

# Science

## Curriculum intent:

*“For all our students to possess a good knowledge of science, to be critical and inquisitive consumers of scientific information relating it to their everyday lives and to become people who are able to continue to learn about science throughout their lifetime”*

### 5 Year Spiral Curriculum linked to 10 Big Ideas

The curriculum is produced around pupils developing ‘big ideas’ of and about science that allows them to understand the scientific aspects of the work around them and make informed decisions about the applications of science. The curriculum supports the progression from small ideas about specific events, phenomena and objects to more abstract and widely applicable ideas of science. Starting from Year 7, pupils can begin to develop a robust schema of science adding more intricate detail each year.

The 10 Big Ideas put forward by the ASE have been linked to 10 Themes which our pupils study each year from Year 7-11.

### Preconceptions & Misconceptions

As a department we are aware that pupils will join us with preconceptions of what ‘science’ is and of explanations for the world around them. Throughout our course we will be aware of the preconceptions and common misconceptions and explicitly teach around these to ensure pupils understand the correct scientific world around them (e.g. when standing on a set of scales, they are not measuring their weight).

### Knowledge Rich

We understand the need for pupils to learn scientific knowledge and we encourage pupils to build it into their schema by linking to prior learning (previous years and across themes) to make sense of new information and to consider how to apply this knowledge to novel situations.

### Metacognition

In order for pupils to develop their own schema and take on the amount of knowledge required for their science curriculum, we aim to teach pupils to consider their own learning and thinking. We build in retrieval activities every lesson to highlight the importance of revisiting prior learning and we tell pupils the retrieval focus for each half-term. Pupils are also given information on their areas of strengths and weaknesses and asked to consider what they need to do to improve.

### Relevance

Our curriculum aims to highlight the relevance of each area of science to their everyday lives, from where they encounter the scientific principles to the careers it might take them to. By having a curriculum considering the 10 Big Ideas, this allows pupils to identify how more abstract concepts at GCSE relates to their lived experience.

### Inquisitiveness

Science develops through failure and one person asking ‘why?’ Our aim in our curriculum is to foster a curiosity and inquisitiveness to always ask ‘why?’ and for pupils not to take statements at face value. Through practical work pupils will see the evidence for the knowledge we teach them

and they can investigate how to improve their understanding. Through our teaching of how models and theories have changed over time and the history of scientific achievements, they will build resilience and understand that scientific developments are made through doing something wrong.

**Literacy/Reading /Oracy opportunities:**  
 Reading Scientific articles in class  
 Speech/Presentation writing and speaking  
 Debate work

Curriculum rationale Year 7 - 11	Autumn	Spring	Summer
<b>Year 7</b>	<p><b>Forces</b> – Speed &amp; Gravity  <b>Organisms</b> – Movement &amp; Cells  <b>Matter</b> – Particle Model &amp; Separating Mixtures  <b>Electromagnets</b> – Potential Difference &amp; Current</p>	<p><b>Ecosystems</b> – Interdependence &amp; Plant Reproduction  <b>Reactions</b> – Acids and Alkalis &amp; Metals and Non-Metals  <b>Energy</b> – Energy Costs &amp; Energy Transfer  <b>Earth</b> – Earth Structure &amp; Universe</p>	<p><b>Waves</b> – Sound &amp; Light  <b>Genes</b> – Variation &amp; Human Reproduction            Revision &amp; Application-Based Learning</p>
<b>Why?</b>	<p>These topics offer the basis of all the Biology, Chemistry &amp; Physics work that pupils will go on to study throughout the 5 years as well as build on knowledge and skills taught in Key Stage 2.            Pupils will:</p> <ul style="list-style-type: none"> <li>- Investigate variable that affect the speed of a toy car rolling down a slope,</li> <li>- Explain the way in which an astronaut’s weight varies on a journey to the moon;</li> <li>- Explore how the skeletal system and muscular system in a chicken wing work together to cause movement;</li> <li>- Identify the principal features of a cheek cell and describe their functions.</li> </ul>	<p>These topics continue to build on KS2 Science knowledge and link to topics in the Autumn term.            Pupils will:</p> <ul style="list-style-type: none"> <li>- Use a model to investigate the impact of changes in a population of one organism on others in the ecosystem;</li> <li>- Use models to evaluate the features of various types of seed dispersal;</li> <li>- Use experimental results to suggest an order of reactivity of various metals;</li> <li>- Devise an enquiry to compare how well indigestion remedies work;</li> <li>- Compare the running costs of fluorescent and filament light bulbs;</li> <li>- Explain the energy transfers in a hand-crack torch;</li> </ul>	<p>These topics continue to build on KS2 Science knowledge and link to topics in the Autumn and Spring term.            Pupils will:</p> <ul style="list-style-type: none"> <li>- Relate changes in the shape of an oscilloscope trace to changes in pitch and volume;</li> <li>- Use ray diagrams to model how light passes through lenses and transparent materials;</li> <li>- Graph data relating to variation and explain how it may lead to the survival of a species;</li> <li>- Relate advice to pregnant women to ideas about transfer of substances to the embryo.</li> </ul>

