



<p><b>Year 7 Overall Curriculum Goal &amp; Intent</b></p> <ul style="list-style-type: none"> <li>To develop students' skills to allow them to conduct experiments safely, and produce meaningful and valid results</li> <li>To deepen students understanding of core concepts in science</li> <li>To link the curriculum to the opportunities that studying science at a higher level may lead to in future careers</li> <li>To go beyond the scope of the examined curriculum, so that students are enthused, deepening their interest in the opportunities that science can bring to improve life on Earth</li> <li>To go beyond the scope of the examined curriculum, so that students may understand their role in protecting the environment and the sustainability of the resources on the Earth</li> </ul>				<p><b>Key prior knowledge and skills</b></p> <p>Students have covered the KS2 science curriculum, introducing many key concepts. These include:</p> <p>Forces, electricity, light and sound          Living things and our environment          Chemical reactions, and the particle model</p>		
	<b>Topics B1</b>	<b>Topics B2</b>	<b>Topics C1</b>	<b>Topics C2</b>	<b>Topics P1</b>	<b>Topics P2</b>
<b>Topic Focus</b>	Systems	Humans	Particles	Reactions	Energy	Motion
<p><b>Summary of key knowledge &amp; skills</b></p> <p><b>What do you want students to know and learn?</b></p> <p><b>What are the opportunities for repetition and over-learning?</b></p>	<p>Students develop their skills to see small objects through microscopes. This also includes the scientific procedures for preparing samples to be viewed under a microscope.</p> <p>They review the work done in KS2 on living things, to identify the signs of life in a living organism, being able to use them to classify objects as living and not living.</p> <p>In living organisms, students will develop their understanding or organ systems, with a particular focus on some of the organ systems in humans.</p>	<p>Pupils learn about the science of reproduction as a life process carried out by living organisms.</p> <p>This topic focuses on the science of human reproduction, but also includes key ideas on how other living organisms reproduce and care for their offspring.</p> <p>Pupils develop the learning taken place in KS2 to identify the key organs in the male and female reproductive systems, and to understand the role each organ plays in the fertilisation of an egg, and the development of an embryo into a baby.</p>	<p>Students develop their work in KS2 classifying materials to identify the three states of matter, and use the particle model to describe how substances can change form one state to another.</p> <p>In KS2 students would have looked at simple separating techniques, this is developed to use more complex techniques, such as chromatographs, filtration and distillation.</p> <p>Students will consider our environmental responsibilities as humans, to look after the worlds resources, as they identify different waste disposal strategies and decide which is best to use in a given situation.</p>	<p>Pupils develop their understanding of chemical reactions through the use of acids and alkalis.</p> <p>Pupils begin to model chemical reactions using chemical equations.</p> <p>Students' knowledge about the use of models for atomic structure is developed. Students look at how atoms form elements and compounds, with a key idea on the arrangement of atoms in chemical reactions to describe the reaction.</p> <p>Students are taught how to work safely with a range of scientific chemicals.</p>	<p>In this topic pupils develop their understanding of different types of energy, which then leads to building on the work done in KS2 looking at how energy is transferred through the flow of electricity.</p> <p>In the energy part of the topic, pupils will consider the energy released when humans consume different foods. This leads to the development of practical methods to calculate the energy released by a range of different foods.</p> <p>The topic then leads to develop pupils' understanding of how energy is stored.</p>	<p>Forces – identifying forces and the effects they have on objects.</p> <p>Springs – Pupils start to investigate Hook's law, and its application.</p> <p>Friction – Pupils develop their understanding of frictional forces, and identify when friction is good, and when it causes wasted heat energy. Pupils develop ideas on how to reduce the friction in a system.</p> <p>Pressure – Students develop their work on forces, to identify how the area a force acts upon affects the pressure observed.</p>



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	The topic develops to look at the feeding relationships between living organisms, and the effects that external factors can have on these feeding relationships.	The topic then develops to look at the key organ systems in the human body, including the skeleton, the muscular system and the circulatory system.	Finally, pupils will revise the particle model, to describe how substances diffuse. Reinforcing the work already done in the particle model, in a new situation.	Skills in presenting and interpreting data are developed.	<p>Students consider the energy stored in fuels, developing the experimental task from earlier in the topic, to enable them to decide which hydrocarbon gives out the most energy.</p> <p>The topic continues with the energy theme to build on the work done in KS2 on renewable and non-renewable energy. In the electricity part of the topic, students' build on the work done in KS2 to build series and parallel circuits and to describe the flow of current through each circuit.</p>	<p>Students may carry out experiments to calculate pressure, and develop their understanding into a wide range of real world contexts to apply their knowledge.</p> <p>Sound – Students will form links with the work done on particle theory, to develop their ideas of how sound travels. This includes appreciating the differences in sound in different media, how the ear works, and the uses of sound in echolocation.</p>



