

# Science



## Year 8 Curriculum Map




## Year 8 – Autumn Term 1

### 8A - Food & Nutrition

### 8E - Combustion

<b>Prior Learning</b>	<p><b>8A - Food &amp; Nutrition</b> From key stage 2, pupils should be able to recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. From previous units, most pupils will be able to recall the main parts of the digestive system (7A); describe how some cells are adapted to the functions (7A); describe how soluble substances are carried by the blood (7C); explain the importance of a healthy skeleton (7C); recall some of the effects of alcohol on the body (7C); describe how animals depend on other animals and plants for food (7D); describe what happens during diffusion, in terms of particles (7G); compare energy values of different foods using labels, including interpreting nutrition information labels (7I).</p> <p><b>8E - Combustion</b> From previous units, pupils should be able to define the term fuel (7I); name the three states of matter and describe their properties (7G); describe features of chemical reactions (7F, 7H); be able to carry out the test for carbon dioxide (7H).</p>
<b>What will I learn?</b>	<p><b>8A - Food &amp; Nutrition</b> This unit looks at the main components in the human diet and why they are needed. The digestive system is also covered in some detail, and the idea of enzymes is introduced.</p> <p><b>8E - Combustion</b> This unit uses the context of combustion engines to cover combustion and oxidation reactions, including those of hydrocarbons, metals and non-metals. The idea of an exothermic reaction is introduced and there is also a look at the pollution of the air by the products of fossil fuel combustion. There are opportunities to discuss the impact of global warming and methods for controlling carbon dioxide emissions.</p>
<b>How will I be assessed?</b>	<p><b>8A - Food &amp; Nutrition</b> Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p> <p><b>8E - Combustion</b> Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p>
<b>Next Steps</b>	<p><b>8A - Food &amp; Nutrition</b> 8C - Breathing &amp; Respiration B1 - Cell Biology B2 - Organisation B4 - Bioenergetics</p> <p><b>8E - Combustion</b> 8F - Periodic Table 8G - Metals &amp; their uses 9F - Reactivity C5 - Energy changes</p>
<b>Opportunities for Independent Learning</b>	<p><b>8A - Food &amp; Nutrition</b> <a href="#">BBC Bitesize – Food, Digestion and Excretion Video clips</a></p> <p><b>8E - Combustion</b> <a href="#">BBC Bitesize - Combustion</a></p>

	<a href="#">Combustion of natural gas video clip</a> <a href="#">Complete and incomplete combustion video clip</a>
<b>Personal Development and CEIAG</b>	<p><b>8A - Food &amp; Nutrition</b>  Pupils will learn about the importance of a healthy, balanced diet and there are opportunities to explore careers in the health care services, e.g. dietician. Pupils will have further opportunities to identify the risks involved in using potentially hazardous chemicals/apparatus and develop their knowledge and confidence at using them safely. Explore career opportunities in health and a dietician.</p> <p><b>8E - Combustion</b>  This is an opportunity for pupils to develop their understanding of how combustion impacts the environment (pollution, acid rain, global warming) as well as exploring careers in the energy sector. Explore career opportunities in earth science, fuel production, chemical industry and climatologist.</p>
<b>Enrichment Opportunities (Cultural Capital)</b>	<p><b>8A - Food &amp; Nutrition</b>  'Supersize Me' film  <a href="#">Junior Doctor experience at The Body Worlds Museum, London</a>  <a href="#">Make a model gut</a>  <a href="#">How much plastic do you eat?</a>  <a href="#">What happens when you don't brush your teeth? BBC Earth lab – Diet video clips</a></p> <p><b>8E - Combustion</b>  <a href="#">Manchester Museum of Science and Industry</a>  Research into how to combat the effects of acid rain  <a href="#">James Dyson Foundation challenge</a> - 16 Fire Extinguisher  <a href="#">BBC Earth lab combustion video clips</a></p>

