

Science Curriculum Overview – Year 7

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
<b>Autumn Term 1</b>						
Lab safety and scientific methodology	<ul style="list-style-type: none"> <li>○ Activity symbols</li> <li>○ Hazards</li> <li>○ Asking scientific questions</li> <li>○ Planning investigations</li> <li>○ Collecting, recording, and presenting data</li> <li>○ Analysing patterns in data</li> <li>○ Evaluating data and methods</li> </ul>	<ul style="list-style-type: none"> <li>○ Practical skill</li> <li>○ Numeracy skills</li> <li>○ Lab safety</li> <li>○ Literacy</li> <li>○ Scientific enquiry</li> </ul>	<ul style="list-style-type: none"> <li>○ AFL in lessons and home work</li> <li>○ Mid-topic assessment</li> <li>○ QWC</li> <li>○ End of topic - summative assessment</li> </ul>	<ul style="list-style-type: none"> <li>○ Worksheets</li> <li>○ Flipped learning activities</li> <li>○ Past exam questions</li> <li>○ Research</li> <li>○ Practical write-ups</li> <li>○ SAM learning</li> <li>○ Satchel Quizzes</li> <li>○ Badger levelled tasks</li> </ul>	<ul style="list-style-type: none"> <li>○ <b>United in harmony</b> in the consideration of team work</li> <li>○ <b>Maths</b></li> <li>○ <b>Lab etiquettes</b></li> <li>○ <b>Scientist</b></li> <li>○ <b>Lab technician</b></li> <li>○ <b>Research scientist</b></li> <li>○ <b>Teacher</b></li> <li>○ <b>Medicine</b></li> <li>○ <b>Clinical research</b></li> </ul>	<ul style="list-style-type: none"> <li>○ KS1/2 Planning scientific enquires</li> <li>○ Control variables</li> <li>○ Taking measurements</li> <li>○ Recording and presenting data</li> <li>○ Making predictions from results</li> <li>○ Using scientific ideas in arguments</li> </ul>

<p>Organisms</p>	<p><b>Movement</b></p> <ul style="list-style-type: none"> <li>○ Levels of organisation</li> <li>○ The skeleton</li> <li>○ Movement : joints</li> <li>○ Movement : Muscles</li> </ul> <p><b>Cells</b></p> <ul style="list-style-type: none"> <li>○ Observing cells</li> <li>○ Plants and animal cells</li> <li>○ Specialised cells</li> <li>○ Movement of substances</li> <li>○ Uni-cellular organisms</li> </ul>			<ul style="list-style-type: none"> <li>○ Worksheets</li> <li>○ Flipped learning activities</li> <li>○ Past exam questions</li> <li>○ Research</li> <li>○ Practical write-ups</li> <li>○ SAM learning</li> <li>○ Satchel Quizzes</li> <li>○ Badger levelled tasks</li> </ul>	<ul style="list-style-type: none"> <li>○ <b>Grateful</b> in awe of the creation of the human body.</li> <li>○ <b>United in harmony</b> in the consideration of the effect of illness and the effect on others</li> <li>○ <b>Generous</b> in the understanding and appreciation of the work that scientists and medical professionals do.</li> <li>○ Care for God's creation</li> <li>○ PE</li> <li>○ History</li> <li>○ Maths</li> <li>○ Museums visits</li> <li>○ Meeting professionals</li> <li>○ Biologist</li> <li>○ Biomedical</li> <li>○ Research Scientist</li> <li>○ Teacher</li> <li>○ Botanist</li> <li>○ Scientist</li> </ul>	<p>KS1/2</p> <ul style="list-style-type: none"> <li>○ Healthy human development</li> <li>○ Digestion</li> <li>○ Nutrient transport in animals</li> </ul> <p>KS4</p> <ul style="list-style-type: none"> <li>○ Cells, tissues and organs Ultrastructure of cells and muscular structure</li> <li>○ KS5 Biology topic - Run for your life KS5 Biology Topic 2</li> </ul>
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**Autumn Term 2**

