

## Science Themes, Domains and Dimensions Upper KS2

Year	Theme	Domain	Scientific Dimensions			
		Biology Chemistry Physics	<b>Scientific knowledge</b> -conceptual understanding through the specific disciplines of biology, chemistry and physics	<b>Scientific enquiry</b> -understanding of the nature, processes and methods of science through different types of science enquiries	<b>Scientific application</b> understand the uses and implications of science, today and for the future.	Links to other knowledge and ideas
		Biology	The life cycles of a mammal, an amphibian, an insect and a bird Including the and aging in humans How and why living things are classified into broad groups according to common observable characteristics The functions of the main parts of the human circulatory system The impact of diet, exercise, drugs and lifestyle on the way their bodies function How nutrients and water are transported within animals, including humans That living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents How animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution That living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago	<b>Answer scientific questions using different types of scientific enquiry, including:</b> <ul style="list-style-type: none"> <li>observing changes over a period of time,</li> <li>noticing patterns, grouping and classifying things,</li> <li>carrying out simple comparative tests</li> <li>finding things out using secondary sources of information</li> </ul> Planning different types of scientific enquiries to answer questions, including: <ul style="list-style-type: none"> <li>controlling variables where necessary</li> <li>taking measurements</li> <li>using a range of scientific equipment with increasing accuracy and precision</li> <li>recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs</li> </ul> Reporting and presenting findings from enquiries, including	<b>Reflect on the interdependency of living things and how changes to habitat and the loss of species impact on other living things</b> Explain the main functions of the human and body and how to keep healthy Explain the impact of genetics on the next generation and how this can be both positive and negative Generalise about how and why species change and adapt over time in response to their environment Hypothesise about how and why species became	<b>Geography:</b> The impact of Pollution Ecosystems Global warming  PSHE Healthy living Diet and Exercise Care for the Environment  RE Respect for our planet and living things

				conclusions, causal relationships and explanations of results in written forms such as displays and other presentations	<b>extinct and relate this to endangered species today</b>	
		Chemistry	<p><b>That everyday materials can be compared on the basis of their properties</b></p> <p><b>That everyday materials, including metals, wood and plastic have particular uses based on their properties</b></p> <p><b>That dissolving, mixing and changes of state are reversible changes</b></p> <p><b>That solids, liquids and gasses can be separated, including through filtering, sieving and evaporating</b></p> <p><b>That some changes result in the formation of new materials, and that this kind of change is not usually reversible</b></p>		<p><b>Reflect on the choice of materials in everyday objects and consider what alternatives might be more environmentally friendly</b></p> <p><b>Evaluate reversible and irreversible changes of state in cooking</b></p>	<p><b>Links to DT</b></p> <p><b>Use of materials based on their properties</b></p> <p><b>Food tech</b></p> <p><b>Effects of mixing, heating sieving</b></p> <p><b>Links to PSHE</b></p> <p><b>Single use plastics and their alternative</b></p>

		Physics	<p>That unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p> <p>The effects of air resistance, water resistance and friction, that act between moving surfaces</p> <p>That some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect</p> <p>That light appears to travel in straight lines and explain how objects are seen because they give out or reflect light into the eye</p> <p>That we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes</p> <p>That light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p> <p>That the number and voltage of cells used in the circuit determines the brightness of a lamp or the volume of a buzzer and the impact of the position of on/off switches</p> <p>The recognised symbols when representing a simple circuit in a diagram</p>		<p>Designing vehicles that are aerodynamic</p> <p>Simple mechanisms in everyday use – link to DT to design a structure to lift a specified weight</p> <p>Bending light through refraction and reflection</p> <p>periscopes and kaleidoscopes</p> <p>Creating a lighting circuit for a model house</p> <p>Identifying all the different types of electrical appliances in their home</p> <p>Saving electricity</p>	<p>DT</p> <p>vehicle design</p> <p>Lifting mechanisms</p> <p>Drama</p> <p>periscopes and kaleidoscopes?</p>
<b>Interpretation</b>						
<b>Year 5</b>						
5a Autumn	<p><b>Key focus</b></p> <p><b>Knowledge:</b></p> <p>Genetic information is passed from one generation of organisms to another</p>	Biology	<p><b>Human body</b></p> <p><b>Animals, including humans</b></p> <p><b>AH5.1</b> Describe the changes as humans develop from birth to old age</p> <p><b>ALT5.2</b> Describe the life process of reproduction of humans</p>	<p>Answer scientific questions using different types of scientific enquiry, including:</p> <p>Noticing patterns, grouping and classifying things,</p> <p>Finding things out using secondary sources of information</p> <p>Recording information of increasing complexity using scientific diagrams and labels,</p>	<p>Create a visual human life cycle with all the key milestones</p> <p>I can use a specific writing genre to tell the story of the human reproductive process</p>	<p><b>PSHE sex education and personal relationships</b></p>