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<b>Main common assessments</b>	<ul style="list-style-type: none"> <li>End of topic assessment</li> <li>40 minute standardised test with an extended written answer in the paper</li> </ul>	<ul style="list-style-type: none"> <li>End of topic assessment</li> <li>40 minute standardised test with an extended written answer in the paper</li> </ul>	<ul style="list-style-type: none"> <li>End of topic assessment</li> <li>40 minute standardised test with an extended written answer in the paper</li> </ul>	<ul style="list-style-type: none"> <li>End of topic assessment</li> <li>40 minute standardised test with an extended written answer in the paper</li> </ul>	<ul style="list-style-type: none"> <li>End of topic assessment</li> <li>40 minute standardised test with an extended written answer in the paper</li> </ul>	<ul style="list-style-type: none"> <li>End of topic assessment</li> <li>40 minute standardised test with an extended written answer in the paper</li> </ul>
<b>Extended writing tasks (at least two per long term)</b>	<ul style="list-style-type: none"> <li>Each topic includes a specific extended writing task that should be carried out by all classes. It includes an instruction sheet from the Badger Learning resources, and then pupils have 1 hour to complete the task. These tasks are given written feedback by the class teacher, and students are then expected to improve, or redraft their written work based on the teacher's feedback.</li> <li>The investigation tasks that are also within each topic will also include opportunities for students to create an extended written piece of work, whether this is in planning an investigation, or concluding and evaluating an investigation.</li> </ul>					
<b>Examples of opportunities for challenge</b>	<ul style="list-style-type: none"> <li>Some students will be given the opportunity to calculate the magnification of images seen in microscopes.</li> <li>Some students will be given the opportunity to identify how the different organ systems link to the seven signs of life.</li> </ul>	<ul style="list-style-type: none"> <li>Linking the number of eggs, or live offspring from a pregnancy to the care given to the offspring by the parents.</li> <li>Compare the different methods of fertilisation by different living organisms, and their success rate.</li> </ul>	<ul style="list-style-type: none"> <li>Using observations to identify the states of different matter, including more challenging examples such as colloids.</li> <li>Justify the most appropriate separation technique to use in a particular situation, giving detailed explanations with their reasoning.</li> </ul>	<ul style="list-style-type: none"> <li>Higher ability students will develop the word equations in this topic into symbol equations, with some pupils supported in trying to balance these symbol equations.</li> </ul>	<ul style="list-style-type: none"> <li>Identifying the different energy requirements for different people, giving reasons why some people require higher or lower energy consumption.</li> <li>Justify the best energy resources for a particular scenario, looking at a wide range of factors including environmental impact.</li> </ul>	<ul style="list-style-type: none"> <li>Pupils have the opportunity to be extended in this topic through developing their understanding of the everyday applications of forces and sound.</li> </ul>



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	<p><b>Topics B1</b></p> <ul style="list-style-type: none"> <li>Some students will be able to identify both natural and human factors that affect the feeding relationships between living organisms.</li> </ul>	<p><b>Topics B2</b></p> <ul style="list-style-type: none"> <li>Identify how cells are adapted to perform a particular role.</li> </ul>	<p><b>Topics C1</b></p> <ul style="list-style-type: none"> <li>Recognise examples where diffusion may cause problems.</li> </ul>	<p><b>Topics C2</b></p>	<p><b>Topics P1</b></p> <ul style="list-style-type: none"> <li>Linking the circuits they build in class to real life applications of circuits, as well as looking at the efficiency and efficacy of particular electrical circuits.</li> </ul>	<p><b>Topics P2</b></p>
<p><b>Links to numeracy, literacy and other subjects</b></p> <p><b>(Including Scientific enquiry Skills)</b></p>	<p>Students' will have the opportunity to develop their skills in presenting information in graphs, with both continuous and discreet variables.</p>	<p>Links to numeracy through the identification of different methods of fertilisation and their probability of success.</p>	<p>Links to numeracy through identifying patterns in results, and interpreting data.</p>	<p>In this topic, students will develop their skills in identifying risks in science, and how to reduce the effects of those risks. They will also develop their knowledge of safety symbols used in scientific environments.</p>	<p>Pupils will develop their skills to problem solve through 'fixing' circuits that do not work.</p> <p>Numeracy in looking at calculating the energy released by different fuels.</p> <p>Links to personal health through identifying the required energy amounts for different people.</p>	<p>Students develop their skills in accurately recording scientific measurements, and discuss how to improve the accuracy.</p> <p>Use of data collection techniques and graphing skills are included in this topic.</p>
<p><b>Enrichment, clubs, trips and other extra-curricular activities</b></p>	<p>Visit to Aerospace Museum with workshop of forces. This takes place about 6 months before this topic is taught, and then the topic will draw on the pupils experiences from this visit</p> <p>Visit to the Science Museum (London) in Term 6</p>					



