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 13
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 year 13 builds on the work in year 12 and work done in the GCSE Physics course in years 9,10 and 11. The SHM, force & momentum module builds on the work in the mechanics module studied in year 12. The module also builds on the work in the P14 (Momentum) module in year 11 and the P9 (Forces) module in year 10. The radioactivity module builds on the Particle & Radiation module in year 12 and P15 (Radioactivity) module studied in year 11. The thermal physics module builds on the work done in the P10 (Changing Energy) & P11 (Thermal Physics & Density) modules in year 10. All learners will be able to describe centripetal forces, angular motion and harmonic motion. Learners will be able to apply their knowledge to the example of a simple harmonic oscillator. They will be able to calculate the displacement, speed and velocity for simple harmonic motion. Learners will be able to articulate the three gas laws and use the ideal gas equation to solve gas pressure problems. Learners will be able to describe the kinetic model of gases and calculate the energy of the gas particles. Learners will understand how our understanding and the models based on that understanding have evolved over time. Learners will expand on their knowledge of gravitational force and be able to perform calculations using Newton's Law of Gravitation. All learners will be able to apply their knowledge to practical examples of the orbits of satellites, calculating the orbital speed and period of these. Learners will be able to compare electrical and gravitation fields. Learners will be able to describe capacitors including charging and discharging times. They will be able to calculate the capacitance by using multiple equations to reach the solution depending on the information given. All learners will have an understanding of the processes of radioactive decay, nuclear fission and nuclear fusion. Learners will be able describe the process of generating energy by nuclear fission including the main components of a nuclear fission reactor. Learners will have an understanding of the main safety considerations in the use of nuclear fission as well as the risks. They will be able to evaluate the overall case for or against nuclear fission in the context of climate change. Learners will use the equations for decay and binding energy in solving problems. All learners will be able to evaluate observations and data. They will be able to use graphs to represent and evaluate data. Learners will be able to use their evaluations to write conclusions to investigations undertaken by them. Learners will be able to apply multiple formulae from different topic areas to solve more complex problems. They will be able to evaluate the risks and benefits of scientific discoveries and make recommendations on the best solutions given the wider context (for example climate change and power generation).

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

Knowledge (topics studied)	SHM, force and momentum, Capacitors, Fields,	SHM, force and momentum, Capacitors, Fields,	Radioactivity, thermal physics, EM induction	Turning points, electrons, relativity	Turning points, wave particle duality	
Key skills	Calculations, using natural logs. Problem solving, graphical skills. Practical skills	Calculations, using natural logs. Problem solving graphical skills practical skills	Calculations, using natural logs. Problem solving graphical skills practical skills	Calculations, using natural logs. Problem solving graphical skills practical skills	Calculations, using natural logs. Problem solving graphical skills practical skills	
Cultural capital and careers	Use of capacitors in circuits. The Millenium Bridge issue. Electrical Engineer, Electronic Engineer,	Use of capacitors in circuits. The Millenium Bridge issue. Theoretical Physicist	Development of the idea of Bohr's model of the atom, domestic applications of simple harmonic motion Radiographer, Radiologist, Energy Analyst	Discovery of the electron. Environmental Consultant, Theoretical Physicist	Theory of wave particle duality. Nanotechnologist, Atomic Researcher	
Assessment	End of Topic Test	End of Topic Test	End of Topic Test	End of Topic Test	End of Topic Test	