-crush-you-12458.html> - Pressure in the ocean | <https://www.scientificamerican.com/article/north-poles-largest-ever-ozone-hole-finally-closes/> - Largest ever ozone hole closes (UV radiation link) | [https://www.bbc.co.uk/bitesize /guides/zc9q7ty/revision/1](https://www.bbc.co.uk/bitesize%20/guides/zc9q7ty/revision/1) Particles BBC bitesize |
| **Wider Reading** | **Reading**:  <https://spaceplace.nasa.gov/jupiter/en/> Pressure on Jupiter  <https://news.softpedia.com/news/Why-Cheetah-is-the-Fastest-Land-Animal-69322.shtml> Spine of a Cheetah    <https://www.nasaspaceflight.com/2020/05/virgin-orbit-first-orbital-launch-launcherone/> - Rocket launch  <https://www.edgarsnyder.com/car-accident/cause-of-accident/cell-phone/cell-phone-statistics.html> - Car accident | ‘  The Martian by Andy Wier.  Astrophysics for people in a hurry. Neil Degrasse Tyson | <https://www.livescience.com/58839-archimedes-principle.html> - The story of Archimedes and his irregular density theories |
| **Literacy Programme** | * Decode it NOW * Guided practice/model answers * Sentence Starters * Writing strategies | * Decode it NOW * Guided practice/model answers * Sentence Starters * Writing strategies | * Decode it NOW * Guided practice/model answers * Sentence Starters * Writing strategies |
| **Independent Learning Tasks** | Mind-map revision homework  Retrieval practice homework  Knowledge Organiser practice Questions.  Selective reading activity.  Points grid ILT. | Mind-map revision homework  Retrieval practice homework  Knowledge Organiser practice Questions.  Selective reading activity.  Points grid ILT. | Mind-map revision homework  Retrieval practice homework  Knowledge Organiser practice Questions.  Selective reading activity.  Points grid ILT. |