

# SCIENCE YEAR 7 Curriculum Overview



## BIG IDEAS CURRICULUM

Throughout Year 7, students explore the key scientific ideas that form the foundation for their studies in later years. They begin by discovering how living things are built and how forces shape the world around us. During the autumn term, they learn to use microscopes to study plant and animal cells and carry out simple investigations into friction, tension and stretching springs.

In the spring term, students move on to the building blocks of matter and the patterns that organise the periodic table, while also exploring the fascinating world of genes, DNA and human reproduction. Practical work helps them to develop investigative skills and confidence using scientific equipment.

During the summer term, students apply their knowledge to real-world contexts. They build electrical circuits, explore how energy moves, observe chemical reactions, and study how light and sound travel as waves. The year ends with a look beyond our planet, learning about the Earth, its place in the Solar System, and the cycles that shape our environment.

Across the year, lessons are highly practical and enquiry-based. Students are encouraged to think scientifically, ask questions, test ideas, and explain their findings using correct scientific language — developing curiosity, teamwork, and analytical thinking that underpin success in all sciences at GCSE and beyond.

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TERM	THEMES/ TOPICS	KEY KNOWLEDGE & SKILLS	KEY ASSESSMENTS
<p><b><u>AUTUMN</u></b></p> <p><b>Term 1</b></p> <p><b>Topic 1</b></p>	<p><b><u>BIOLOGY</u></b></p> <p><b><u>BIG IDEA</u></b> <b>Organisms</b></p> <p><b><u>TOPIC</u></b> <b>Plant and Animal Cells</b></p>	<p style="text-align: center;"><b><u>Core Substantive Knowledge</u></b></p> <ul style="list-style-type: none"> <li>• Differences between plant &amp; animal cells               <ul style="list-style-type: none"> <li>• Function of cell organelles</li> <li>• Using a light microscope</li> </ul> </li> <li>• Levels of organisation (cell→ tissue→ organ→ system→ organism)</li> </ul> <p style="text-align: center;"><b><u>Disciplinary Focus (Skills &amp; Working Scientifically)</u></b></p> <ul style="list-style-type: none"> <li>• Use of light microscope and drawing cells accurately               <ul style="list-style-type: none"> <li>• Planning and recording observations</li> <li>• Using scientific language and models</li> <li>• Developing explanations from evidence</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Low-stakes retrieval quiz on cells</b></li> <li>• <b>Microscope skills practical</b> <ul style="list-style-type: none"> <li>• <b>End-of topic test (Deliberate Practice)</b></li> </ul> </li> </ul>

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<p><b><u>AUTUMN</u></b></p> <p><b>Term 1</b></p> <p><b>Topic 2</b></p>	<p><b><u>PHYSICS</u></b></p> <p><b><u>BIG IDEA</u></b> <b>Forces</b></p> <p><b><u>TOPIC</u></b> <b>Contact Forces</b></p>	<p style="text-align: center;"><b><u>Core Substantive Knowledge</u></b></p> <ul style="list-style-type: none"> <li>• What forces are and how they act</li> <li>• Friction, air resistance and tension               <ul style="list-style-type: none"> <li>• Resultant force and motion                   <ul style="list-style-type: none"> <li>• Hooke's Law</li> <li>• Mass vs weight</li> </ul> </li> </ul> </li> </ul> <p style="text-align: center;"><b><u>Disciplinary Focus (Skills &amp; Working Scientifically)</u></b></p> <ul style="list-style-type: none"> <li>• Measuring forces with a newton meter               <ul style="list-style-type: none"> <li>• Drawing force diagrams</li> </ul> </li> <li>• Recording data and identifying patterns               <ul style="list-style-type: none"> <li>• Evaluating sources of error</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Mini practical investigation (Hooke's Law)</li> <li>• End-of topic test (Deliberate Practice)</li> </ul>

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<p><b><u>AUTUMN</u></b></p> <p>Term 2</p> <p>Topic 1</p>	<p><b>CHEMISTRY</b></p> <p><b><u>BIG IDEA</u></b></p> <p>Matter</p> <p><b><u>TOPIC</u></b></p> <p>Solids, Liquids and Gases</p>	<p><b><u>Core Substantive Knowledge</u></b></p> <ul style="list-style-type: none"> <li>• Particle model of matter</li> <li>• Changes of state and energy                             <ul style="list-style-type: none"> <li>• Diffusion and density</li> </ul> </li> <li>• Temperature &amp; kinetic energy link</li> </ul> <p><b><u>Disciplinary Focus (Skills &amp; Working Scientifically)</u></b></p> <ul style="list-style-type: none"> <li>• Modelling particle diagrams</li> <li>• Use of scientific models to explain phenomena</li> <li>• Interpreting data and graphs</li> </ul>	<ul style="list-style-type: none"> <li>• Retrieval practice on particle model</li> <li>• Practical on diffusion                             <ul style="list-style-type: none"> <li>• End-of topic test (Deliberate Practice)</li> </ul> </li> </ul>

