



Intent
To consolidate the material covered throughout Year 12 AS Level Physics and build upon this into the concepts covered in A2 Physics. To instil a passion for the subject within students and an interest in further developing their knowledge and understanding of Physics.

Year 13 Physics

Term 1 September to December
Catch up on any content not taught in Year 12 of further mechanics, thermal physics and astrophysics. Begin teaching nuclear physics and fields.

Term 2 January to Easter
Finish teaching nuclear physics and fields.

Begin revision

Term 3 April to June
Revision

Knowledge
(facts, information, concepts and key terminology)

Rotational quantities and their units
Laws of thermodynamics
Knowledge of telescopes, classification of stars and cosmology
Describe how the model of the atom has developed over time.
Describe and understand what a field is

Describe Newtons law of gravitation, gravitational potential and gravitational potential energy.
Describe Coulombs law, electric potential and electric potential energy.
Describe the laws of electromagnetic induction.
Describe the function of a transformer
Describe different forms of radiation
Describe how energy can be generated using fission/fusion

Review all topics.
Retrieval practice each lesson and regular use of the exam specification to encourage students to review their knowledge.

Understanding
(ability to connect and synthesise knowledge within a context)

Applying rotational mechanics to questions
Applying laws of thermodynamics to questions
Apply lens equations to work out characteristics of distant objects
Explain the life cycle of stars and what properties of stars tell us about their composition
Explain how the universe formed
Explain how the model of the atom has been developed over time

Apply fields equations to questions
Derive $T^2 \propto r^3$
Explain how a capacitor works and apply capacitance equations to questions
Explain the random nature of radioactive decay and apply the appropriate equations.
Explain why some nuclei are unstable and calculate nuclear radius
Explain mass – energy equivalency

Practice all types of exam style questions.
Lots of opportunities for low stakes testing and encouraging students to critically analyse whether they fully understand concepts or they have simply memorised the information.

Skills
(successful application of knowledge and understanding to a specific task)

Finding the time period of simple harmonic systems
Using specialist equipment to prove gas laws

Use a GM tube to investigate the inverse square law
Analyse exponential graphs showing radioactive decay and capacitance
Investigate capacitors charging and discharging with analysis including log-linear plotting

Master answering all types of exam question.

Formal Assessments
(those done by all/vast majority of the cohort)

End of unit tests available for all units. Formal assessments carried out following the assessment calendar.

- **By the end of the year students on course for at least a grade C will... be able to describe and apply key ideas relating to rotational mechanics, thermodynamics, astrophysics, nuclear physics and fields (including gravitational, electric and magnetic). They will be able to Recall and apply key quantities and units, re-arranging where necessary. They will also develop and refine practical designs and procedures, and apply these to different situations in an exam context.**