

Science



Year 8 Curriculum Map




Year 8 – Autumn Term 1

8A - Food & Nutrition


8E - Combustion

Prior Learning	<p>8A - Food & Nutrition 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>8E - Combustion 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>
What will I learn?	<p>8A - Food & Nutrition 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>8E - Combustion 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>
How will I be assessed?	<p>8A - Food & Nutrition 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>8E - Combustion 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>
Next Steps	<p>8A - Food & Nutrition 8C - Breathing & Respiration B1 - Cell Biology B2 - Organisation B4 - Bioenergetics</p> <p>8E - Combustion 8F - Periodic Table 8G - Metals & their uses 9F - Reactivity C5 - Energy changes</p>
Opportunities for Independent Learning	<p>8A - Food & Nutrition BBC Bitesize – Food, Digestion and Excretion Video clips</p> <p>8E - Combustion BBC Bitesize - Combustion</p>

	Combustion of natural gas video clip Complete and incomplete combustion video clip
Personal Development and CEIAG	<p>8A - Food & Nutrition 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>8E - Combustion 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>
Enrichment Opportunities (Cultural Capital)	<p>8A - Food & Nutrition 'Supersize Me' film Junior Doctor experience at The Body Worlds Museum, London Make a model gut How much plastic do you eat? What happens when you don't brush your teeth? BBC Earth lab – Diet video clips</p> <p>8E - Combustion Manchester Museum of Science and Industry Research into how to combat the effects of acid rain James Dyson Foundation challenge - 16 Fire Extinguisher BBC Earth lab combustion video clips</p>

	<h2>Year 8 – Autumn Term 2</h2> <h3>8I - Fluids</h3>
Prior Learning	<p>8I - Fluids 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>
What will I learn?	<p>8I - Fluids 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>
How will I be assessed?	<p>8I - Fluids 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>
Next Steps	<p>8I - Fluids P3 - Particle Model of Matter</p>
Opportunities for	<p>8I - Fluids BBC Bitesize - Pressure in liquids Changes of state video clip</p>

Independent Learning	BBC Earth lab video clips - Fluids
Personal Development and CEIAG	<p>8I - Fluids</p> <p>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>
Enrichment Opportunities (Cultural Capital)	<p>8I - Fluids</p> <p>James Dyson Foundation challenges:</p> <ol style="list-style-type: none"> 1. Changing state 3. Floating ping-pong balls 5. Liquid densities 6. Expanding gases 7. Tornado in a bottle 14. Weather balloon 18. Dancing raisins 19. How to make a lava lamp 20. Ivory soap

	<p>Year 8 – Spring Term 1</p> <p>8F - Periodic Table</p> <p>8I - Light</p>
Prior Learning	<p>8F - Periodic Table</p> <p>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>8I - Light</p> <p>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>
What will I learn?	<p>8F - Periodic Table</p> <p>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>8I - Light</p> <p>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>

<p>How will I be assessed?</p>	<p>8F - Periodic Table 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>8I - Light 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>Next Steps</p>	<p>8F - Periodic Table 8G - Metals & their Uses 9E - Materials Year 9 - Chemistry Transition Unit C1-9 Fundamental knowledge</p> <p>8I - Light P6 - Waves</p>
<p>Opportunities for Independent Learning</p>	<p>8F - Periodic Table BBC Bitesize – The Periodic Table Introduction to atoms and elements video clip Period in the Periodic Table video clip</p> <p>8I - Light BBC Bitesize - Light waves Waves – reflection, refraction and diffraction video clip Longitudinal and transverse waves video clip</p>
<p>Personal Development and CEIAG</p>	<p>8F - Periodic Table 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>8I - Light Within the unit there are plenty of opportunities to explore careers in the health care services, e.g. optometry, and photography.</p>
<p>Enrichment Opportunities (Cultural Capital)</p>	<p>8F - Periodic Table Interactive Periodic Table (Royal Society of Chemistry) The genius of Mendeleev's Periodic Table video clip Periodic Table bingo Catalyst Science Discovery Centre & Museum (Widness) James Dyson Foundation challenges - 22 Invisible ink</p> <p>8I - Light Camera Obscura & World of Illusions (Edinburgh) Scientific Eye – Light & Colour Science in Action – Light & Refraction James Dyson Foundation challenges - 13 Measure the speed of light</p>