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<p><b><u>AUTUMN</u></b></p> <p>Term 2</p> <p>Topic 2</p>	<p><b><u>CHEMISTRY</u></b></p> <p><b><u>BIG IDEA</u></b> Matter</p> <p><b><u>TOPIC</u></b> Atoms, Elements and Compounds</p>	<p style="text-align: center;"><b><u>Core Substantive Knowledge</u></b></p> <ul style="list-style-type: none"> <li>• Structure of atoms</li> <li>• Elements, compounds &amp; mixtures</li> <li>• Chemical symbols and formulae</li> <li>• Simple word equations</li> </ul> <p style="text-align: center;"><b><u>Disciplinary Focus (Skills &amp; Working Scientifically)</u></b></p> <ul style="list-style-type: none"> <li>• Using periodic table to identify elements</li> <li>• Representing reactions with models               <ul style="list-style-type: none"> <li>• Symbol use accuracy</li> </ul> </li> <li>• Collaboration &amp; peer explanation</li> </ul>	<ul style="list-style-type: none"> <li>• End-of-term assessment (Matter topics)</li> <li>• End-of topic test (Deliberate Practice)</li> </ul>

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<p><b><u>Spring</u></b> <b>Term 1</b> <b>Topic 1</b></p>	<p><b><u>BIOLOGY</u></b></p> <p><b><u>BIG IDEA</u></b> <b>Genes</b></p> <p><b><u>TOPIC</u></b> <b>DNA and Inheritance</b></p>	<p style="text-align: center;"><b><u>Core Substantive Knowledge</u></b></p> <ul style="list-style-type: none"> <li>• Structure and function of DNA               <ul style="list-style-type: none"> <li>• Genes and chromosomes</li> <li>• Variation and inheritance</li> </ul> </li> <li>• Simple dominant/recessive traits</li> </ul> <p style="text-align: center;"><b><u>Disciplinary Focus (Skills &amp; Working Scientifically)</u></b></p> <ul style="list-style-type: none"> <li>• Modelling DNA structure</li> <li>• Data analysis of variation</li> <li>• Drawing and interpreting genetic diagrams</li> </ul>	<ul style="list-style-type: none"> <li>• Retrieval quiz on genetics</li> <li>• Modelling activity assessment               <ul style="list-style-type: none"> <li>• End-of topic test (Deliberate Practice)</li> </ul> </li> </ul>

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<p><b><u>Spring</u></b> <b>Term 1</b> <b>Topic 2</b></p>	<p><b><u>PHYSICS</u></b></p> <p><b><u>BIG IDEA</u></b> Energy</p> <p><b><u>TOPIC</u></b> Stores and Transfers</p>	<p style="text-align: center;"><b><u>Core Substantive Knowledge</u></b></p> <ul style="list-style-type: none"> <li>• Different energy stores</li> <li>• Energy transfer pathways</li> <li>• Conservation of energy</li> <li>• Useful and wasted energy                             <ul style="list-style-type: none"> <li>• Energy efficiency</li> </ul> </li> </ul> <p style="text-align: center;"><b><u>Disciplinary Focus (Skills &amp; Working Scientifically)</u></b></p> <ul style="list-style-type: none"> <li>• Using Sankey diagrams</li> <li>• Calculating efficiency</li> <li>• Planning investigations into insulators</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Practical investigation on insulation</b></li> <li>• <b>Low-stakes test</b></li> <li>• <b>End-of topic test (Deliberate Practice)</b></li> </ul>

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<p><b><u>Spring</u></b> <b>Term 2</b> <b>Topic 1</b></p>	<p><b><u>BIOLOGY</u></b></p> <p><b><u>BIG IDEA</u></b> <b>Genes</b></p> <p><b><u>TOPIC</u></b> <b>Reproductive Systems</b></p>	<p style="text-align: center;"><b><u>Core Substantive Knowledge</u></b></p> <ul style="list-style-type: none"> <li>• Structure and function of male &amp; female systems               <ul style="list-style-type: none"> <li>• Fertilisation and development                   <ul style="list-style-type: none"> <li>• Menstrual cycle</li> <li>• Gestation and birth</li> </ul> </li> </ul> </li> </ul> <p style="text-align: center;"><b><u>Disciplinary Focus (Skills &amp; Working Scientifically)</u></b></p> <ul style="list-style-type: none"> <li>• Labelling and modelling biological systems               <ul style="list-style-type: none"> <li>• Ethical discussion skills</li> </ul> </li> <li>• Use of scientific terminology accurately</li> </ul>	<ul style="list-style-type: none"> <li>• <b>End-of topic test (Deliberate Practice)</b></li> </ul>

