# Curriculum Progression (Intent) Science

## Long Term Intent

- **To provide learners with scientific knowledge and understanding whilst developing their scientific powers, including application, enquiry, exploration, investigation and scientific literacy.**

- To develop successful learners who are independent and enjoy learning; making outstanding progress and achieving personal excellence.
- To learn through discovery and exploration and develop a love of learning science.
- To be confident individuals who understand how science fits into society.
- To develop an ethos which allows everyone to experience success and build resilient and confident scientists.
- To inspire and empower pupils to take next steps in science education beyond Unsworth Academy High School.

| | Knowledge and Understanding | Skills |
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| Year 11 | <ul><li>Know the following topics to a secure understanding:</li></ul><br>Biology<br>6. Inheritance, Variation and Evolution<br>7. Ecology<br><br>Chemistry<br>7. Organic Chemistry<br>8. Chemical Analysis<br>9. Chemistry of the Atmosphere<br>10. Using Resources<br><br>6. Waves<br>7. Magnetism and Electromagnetism<br>8. Space Physics (triple only)<br><br><ul><li>Within all topics show a detailed understanding of science</li><li>Use technical vocabulary appropriately</li><li>Demonstrate clear communication skills</li><li>Be able to re-arrange equations and use standard form</li><li>Explain how scientific theories can be changed by new evidence</li><li>Apply scientific knowledge to a range of tasks and situations</li><li>Confidently understand and use SI units and chemical nomenclature</li></ul> | <ul><li>Correctly identify all key variables</li><li>Use the correct term of key variables</li><li>Lists all key pieces of equipment using correct names</li><li>Describes how to use all key equipment correctly</li><li>All measurements are correctly included with a suitable range to match the experiment</li><li>Clear understanding of why 3 repeats are conducted in an experiment</li><li>Explanation of how variables are controlled and how it will affect the result if they are not well controlled</li><li>Identified hazards and describes clear measures taken to reduce risk</li><li>Clear explanation of why the data collection method is best for giving reproducible and precise results</li><li>Justify conclusions consistent with evidence available</li><li>Suggest improvements to methods to make the evidence more reliable</li><li>Anomalous results are identified and not included in graph patterns or when calculating mean value</li><li>Be able to draw conclusions from unseen data</li></ul> |

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| Year 10 | • Know the following topics to a secure understanding:<br><br>Biology<br>1. Cell Biology<br>2. Organisation<br>3. Infection and response<br>4. Bioenergetics<br>5. Homeostasis and response<br><br>Chemistry<br>1. Atomic structure and the Periodic table<br>2. Bonding, Structure and Properties of Matter<br>3. Quantitative Chemistry<br>4. Chemical changes<br>5. Energy changes<br>6. Rate and Extent of Chemical Change<br><br>1. Energy<br>2. Electricity<br>3. Particle Model of Matter<br>4. Atomic Structure<br>5. Forces<br><br>• Within all topics show a detailed understanding of science<br>• Use technical vocabulary appropriately<br>• Demonstrate clear communication skills<br>• Be able to re-arrange equations and use standard form<br>• Explain how scientific theories can be changed by new evidence<br>• Apply scientific knowledge to a range of tasks and situations<br>• Confidently understand and use SI units and chemical nomenclature | • Identified hazards and describes clear measures taken to reduce risk<br>• Clear explanation of why the data collection method is best for giving reproducible and precise results<br>• Justify conclusions consistent with evidence available<br>• Suggest improvements to methods to make the evidence more reliable<br>• Anomalous results are identified and not included in graph patterns or when calculating mean value<br>• Be able to draw conclusions from unseen data |
| Year 9 | • Know the following topics to a secure understanding:<br><br>Biology<br>1. Microscopic world<br>2. Digestion<br>3. Diseases<br>4. Respiration<br>5. The nervous system<br>6. DNA and chromosomes | • Correctly identify all key variables<br>• Use the correct term of key variables<br>• Lists all key pieces of equipment using correct names<br>• Describes how to use all key equipment correctly<br>• All measurements are correctly included with a suitable range to match the experiment |

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| | **Chemistry**<br>1. Atoms and elements<br>2. Covalent bonding<br>3. Conservation of mass<br>4. Chemical reactions (acids)<br>5. Exothermic and endothermic reactions<br>6. Chemical reactions (rates)<br><br>**Physics**<br>1. The Joule<br>2. The Ampere<br>3. Eureka<br>4. Atomos<br>5. The Newton<br>6. Hertz<br><br>• Within all topics show a detailed<br>• understanding of science<br>• Use technical vocabulary appropriately<br>• Demonstrate clear communication skills<br>• Be able to re-arrange equations and begin to embed using standard form<br>• Explain how scientific theories can be changed by new evidence<br>• Begin to apply scientific knowledge to a range of tasks and situations<br>• Understand and use SI units and chemical nomenclature | • Clear understanding of why 3 repeats are conducted in an experiment<br>• Explanation of how variables are controlled and how it will affect the result if they are not well controlled |
| Year 8 | • Know the following topics to a secure understanding:<br><br>**Biology**<br>1. Plants and ecosystems<br>2. Health and drugs<br>3. Variation for survival<br><br>**Chemistry**<br>1. Chemical changes<br>2. Obtaining useful materials<br>3. Using our Earth sustainably<br><br>**Physics**<br>1. Magnetism and electricity<br>2. Motion on Earth and in space<br>3. Waves and energy transfer<br><br>• Within all topics show a good level of understanding of science | • Numeracy – calculate mean, median, range, uncertainty. Use and convert numbers to correct number of decimal places or significant figures.<br>• Graphs – draw bar charts, scatter graphs and pie charts. Interpret positive, negative and zero correlations. Calculate gradient of a line.<br>• Evaluation – can explain how a scientific method can be improved and suggest further investigations. |

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|  | <ul><li>Begin to frequently use technical vocabulary appropriately</li><li>Develop and demonstrate their communication skills</li><li>Be able to re-arrange equations and begin to embed using standard form</li><li>To consider how scientific theories can be changed by new evidence</li><li>Begin to apply scientific knowledge to a range of tasks and situations</li><li>Embed and understand and use SI units and chemical nomenclature</li></ul> |  |
| Year 7 | <ul><li>Know the following topics to a secure understanding:</li></ul><p>Biology</p><ol><li>Cells</li><li>Eating, drinking and breathing</li><li>Getting the energy your body needs</li></ol><p>Chemistry</p><ol><li>Mixing, dissolving and separating</li><li>Elements, compounds and reactions</li><li>Physical changes</li></ol><p>Physics</p><ol><li>Forces</li><li>Energy transfers and sound</li><li>Exploring contact and non-contact forces</li></ol><ul><li>Within all topics show a good level of understanding of science</li><li>Begin to frequently use technical vocabulary appropriately</li><li>Develop and demonstrate their communication skills</li><li>Be able to re-arrange equations</li><li>To consider how scientific theories can be changed by new evidence</li><li>Begin to apply scientific knowledge to a range of tasks and situations</li><li>Learn about SI units and chemical nomenclature</li></ul> | <ul><li>Hazards and variables – identify risks and hazards. Independent, dependent, control variables.</li><li>Data and graphs – categoric, discrete, bar charts, line graphs, anomalous results, scales, labelling axes, drawing a line of best fit, random/human/systematic error.</li><li>Qualitative science – repeatable, reproducible, resolution, accuracy, precision, valid</li></ul> |