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<b><u>Opportunities for links to careers</u></b>			<b><u>Opportunities for links to SMSC, PSHE, ethos and values</u></b>		
<p>Teachers are able to link to science-based careers throughout the topics taught in year 7. This includes careers based in scientific research, the environment, ecology and engineering.</p> <p>Students develop their DOTS Skills:</p> <ul style="list-style-type: none"> <li>Decision making</li> <li>Opportunity awareness of careers in science</li> <li>Transitioning – pupils find out about studying science at a higher level, including GCSE, A level and beyond</li> </ul> <p>Self-awareness – students will reflect on their skills throughout the year and recognise their strengths and weaknesses.</p>			<p>The impact humans have on the environment and other living organisms, and how humans can impact on the populations of other organisms.</p> <p>The lifelong decision parents make when they decide to reproduce and have children.</p> <p>Identifying the impact humans have on the Earth’s resources when we consider disposal of waste.</p> <p>Pupils will develop their skills in assessing risk throughout the year.</p>		
<b><u>How can parents support learning?</u></b>			<b><u>Other comments</u></b>		
<p>All students are given a revision guide in Year 7, parents can opt to purchase these so students can annotate them and personalise them for their own revision.</p> <p>Discussing scientific articles in the news, looking at some of the recent developments in science, beyond the curriculum, improving the breadth of students understanding on the role science takes in the world.</p>					



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	<b>Topics B3</b>	<b>Topics B4</b>	<b>Topics C3</b>	<b>Topics C4</b>	<b>Topics P3</b>	<b>Topics P4</b>
<b>Topic Focus</b>	Humans 2	Organisms	Reactions 2	Resources	Energy 2	Matter
<p><b>Summary of key knowledge &amp; skills</b></p> <p><b>What do you want students to know and learn?</b></p> <p><b>What are the opportunities for repetition and over-learning?</b></p>	<p>This topic starts by looking at the nutritional information for different foods, allowing an opportunity to revisit some of the work they did in year 7 on the energy stored in foods.</p> <p>This is then developed to consider the consequences of not eating a balanced diet, including over or under eating.</p> <p>Pupils consider the impact on health due to diseases caused by deficiency of vitamins and minerals.</p>	<p>Students revisit what they have learnt in the B2 topic (Year 7) where they looked at reproduction in humans. In this topic, this work is developed to consider reproduction in plants, where they have the opportunity to identify the similarities and differences.</p> <p>The topic then develops students understanding of microscopic living organisms including bacteria, fungi, and viruses.</p>	<p>Students will apply their knowledge and learning from year 7 in ideas about combustion and oxidation. They will use models of chemical reactions that have been learnt previously to describe chemical changed.</p> <p>Students will begin to learn about trends in chemical reactivity and link these to the periodic table</p> <p>Students will identify variables in experiments and discuss the quality of the data collected.</p>	<p>In this topic, students will review and develop their work looking at chemical reactions, through the development of their understanding of the reactions between metals and acid, as well as between metals and water.</p> <p>Students will develop their skills in improving their experimental scientific methods, using observations and data from experiments to form conclusions, with consideration on the quality of the data collected.</p>	<p>In this topic, students develop their understanding of light.</p> <p>Pupils develop their skills at drawing ray diagrams, through the application of describing how cameras work.</p> <p>The topic develops to look at other forms of energy including thermal energy and how the temperature of an object is linked to the objects thermal energy store.</p> <p>The topic then looks at energy transfers, and efficiency, which is done in the context of saving energy in the home, and using more energy efficient appliances.</p>	<p>In this topic, students link observations carried out on everyday objects, with the underlying particle theory of how the particles are moving in the object. This includes measuring the volume of regular and irregular objects, and then considering how materials change depending on environmental conditions.</p> <p>The topic then develops students understanding of the world we live in, with explaining the seasons, and the Earths' magnetic field.</p>