	<b>Key Focus Skills</b> <i>Finding things out using secondary sources of information</i>			classification keys, tables and bar and line graphs Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results in written forms such as displays and other presentations		
5b Autumn	<b>Key focus Knowledge:</b> Genetic information is passed from one generation of organisms to another  <b>Key Focus Skills:</b> Noticing patterns, grouping and classifying things Finding things out using secondary sources of information	Biology	<b>Living things and their habitats</b> <b>ALT5.1</b> Explain differences in the life cycles of a mammal, an amphibian, an insect and a bird <b>ALT5.2</b> Describe the life process of reproduction in some plants and animals	Answer scientific questions using different types of scientific enquiry, including: Noticing patterns, grouping and classifying things, Finding things out using secondary sources of information Recording information of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results in written forms such as displays and other presentations	<b>Make a presentation on the interdependency of all living things and how changes to habitat and the loss of species impact on other living things</b>  <b>Explain the impact of genetics on the next generation and how this can be both positive and negative</b>	<b>SMSC environmental impact of change of animals and plants</b>
5c Spring	<b>Key focus Knowledge</b> The solar system is a	Physics	<b>Earth and Space</b> <b>E&amp;S5.1</b> Describe the movement of the Earth relative to the Sun in the solar system	Answer scientific questions using different types of scientific enquiry, including:	Explain how our position in the solar system and the movement of the	Links to geography Northern and southern hemisphere The tilt of the earth

	<p>very small part of one million galaxies in the universe</p> <p><b>Key Focus Skills:</b> Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results in written forms such as displays and other presentations</p>		<p><b>E&amp;S5.2</b> Describe the movement of the Moon relative to the Earth  <b>E&amp;S5.3</b> Describe the Sun, Earth and Moon as approximately spherical bodies  <b>E&amp;S5.4</b> Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky</p>	<p>Observing changes over a period of time,  Noticing patterns, grouping and classifying things,  Finding things out using secondary sources of information  Recording information of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs  Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results in written forms such as displays and other presentations</p>	<p>earth around the sun makes earth the only planet in our solar system with life and determines the climate in different regions</p>	<p>The effect of the moon on tides  Length of night and day  Links to RE and ancient beliefs in history</p>
5d Summer	<p><b>Key focus Knowledge</b> Changing the movement of an object requires a net force to be acting on it.  <b>Key Focus Skills:</b></p>	Physics	<p><b>Forces</b>  <b>FO5.1</b> Explain that unsupported objects fall towards the earth because of the force of gravity acting between the Earth and falling object  <b>FO5.2</b> Identify the effects of air resistance, water resistance and friction, that act between moving surfaces  <b>FO5.3</b> Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect</p>	<p>Answer scientific questions using different types of scientific enquiry, including:  Carrying out simple comparative tests  Finding things out using secondary sources of information  Planning different types of scientific enquiries to answer questions, including:</p>	<p><b>Designing vehicles that are aerodynamic Simple mechanisms in everyday use – link to DT to design a structure to lift a specified weight</b></p> <p><b>Reflect on what it would be like in</b></p>	<p><b>DT vehicle design Lifting mechanisms</b></p>

	Planning different types of scientific enquiries to answer questions, including: controlling variables where necessary taking measurements using a range of scientific equipment with increasing accuracy and precision			<ul style="list-style-type: none"> <li>controlling variables where necessary</li> <li>taking measurements</li> <li>using a range of scientific equipment with increasing accuracy and precision</li> <li>recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs</li> </ul> Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results in written forms such as displays and other presentations	<b>zero gravity – space travel</b>	
	<a href="https://www.explainthatstuff.com/pulleys.html">https://www.explainthatstuff.com/pulleys.html</a>					
5e Summer	<b>Key focus Knowledge</b> All material in the universe is made of very small particles.  <b>Key Focus Skills:</b> Noticing patterns, grouping and	Chemistry	<b>Properties of and changes to materials</b> <b>EM5.1</b> Compare and group together everyday materials based on evidence from comparative and fair tests, including their hardness, solubility, conductivity (electrical and thermal) and response to magnets <b>EM5.2</b> Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution <b>EM5.3</b> Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporation	Answer scientific questions using different types of scientific enquiry, including: Observing changes over a period of time, Noticing patterns, grouping and classifying things, Carrying out simple comparative tests Planning different types of scientific enquiries to answer questions, including: <ul style="list-style-type: none"> <li>controlling variables where necessary</li> </ul>	Reflect on the choice of materials in everyday objects and consider what alternatives might be more environmentally friendly  Evaluate reversible and irreversible changes of state in cooking	Links to DT Use of materials based on their properties Food tech Effects of mixing, heating sieving Links to PSHE Single use plastics and their alternative