	<ul style="list-style-type: none"> <li>- Relate the features of the particle model to the properties of materials in different states;</li> <li>- Devise ways to separate mixtures, based on their properties;</li> <li>- Compare the voltage drop across resistors connected in series in a circuit;</li> <li>- Compare and explain current flow in different parts of a parallel circuit.</li> </ul>	<ul style="list-style-type: none"> <li>- Model the processes that are responsible for rock formation and link these to the rock features;</li> <li>- Relate observations of changing day length to an appropriate model of the solar system.</li> </ul>	
<b>How parents / carers can support</b>	<p><b>Forces:</b> Make a parachute to safely land an egg</p> <p><b>Organisms:</b> Make a 3D model cell</p> <p><b>Matter:</b> Discuss methods of separating mixtures while cooking (e.g. using a sieve, colander, boiling water)</p> <p><b>Electromagnets:</b> Discuss the use of electricity in the home, the difference between turning off and putting appliances to sleep.</p>	<p><b>Ecosystems:</b> Think Tank Birmingham, Planet Earth documentary</p> <p><b>Reactions:</b> Make red cabbage indicator</p> <p><b>Energy:</b> Netflix – Down to Earth</p> <p><b>Earth:</b> Star gazing in the back garden Visit the National Space museum</p>	<p><b>Waves:</b> Look at shadows produced throughout the day and see how they change. Make cup and string telephones.</p> <p><b>Genes:</b> Discuss the differences between people and within families.</p>
	<b>Autumn</b>	<b>Spring</b>	<b>Summer</b>
<b>Year 8</b>	<p><b>Forces</b> – Contact Forces &amp; Pressure</p> <p><b>Organisms</b> – Breathing &amp; Digestion</p> <p><b>Matter</b> –Periodic Table &amp; Elements</p> <p><b>Electromagnets</b> – Electromagnets &amp; Magnetism</p>	<p><b>Ecosystems</b> – Respiration &amp; Photosynthesis</p> <p><b>Reactions</b> – Chemical Energy &amp; Types of Reaction</p> <p><b>Energy</b> – Work &amp; Heating and Cooling</p> <p><b>Earth</b> – Climate &amp; Earth’s Resources</p>	<p><b>Waves</b> – Wave Effects &amp; Wave Properties</p> <p><b>Genes</b> – Evolution &amp; Inheritance</p> <p>Revision &amp; Application-Based Learning</p>
<b>Why?</b>	<p><b>Forces</b> – Pupils will build on their knowledge by considering how motion and speed is affected by other forces, investigating factors that affect the size of frictional or drag forces and will investigate how pressure from your foot on the ground varies with different footwear.</p>	<p><b>Ecosystems</b> – Pupils will build on the interdependence of organisms by using data from investigating fermentation with yeast to explore respiration and use lab tests on variegated leaves to show that chlorophyll is essential for photosynthesis.</p>	<p><b>Waves</b> - Pupils will deepen their knowledge of sound and light by considering what sound and light are made up of and relating the impact of different types of waves on living cells to their frequency and the energy carried by the wave. They will then use the wave model to explain observations of the</p>

