

## Fairfield High School Curriculum Overview – Year 8

Subject	Science	Why do we study these units in Year 8?
Lessons per fortnight	8	The Year 8 Science programme builds on the <b>10 big ideas introduced in Year 7</b> . The <b>mastery approach</b> to the KS3 National Science Curriculum spirals this year as the smaller topics, the building blocks for the big ideas, build in complexity from simpler, more concrete topics like 'Light' and 'Sound', to more abstract ones such as 'Wave properties' and 'Wave effects'. These have been created to avoid repetition, draw on various scientific skills and use different contexts. The science capital of students is supplemented further with a range of trips and extra-curricular workshops offered throughout the year.
Setting	Mixed ability teaching in mixed tutor groups	

**Students are encouraged to be Responsible Global Citizens** through numerous links to the sustainable development goals embedded within the year 8 programme of study. All science topics are linked to at least one goal and these are explored through their links to the science being explored.

**We ensure all students experience high challenge in the sciences by** differentiating lessons so that ideas can be extended by all students even those making greater than expected progress.

**Literacy work this year includes** the introduction of a wide range of scientific vocabulary. This is explored through various scientific texts and scientific talk.

**Innovation and Creativity opportunities** are included in lessons and via workshops delivered by local universities and employers throughout the year. Through a range of off-site trips pupils are challenged to explore the sciences in all its forms.

**Employability opportunities and skills** are highlighted in lessons throughout the course and supplemented with workshops and trips throughout the year.

Term	Unit title	Knowledge and Understanding/content	Skills	Assessment
1	<b>Forces:-</b> Contact forces  Pressure	<ol style="list-style-type: none"> <li>Analysing equilibrium</li> <li>What a drag!</li> <li>Understanding stretch and compression</li> <li>Investigating Hooke's Law</li> <li>Exploring pressure on a solid surface</li> <li>Exploring pressure in a fluid</li> <li>Calculating pressure</li> <li>Explaining floating and sinking</li> </ol>	<ul style="list-style-type: none"> <li>Sketch the forces acting on an object and label their size and direction.</li> <li>Use the formula: fluid pressure, or stress on a surface = force (N)/area (m<sup>2</sup>).</li> </ul>	<p><b>Homework:</b> Topic guide with keywords to learn</p> <p><b>Homework:</b> Getting 'GCSE' ready practice questions to research</p> <p><b>End of unit test:</b> Know, apply &amp; extended knowledge test.</p>
1	<b>Matter:-</b> Periodic Table  Elements	<ol style="list-style-type: none"> <li>Looking at the periodic table of elements</li> <li>Exploring metals in the periodic table</li> <li>Exploring non-metals in the periodic table</li> <li>Analysing wider patterns within the periodic table</li> <li>Combining elements</li> <li>Comparing elements and compounds</li> <li>Exploring polymers</li> </ol>	<ul style="list-style-type: none"> <li>Choose elements for different uses from their position in the periodic table.</li> <li>Use particle diagrams to classify a substance as an element, mixture or compound and as molecules or atoms.</li> </ul>	<p><b>Homework:</b> Topic guide with keywords to learn</p> <p><b>Homework:</b> Getting 'GCSE' ready practice questions to research</p>

		8. Exploring ceramics and composites	<ul style="list-style-type: none"> <li>Name simple compounds using rules: change non-metal to –ide; mono, di, tri prefixes; and symbols of hydroxide, nitrate, sulfate and carbonate.</li> </ul>	<b>End of unit test:</b> Know, apply & extended knowledge test.
2	<b>Organisms:-</b> Breathing  Digestion	<ol style="list-style-type: none"> <li>Understanding how we breathe</li> <li>Measuring breathing</li> <li>Explaining gas exchange in humans</li> <li>Exploring the effects of disease and lifestyle</li> <li>Exploring a healthy diet</li> <li>Understanding the effects of an unbalanced diet</li> <li>Understanding the human digestive system</li> <li>Understanding the roles of the digestive organs</li> </ol>	<ul style="list-style-type: none"> <li>Predict how a change in the gas exchange system could affect other processes in the body.</li> <li>Design a diet for a person with specific dietary needs.</li> </ul>	<b>Homework:</b> Topic guide with keywords to learn  <b>Homework:</b> Getting ‘GCSE’ ready practice questions to research  <b>End of unit test:</b> Know, apply & extended knowledge test.
2	<b>Electromagnets:-</b> Magnetism Electromagnetism	<ol style="list-style-type: none"> <li>Forces and fields</li> <li>Using ideas about fields</li> <li>Investigating electromagnetism</li> <li>Using electromagnets</li> <li>Investigating strength of electromagnets</li> </ol>	<ul style="list-style-type: none"> <li>Suggest how bells, circuit breakers and loudspeakers work, from diagrams.</li> <li>Predict the pattern of field lines and the force around two magnets placed near each other.</li> </ul>	<b>Homework:</b> Topic guide with keywords to learn  <b>Homework:</b> Getting ‘GCSE’ ready practice questions to research  <b>End of unit test:</b> Know, apply & extended knowledge test.
3	<b>Reactions:-</b> Chemical energy  Types of reaction	<ol style="list-style-type: none"> <li>Understanding exothermic reactions</li> <li>Comparing endothermic and exothermic changes</li> <li>Investigating endothermic reactions</li> <li>Explaining the use of catalysts</li> </ol>	<ul style="list-style-type: none"> <li>Predict whether a chemical reaction will be exothermic or endothermic given data on bond strengths.</li> </ul>	<b>Homework:</b> Topic guide with keywords to learn