	classifying things Carrying out comparative tests		<p><b>EM5.4</b> Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p><b>EM5.5</b> Demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p><b>EM5.6</b> Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning, oxidisation, and the action of acid on bicarbonate of soda</p>	<ul style="list-style-type: none"> <li>• taking measurements</li> <li>• using a range of scientific equipment with increasing accuracy and precision</li> <li>• recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs</li> </ul> <p>Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results in written forms such as displays and other presentations</p>		
Year 6						
6a Autumn	<p><b>Key focus Knowledge</b> The total amount of energy in the universe is always the same but the energy can be transformed when things change or are made to happen</p> <p><b>Key Focus Skills</b> Reporting and presenting findings from enquiries,</p>	Physics	<p><b>Light</b></p> <p><b>LT6.1</b> Recognise that light appears to travel in straight lines</p> <p><b>LT6.2</b> Use the idea light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye</p> <p><b>LT6.3</b> Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes</p> <p><b>LT6.4</b> Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them, and to predict the size of shadows when the position of the light source changes</p>	<p>Answer scientific questions using different types of scientific enquiry, including:</p> <ul style="list-style-type: none"> <li>• <i>observing changes over a period of time,</i></li> <li>• <i>noticing patterns,</i></li> <li>• <i>carrying out simple comparative tests</i></li> <li>• <i>finding things out using secondary sources of information</i></li> </ul> <p>Planning different types of scientific enquiries to answer questions, including:</p> <ul style="list-style-type: none"> <li>• controlling variables where necessary</li> <li>• taking measurements</li> <li>• using a range of scientific equipment with increasing accuracy and precision</li> <li>• recording data and results of increasing complexity using</li> </ul>	<p><b>Bending light through refraction and reflection periscopes and kaleidoscopes</b></p>	<p>RE the importance of light in religious festivals – Diwali, Hanukah, Christmas</p> <p><b>DT -periscopes and kaleidoscopes?</b></p>

	including conclusions, causal relationships and explanations of results in written forms such as displays and other presentations			scientific diagrams and labels, classification keys, tables and bar and line graphs Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results in written forms such as displays and other presentations		
	<a href="http://www.peachpit.com/articles/article.aspx?p=486505&amp;seqNum=4">http://www.peachpit.com/articles/article.aspx?p=486505&amp;seqNum=4</a> <a href="https://www.bbc.co.uk/bitesize/clips/zyntsbk">https://www.bbc.co.uk/bitesize/clips/zyntsbk</a> <a href="https://www.bbc.co.uk/bitesize/clips/zf9c87h">https://www.bbc.co.uk/bitesize/clips/zf9c87h</a> <a href="https://sciencing.com/happens-light-passes-through-prism-8557530.html">https://sciencing.com/happens-light-passes-through-prism-8557530.html</a> <a href="https://www.sciencelearn.org.nz/resources/2220-teachers-using-the-hub-light-and-sight-in-the-classroom">https://www.sciencelearn.org.nz/resources/2220-teachers-using-the-hub-light-and-sight-in-the-classroom</a>					
<b>6b</b> <b>Autumn</b>	<b>Key focus Knowledge</b> The total amount of energy in the universe is always the same but the energy can be transformed when things change or are made to happen.  <b>Key Focus Skills:</b> Planning different types of	<b>Physics</b>	<b>Electricity</b> <b>ELEC6.1</b> Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit <b>ELEC6.2</b> Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches <b>ELEC6.3</b> Use recognised symbols when representing a simple circuit in a diagram	Answer scientific questions using different types of scientific enquiry, including: <ul style="list-style-type: none"> <li>carrying out simple comparative tests</li> </ul> Planning different types of scientific enquiries to answer questions, including: <ul style="list-style-type: none"> <li>controlling variables where necessary</li> <li>taking measurements</li> <li>using a range of scientific equipment with increasing accuracy and precision</li> <li>recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs</li> </ul> Reporting and presenting findings from enquiries, including	<b>Designing a lighting circuit for a model house</b>  <b>Identifying all the different types of electrical appliances in their home</b> <b>Saving electricity</b>  <b>Investigate renewable energy sources for a class debate on the pros and cons of different power sources</b>	Alternative energy and saving energy  History – life before electricity



