

Physics Curriculum Overview – Year 11

Sequencing of topics	What knowledge will students develop? (Including key terminology)	What skills will students develop? (Including literacy & numeracy)	Assessment opportunities	Homework opportunities	Personal development (Ursuline Values, Catholic Social Teaching, Cultural Capital, Cross-curricular, Careers)	Curriculum links
Autumn Half Term 1						
Atomic structure	<ul style="list-style-type: none"> ○ The structure of an atom ○ Mass number, atomic number and isotopes ○ The development of the model of the atom ○ Radioactive decay and nuclear radiation ○ Nuclear equations ○ Half-lives and the random nature of radioactive decay ○ Radioactive contamination ○ Background radiation ○ Different half-lives of radioactive isotopes ○ Uses of nuclear radiation ○ Nuclear fission ○ Nuclear fusion 	<ul style="list-style-type: none"> ○ Use a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts ○ Evaluate risks both in practical science and the wider societal context, including perception of risk in relation to data and consequences ○ Plan experiments or devise procedures to make observations, produce or characterise a substance, test hypotheses, check data or explore phenomena ○ Apply a knowledge of a range of techniques, instruments, apparatus, and materials to select those appropriate to the experiment ○ Carry out experiments appropriately having due regard for the correct manipulation of 	<ul style="list-style-type: none"> ○ Targeted questioning ○ Mid-topic assessment ○ End of topic assessment 	<ul style="list-style-type: none"> ○ Worksheets ○ Flipped learning activities ○ Past exam questions ○ Research ○ Practical write-ups ○ Isaac Physics 	<ul style="list-style-type: none"> ○ Grateful for waves enabling us to be able to communicate ○ Discerning when analysing data presented to us and joyful at the possibilities of science ○ Leading others in pursuit of justice when planning and carrying out a practical ○ Service and sacrifice when we recognise the scientific work that has been done before us ○ Loving and compassionate when we consider how scientific advancements can 	<ul style="list-style-type: none"> KS1/2 <ul style="list-style-type: none"> ○ Matter KS3 <ul style="list-style-type: none"> ○ Atomic structure KS4 KS5 <ul style="list-style-type: none"> ○ Nuclear physics

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		<p>apparatus, the accuracy of measurements and health and safety considerations</p> <ul style="list-style-type: none"> ○ Make and record observations and measurements using a range of apparatus and methods ○ Evaluate methods and suggest possible improvements and further investigations ○ Presenting observations and other data using appropriate methods ○ Interpreting observations and other data (presented in verbal, diagrammatic, graphical, symbolic or numerical form), including identifying patterns and trends, making inferences and drawing conclusions ○ Presenting reasoned explanations including relating data to hypotheses ○ Being objective, evaluating data in terms of accuracy, precision, repeatability and reproducibility and identifying potential sources of random and systematic error ○ Use scientific vocabulary, terminology and definitions ○ Recognise the importance of scientific quantities and 			<p>be used to help others</p> <ul style="list-style-type: none"> ○ Dignity of God's people ○ Community and participation ○ Care for creation ○ Dignity in work ○ Peace and reconciliation ○ Solidarity ○ Personal ○ Social ○ Moral ○ Cultural ○ Art ○ Geography ○ Maths ○ 	

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		<p>understand how they are determined</p> <ul style="list-style-type: none"> ○ Use SI units (eg kg, g, mg; km, m, mm; kJ, J) and IUPAC chemical nomenclature unless inappropriate ○ Use prefixes and powers of ten for orders of magnitude (eg tera, giga, mega, kilo, centi, milli, micro and nano) ○ Interconvert units ○ Use an appropriate number of significant figures in calculation 				