Year 8 – Spring Term 2

8C - Breathing & Respiration


8G - Metals and their Uses

Prior Learning	<p>8C - Breathing & Respiration 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>8G - Metals and their Uses 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>
What will I learn?	<p>8C - Breathing & Respiration 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>8G - Metals and their Uses 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>
How will I be assessed?	<p>8C - Breathing & Respiration 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>8G - Metals and their Uses 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>
Next Steps	<p>8C - Breathing & Respiration B2 - Organisation B4 - Bioenergetics Year 9 - Biology Transition unit</p> <p>8G - Metals and their Uses 9F - Materials Year 9 - Chemistry Transition Unit C2 - Bonding, structure and properties of matter</p>
Opportunities for Independent Learning	<p>8C - Breathing & Respiration BBC Bitesize - Respiration Aerobic respiration video clip Respiratory system video clip Respiration 3D Animation BBC Earth lab video clip - Getting energy from food (Live experiment)</p>

	<p>8G - Metals and their Uses BBC Bitesize - Metals BBC Bitesize – The reactivity series BBC Earth lab video clips - Metals</p>
Personal Development and CEIAG	<p>8C - Breathing & Respiration Pupils will learn how healthy organ systems function and there are opportunities to explore careers in sports science.</p> <p>8G - Metals and their Uses 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>
Enrichment Opportunities (Cultural Capital)	<p>8C Breathing & Respiration Scuba diving Research into heart and lung transplants</p> <p>8G Metals and their Uses Research into artwork made from metal, e.g. The Angel of the North, the Kelpies in Falkirk. James Dyson Foundation challenges – 9 Bright as a Penny</p>

	<p>Year 8 – Summer Term 1 8D - Unicellular Organisms 8K - Energy Transfers</p>
Prior Learning	<p>8D - Unicellular Organisms 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 for certain functions (7A, 7B, 7C); describe how organisms are interdependent in an ecosystem (7D); describe diffusion (7G).</p> <p>8K - Energy Transfers 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>
What will I learn?	<p>8D - Unicellular Organisms 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>8K - Energy Transfers This unit looks at energy transfers by heating in the context of homes.</p>
How will I be assessed?	<p>8D Unicellular Organisms 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>8K Energy Transfers 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>
Next Steps	8D Unicellular Organisms

	<p>Year 9 - Biology Transition unit B3 - Infection and response</p> <p>8K - Energy Transfers Year 9 - Physics transition unit P1 - Energy</p>
Opportunities for Independent Learning	<p>8D - Unicellular Organisms BBC Bitesize – Unicellular organisms BBC Bitesize – What are bacteria? BBC Earth lab video clips - Bacteria</p> <p>8K - Energy Transfers Conduction, convection and radiation video clip BBC Bitesize – Conservation of energy Science in Action – Heat and temperature video clip Scientific Eye – Temperature and heat video clip</p>
Personal Development and CEIAG	<p>8D - Unicellular Organisms 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>8K - Energy Transfers 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>
Enrichment Opportunities (Cultural Capital)	<p>8D - Unicellular Organisms Research into different bacterial and fungal diseases Build a model of a bacterial cell Baking bread (using yeast) Cheese and yoghurt making Yeast respiration virtual experiment Effect of penicillin on bacterial growth virtual experiment</p> <p>8K - Energy Transfers Exploring energy efficiency ratings of appliances found at home Make a convection spiral Tested! Conservation of Energy Principle video clip Conservation of energy – Brian Cox Wonders of Life video clip James Dyson Foundation challenges - 2 Underwater volcano</p>

	<p>Year 8 – Summer Term 2</p> <p>8H - Rocks</p> <p>8L - Earth & Space</p>
Prior Learning	<p>8H – Rocks 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>8L - Earth & Space 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>
What will I learn?	<p>8H – Rocks 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>8L - Earth & Space 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>
How will I be assessed?	<p>8H – Rocks 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>8L - Earth & Space 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>
Next Steps	<p>8H – Rocks C9 - Chemistry of the atmosphere</p> <p>8L - Earth & Space P8 - Space Physics – Separate physics only</p>
Opportunities for Independent Learning	<p>8H – Rocks BBC Bitesize - Rock BBC Bitesize – The rock cycle Science in Action – Rocks video clip Scientific Eye – Rocks video clip</p> <p>8L - Earth & Space BBC Bitesize - Space Space video clips Moon calendar BBC Earth lab video clips - Space</p>
Personal Development and CEIAG	<p>8H – Rocks 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>8L - Earth & Space 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>

Enrichment Opportunities (Cultural Capital)	<p>8H - Rocks</p> <p>Fossil hunting</p> <p>The Lapworth Museum of Geology (Birmingham)</p> <p>Natural History Museum (London)</p> <p>Make a model volcano</p> <p>8L - Earth & Space</p> <p>Jodrell Bank Discovery Centre (Macclesfield)</p> <p>National Space Centre (Leicester)</p> <p>The Royal Observatory (London)</p> <p>Stargazing</p> <p>BBC News – Space topics</p> <p>Live stream from International Space Station</p> <p>Make a model Solar System</p>
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