	<p><b>Year 8 – Autumn Term 2</b>  <b>8F - Periodic Table</b>  <b>8I – Fluids</b></p>
<b>Prior Learning</b>	<p><b>8F - Periodic Table</b>  From previous units, pupils should be able to describe the difference between chemical and physical changes (7H); use the particle model to explain other observations about matter (7G); describe elements, mixtures and compounds using words and particle diagrams (7H); use chemical symbols for common elements and explain why they are an international code (7H); describe and identify metals and non-metals by their properties (7H); describe the changes you might see when compounds are formed (7H); name simple compounds and use word equations to describe chemical reactions (7H).</p> <p><b>8I - Fluids</b>  From key stage 2, pupils should be able to classify substances as solids, liquids or gases; observe and name changes of state; identify the effects of air resistance and water resistance. From previous units, most pupils may be able to use the particle model to explain the properties of solids, liquids and gases (7G); understand how particles in a gas cause pressure (7G); identify differences between chemical and physical changes (7H); describe the effects of balanced and unbalanced forces on objects (7K).</p>
<b>What will I learn?</b>	<p><b>8F - Periodic Table</b>  This unit uses the context of fireworks to develop pupils' understanding of matter, atoms and chemical and physical change. Pupils then look at using the trends in the periodic table to make predictions about physical and chemical properties of elements and their compounds.</p>

	<p><b>8I - Fluids</b> This unit looks at changes of state, and then goes on to look at fluids and some of their effects, including pressure, floating and sinking, and drag.</p>
<b>How will I be assessed?</b>	<p><b>8F - Periodic Table</b> Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p> <p><b>8I - Fluids</b> Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p>
<b>Next Steps</b>	<p><b>8F - Periodic Table</b> 8G - Metals &amp; their Uses 9E - Materials Year 9 - Chemistry Transition Unit C1-9 Fundamental knowledge</p> <p><b>8I - Fluids</b> P3 - Particle Model of Matter</p>
<b>Opportunities for Independent Learning</b>	<p><b>8F - Periodic Table</b> <a href="#">BBC Bitesize – The Periodic Table</a> <a href="#">Introduction to atoms and elements video clip</a> <a href="#">Period in the Periodic Table video clip</a></p> <p><b>8I - Fluids</b> <a href="#">BBC Bitesize - Pressure in liquids</a> <a href="#">Changes of state video clip</a> <a href="#">BBC Earth lab video clips - Fluids</a></p>
<b>Personal Development and CEIAG</b>	<p><b>8F - Periodic Table</b> Pupils will have further opportunities to identify the risks involved in using potentially hazardous chemicals/apparatus and develop their knowledge and confidence at using them safely. Explore career opportunities in the chemical industry.</p> <p><b>8I - Fluids</b> Pupils will have further opportunities to identify the risks involved in using potentially hazardous apparatus and develop their knowledge and confidence at using it safely. Explore career opportunities in mechanical engineering.</p>
<b>Enrichment Opportunities (Cultural Capital)</b>	<p><b>8I - Fluids</b> <a href="#">James Dyson Foundation challenges:</a></p> <ol style="list-style-type: none"> <li>1. Changing state</li> <li>3. Floating ping-pong balls</li> <li>5. Liquid densities</li> <li>6. Expanding gases</li> <li>7. Tornado in a bottle</li> <li>14. Weather balloon</li> <li>18. Dancing raisins</li> <li>19. How to make a lava lamp</li> <li>20. Ivory soap</li> </ol> <p><b>8F - Periodic Table</b> <a href="#">Interactive Periodic Table</a> (Royal Society of Chemistry) <a href="#">The genius of Mendeleev's Periodic Table video clip</a> <a href="#">Periodic Table bingo</a> <a href="#">Catalyst Science Discovery Centre &amp; Museum (Widness)</a> <a href="#">James Dyson Foundation challenges</a> - 22 Invisible ink</p>




## Year 8 – Spring Term 1

### 8L - Sound


### 8J - Light

<b>Prior Learning</b>	<p><b>8L – Sound</b> From key stage 2, pupils should be able to name a variety of sound sources; recall that sounds get fainter with distance; explain that sounds are made by vibrations; link the size of an object with the pitch of the sound it produces; link the volume of a sound with the size of the vibrations producing it. From previous units, pupils should be able to recall that animals need to attract mates (7A, 7D); ultrasound scans are used to make images of a developing foetus (7B); some animals are only active at night and have adaptations for this (7D).</p> <p><b>8J - Light</b> From key stage 2, pupils should understand that light travels in straight lines and use this idea to explain how objects are seen; explain why shadows have the same shape as the objects that cast them and predict the size of shadows when the position of the light source changes. From previous units, most pupils may be able to recall that energy is transferred by waves (7L); describe different kinds of wave (7L); recall that waves travel at different speeds in different materials (7L).</p>
<b>What will I learn?</b>	<p><b>8L – Sound</b> This unit looks at how sounds are made, transmitted and detected, some uses of sound and compares sound waves with waves on the surface of water.</p> <p><b>8J - Light</b> This unit revises work from KS2 on light, which is then extended to consider how light travels and what happens when it meets an object. The unit is set in the context of stage, film and illusions.</p>
<b>How will I be assessed?</b>	<p><b>8L – Sound</b> Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p> <p><b>8J - Light</b> Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p>
<b>Next Steps</b>	<p><b>8L – Sound</b> P6 - Waves</p> <p><b>8J - Light</b> P6 - Waves</p>
<b>Opportunities for Independent Learning</b>	<p><b>8L – Sound</b> <a href="#">BBC Bitesize – Sounds Waves</a> <a href="#">Transverse and longitudinal waves video clip</a> Pupils have access to Seneca for practice questions in the Sound section <a href="https://app.senecalearning.com/">https://app.senecalearning.com/</a></p> <p><b>8J - Light</b> <a href="#">BBC Bitesize - Light waves</a> <a href="#">Waves – reflection, refraction and diffraction video clip</a> <a href="#">Longitudinal and transverse waves video clip</a></p>