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Autumn Half Term 2						
Magnetism and electromagnetism	<ul style="list-style-type: none"> ○ Poles of a magnet ○ Magnetic fields ○ Electromagnetism ○ Fleming's left-hand rule ○ Electric motors ○ Loudspeakers (physics only) ○ Induced potential ○ Uses of the generator effect ○ Microphones ○ Transformers 	<ul style="list-style-type: none"> ○ Understand how scientific methods and theories develop over time ○ Use a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts ○ Evaluate risks both in practical science and the wider societal context, including perception of risk in relation to data and consequences ○ Use scientific theories and explanations to develop hypotheses ○ Plan experiments or devise procedures to make observations, produce or characterise a substance, test hypotheses, check data or explore phenomena ○ Apply a knowledge of a range of techniques, instruments, apparatus, and materials to select 	<ul style="list-style-type: none"> ○ Targeted questioning ○ Mid-topic assessment ○ End of topic assessment 	<ul style="list-style-type: none"> ○ Worksheets ○ Flipped learning activities ○ Past exam questions ○ Research ○ Practical write-ups ○ Isaac Physics 	<ul style="list-style-type: none"> ○ United in harmony when planning and carrying out a practical ○ Discerning when analysing data and joyful at the possibilities of science ○ Leading others in pursuit of justice when planning and carrying out a practical ○ Service and sacrifice when we recognise the scientific work that has been done before us ○ Care for creation ○ Community and participation ○ Dignity of God's people ○ Solidarity ○ Personal ○ Social 	<ul style="list-style-type: none"> KS1/2 ○ Magnets KS3 ○ Electromagnetism KS4 KS5 ○ Forces ○ Fields ○ Turning points in physics

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		<p>those appropriate to the experiment</p> <ul style="list-style-type: none"> ○ Carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations ○ Make and record observations and measurements using a range of apparatus and methods ○ Evaluate methods and suggest possible improvements and further investigations ○ Presenting observations and other data using appropriate methods ○ Interpreting observations and other data (presented in verbal, diagrammatic, graphical, symbolic or numerical form), including identifying patterns and trends, making inferences and drawing conclusions ○ Presenting reasoned explanations including relating data to hypotheses ○ Being objective, evaluating data in terms of accuracy, precision, repeatability and reproducibility and identifying potential sources of random and systematic error 			<ul style="list-style-type: none"> ○ Physical ○ Moral ○ Cultural ○ Geography ○ PE ○ Food Tech ○ Maths 	

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		<ul style="list-style-type: none"> ○ Use scientific vocabulary, terminology and definitions ○ Recognise the importance of scientific quantities and understand how they are determined ○ Use SI units (eg kg, g, mg; km, m, mm; kJ, J) and IUPAC chemical nomenclature unless inappropriate ○ Use prefixes and powers of ten for orders of magnitude (eg tera, giga, mega, kilo, centi, milli, micro and nano) ○ Interconvert units ○ Use an appropriate number of significant figures in calculation 				

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Spring Half Term 1						
Magnetism and electromagnetism	<ul style="list-style-type: none"> ○ Loudspeakers (physics only) ○ Induced potential ○ Uses of the generator effect ○ Microphones ○ Transformers 	<ul style="list-style-type: none"> ○ Use a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts ○ Evaluate risks both in practical science and the wider societal context, including perception of risk in relation to data and consequences ○ Plan experiments or devise procedures to make observations, produce or characterise a substance, test hypotheses, check data or explore phenomena ○ Apply a knowledge of a range of techniques, instruments, apparatus, and materials to select those appropriate to the experiment ○ Carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of 	<ul style="list-style-type: none"> ○ Targeted questioning ○ Mid-topic assessment ○ End of topic assessment 	<ul style="list-style-type: none"> ○ Worksheets ○ Flipped learning activities ○ Past exam questions ○ Research ○ Practical write-ups ○ Isaac Physics 	<ul style="list-style-type: none"> ○ Grateful for waves enabling us to be able to communicate ○ Discerning when analysing data presented to us and joyful at the possibilities of science ○ Leading others in pursuit of justice when planning and carrying out a practical ○ Service and sacrifice when we recognise the scientific work that has been done before us ○ Loving and compassionate when we consider how scientific advancements can be used to help others 	<p>KS1/2</p> <ul style="list-style-type: none"> ○ Light ○ Sound <p>KS3</p> <ul style="list-style-type: none"> ○ Observed waves ○ Sound waves ○ Energy and waves ○ Light waves <p>KS4</p> <ul style="list-style-type: none"> ○ Y10 Waves <p>KS5</p> <ul style="list-style-type: none"> ○ Waves

