

Year 9: Physics (separate)	Curriculum Intent: Year 9 science looks to build on the foundations from years 7 and 8 and work towards developing knowledge of similar areas as students begin to work towards their GCSE examinations: <ul style="list-style-type: none"> • Physics: Energy, Motion, Waves and Radiation. The subject and procedural knowledge demands increase in this year, and students will be exposed to more complex ideas, models and explanations. Practical Activities (PAG) will be coupled with mathematical skills to build more procedural knowledge, focusing on areas such as data analysis and interpretation of graphs. The scientific knowledge developed through this year will provide the basis for further study in these areas as students enter year 10, with the whole of the content being taught before the year 11 PPE's.					
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Key ideas and sequence of learning	Physics module 7 <ul style="list-style-type: none"> • Energy stores and transfers Physics module 1 -Matter <ul style="list-style-type: none"> • Density • Heat and temperature • Specific heat capacity • Specific latent heat Physics Module 4 Magnetism and Magnetic Fields <ul style="list-style-type: none"> • Magnets • Magnetic Fields 	<ul style="list-style-type: none"> • Physics module 3 • Electrostatics • Electric fields <ul style="list-style-type: none"> • Physics module 5- waves • Wavelength and frequency • Wave properties • Wave speed • Wavelength and frequency • Wave properties • Wave speed • Sound and properties • ultrasound • EM waves and EM spectrum • Uses of EM waves • Imaging using X rays and Infra red 	Physics module 5- waves <ul style="list-style-type: none"> • EM waves and matter • Lenses • Light and colour • Isotopes • Radioactive decay • Alpha, beta and gamma radiation • Rutherford experiment 	Physics module 5- waves <ul style="list-style-type: none"> • Nuclear equations • Half life • Radiation in and out of atoms • Isotopes • Nuclear Fission and Fusion Physics module 2- motion <ul style="list-style-type: none"> • Distance time and speed • Speed • Vectors and scalars • Acceleration 	Physics module- 2 motion and forces <ul style="list-style-type: none"> • Acceleration cont. • Distance- time graph • Velocity – time graphs • Kinetic energy and motion calculations • Forces and interactions • Newtons Laws 	<i>Revision for end of year exams</i> End of Year Exams Physics module- 2 motion and forces <ul style="list-style-type: none"> • Newtons Laws cont. • Momentum

**Key
Questions**

1. What are energy stores and how is energy transferred between them?
2. What is density and how can it be calculated?
3. How can heat transfer be calculated during heating and changing state?

1. How can objects become charged up?
2. How does speed affect energy carried
3. What are the properties of waves?
4. How do we calculate wave speed?
5. What is sound and how is it detected?
6. What is ultrasound and how can it be calculated?
7. What can we use x-rays and IR for?
8. What is the EM spectrum and how does it affect our lives?

1. How can EM waves interact with matter?
2. What are lenses and how do they work?
3. How do we perceive colour?
4. What are isotopes?
5. What is ionising radiation and how do we measure it?
6. What is the Rutherford experiment?

1. How can we balance nuclear equations?
2. How can we determine the half-life of a radioisotope?
3. How do objects absorb and give out light?
4. How do fission and fusion release energy?
5. How do we calculate and measure speed and acceleration?

1. How can we interpret distance-time and velocity-time graphs
2. How can we analyse the motion of an object?
3. How can we show how forces interact with an object?
4. What are newtons 1st and 3rd laws?

1. What is Newton's second law?
2. What is momentum and how can it be calculated?

<p>Vocabulary</p>	<ul style="list-style-type: none"> • Energy store • Energy transfer • Normal reaction force • Density 	<ul style="list-style-type: none"> • Friction • charge • field • Attraction • Repulsion • Transverse • longitudinal • Wavelength • Frequency • Ripple tank • Compression • Rarefaction • Lambda • Electromagnetic • Radio • Microwave • Infrared • Visible • Ultraviolet • X-Ray • Gamma 	<ul style="list-style-type: none"> • Lens • Converging • Diverging • Convex • Concave • Focal point • Principal axis • Real image • Virtual image • Magnified • Diminished • Upright • Inverted • Alpha • Beta • Unstable • Stable • Isotope • Gold leaf 	<ul style="list-style-type: none"> • Half life • Ionisation • Absorb • Emit • excitation • de-excited • Velocity • Acceleration • Deceleration • Distance • Displacement • Time • m/s • km/s • Equation • m/s^2 	<ul style="list-style-type: none"> • axes • dependent variable • independent variable • gradient • area under line • initial velocity • final velocity • weight • free body diagram • uniform motion • unbalanced 	<ul style="list-style-type: none"> • mass • momentum • conservation of momentum <p>Disciplinary knowledge</p> <ul style="list-style-type: none"> • law • Precision • Accuracy • Variables • Valid • Reproducible • Repeatable
<p>Practical Skills</p>	<ul style="list-style-type: none"> • Density determination • Specific heat capacity • Specific latent heat 	<ul style="list-style-type: none"> • Charging rods • Van der Graaff • Observing waves to measure frequency and wavelength 	<ul style="list-style-type: none"> • Determining the focal length of a lens • Processing radiation data • radiation demonstration 	<ul style="list-style-type: none"> • skittles experiment • modelling decay • Measuring speed • Calculating acceleration 	<ul style="list-style-type: none"> • Measuring speed • Measuring changes in velocity • Effects of unbalanced forces 	<ul style="list-style-type: none"> • Verifying Newton's second law • Measuring momentum