<p>Forces</p>	<ul style="list-style-type: none"> <li>○ Introduction to forces</li> <li>○ Balanced and unbalanced forces</li> <li>○ Speed</li> <li>○ Distance-time graphs</li> <li>○ Gravity</li> </ul>	<p>Use the formula speed = distance / time</p> <p>Draw distance-time graphs</p> <p>Use the formula weight (N) = mass (kg) x gravitational field strength (N/kg).</p> <p>Converting units and using prefixes.</p> <p>Expressing numbers in standard form.</p>	<p>AFL in lessons. Homework</p> <p>Mid-topic Assessment QWC Task</p> <p>End-of-topic summative assessment</p>	<ul style="list-style-type: none"> <li>○ Worksheets</li> <li>○ Flipped learning activities</li> <li>○ Past exam questions</li> <li>○ Research</li> <li>○ Practical write-ups</li> <li>○ SAM learning</li> <li>○ Satchel Quizzes</li> <li>○ Badger levelled tasks</li> </ul>	<ul style="list-style-type: none"> <li>○ <b>Awe and wonder</b> as we start to look at the vastness of the Universe and the objects within it</li> <li>○ <b>Grateful</b> for the positive impact that Newton's laws on space travel and everyday machines.</li> <li>○ Maths</li> <li>○ PE</li> <li>○ Museum visits. Meeting professionals</li> <li>○ STEM competitions</li> <li>○ Lectures and talks</li> <li>○ Physicist</li> <li>○ Engineering</li> <li>○ Architecture</li> <li>○ Aviation industry</li> <li>○ Transport industry</li> <li>○ Design</li> <li>○ Interior designer</li> </ul>	<p>KS1/2</p> <ul style="list-style-type: none"> <li>○ Contact and non-contact forces</li> <li>○ Gravity</li> <li>○ Friction and air/water resistance</li> <li>○ Force multiplier</li> <li>○ KS4 velocity, acceleration and momentum</li> <li>○ KS5 A-level Physics Mechanics and further mechanics</li> </ul>
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Electromagnets	<p><b>Potential difference and resistance</b></p> <ul style="list-style-type: none"> <li>○ Potential difference</li> <li>○ Resistance</li> <li>○ Series and parallel circuits</li> <li>○</li> </ul> <p><b>Current</b></p> <ul style="list-style-type: none"> <li>○ Current</li> <li>○ Charging up</li> </ul>	Use the formula resistance ( $\Omega$ ) = potential difference (V) $\div$ current (A).	<p>AFL in lessons. Homework</p> <p>Mid-topic Assessment QWC Task</p> <p>End-of-topic summative assessment</p>	<ul style="list-style-type: none"> <li>○ Worksheets</li> <li>○ Flipped learning activities</li> <li>○ Past exam questions</li> <li>○ Research</li> <li>○ Practical write-ups</li> <li>○ SAM learning</li> <li>○ Satchel Quizzes</li> <li>○ Badger levelled tasks</li> </ul>	<ul style="list-style-type: none"> <li>○ <b>Grateful</b> for the positive impact that electricity and magnetism has had to our lives.</li> <li>○ <b>Awe and wonder</b> as we start to look how motors and generators work</li> <li>○ Maths</li> <li>○ Design and technology</li> <li>○ Museum visits.</li> <li>○ Meeting professionals</li> <li>○ STEM competitions</li> <li>○ Lectures and talks</li> <li>○ Physicist</li> <li>○ Electrician</li> <li>○ Engineering</li> <li>○ Design</li> <li>○ Electronics</li> <li>○ Computer science</li> </ul>	<p>KS1/2</p> <ul style="list-style-type: none"> <li>○ Electricity and magnetism</li> <li>○ Electrical circuits</li> <li>○ Conductors and insulators</li> <li>○ Voltage</li> <li>○ KS4</li> <li>○ Magnetism and electromagnetism</li> <li>○ Topic</li> <li>○ KS5 A Level-Physics</li> <li>○ Electricity</li> <li>○ Magnetic fields</li> </ul>
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**Spring Term 1**