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<p><b><u>Spring</u></b> <b>Term 2</b> <b>Topic 2</b></p>	<p><b><u>CHEMISTRY</u></b></p> <p><b><u>BIG IDEA</u></b> <b>Matter</b></p> <p><b><u>TOPIC</u></b> <b>Periodic Table and Properties</b></p>	<p style="text-align: center;"><b><u>Core Substantive Knowledge</u></b></p> <ul style="list-style-type: none"> <li>• Structure of periodic table               <ul style="list-style-type: none"> <li>• Groups &amp; periods</li> <li>• Metals vs non-metals</li> <li>• Patterns and reactivity</li> </ul> </li> <li>• Noble gases and halogens overview</li> </ul> <p style="text-align: center;"><b><u>Disciplinary Focus (Skills &amp; Working Scientifically)</u></b></p> <ul style="list-style-type: none"> <li>• Using periodic table to predict patterns               <ul style="list-style-type: none"> <li>• Interpreting trends</li> </ul> </li> <li>• Communicating evidence-based ideas</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Retrieval practice</b></li> <li>• <b>End-of topic test (Deliberate Practice)</b></li> </ul>

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<p><u>Summer</u></p> <p>Term 1</p> <p>Topic 1</p>	<p><u>PHYSICS</u></p> <p><u>BIG IDEA</u> Electricity &amp; Magnetism</p> <p><u>TOPIC</u> Series and Parallel Circuits</p>	<p style="text-align: center;"><b><u>Core Substantive Knowledge</u></b></p> <ul style="list-style-type: none"> <li>• Circuit symbols</li> <li>• Series vs parallel behaviour             <ul style="list-style-type: none"> <li>• Voltage and current</li> </ul> </li> <li>• Conductors and insulators</li> </ul> <p style="text-align: center;"><b><u>Disciplinary Focus (Skills &amp; Working Scientifically)</u></b></p> <ul style="list-style-type: none"> <li>• Building and testing circuits             <ul style="list-style-type: none"> <li>• Recording data</li> </ul> </li> <li>• Evaluating results             <ul style="list-style-type: none"> <li>• Safety skills</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Practical skills assessment</li> <li>• Retrieval quiz on energy links             <ul style="list-style-type: none"> <li>• End-of topic test (Deliberate Practice)</li> </ul> </li> </ul>

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<p><u>Summer</u></p> <p>Term 1</p> <p>Topic 2</p>	<p><u>CHEMISTRY</u></p> <p><u>BIG IDEA</u> Reactions</p> <p><u>TOPIC</u> Types of Chemical Reaction</p>	<p style="text-align: center;"><b><u>Core Substantive Knowledge</u></b></p> <ul style="list-style-type: none"> <li>• Physical vs chemical changes</li> <li>• Combustion, oxidation, neutralisation, displacement</li> <li>• Conservation of mass</li> </ul> <p style="text-align: center;"><b><u>Disciplinary Focus (Skills &amp; Working Scientifically)</u></b></p> <ul style="list-style-type: none"> <li>• Planning &amp; observing chemical reactions               <ul style="list-style-type: none"> <li>• Recording observations</li> <li>• Writing word equations</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Core practical assessment</li> <li>• End-of topic test (Deliberate Practice)</li> </ul>

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<p><u>Summer</u></p> <p>Term 2</p> <p>Topic 1</p>	<p><u>PHYSICS</u></p> <p><u>BIG IDEA</u> Waves</p> <p><u>TOPIC</u> Light and Sound</p>	<p style="text-align: center;"><b><u>Core Substantive Knowledge</u></b></p> <ul style="list-style-type: none"> <li>• Properties of light</li> <li>• Reflection &amp; refraction               <ul style="list-style-type: none"> <li>• Colour and filters</li> <li>• Sound as vibration</li> <li>• Pitch and amplitude</li> </ul> </li> </ul> <p style="text-align: center;"><b><u>Disciplinary Focus (Skills &amp; Working Scientifically)</u></b></p> <ul style="list-style-type: none"> <li>• Using ray diagrams</li> <li>• Wave modelling</li> <li>• Measuring frequency and wavelength               <ul style="list-style-type: none"> <li>• Graph skills</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>practical assessment</b></li> <li>• <b>End-of topic test (Deliberate Practice)</b></li> </ul>

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<p><u>Summer</u></p> <p>Term 2</p> <p>Topic 2</p>	<p><u>CHEMISTRY</u></p> <p><u>BIG IDEA</u> Earth</p> <p><u>TOPIC</u> Earth and Beyond</p>	<p style="text-align: center;"><b><u>Core Substantive Knowledge</u></b></p> <ul style="list-style-type: none"> <li>• Structure of Earth               <ul style="list-style-type: none"> <li>• Rock cycle</li> </ul> </li> <li>• Fossils &amp; geological time               <ul style="list-style-type: none"> <li>• Day and night</li> <li>• Seasons</li> </ul> </li> <li>• Solar system overview</li> </ul> <p style="text-align: center;"><b><u>Disciplinary Focus (Skills &amp; Working Scientifically)</u></b></p> <ul style="list-style-type: none"> <li>• Modelling Earth movements</li> <li>• Using secondary sources</li> <li>• Data interpretation from graphs and images</li> </ul>	<ul style="list-style-type: none"> <li>• practical assessment</li> <li>• End-of topic test (Deliberate Practice)</li> <li>• End-of-year exam</li> </ul>