<b>Personal Development and CEIAG</b>	<p><b>8L – Sound</b> Pupils will have further opportunities to identify the risks involved in using potentially hazardous apparatus and develop their knowledge and confidence at using it safely. In addition to this, there are opportunities to explore careers in sound production, e.g. sound effects, and health care services that use sound, e.g. audiology, sonography, physiotherapy.</p> <p><b>8J - Light</b> Within the unit there are plenty of opportunities to explore careers in the health care services, e.g. optometry, and photography.</p>
<b>Enrichment Opportunities (Cultural Capital)</b>	<p><b>8L – Sound</b> Further research into how <a href="#">animals communicate</a> <a href="#">Top 10 Animal Sounds</a> <a href="#">Manchester Museum of Science and Industry</a> Institute of Physics – Do try this at home - <a href="https://www.iop.org/explore-physics/at-home/episode-1-rubber-band-bass-guitar">https://www.iop.org/explore-physics/at-home/episode-1-rubber-band-bass-guitar</a></p> <p><b>8J - Light</b> <a href="#">Camera Obscura &amp; World of Illusions (Edinburgh)</a> <a href="#">Scientific Eye – Light &amp; Colour</a> <a href="#">Science in Action – Light &amp; Refraction</a> <a href="#">James Dyson Foundation challenges</a> - 13 Measure the speed of light</p>

	<p><b>Year 8 – Spring Term 2</b> <b>8C - Breathing &amp; Respiration</b> <b>8G - Metals and their Uses</b></p>
<b>Prior Learning</b>	<p><b>8C - Breathing &amp; Respiration</b> From Year 7, pupils should be able to recall how cells, tissues, organs and organ systems are related (7A); describe how some cells are adapted for certain functions (7A, 7B, 7C); recall that respiration and breathing are not the same (7C); describe how certain drugs affect the body (7C); describe how the circulatory system carries food and oxygen around the body (7C); describe diffusion (7G); explain the concept of air pressure (7G).</p> <p><b>8G - Metals and their Uses</b> From previous units, pupils should be able to describe the difference between chemical and physical changes (7H); use the particle model to explain other observations about matter (7G); describe elements, mixtures and compounds using words and particle diagrams (7H); use chemical symbols for common elements (7H); describe and identify metals and non-metals by their properties (7H); describe the changes you might see when compounds are formed (7H); name simple compounds and use word equations to describe chemical reactions (7H).</p>
<b>What will I learn?</b>	<p><b>8C - Breathing &amp; Respiration</b> Under the broad theme of water sports, this unit covers gas exchange in humans and other organisms, together with details of aerobic and anaerobic respiration in humans.</p> <p><b>8G - Metals and their Uses</b> This unit uses the context of metals used in building to review common physical properties of metals, and to introduce their main chemical properties. The idea that reactions can occur at different speeds is also illustrated and this leads to the introduction of the general reactivity series of metals</p>