<p>Matter</p>	<p><b>Particle model</b></p> <ul style="list-style-type: none"> <li>○ The particle model</li> <li>○ States of matter</li> <li>○ Melting and freezing</li> <li>○ Boiling</li> <li>○ More change of state</li> <li>○ Diffusion</li> <li>○ Gas pressure</li> <li>○ Inside particles</li> </ul> <p><b>Separating mixtures</b></p> <ul style="list-style-type: none"> <li>○ Pure substance and mixtures</li> <li>○ Solutions</li> <li>○ Solubility</li> <li>○ Filtration</li> <li>○ Evaporation and distillation</li> <li>○ chromatography</li> </ul>	<p>Calculating densities (mass ÷ volume)</p> <p>Changes in mass of dissolving. Mass of solution = mass of solute + mass of solvent. Addition &amp; subtraction.</p>	<p>AFL in lessons. Homework</p> <p>Mid-topic Assessment</p> <p>QWC Task</p> <p>End-of-topic summative assessment</p>	<ul style="list-style-type: none"> <li>○ Worksheets</li> <li>○ Flipped learning activities</li> <li>○ Past exam questions</li> <li>○ Research</li> <li>○ Practical write-ups</li> <li>○ SAM learning</li> <li>○ Satchel Quizzes</li> <li>○ Badger levelled tasks</li> </ul>	<ul style="list-style-type: none"> <li>○ <b>United in harmony</b> when conducting Science practicals.</li> <li>○ Awe and wonder and gratefulness at how world around us work on an microscopic level.</li> <li>○ Maths</li> <li>○ Working in a science lab</li> <li>○ Practical techniques</li> <li>○ Chemist</li> <li>○ Lab technician</li> <li>○ Engineering</li> <li>○ Teacher</li> </ul>	<p>KS1</p> <ul style="list-style-type: none"> <li>○ solids, liquids and gases</li> <li>○ Changes of state</li> <li>○ Classifying material</li> <li>○ Water cycle</li> <li>○ Dissolving</li> <li>○ Reversible reactions</li> </ul> <p>KS4</p> <ul style="list-style-type: none"> <li>○ Physics- Particle model of matter</li> <li>○ Chemistry – States of matter</li> </ul> <p>KS5</p> <ul style="list-style-type: none"> <li>○ A-level Physics – Thermal Physics</li> <li>○ A-level Chemistry – practical skills</li> <li>○ Bonding</li> </ul>
<p>Ecosystem</p>	<p><b>Interdependence</b></p> <ul style="list-style-type: none"> <li>○ Food chains to food chains and webs</li> <li>○ Disruption to food chains and webs</li> <li>○ Ecosystems</li> <li>○ Competition</li> </ul> <p><b>Plant reproduction</b></p>	<p>Predator –prey cycle graphs.</p> <p>Data handling</p>	<p>AFL in lessons. Homework</p> <p>Mid-topic Assessment</p> <p>QWC Task</p>	<ul style="list-style-type: none"> <li>○ Worksheets</li> <li>○ Flipped learning activities</li> <li>○ Past exam questions</li> <li>○ Research</li> <li>○ Practical write-ups</li> </ul>	<ul style="list-style-type: none"> <li>○ <b>Grateful in awe</b> of the creation of species and <b>United in harmony</b> when considering our impact on the ecosystem</li> </ul>	<p>KS4</p> <ul style="list-style-type: none"> <li>○ Year 9 Evolution</li> </ul> <p>KS5</p> <ul style="list-style-type: none"> <li>○ Topic 4 Biodiversity and Natural Selection</li> </ul>

