The Fisher Way: Curriculum

The Fisher Way aims to educate and inspire with joy, faith and love because we are an inclusive Catholic community.

Successful and resilient learners who aspire to and achieve excellence

Confident individuals who can explore and communicate effectively

Responsible citizens who are active, loving and wise in all their endeavours

Subject	Physics
Year Group	Year 12
Intent	**Successful and resilient learners:** who are able to use their physics knowledge and their scientific skills to investigate the world around them and solve problems associated with the workings of the physical world. **Confident individuals:** who can apply their knowledge of forces, energy, waves and the particle model of matter to understand, interpret, challenge and articulate what happens in the wider world. **Responsible citizens:** who are able to distinguish between what we CAN do as scientists and what is morally right for us to do as human beings. Pupils should be able to suggest solutions to some of the world's problems such as global

	warming and pollution and should be able to evaluate and debate the issues around current global issues such as Power Generation and Energy Use. They should be able to use the skills of working scientifically and their understanding to help them make informed decisions in later life to benefit both themselves and the wider world.
Narrative	The work in this year builds on the work done in prior years as part of the GCSE Physics course. The mechanics module builds on the work done as part of the P9 module (Forces and Elasticity) in year 10. The work in the waves module builds on the P5 (waves) module studied in year 9. The particles and radiation module builds on the work done in the year 11 module P14 (Radioactivity) as well as the work undertaken in the chemistry module P5a in year 9. All learners will be able to solve circuit problems involving parallel and series circuits. They will know the characteristics of common electrical components, the relationships between potential difference and current of these components and how these can be applied in products. The calculation of circuit quantities is key information required prior to undertaking the Capacitors and Magnetic Fields modules in year 13. Learners will be able to describe sub-atomic particles and antiparticles. They will know that particle properties are conserved in most particle interactions and use this knowledge to evaluate whether reactions can occur. Learners will expand their earlier learning on waves and the interactions of waves with boundaries between materials. All learners will be able to both describe and calculate the refractive index of a material and its effect on a wave. Learners will know what is meant by the term resonance and describe the factors affecting the resonant frequency. They will be able to articulate the use of optical fibres and explain how signal degradation occurs in optical fibre communications. Learners will apply their knowledge of waves to the use of optics in medicine. They will understand the stress and strain characteristics of materials and be able to calculate the energy stored in an elastic material. They will be able to apply the knowledge of Newton's Laws of Motion to real world situations. The learners will understand more complex patterns of motion and be able to calculate the speed of these objects. This is key information for the year 13 module on Further Mechanics. All learners will be able to extract information from a graph and use this information to solve problems. Learners will able to relate formulae and apply multiple formulae to solve complex problems. They will be able to evaluate the results of an investigation and challenge the conclusions that have been made. Learners will be able to construct a clear and supported conclusion to investigations that they have undertaken including the validity of their observations.

Half term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2

Knowledge (topics studied)	Practical Skills, particles, quantum mechanics and electricity	Materials, particles and quantum mechanics and electricity	Waves, particles, quantum mechanics and mechanics	Waves, particles, quantum mechanics and mechanics	Power, optics, mechanics	Power, optics, circular motion
Key skills	Powers of 10, calculations. Vectors, units, practical skills	Powers of 10, calculations. Vectors, units, practical skills	Use of calculations in Newtonian mechanic. graphical skills and practical skills	Use of calculations in Newtonian mechanic. graphical skills and practical skills	Calculations and application. Careful experimental skills in optics experiments.	Powers of 10, calculations. Vectors, units, practical skills
Cultural capital and careers	Development of the story of the Standard Model of Matter, though the Solvay Conference and work at CERN. Physicists	Development of the story of the Standard Model of Matter, though the Solvay Conference and work at CERN. Quantum Physicist, Electrical Engineer, Civil Engineer	Certainty of Newtonian mechanics, uncertainty of quantum mechanics. Communication science, medical uses. Radiographer.	Certainty of Newtonian mechanics, uncertainty of quantum mechanics. Communication science, medical uses. Radiographer, Radiologist	Use of lenses and power of machines Opticians, Ophthalmologist. Mechanical Engineer	Use of lenses and power of machines. Opticians, Ophthalmologist. Mechanical Engineer
Assessment	End of topic assessment.	End of topic assessment.	End of topic assessment.	End of topic assessment.	End of topic assessment.	End of topic assessment. Year 12 Exam.