	<p><b>Matter</b> – Pupils will use their knowledge of the particle model to understand different types of atoms. They will sort elements using chemical data and relate this to their position in the periodic table and compare the properties of elements with the properties of a compound formed from them.</p> <p><b>Organisms</b> – Pupils will use their knowledge of cells to understand how these work together in the human body by investigating a claim linking height to lung volume and evaluating how well a model represents key features of the digestive system.</p> <p><b>Electromagnets</b> – Pupils will use their knowledge of current and potential difference to consider how this can be used with a magnet and investigate ways of varying strength of an electromagnet. They will then explore the magnetic field pattern around different types or combinations of magnets.</p>	<p><b>Reactions</b> – Pupils will add to their understanding of chemical reactions to investigate a phenomenon that relies on an exothermic or endothermic reaction. They will then investigate changes in mass for chemical and physical processes.</p> <p><b>Energy</b> – Pupils will build on their knowledge of energy transfer by explaining how an electric motor raising a weight is doing work and considering how energy costs can be kept down by investigating how to prevent heat loss by conduction, convection and radiation.</p> <p><b>Earth</b> – Pupils will widen their understanding of the Earth’s resources by investigating the contribution that natural and human chemical processes make to our carbon dioxide emissions and predict the method used for extracting metal based on its position in the reactivity series.</p>	<p>reflection, absorption, and transmission of waves.</p> <p><b>Genes</b> – Pupils will develop their knowledge of reproduction and species survival by reviewing the evidence for theories about how a particular species went extinct and modelling the inheritance of a specific trait and exploring the variation in the offspring produced.</p>
<p><b>How parents / carers can support</b></p>	<p><b>Forces:</b> Identify the effects of different shoes on snow. Watch motor racing &amp; Formula 1 and discuss the forces involved during the race and how friction of the tyres are controlled.</p> <p><b>Organisms:</b> Complete a Joe Wicks workout and measure how breathing rate and pulse rate changes before and after exercise. Keep a food diary looking out how healthy the family’s diet is.</p>	<p><b>Ecosystems:</b> Grow cress seeds on the windowsill and in a cupboard and compare the difference.</p> <p><b>Reactions:</b> Use hand warmers and ice packs and consider the differences in their reactions.</p> <p><b>Energy:</b> Visit a lock to see the size of the levers required to open the lock.</p> <p><b>Earth:</b> Watch ‘An Inconvenient Truth’ &amp; ‘The Day After Tomorrow’</p>	<p><b>Waves:</b> Visit an amusement park and go to a Hall of Mirrors or a Fun House and look at concave and convex mirrors. Make a homemade periscope.</p> <p><b>Genes:</b> Watch David Attenborough documentaries.</p>