	<ul style="list-style-type: none"> <li>○ Flower and pollination</li> <li>○ Fertilisation and germination</li> <li>○ Seed dispersal</li> </ul>		<p>End-of-topic summative assessment</p>	<ul style="list-style-type: none"> <li>○ SAM learning</li> <li>○ Satchel Quizzes</li> <li>○ Badger levelled tasks</li> </ul>	<ul style="list-style-type: none"> <li>○ <b>Grateful in awe</b> of the creation of the plant family. <ul style="list-style-type: none"> <li>○ Maths</li> <li>○ Geography</li> <li>○ Field work</li> <li>○ Working with current data</li> <li>○ Biologist</li> <li>○ Teacher</li> <li>○ Environmental scientist</li> <li>○ Food industry</li> <li>○ Agricultural industry</li> </ul> </li> </ul>	<p>KS5</p> <ul style="list-style-type: none"> <li>○ Topic 3 Voice of the genome and</li> <li>○ Topic 4 Biodiversity and evolution</li> </ul>
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**Spring Term 2**

<b>Spring Term 2</b>						
Waves	<p><b>Sound</b></p> <ul style="list-style-type: none"> <li>○ Sound waves and speed</li> <li>○ Loudness and amplitude</li> <li>○ Frequency and pitch</li> <li>○ The ear and hearing</li> </ul> <p><b>Light</b></p> <ul style="list-style-type: none"> <li>○ Light</li> <li>○ Reflection</li> <li>○ Refraction</li> <li>○ The eye and vision</li> <li>○ Colour</li> </ul>	<p>Drawing reflection and refraction diagrams using ruler and protractor.</p> <p>Converting units and using prefixes.</p> <p>Expressing numbers in standard form.</p> <p>Interrupting wave traces.</p> <p>Literacy Scientific enquiry</p>	<p>AFL in lessons. Homework</p> <p>Mid-topic Assessment QWC Task</p> <p>End-of-topic summative assessment</p>	<ul style="list-style-type: none"> <li>○ Worksheets</li> <li>○ Flipped learning activities</li> <li>○ Past exam questions</li> <li>○ Research</li> <li>○ Practical write-ups</li> <li>○ SAM learning</li> <li>○ Satchel Quizzes</li> <li>○ Badger levelled tasks</li> </ul>	<p><b>Awe and wonder</b> and gratefulness how we see and hear the world around us.</p> <ul style="list-style-type: none"> <li>○ Music</li> <li>○ Math</li> <li>○ Musician</li> <li>○ Optician</li> <li>○ Artist</li> <li>○ Interior design</li> <li>○ Engineering</li> <li>○ Architecture</li> <li>○ Ophthalmologist</li> <li>○ Otolaryngologist</li> <li>○ Seismologist</li> <li>○ Physicians</li> <li>○ Sonographers</li> </ul>	<p>KS1</p> <ul style="list-style-type: none"> <li>○ Light and dark</li> <li>○ Reflection</li> <li>○ Shadows</li> <li>○ How we see objects</li> <li>○ Sound and vibration</li> </ul> <p>KS4</p> <ul style="list-style-type: none"> <li>○ GCSE waves topic</li> </ul> <p>KS5</p> <ul style="list-style-type: none"> <li>○ A-level Physics</li> <li>○ Waves topic</li> </ul>
Reactions	<p><b>Acids and alkali</b></p> <ul style="list-style-type: none"> <li>○ Chemical reactions</li> <li>○ Acid and alkalis</li> <li>○ Indicators and pH</li> <li>○ Acid strength</li> <li>○ Neutralisation</li> <li>○ Making salts</li> </ul> <p><b>Metals and non-metals</b></p> <ul style="list-style-type: none"> <li>○ More about elements</li> <li>○ Chemical reactions of metals and non-metals</li> <li>○ Metals and acids</li> <li>○ Metals and oxygen</li> </ul>	<p>Collecting and testing carbon dioxide gas using lime water – Lab skills</p> <p>Literacy Scientific enquiry</p>	<p>AFL in lessons. Homework</p> <p>Mid-topic Assessment QWC Task</p> <p>End-of-topic summative assessment</p>	<ul style="list-style-type: none"> <li>○ Worksheets</li> <li>○ Flipped learning activities</li> <li>○ Past exam questions</li> <li>○ Research</li> <li>○ Practical write-ups</li> <li>○ SAM learning</li> <li>○ Satchel Quizzes</li> <li>○ Badger levelled tasks</li> </ul>	<p><b>Grateful- in awe</b> of the creation of the chemicals understanding and appreciating the work of scientists and chemists</p> <p><b>United in harmony</b> when conducting Science practicals.</p> <ul style="list-style-type: none"> <li>○ Maths</li> <li>○ History of medicine</li> <li>○ Design and Technology</li> <li>○ Practical work</li> <li>○ Chemist</li> </ul>	<p>KS1/2</p> <ul style="list-style-type: none"> <li>○ Reversible and irreversible reactions</li> </ul> <p>KS4</p> <ul style="list-style-type: none"> <li>○ GCSE Chemistry: chemical changes</li> </ul> <p>KS5</p> <ul style="list-style-type: none"> <li>○ A-level Chemistry Chemical</li> </ul>