<p><b>How will I be assessed?</b></p>	<p><b>8C - Breathing &amp; Respiration</b> Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p> <p><b>8G - Metals and their Uses</b> Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p>
<p><b>Next Steps</b></p>	<p><b>8C - Breathing &amp; Respiration</b> B2 - Organisation B4 - Bioenergetics Year 9 - Biology Transition unit</p> <p><b>8G - Metals and their Uses</b> 9F - Materials Year 9 - Chemistry Transition Unit C2 - Bonding, structure and properties of matter</p>
<p><b>Opportunities for Independent Learning</b></p>	<p><b>8C - Breathing &amp; Respiration</b> <a href="#">BBC Bitesize - Respiration</a> <a href="#">Aerobic respiration video clip</a> <a href="#">Respiratory system video clip</a> <a href="#">Respiration 3D Animation</a> <a href="#">BBC Earth lab video clip - Getting energy from food (Live experiment)</a></p> <p><b>8G - Metals and their Uses</b> <a href="#">BBC Bitesize - Metals</a> <a href="#">BBC Bitesize – The reactivity series</a> <a href="#">BBC Earth lab video clips - Metals</a></p>
<p><b>Personal Development and CEIAG</b></p>	<p><b>8C - Breathing &amp; Respiration</b> Pupils will learn how healthy organ systems function and there are opportunities to explore careers in sports science.</p> <p><b>8G - Metals and their Uses</b> Pupils will have further opportunities to identify the risks involved in using potentially hazardous chemicals/apparatus and develop their knowledge and confidence at using them safely. Explore career opportunities in the chemical industry.</p>
<p><b>Enrichment Opportunities (Cultural Capital)</b></p>	<p><b>8C Breathing &amp; Respiration</b> Scuba diving Research into heart and lung transplants</p> <p><b>8G Metals and their Uses</b> Research into artwork made from metal, e.g. The Angel of the North, the Kelpies in Falkirk. <a href="#">James Dyson Foundation challenges</a> – 9 Bright as a Penny</p>

	<p><b>Year 8 – Summer Term 1</b></p> <p><b>8D - Unicellular Organisms</b></p> <p><b>8K - Energy Transfers</b></p>
<p><b>Prior Learning</b></p>	<p><b>8D - Unicellular Organisms</b> From key stage 2, pupils should be able to recall that microorganisms are tiny living things. From year 7, pupils should be able to recall the seven life processes (7A); recall how cells, tissues, organs and organ systems are related (7A); describe how some cells are adapted</p>

	<p>for certain functions (7A, 7B, 7C); describe how organisms are interdependent in an ecosystem (7D); describe diffusion (7G).</p> <p><b>8K - Energy Transfers</b>  From previous work, most pupils will be able to use the particle model of matter to explain the properties of solids, liquids and gases (7G); recall some ways in which energy is transferred and stored (7I); recall the law of conservation of energy, and that the efficiency of a machine tells us how much energy is transferred as wasted energy (7I).</p>
<b>What will I learn?</b>	<p><b>8D - Unicellular Organisms</b>  Under the broad theme of diseases, this unit takes a detailed look at what unicellular organisms are, the differences between different types, their problems and their uses.</p> <p><b>8K - Energy Transfers</b>  This unit looks at energy transfers by heating in the context of homes.</p>
<b>How will I be assessed?</b>	<p><b>8D Unicellular Organisms</b>  Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class.  Summative – end of topic test.</p> <p><b>8K Energy Transfers</b>  Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class.  Summative – end of topic test.</p>
<b>Next Steps</b>	<p><b>8D Unicellular Organisms</b>  Year 9 - Biology Transition unit  B3 - Infection and response</p> <p><b>8K - Energy Transfers</b>  Year 9 - Physics transition unit  P1 - Energy</p>
<b>Opportunities for Independent Learning</b>	<p><b>8D - Unicellular Organisms</b>  <a href="#">BBC Bitesize – Unicellular organisms</a>  <a href="#">BBC Bitesize – What are bacteria?</a>  <a href="#">BBC Earth lab video clips - Bacteria</a></p> <p><b>8K - Energy Transfers</b>  <a href="#">Conduction, convection and radiation video clip</a>  <a href="#">BBC Bitesize – Conservation of energy</a>  <a href="#">Science in Action – Heat and temperature video clip</a>  <a href="#">Scientific Eye – Temperature and heat video clip</a></p>
<b>Personal Development and CEIAG</b>	<p><b>8D - Unicellular Organisms</b>  Pupils will learn about disease and there are opportunities to explore careers in the health care services, e.g. pathology and epidemiology. Pupils will have further opportunities to identify the risks involved in using potentially hazardous chemicals/apparatus and develop their knowledge and confidence at using them safely. Explore career opportunities in microbiology, ecology and brewing.</p> <p><b>8K - Energy Transfers</b>  Pupils will have further opportunities to identify the risks involved in using potentially hazardous apparatus and develop their knowledge and confidence at using it safely. Explore career opportunities in the energy sector and engineering.</p>
<b>Enrichment Opportunities (Cultural Capital)</b>	<p><b>8D - Unicellular Organisms</b>  Research into different bacterial and fungal diseases  Build a model of a bacterial cell  Baking bread (using yeast)</p>