	<p><b>Matter:</b> Locate different metals and discuss how they are different to each other. Bake a cake and discuss the differences between the ingredients on their own and the final cake.</p> <p><b>Electromagnets:</b> Go walking or orienteering using a traditional compass. Watch Toy Story 3 considering the use of the electromagnet in the landfill site.</p>		
	<b>Autumn</b>	<b>Spring</b>	<b>Summer</b>
<b>Year 9 – Combined Science &amp; Separate Science</b>	<b>B1 Cell Biology</b> <b>C1 Atomic Structure &amp; the Periodic Table</b> <b>P1 Energy</b> <b>B2 Organisation</b>	<b>C2 Structure, Bonding &amp; the Properties of Matter</b> <b>P3 Particle Model of Matter</b> <b>B3 Infection &amp; Response</b> <b>C9 Chemistry of the Atmosphere</b>	<b>B4 Bioenergetics</b> <b>P4 Atomic Structure</b>
<b>Why?</b>	<p><b>B1 Cell Biology &amp; B2 Organisation</b> – Pupils will build on KS3 knowledge by exploring the structural and functional differences of cells and how new cells are made. They will also consider new developments in medicine such as stem cell technology and therapeutic cloning as well as looking at the transport mechanisms for substances into and out of cells. They will then consider how organ systems learnt in KS3 are adapted for their function, consider medical approaches to dealing with problems in organ systems, and learn about plant organ systems.</p> <p><b>C1 Atomic Structure &amp; the Periodic Table</b> – This will allow pupils to build on their knowledge of particles and elements by considering the history of the models of the atom and the Periodic Table and understand</p>	<p><b>C2 Structure, Bonding &amp; the Properties of Matter</b> – Pupils build on their understanding of atomic structure to consider how atoms can be arranged in different ways and how they are bonded together. They will consider how knowledge of structure and bonding can be used to engineer new materials with desirable properties which may offer new applications in a range of different technologies.</p> <p><b>P3 Particle Model of Matter</b> – Pupils continue to develop their knowledge of the particle model to predict and explain the behaviour of solids, liquids, and gases. They will explain a wide range of observations which engineers use when designing vessels to withstand high pressures and</p>	<p><b>B4 Bioenergetics</b> – Pupils will deepen their knowledge of photosynthesis and respiration by considering the factors involved in controlling photosynthesis and what happens when an organism does not receive enough oxygen for aerobic respiration.</p> <p><b>P4 Atomic Structure</b> – Pupils continue their understanding of atomic structure to consider when this can change and how ionising radiation can be both hazardous and very useful. They will consider how radioactive materials are widely used in medicine, industry, agriculture, and electrical power generation.</p>

	<p>how scientific ideas and explanations develop over time with new evidence and will consider how atomic structure relates to chemical properties.</p> <p><b>P1 Energy</b> – Pupils will develop their ideas of energy stores by considering the mathematical constraints behind them and the factors which affect them. They will consider the use of fossil fuels and renewable energy sources and how we can reduce energy usage.</p>	<p>temperatures. They will consider density and how this affects floating and sinking.</p> <p><b>B3 Infection &amp; Response</b> – Pupils will build on their knowledge of bacteria by considering bacteria which cause illness and other pathogens. They will explore how they can avoid diseases and how our bodies fight them. They will consider the use of medicines to fight disease and the rise of antibiotic bacteria.</p> <p><b>C9 Chemistry of the Atmosphere</b> – Pupils build on their understanding of the Earth’s resources by considering how the Earth’s atmosphere has changed over time and why. Pupils will consider climate change and the problems being caused to the atmosphere now.</p>	
<b>How parents / carers can support</b>	<p><b>B1 &amp; B2</b> - Osmosis home practical (absorption of water into potatoes), organ donor and transplant discussions, observing plants which have received different amounts of water.</p> <p><b>C1</b> – Make models of the atom</p> <p><b>P1</b> - Alton Towers - science of roller coasters</p>	<p><b>B3</b> – Put a small amount of glitter on the hand and see how far it travels around the house.</p> <p>Discuss the use of different restrictions during the Covid-19 pandemic.</p> <p><b>C2 &amp; P3</b> - Changes of state experiments at home</p> <p><b>P3</b> – Test various objects to see if they float or sink</p> <p><b>C9</b> - Documentaries on climate change</p>	<p><b>B4</b> - Baking bread (fermentation)</p> <p><b>P4</b> - Documentaries on Chernobyl Films / books about Marie Curie Read ‘The Radium Girls’</p>
	<b>Autumn</b>	<b>Spring</b>	<b>Summer</b>
<b>Year 10 – Combined Science</b>	<p>Recap of Prior Learning</p> <p><b>P2 Electricity</b></p> <p><b>C3 Quantitative Chemistry</b></p> <p><b>B5 Homeostasis &amp; Response</b></p>	<p><b>C4 Chemical Changes</b></p> <p><b>C5 Energy Changes</b></p> <p><b>C7 Organic Chemistry</b></p> <p><b>P5 Forces</b></p>	<p><b>B7 Ecology</b></p> <p><b>C6 The Rate &amp; Extent of Chemical Change</b></p>