	<ul style="list-style-type: none"> <li>○ Metals and water</li> <li>○ Metal displacement reactions</li> </ul>				<ul style="list-style-type: none"> <li>○ Engineering</li> <li>○ Electronics</li> <li>○ Chemical industry</li> <li>○ Physicist</li> <li>○ teacher</li> </ul>	V reactions
<b>Summer Term 1</b>						
Genes	<p><b>Variation</b></p> <ul style="list-style-type: none"> <li>○ Variation</li> <li>○ Continuous and discontinuous</li> <li>○ Adapting to change</li> </ul> <p><b>Human reproduction</b></p> <ul style="list-style-type: none"> <li>○ adolescence</li> <li>○ Reproductive system</li> <li>○ Fertilisation and implantation</li> <li>○ Development of a fetus</li> <li>○ The menstrual cycle</li> </ul>	Literacy Numeracy – graphs and data handling	AFL in lessons. Homework  Mid-topic Assessment QWC Task  End-of-topic summative assessment	<ul style="list-style-type: none"> <li>○ Worksheets</li> <li>○ Flipped learning activities</li> <li>○ Past exam questions</li> <li>○ Research</li> <li>○ Practical write-ups</li> <li>○ SAM learning</li> <li>○ Satchel Quizzes</li> <li>○ Badger levelled tasks</li> </ul>	<ul style="list-style-type: none"> <li>○ <b>Grateful- in awe</b> of the creation of the human body and cells Generous-understanding and appreciating the work of scientists and medical professionals</li> <li>○ <b>Faith-filled and hopeful</b> when given the opportunity to discuss God's role in the word and a chance for spiritual reflection.</li> <li>○ <b>Family and community</b> when we realise how our bodies function and are able to give life.</li> <li>○ Religious education</li> <li>○ Maths</li> <li>○ Geography</li> <li>○ Biologist</li> <li>○ Obstetrician</li> <li>○ Midwife</li> </ul>	<p>KS4</p> <ul style="list-style-type: none"> <li>○ Year 9 Evolution topic KS4</li> <li>○ Year 11 Genetic topic</li> <li>○ KS5 Topic 4 Biodiversity and Natural Selection</li> </ul> <p>KS4</p> <ul style="list-style-type: none"> <li>○ Year 10 Hormones topic</li> </ul> <p>KS5</p> <ul style="list-style-type: none"> <li>○ Topic 7 includes elements of hormonal control</li> </ul>



