The English Martyrs Catholic School and Sixth Form College

Physics Year 12 - A	Module 1	Module 2	Module 3
Topic Theme and Intent	Students learn about **Particles and Radiation.** This topic is an introduction to A-Level Physics, covering basic maths skills and practical skills. The particle physics delves deep into an atom and the **subatomic** particles within. This topic introduces a world beyond what was studied at GCSE, introducing new forces and new subatomic particles.	Students learn about **mechanics.** The module looks at how things move, and what happens when objects are stationary, in equilibrium, before linking this to Newton's Laws and energy. This will allow students to understand and quantify the effect of forces.	Students will learn more about **mechanics.** This module builds on the work in module 2. Students will consider motion in a circle and apply this to various physical systems. This will allow students to understand the importance of circular motion when designing moving objects.
Knowledge	• The atom and the nuclei • Particles, antiparticles and photons • Quarks and antiquarks • The photoelectric effect • Collisions of electrons with atoms • Energy levels and photon emission • Wave-particle duality	• Scalars and vectors • Moments • Motion and Projectile motion • Newton's laws of motion • Momentum • Work, energy and power • Conservation of energy	• Circular motion • Centripetal force and acceleration • Simple harmonic motion • Mass-spring system • Simple Pendulum • Free and forced vibrations
Skills	Students will use experimental data to draw conclusions about physical phenomena.	Students will carry out experiments to determine a value for 'g' by freefall method.	Students will investigate simple harmonic motion in spring systems and with a simple pendulum.
Literacy Links	**Reading –** Students will read about advances in our understanding of the particle model. **Writing –** Students start to communicate scientific ideas and concepts through writing. **Oracy –** Students start to use scientific vocabulary in discussion and question and answering.	**Reading –** Students will read about the effect of forces. **Writing –** Students practise communicating scientific ideas and concepts through writing. **Oracy –** Students practise the use scientific vocabulary in discussion and question and answering.	**Reading –** Students will read about physical situations where circular motion is important. **Writing –** Students will communicate scientific ideas and concepts through writing. **Oracy –** Students use scientific vocabulary in discussion and question and answering.
Essential Vocabulary	photon, antiparticle, pion, kaon, hadron, lepton, meson, baryon, quark, antiquark, weak nuclear force, photoelectric	forces, moment, couple, displacement, velocity, acceleration, Newton's laws, uniform, kinetic, gravitational, work done	Circular motion, Centripetal, Simple Harmonic motion, Pendulum, Free vibrations, forced vibrations.

Disciplinary Reading	Reading for Pleasure		
CGP Books – A level Physics, & Oxford Revise A level Physics.	T. Pratchett and N. Gaiman - Good Omens	D. Adams - The Hitchhiker's Guide to the Galaxy	S. Clarke - Piranesi