<p><b>Why?</b></p>	<p><b>P2 Electricity</b> – Pupils will develop their understanding of electricity from KS3 using their new knowledge on energy from Year 9. They will consider that electric charge is a fundamental property of matter everywhere and there is a difference in the microstructure of conductors and insulators. Pupils will consider the difference between battery-power and mains powered.</p> <p><b>C3 Quantitative Chemistry</b> – Pupils will use their knowledge of elements and atomic structure to understand how chemists use quantitative analysis to determine the formulae of compounds and equations for reactions. They will then build on knowledge of pure and impure substances to understand how analysts use quantitative methods to determine the purity of chemical samples and monitor yield from chemical reactions.</p> <p><b>B5 Homeostasis &amp; Response</b> – Pupils will learn about the constant regulation of the human body building on ideas of cells, organs, and reproduction from KS3. They will consider the nervous system and endocrine system as well as the use of hormones in controlling and increasing fertility.</p>	<p><b>C4 Chemical Changes</b> – Pupils will develop their knowledge of chemical reactions from KS3 and Year 9 by considering the various extraction of metal methods, how we can determine reactivity, and explain, on an atomic level, what happens during a chemical reaction.</p> <p><b>C5 Energy Changes</b> – Pupils develop their knowledge from Year 8 regarding endothermic and exothermic reactions to explain why some reactions release energy and others take in energy with regard to breaking and forming bonds.</p> <p><b>C7 Organic Chemistry</b> – This is its own branch of chemistry but builds on knowledge gained from atomic structure, chemical bonding and the Earth’s resources. Pupils will learn about organic molecules and where they come from and how we can modify them to make new and useful materials such as polymers, pharmaceuticals, perfumes, flavourings, dyes and detergents.</p> <p><b>P5 Forces</b> – Pupils will develop their knowledge of forces from KS3 to consider how these need to be taken into account when designing machines and instruments. They will learn about Newton’s Laws of Motion and how we can forces affect our everyday life.</p>	<p><b>B7 Ecology</b> – Pupils will build on their understanding of interdependence and the Earth’s resource from KS3 and Year 9 by considering how resources are recycled on Earth and how ecosystems are composed of complex communities of animals and plants dependent on each other while being adapted to particular conditions. They will explore how humans are threatening biodiversity as well as the natural systems that support it.</p> <p><b>C6 The Rate &amp; Extent of Chemical Change</b> – This builds on all knowledge of chemical reactions across Year 7 – 10 and considers how the rate at which they take place can be affected and why this might be considered in an industrial setting. Understanding energy changes that accompany chemical reactions is vital to this topic.</p>
<p><b>How parents / carers can support</b></p>	<p><b>P2</b> - Wiring a plug – practice putting a fuse into a plug at home</p> <p><b>B5</b> – Reaction times and reflex tests</p>	<p><b>C4</b> - Making an indicator at home (red cabbage indicator) to test household substances</p>	<p><b>B7</b> - Sampling at Netherton Saltwells Nature Reserve / Baggeridge country park</p> <p>Ecological surveys at home</p>