					<ul style="list-style-type: none"> <li>○ Gynaecologist</li> <li>○ Doctor</li> <li>○ Teacher</li> </ul>	
Energy	<p><b>Energy costs</b></p> <ul style="list-style-type: none"> <li>○ Food and fuels</li> <li>○ Energy resources</li> <li>○ Energy and power</li> </ul> <p><b>Energy transfer</b></p> <ul style="list-style-type: none"> <li>○ Energy adds up</li> <li>○ Energy dissipation</li> </ul>	<p>Use the formula  <math>\text{cost} = \text{power (kW) } \times \text{ time (hours) } \times \text{ price (per kWh)}</math></p> <p>Converting units          using standard form to represent very large numbers.</p> <p>Using prefixes.</p>	<p>AFL in lessons.          Homework</p> <p>Mid-topic          Assessment          QWC Task</p> <p>End-of-topic          summative          assessment</p>	<ul style="list-style-type: none"> <li>○ Worksheets</li> <li>○ Flipped learning activities</li> <li>○ Past exam questions</li> <li>○ Research</li> <li>○ Practical write-ups</li> <li>○ SAM learning</li> <li>○ Satchel Quizzes</li> <li>○ Badger levelled tasks</li> </ul>	<ul style="list-style-type: none"> <li>○ <b>Stewardship</b> by considering how the impact of our choices affects the planet</li> <li>○ <b>Grateful in awe</b> of the creation of electricity</li> <li>○ <b>United in harmony</b> when considering our impact of using fossil fuels on Earth's climate.</li> <li>○ <b>Faith-filled and hopeful</b> when given the opportunity to discuss solutions to global warming and climate change.</li> <li>○ Maths</li> <li>○ Design and technology</li> <li>○ Geography</li> <li>○ Visits to Energy resources e.g. wind turbine/ solar panel powerplants</li> <li>○ Musuem of engineering</li> </ul>	<p>KS1/2</p> <ul style="list-style-type: none"> <li>○ Energy in food chains and webs</li> <li>○ Sound and light energy</li> <li>○ Electrical energy</li> </ul> <p>KS4</p> <ul style="list-style-type: none"> <li>○ This builds a solid foundation for work on energy and energy resources lin GCSE.</li> </ul> <p>KS5</p> <ul style="list-style-type: none"> <li>○ A-level Physics</li> <li>○ Conservation of energy law</li> <li>○ Energy, work and power</li> </ul>

					<ul style="list-style-type: none"> <li>○ Musuem of transport</li> <li>○ Physics teacher</li> <li>○ physicist</li> <li>○ Engineer</li> <li>○ Energy generation industry</li> <li>○ Electrician</li> <li>○ Food industry</li> <li>○ Power generation</li> <li>○ Automobile industry</li> </ul>	
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**Summer Term 2**

Earth	<p><b>Earth structure</b></p> <ul style="list-style-type: none"> <li>○ The structure of the Earth</li> <li>○ Sedimentary rocks</li> <li>○ Igneous and metamorphic rocks</li> <li>○ The rock cycle</li> <li>○ Ceramics</li> </ul> <p><b>Universe</b></p> <ul style="list-style-type: none"> <li>○ The night sky</li> <li>○ The solar system</li> <li>○ The Earth</li> <li>○ The Moon and changing ideas</li> </ul>	<p>Age of the Earth: using standard form to represent very large numbers.</p> <p>Graph plotting: orbital properties of other planets (length of orbit against distance from Sun).</p> <p>Scale factors from maths and correct use of units.</p> <p>Using standard form to represent very large numbers.</p>	<p>AFL in lessons. Homework</p> <p>Mid-topic Assessment QWC Task</p> <p>End-of-topic summative assessment</p>	<ul style="list-style-type: none"> <li>○ Worksheets</li> <li>○ Flipped learning activities</li> <li>○ Past exam questions</li> <li>○ Research</li> <li>○ Practical write-ups</li> <li>○ SAM learning</li> <li>○ Satchel Quizzes</li> <li>○ Badger levelled tasks</li> </ul>	<ul style="list-style-type: none"> <li>○ <b>Grateful in awe</b> of the wonders of the universe.</li> <li>○ <b>Grateful</b> for the human explorations and discoveries that have unlocked some of the mysteries of the universe.</li> <li>○ <b>Faith-filled and hopeful</b> when given the opportunity to discuss space exploration and use of Earth's resources.</li> <li>○ Maths</li> <li>○ Geography</li> </ul>	<p>KS1/2</p> <ul style="list-style-type: none"> <li>○ The movement of the Earth and other plants, relative to the sun in the solar system</li> <li>○ The movement of the moon relative to the Earth.</li> <li>○ Day and night and the apparent movement of the sun across the sky</li> <li>○ KS4 GCSE Chemistry –</li> </ul>
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\*QWC – Quality of written communication