# Year 10 Physics Curriculum End Points and Key Vocabulary

| | Autumn Term 1 | Autumn Term 2 | Spring Term 1 | Spring Term 2 | Summer Term 1 | Summer Term 2 |
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| **Unit of Work** | Particle Model of Matter | Atomic Structure | Forces and Motion | | Waves | Magnetism and Electromagnetism |
| **Ethos links** | **STEM** – explaining observations | **STEM** – Theories and models developing over time due to technological advances. Radioactive decay and nuclear fusion/fission | **STEM –** understanding stopping distances and linking this to transport<br>**MK** – Calculating speed of journeys around the city | | **STEM** – using waves to detect or explore, how lenses are used to improve vision, uses of the EM in communication, medicine and investigation | **STEM** – making loudspeakers and microphones using magnets |
| **Knowledge** | By the end of this unit students will know and understand:<br>- What is meant by density, how to calculate it and how to find the density of regular and irregular objects<br>- The conservation of mass when applied to changes of state<br>- Internal energy and how this is changes with temperature<br>- What is meant by specific heat capacity and how it is calculate<br>- What is meant by specific latent heat and how it is calculated<br>- Particle motion in solids, liquids and gases<br>- Causes of pressure in gases and how to use the equation pV=constant (triple only)<br>- How the pressure of a gas can be increased, and how this relates to temperature and work (triple only) (HT) | By the end of this unit students will know and understand:<br>- The structure of an atom and its approximate size<br>- How to calculate the number of protons, neutrons and electrons in an atom<br>- What is meant by isotope, and how ions are formed<br>- The development of the model of the atom and what led to the changes<br>- Why some atoms are radioactive, and how this is measured<br>- The three types of nuclear radiation; alpha, beta and gamma, and their range in air, penetrative ability and ionising power<br>- How to write nuclear equations showing alpha and beta decay<br>- Half-life, and how to determine it from given information, including graphs<br>- Radioactive contamination and irradiation<br>- Hazards and uses of radioactive emissions and of background radiation (triple only) | By the end of this unit students will know and understand:<br>- The difference between scalar and vector quantities, and some examples of each<br>- Contact and non-contact forces, and some examples of each<br>- The force of weight and how it is calculated<br>- What is meant by resultant force and how to calculate it and represent it with a free body diagram<br>- What is meant by work done<br>- The equation linking force with spring constant and extension and how to use it<br>- Turning forces and how to calculate moments (triple only)<br>- What causes pressure in fluids and how it is calculated using p=F/A and p=hρg<br>- What causes atmospheric pressure<br>- Distance and displacement and use them to calculate speed and velocity<br>- The distance-time relationship and how this is shown on a graph<br>- Acceleration and how to use equations linking to it (a=Δt/v) and $v^2$-$u^2$=2as<br>- Velocity time graphs and calculations to find acceleration and distance travelled<br>- Newton's first law and how this affects motion<br>- Newton's second law and the equation F=ma<br>- Newton's third law<br>- What is meant by stopping distance and factors affecting it<br>- What momentum is and how to calculate it<br>- The conservation of momentum and the equation F=mΔv/Δt (triple only) | | By the end of this unit students will know and understand:<br>- The properties of transverse and longitudinal waves and their motion<br>- What is meant by frequency and period of a wave, and how to calculate frequency, period and speed of a wave<br>- How waves are reflected (triple only)<br>- How sound waves travel and how humans hear (triple only)<br>- How waves are used for detection and exploration, such as ultrasound waves in medicine and industrial imaging, and echolocation (triple only)<br>- The different types of seismic waves (triple only)<br>- The electromagnetic spectrum, and how electromagnetic waves travel and refract and the properties and uses of some electromagnetic waves<br>- How lenses work to focus images (triple only)<br>- How visible light travels, including the spectrum, how we see colour and how | By the end of this unit students will know and understand:<br>- Where the poles of a magnet are and how they interact with each other and other materials around<br>- What is meant by magnetic field and how to plot it<br>- What an electromagnet is, how to make one, and the factors affecting the strength<br>- Fleming's left-hand rule and the motor effect, including the use of the equation F=BIl (HT)<br>- The formation of an electric motor<br>- How loudspeakers and microphones use the motor effect (triple only)<br>- Induced potential difference, induced current and the generator effect<br>- How the generator effect is used to generate ac and dc (triple only)<br>- How microphones use the generator effect (triple only)<br>- How the effect of an alternating current in one coil in inducing a current in another is used in transformers |

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| | | - Nuclear fission and fusion (triple only) | | coloured filters work (triple only)<br>- The emission and absorption of infrared radiation and what a perfect black body is (triple only) | - How the ratio of the potential differences across the two coils depends on the ratio of the number of turns on each, including how to use the equation |
| **Key vocabulary** | Particle<br>Latent heat<br>Internal energy<br>pressure | Alpha<br>Beta<br>Gamma<br>Isotope<br>Radioactive<br>Irradiation<br>Fusion<br>Fission<br>Decay<br>Half-life | Resultant force<br>Scalar<br>Vector<br>Velocity<br>Acceleration<br>Displacement<br>Elasticity<br>Moments<br>Levers<br>Pressure<br>Momentum | Transverse<br>Longitudinal<br>Compression<br>Rarefaction<br>Amplitude<br>Frequency<br>Period<br>Wavelength<br>Seismic<br>Electromagnetic<br>Concave<br>Convex<br>Black body<br>Infrared | Magnetism<br>Electromagnet<br>Solenoid<br>Current<br>Magnetic flux density<br>The motor effect<br>The generator effect<br>Transformer |