		<p><b>C5</b> - Use hand warmers and ice packs and consider the differences in their reactions.</p> <p><b>C7</b> – Look for fossils at Wrens Nest Nature Reserve.</p> <p><b>P5</b> - Make Egg parachutes, make disc/cd hovercrafts</p>	<b>C6</b> – Compare cooking pasta on low heat and high heat.
<b>Year 10 – Biology</b>	<p><b>Recap of Prior Learning</b> <b>B5 Homeostasis &amp; Response</b></p>	<b>B7 Ecology</b>	<b>Revision</b>
<b>Why?</b>	<p><b>B5 Homeostasis &amp; Response</b> – Pupils will learn about the constant regulation of the human body building on ideas of cells, organs, and reproduction from KS3. They will consider the nervous system and endocrine system as well as the use of hormones in controlling and increasing fertility.</p>	<p><b>B7 Ecology</b> – Pupils will build on their understanding of interdependence and the Earth’s resource from KS3 and Year 9 by considering how resources are recycled on Earth and how ecosystems are composed of complex communities of animals and plants dependent on each other while being adapted to particular conditions. They will explore how humans are threatening biodiversity as well as the natural systems that support it.</p>	<p>This time will allow pupils to consolidate their five years of Biology learning making links between each of the topics.</p>
<b>How parents / carers can support</b>	<b>B5</b> – Reaction times and reflex tests	<b>B7</b> - Sampling at Netherton Saltwells Nature Reserve / Baggeridge country park Ecological surveys at home	Revision Guides and testing
<b>Year 10 – Chemistry</b>	<p><b>Recap of Prior Learning</b> <b>C3 Quantitative Chemistry</b> <b>C5 Energy Changes</b></p>	<p><b>C4 Chemical Changes</b> <b>C6 The Rate &amp; Extent of Chemical Change</b></p>	<p><b>C7 Organic Chemistry</b>  <b>Revision</b></p>
<b>Why?</b>	<p><b>C3 Quantitative Chemistry</b> – Pupils will use their knowledge of elements and atomic structure to understand how chemists use quantitative analysis to determine the formulae of compounds and equations for reactions. They will then build on knowledge of pure and impure substances to understand how analysts use quantitative</p>	<p><b>C4 Chemical Changes</b> – Pupils will develop their knowledge of chemical reactions from KS3 and Year 9 by considering the various extraction of metal methods, how we can determine reactivity, and explain, on an atomic level, what happens during a chemical reaction.</p>	<p><b>C7 Organic Chemistry</b> – This is its own branch of chemistry but builds on knowledge gained from atomic structure, chemical bonding and the Earth’s resources. Pupils will learn about organic molecules and where they come from and how we can modify them to make new and useful materials such as polymers,</p>



	<p>methods to determine the purity of chemical samples and monitor yield from chemical reactions.</p> <p><b>C5 Energy Changes</b> – Pupils develop their knowledge from Year 8 regarding endothermic and exothermic reactions to explain why some reactions release energy and others take in energy with regard to breaking and forming bonds. They will build on their electricity knowledge by looking at how some cells and batteries use these chemical reactions to produce electricity.</p>	<p><b>C6 The Rate &amp; Extent of Chemical Change</b> – This builds on all knowledge of chemical reactions across Year 7 – 10 and considers how the rate at which they take place can be affected and why this might be considered in an industrial setting. Understanding energy changes that accompany chemical reactions is vital to this topic.</p>	<p>pharmaceuticals, perfumes, flavourings, dyes and detergents.</p>
<b>How parents / carers can support</b>	<p><b>C5</b> - Use hand warmers and ice packs and consider the differences in their reactions. Use rechargeable batteries.</p>	<p><b>C4</b> - Making an indicator at home (red cabbage indicator) to test household substances.</p> <p><b>C6</b> – Compare cooking pasta on low heat and high heat.</p>	<p><b>C7</b> – Look for fossils at Wrens Nest Nature Reserve.</p>
<b>Year 10 – Physics</b>	<p><b>Recap of Prior Learning</b> <b>P2 Electricity</b></p>	<p><b>P5 Forces</b></p>	<p><b>P8 Space</b>  <b>Revision</b></p>
<b>Why?</b>	<p><b>P2 Electricity</b> – Pupils will develop their understanding of electricity from KS3 using their new knowledge on energy from Year 9. They will consider that electric charge is a fundamental property of matter everywhere and there is a difference in the microstructure of conductors and insulators. Pupils will consider the difference between battery-power and mains powered. They will also learn about static electricity and electric fields.</p>	<p><b>P5 Forces</b> – Pupils will develop their knowledge of forces from KS3 to consider how these need to be taken into account when designing machines and instruments. They will learn about Newton’s Laws of Motion and how we can forces affect our everyday life.</p>	<p><b>P8 Space Physics</b> – Pupils build on their understanding of the universe from KS3 to question where we are and where we came from. They will consider the structure of the solar system, the life cycle of stars and the evidence we have for the universe expanding.</p>
<b>How parents / carers can support</b>	<p><b>P2</b> - Parents discuss why we have circuit breakers in our house</p>	<p><b>P5</b> - Make Egg parachutes, make disc/cd hovercrafts</p>	<p><b>P7</b> – Consider looking at the mechanisms inside hairdryers and motorised toys.</p>