	scientific enquiries to answer questions, including: controlling variables where necessary taking measurements using a range of scientific equipment with increasing accuracy and precision recording data and results of increasing complexity			conclusions, causal relationships and explanations of results in written forms such as displays and other presentations		
<b>6c Spring</b>	<p><b>Key focus Knowledge</b> The diversity of organisms, living and extinct, is the result of evolution</p> <p><b>Key Focus Skills</b></p>	<b>Biology</b>	<p><b>Living things and their habitats</b> ALT6.1 Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including plants, animals and microorganisms ALT6.2 Give reasons for classifying plants and animals based on specific characteristics</p>	<p>Answer scientific questions using different types of scientific enquiry, including: Noticing patterns, grouping and classifying things, Finding things out using secondary sources of information Recording information of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs Reporting and presenting findings from enquiries, including</p>	<p><b>Reflect on how classifying creatures helps us to understand how creatures adapt to their environment over time and the conditions they need to thrive</b></p> <p><b>Generalise about how the characteristics of</b></p>	<p>Geography: The impact of Pollution Ecosystems Global warming</p> <p>RE Respect for our planet and living things</p>

	<p>Noticing patterns, grouping and classifying things</p> <p>Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations</p>			<p>conclusions, causal relationships and explanations of results in written forms such as displays and other presentations</p>	<p><b>different groups of creatures are determined by their environment</b></p>	
<p><b>6d Summer</b></p>	<p><b>Key focus Knowledge</b></p> <p>Organisms require a supply of energy and materials for which they are often dependent on or in competition with other organisms</p> <p><b>Key Focus Skills:</b></p> <p>Finding things out using secondary</p>	<p><b>Biology</b></p>	<p><b>Animals, including humans</b></p> <p><b>AH6.1</b> Identify and name the main parts of the human circulatory system and explain the functions of the heart, blood vessels and blood</p> <p><b>AH6.2</b> Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p><b>AH6.3</b> Describe the ways in which nutrients and water are transported within animals, including humans</p>	<p><b>Answer scientific questions using different types of scientific enquiry, including:</b></p> <p>Noticing patterns, grouping and classifying things, Carrying out simple comparative tests</p> <p>Finding things out using secondary sources of information</p> <p>Planning different types of scientific enquiries to answer questions, including:</p> <ul style="list-style-type: none"> <li>controlling variables where necessary taking measurements</li> <li>using a range of scientific equipment with increasing accuracy and precision</li> <li>recording data and results of increasing complexity using scientific diagrams and labels,</li> </ul>	<p><b>Explain the main functions of the human and body and how to keep healthy</b></p>	<p><b>PSHE</b></p> <p><b>Healthy living</b></p> <p><b>Diet and Exercise</b></p>

	sources of information Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations			classification keys, tables and bar and line graphs Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results in written forms such as displays and other presentations		
<b>6e Summer</b>	<p><b>Key focus Knowledge</b> <b>The diversity of organisms, living and extinct, is the result of evolution</b></p> <p><b>Key Focus Skills:</b> Finding things out using secondary sources of information Reporting and presenting findings from enquiries, including</p>	<b>Biology</b>	<p><b>Evolution and Inheritance</b></p> <p><b>EV6.1</b> Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <p><b>EV6.2</b> Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</p> <p><b>EV6.3</b> Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</p>	<p>Answer scientific questions using different types of scientific enquiry, including:</p> <ul style="list-style-type: none"> <li>observing changes over a period of time,</li> <li>noticing patterns, grouping and classifying things,</li> <li>finding things out using secondary sources of information</li> <li>recording information of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs</li> </ul> <p>Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results in written forms such as displays and other presentations</p>	<p><b>Generalise about how and why species change and adapt over time in response to their environment</b></p> <p><b>Hypothesise about how and why species became extinct and relate this to endangered species today for a class debate on the “survival of the fittest</b></p> <p><b>Research who are we like in our family</b></p>	<p>PSHE genetically modified food</p> <p>History – family trees</p>

	conclusions, causal relationships and explanations					
	<a href="https://onekindplanet.org/top-10/10-adorable-animals-threatened-by-climate-change/">https://onekindplanet.org/top-10/10-adorable-animals-threatened-by-climate-change/</a> <a href="https://inhabitat.com/6-critically-endangered-animals-under-threat-of-extinction-due-to-human-activity/1-endangered-animals/">https://inhabitat.com/6-critically-endangered-animals-under-threat-of-extinction-due-to-human-activity/1-endangered-animals/</a> <a href="https://www.bbc.co.uk/bitesize/topics/zvhhvcw/articles/zp9f4qt">https://www.bbc.co.uk/bitesize/topics/zvhhvcw/articles/zp9f4qt</a> <a href="https://www.sciencelearn.org.nz/resources/208-meiosis-inheritance-and-variation">https://www.sciencelearn.org.nz/resources/208-meiosis-inheritance-and-variation</a>					