		<ol style="list-style-type: none"> <li>5. Exploring combustion</li> <li>6. Exploring the use of fuels</li> <li>7. Understanding thermal decomposition</li> <li>8. Explaining changes</li> </ol>	<ul style="list-style-type: none"> <li>• Write word equations from information about chemical reactions.</li> </ul>	<p><b>Homework:</b> Getting 'GCSE' ready practice questions to research</p> <p><b>End of unit test:</b> Know, apply &amp; extended knowledge test.</p>
4	<p><b>Ecosystems:-</b>      Respiration</p> <p style="text-align: center;">Photosynthesis</p>	<ol style="list-style-type: none"> <li>1. Understanding aerobic respiration</li> <li>2. Exploring respiration in sport</li> <li>3. Understanding anaerobic respiration</li> <li>4. Investigating fermentation</li> <li>5. Comparing aerobic and anaerobic respiration</li> <li>6. Exploring how plants make food</li> <li>7. Looking at leaves</li> <li>8. Exploring the movement of water and minerals in plants</li> <li>9. Investigating the importance of minerals to plants</li> <li>10. Investigating photosynthesis</li> </ol>	<ul style="list-style-type: none"> <li>• Describe similarities and differences between aerobic and anaerobic respiration.</li> <li>• Suggest reasons for particular adaptations of leaves, roots and stems.</li> </ul>	<p><b>Homework:</b> Topic guide with keywords to learn</p> <p><b>Homework:</b> Getting 'GCSE' ready practice questions to research</p> <p><b>End of unit test:</b> Know, apply &amp; extended knowledge test.</p>
4	<p><b>Energy:-</b>                      Work</p> <p style="text-align: center;">Heating and cooling</p>	<ol style="list-style-type: none"> <li>1. Doing work</li> <li>2. Making work easier</li> <li>3. Explaining thermal energy</li> <li>4. How heat travels</li> <li>5. How to stop heat from travelling</li> <li>6. Energy and temperature</li> </ol>	<ul style="list-style-type: none"> <li>• Use the formula: work done (J) = force (N) x distance moved (m) to compare energy transferred for objects moving horizontally.</li> <li>• Sketch a graph to show the pattern of temperature change against time.</li> </ul>	<p><b>Homework:</b> Topic guide with keywords to learn</p> <p><b>Homework:</b> Getting 'GCSE' ready practice questions to research</p> <p><b>End of unit test:</b> Know, apply &amp; extended knowledge test.</p>

5	<b>Earth:-</b>  Climate  Earth's resources	<ol style="list-style-type: none"> <li>1. Understanding our atmosphere</li> <li>2. Understanding how carbon is recycled</li> <li>3. Exploring how humans affect the carbon cycle</li> <li>4. Understanding global warming</li> <li>5. Exploring damage to the Earth's resources</li> <li>6. Considering the importance of recycling</li> <li>7. How to extract metals</li> </ol>	<ul style="list-style-type: none"> <li>• Evaluate claims that human activity is causing global warming or climate change.</li> <li>• Suggest ways in which changes in behaviour and the use of alternative materials may limit the consumption of natural resources.</li> </ul>	<p><b>Homework:</b> Topic guide with keywords to learn</p> <p><b>Homework:</b> Getting 'GCSE' ready practice questions to research</p> <p><b>End of unit test:</b> Know, apply &amp; extended knowledge test.</p>
5	<b>Genes:-</b>  Evolution  Inheritance	<ol style="list-style-type: none"> <li>1. Explaining natural selection</li> <li>2. Understanding the importance of biodiversity</li> <li>3. Explaining extinction</li> <li>4. Understanding the nature of genetic material</li> <li>5. Exploring the role of chromosomes</li> <li>6. Understanding variation</li> <li>7. Modelling inheritance</li> </ol>	<ul style="list-style-type: none"> <li>• Predict and explain the changes in a population over time due to natural selection.</li> <li>• Suggest arguments for and against genetic modification.</li> </ul>	<p><b>Homework:</b> Topic guide with keywords to learn</p> <p><b>Homework:</b> Getting 'GCSE' ready practice questions to research</p> <p><b>End of unit test:</b> Know, apply &amp; extended knowledge test.</p>
6	<b>Waves:-</b>  Wave effects  Wave properties	<ol style="list-style-type: none"> <li>1. Exploring sound</li> <li>2. Sound systems</li> <li>3. Exploring light</li> <li>4. Exploring waves</li> <li>5. Comparing transverse and longitudinal waves</li> </ol>	<ul style="list-style-type: none"> <li>• Suggest reasons why sound waves can agitate a liquid for cleaning objects, or massage muscles for physiotherapy.</li> <li>• Suggest what happens when two waves combine.</li> </ul>	<p><b>Homework:</b> Topic guide with keywords to learn</p> <p><b>Homework:</b> Getting 'GCSE' ready practice questions to research</p> <p><b>End of unit test:</b> Know, apply &amp; extended knowledge test.</p>