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		<p>measurements and health and safety considerations</p> <ul style="list-style-type: none"> ○ Make and record observations and measurements using a range of apparatus and methods ○ Evaluate methods and suggest possible improvements and further investigations ○ Presenting observations and other data using appropriate methods ○ Interpreting observations and other data (presented in verbal, diagrammatic, graphical, symbolic or numerical form), including identifying patterns and trends, making inferences and drawing conclusions ○ Presenting reasoned explanations including relating data to hypotheses ○ Being objective, evaluating data in terms of accuracy, precision, repeatability and reproducibility and identifying potential sources of random and systematic error ○ Use scientific vocabulary, terminology and definitions ○ Recognise the importance of scientific quantities and understand how they are determined 			<ul style="list-style-type: none"> ○ Dignity of God's people ○ Community and participation ○ Care for creation ○ Dignity in work ○ Peace and reconciliation ○ Solidarity ○ Personal ○ Social ○ Moral ○ Cultural ○ Art ○ Geography ○ Maths 	

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Spring Half Term 2						
Space physics	<ul style="list-style-type: none"> ○ Our solar system ○ The life cycle of a star ○ Orbital motion, natural and artificial satellites ○ Red-shift 	<ul style="list-style-type: none"> ○ Use a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts ○ Evaluate risks both in practical science and the wider societal context, including perception of risk in relation to data and consequences ○ Plan experiments or devise procedures to make observations, produce or characterise a substance, test hypotheses, check data or explore phenomena ○ Apply a knowledge of a range of techniques, instruments, apparatus, and materials to select those appropriate to the experiment ○ Carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of 	<ul style="list-style-type: none"> ○ Targeted questioning ○ Mid-topic assessment ○ End of topic assessment 	<ul style="list-style-type: none"> ○ Worksheets ○ Flipped learning activities ○ Past exam questions ○ Research ○ Practical write-ups ○ Isaac Physics 	<ul style="list-style-type: none"> ○ Grateful for waves enabling us to be able to communicate ○ Discerning when analysing data presented to us and joyful at the possibilities of science ○ Leading others in pursuit of justice when planning and carrying out a practical ○ Service and sacrifice when we recognise the scientific work that has been done before us ○ Loving and compassionate when we consider how scientific advancements can be used to help others 	KS1/2 <ul style="list-style-type: none"> ○ Earth & space KS3 <ul style="list-style-type: none"> ○ Earth & space KS4 KS5 <ul style="list-style-type: none"> ○ Fields

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		<p>measurements and health and safety considerations</p> <ul style="list-style-type: none"> ○ Make and record observations and measurements using a range of apparatus and methods ○ Evaluate methods and suggest possible improvements and further investigations ○ Presenting observations and other data using appropriate methods ○ Interpreting observations and other data (presented in verbal, diagrammatic, graphical, symbolic or numerical form), including identifying patterns and trends, making inferences and drawing conclusions ○ Presenting reasoned explanations including relating data to hypotheses ○ Being objective, evaluating data in terms of accuracy, precision, repeatability and reproducibility and identifying potential sources of random and systematic error ○ Use scientific vocabulary, terminology and definitions ○ Recognise the importance of scientific quantities and understand how they are determined 			<ul style="list-style-type: none"> ○ Dignity of God's people ○ Community and participation ○ Care for creation ○ Dignity in work ○ Peace and reconciliation ○ Solidarity ○ Personal ○ Social ○ Moral ○ Cultural ○ Art ○ Geography ○ Maths 	

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Summer Term						
Revision		<ul style="list-style-type: none"> ○ Use a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts ○ Evaluate risks both in practical science and the wider societal context, including perception of risk in relation to data and consequences ○ Plan experiments or devise procedures to make observations, produce or characterise a substance, test hypotheses, check data or explore phenomena ○ Apply a knowledge of a range of techniques, instruments, apparatus, and materials to select those appropriate to the experiment ○ Carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of 	<ul style="list-style-type: none"> ○ Targeted questioning ○ Past papers 	<ul style="list-style-type: none"> ○ Worksheets ○ Flipped learning activities ○ Past exam questions ○ Research ○ Practical write-ups ○ Isaac Physics 	<ul style="list-style-type: none"> ○ Grateful for waves enabling us to be able to communicate ○ Discerning when analysing data presented to us and joyful at the possibilities of science ○ Leading others in pursuit of justice when planning and carrying out a practical ○ Service and sacrifice when we recognise the scientific work that has been done before us ○ Loving and compassionate when we consider how scientific advancements can be used to help others 	

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