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	The topic develops to consider respiration in living organisms, including the role of various organ systems to aid reparation, and the effect of exercise on respiration.			Finally, in this topic students consider the Earth's resources. This includes the structure of the earth, and how the Earth's resources are used, such as the use of metals in batteries.		
<b>Main common assessments</b>	<ul style="list-style-type: none"> <li>End of topic assessment</li> <li>40 minute standardises test with an extended written answer in the paper</li> </ul>	<ul style="list-style-type: none"> <li>End of topic assessment</li> <li>40 minute standardises test with an extended written answer in the paper</li> </ul>	<ul style="list-style-type: none"> <li>End of topic assessment</li> <li>40 minute standardises test with an extended written answer in the paper</li> </ul>	<ul style="list-style-type: none"> <li>End of topic assessment</li> <li>40 minute standardises test with an extended written answer in the paper</li> </ul>	<ul style="list-style-type: none"> <li>End of topic assessment</li> <li>40 minute standardises test with an extended written answer in the paper</li> </ul>	<ul style="list-style-type: none"> <li>End of topic assessment</li> <li>40 minute standardises test with an extended written answer in the paper</li> </ul>
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<b>Examples of opportunities for challenge</b>	<ul style="list-style-type: none"> <li>Students can look at the history of deficiency diseases and the different treatment methods.</li> </ul>	<ul style="list-style-type: none"> <li>Comparing and contrasting the methods of reproduction for different living organisms.</li> </ul>	<ul style="list-style-type: none"> <li>Students will have the opportunities to make links between the chemical reactions, and trends observed to atomic structure.</li> </ul>	<ul style="list-style-type: none"> <li>Considering trends and patterns in results.</li> </ul>	<ul style="list-style-type: none"> <li>Students have the opportunity to build their ideas of the application of science in this topic, with</li> </ul>	<ul style="list-style-type: none"> <li>Students will be able to look at the application of the effect on external conditions on materials, to consider</li> </ul>



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	<p><b>Topics B3</b></p> <ul style="list-style-type: none"> <li>Developing the ability to plan to collect quantitative data when looking at the rate of exercise vs heart rate.</li> </ul>	<p><b>Topics B4</b></p> <ul style="list-style-type: none"> <li>Comparing and contrasting the similarities and differences between unicellular and multicellular living organisms.</li> </ul>	<p><b>Topics C3</b></p> <ul style="list-style-type: none"> <li>Evaluate evidence that has led to developing scientific theories.</li> </ul>	<p><b>Topics C4</b></p> <ul style="list-style-type: none"> <li>Developing scientific explanations regarding why all metals do not react in the same way.</li> <li>Considering the impact on the Earth due to human activities such as mining.</li> </ul>	<p><b>Topics P3</b></p> <p>opportunities for extended research.</p> <ul style="list-style-type: none"> <li>Students will be able to build their skills in comparing and contrasting the methods of saving energy in the home.</li> </ul>	<p><b>Topics P4</b></p> <p>the best materials to use for buildings.</p> <ul style="list-style-type: none"> <li>Students will be able to develop the work on volume, into deepening their understanding of density, and how density changes with external conditions varying.</li> </ul>
<p><b>Links to numeracy, literacy and other subjects</b></p> <p><b>(Including Scientific enquiry Skills)</b></p>	<p>Identify when reading should be repeated. Collect data systematically and with precision and accuracy, using a range of apparatus. Identify ranges in reading in data. Calculating means. Identify anomalous data.</p>		<p>Safety considerations when carrying out experiments, such as safety with fire. Impact of combustion on air quality.</p>	<p>Assessing data and information to form out own opinions and conclusions. Environmental impact on using the Earth's resources.</p>	<p>Accurate drawing of diagrams and calculations of energy efficiency. Developing skills in experimenting with light, and the methods for recording the path light takes through various objects.</p>	<p>Calculations of volume for regular shapes. Calculations of density, including multiple step calculations.</p>
<p><b>Enrichment, clubs, trips and other extra-curricular activities</b></p>	<p>Visit to Bristol Zoo, with a presentation on the human impact on the Earth's resources, and the impact this has on other living species</p>					





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<b><u>How can parents support learning?</u></b>			<b><u>Other comments</u></b>		
<p>All students are given a revision guide in Year 7, parents can opt to purchase these so students can annotate them and personalise them for their own revision.</p> <p>Discussing scientific articles in the news, looking at some of the recent developments in science, beyond the curriculum, improving the breadth of students understanding on the role science takes in the world.</p>					