	<p>Cheese and yoghurt making</p> <p><a href="#">Yeast respiration virtual experiment</a></p> <p><a href="#">Effect of penicillin on bacterial growth virtual experiment</a></p> <p><b>8K - Energy Transfers</b></p> <p>Exploring energy efficiency ratings of appliances found at home</p> <p><a href="#">Make a convection spiral</a></p> <p><a href="#">Tested! Conservation of Energy Principle video clip</a></p> <p><a href="#">Conservation of energy – Brian Cox Wonders of Life video clip</a></p> <p><a href="#">James Dyson Foundation challenges</a> - 2 Underwater volcano</p>
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	<h2>Year 8 – Summer Term 2</h2> <h3>8H - Rocks</h3> <h3>8M - Earth &amp; Space</h3>
<p><b>Prior Learning</b></p>	<p><b>8H – Rocks</b></p> <p>From key stage 2, pupils should be able to compare and group together different kinds of rocks on the basis of their appearance and simple physical properties; describe in simple terms how fossils are formed when things that have lived are trapped within rock. From previous units, most pupils will be able to describe elements, compounds and mixtures, chemical and physical changes (7H).</p> <p><b>8M - Earth &amp; Space</b></p> <p>From key stage 2, pupils should be able to describe the movement of the Earth and other planets relative to the Sun; describe the movement of the Moon relative to the Earth; describe the Sun, Earth and Moon as approximately spherical bodies; use the idea of the Earth’s rotation to explain day and night. From previous units, most pupils will be able to describe the difference between weight and mass (7K); recall the direction in which gravity acts (7K).</p>
<p><b>What will I learn?</b></p>	<p><b>8H – Rocks</b></p> <p>This unit examines the different types of rock and the processes that bring about their formation, leading to the idea of a rock cycle that operates within a huge geological timescale. It also looks at the Earth as a source of resources and the advantages of recycling metals. The unit is set in the context of natural disasters.</p> <p><b>8M - Earth &amp; Space</b></p> <p>This unit builds on work from key stage 2 on the Solar System and looks at the Earth, including the seasons and the Earth’s magnetic field and gravity. It also looks at the Solar System and what is beyond the Solar System. The theme is exploring the Solar System– in terms of observations and the use of models as well as via astronauts and space probes.</p>
<p><b>How will I be assessed?</b></p>	<p><b>8H – Rocks</b></p> <p>Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p> <p><b>8M - Earth &amp; Space</b></p> <p>Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p>
<p><b>Next Steps</b></p>	<p><b>8H – Rocks</b></p> <p>C9 - Chemistry of the atmosphere</p> <p><b>8J - Earth &amp; Space</b></p> <p>P8 - Space Physics – Separate physics only</p>

<p><b>Opportunities for Independent Learning</b></p>	<p><b>8H – Rocks</b>  <a href="#">BBC Bitesize - Rock</a>  <a href="#">BBC Bitesize – The rock cycle</a>  <a href="#">Science in Action – Rocks video clip</a>  <a href="#">Scientific Eye – Rocks video clip</a></p> <p><b>8M - Earth &amp; Space</b>  <a href="#">BBC Bitesize - Space</a>  <a href="#">Space video clips</a>  <a href="#">Moon calendar</a>  <a href="#">BBC Earth lab video clips - Space</a></p>
<p><b>Personal Development and CEIAG</b></p>	<p><b>8H – Rocks</b>  Pupils will have further opportunities to identify the risks involved in using potentially hazardous chemicals/apparatus and develop their knowledge and confidence at using them safely. They will also be able to explore careers in areas such as geology, palaeontology and volcanology.</p> <p><b>8M - Earth &amp; Space</b>  This units provides an opportunity for pupil to look into careers in the field of astronomy and space exploration. Explore career opportunities in astronomy, working for NASA and earth science.</p>
<p><b>Enrichment Opportunities (Cultural Capital)</b></p>	<p><b>8H - Rocks</b>  <a href="#">Fossil hunting</a>  <a href="#">The Lapworth Museum of Geology (Birmingham)</a>  <a href="#">Natural History Museum (London)</a>  <a href="#">Make a model volcano</a></p> <p><b>8M - Earth &amp; Space</b>  <a href="#">Jodrell Bank Discovery Centre (Macclesfield)</a>  <a href="#">National Space Centre (Leicester)</a>  <a href="#">The Royal Observatory (London)</a>  <a href="#">Stargazing</a>  <a href="#">BBC News – Space topics</a>  <a href="#">Live stream from International Space Station</a>  Make a model Solar System</p>