	Wiring a Plug practical Create friction between balloons and jumpers and see how many balloons stick to the wall		<b>P8</b> – Make models of the solar system. Observe the night sky. Visit Jodrell Bank or the National Space Centre.
	<b>Autumn</b>	<b>Spring</b>	<b>Summer</b>
<b>Year 11</b>	<b>Recap of Prior Learning</b> <b>P6 Waves</b> <b>B6 Inheritance, Variation &amp; Evolution</b> <b>C8 Chemical Analysis</b>	<b>P7 Magnetism &amp; Electromagnetism</b> <b>C10 Using Resources</b> <b>Revision</b>	<b>Revision</b>
<b>Why?</b>	<p><b>P6 Waves</b> – This will build on ideas of waves from KS3 and energy from KS4 to consider how wave behaviour is common in both natural and man-made systems. They will consider how energy and information can be passed along waves so that they can be used in a vast range of technologies.</p> <p><b>B6 Inheritance, Variation &amp; Evolution</b> – This will help pupils to build on ideas of human and plant reproduction as well as the menstrual cycle. They will learn about how cells divide to form gametes and the impact of mutations. They will build on their knowledge of disease by considering inherited conditions and weigh up the ethics behind selective breeding and genetic engineering.</p> <p><b>C8 Chemical Analysis</b> – Pupils build on their understanding of pure and impure substances and learn about qualitative tests used to detect specific chemicals. They will also consider why forensic scientists and drug control scientists rely on instrumental methods instead.</p>	<p><b>P7 Magnetism &amp; Electromagnetism</b> – This will build on ideas of magnets and electromagnets from KS3 as well as concepts from energy, electricity, and waves so that pupils can understand how electromagnetic effects are used in a wide variety of devices.</p> <p><b>C10 Using Resources</b> – Pupils will bring together all of their knowledge on the Earth’s resources and consider how industries use them to manufacture new and useful products. They will consider the impact of the material at each stage of the life of a product and new ways of dealing with materials.</p>	This time will allow pupils to consolidate their five years of Biology, Chemistry and Physics learning making links between each of the topics.

<b>How parents / carers can support</b>	<p><b>P6 Waves</b> – View the effects of refraction through glass objects and light/water.</p> <p><b>B6</b> – Read ‘The Immortal Life of Henrietta Lacks’</p> <p>Discussion of Grandparents dominant characteristics that have been passed down e.g. noses or hair colour. Family trees (create own family trees)</p> <p><b>C8</b> - Home-made chromatography practical</p> <p>Watch fireworks</p>	<p><b>P7</b> – Consider looking at the mechanisms inside hairdryers and motorised toys.</p> <p><b>C10</b> - Purifying water at home</p> <p>Carrying out a Life Cycle Assessment on paper vs plastic bags.</p>	Revision Guides and testing
<b>Year 11 – Biology</b>	<p><b>Recap of Prior Learning</b></p> <p><b>B6 Inheritance, Variation &amp; Evolution</b></p>	<b>Revision</b>	<b>Revision</b>
<b>Why?</b>	<p><b>B6 Inheritance, Variation &amp; Evolution</b> – This will help pupils to build on ideas of human and plant reproduction as well as the menstrual cycle. They will learn about how cells divide to form gametes and the impact of mutations. They will build on their knowledge of disease by considering inherited conditions and weigh up the ethics behind selective breeding and genetic engineering.</p>	This time will allow pupils to consolidate their five years of Biology learning making links between each of the topics.	This time will allow pupils to consolidate their five years of Biology learning making links between each of the topics.
<b>How parents / carers can support</b>	<p><b>B6</b> – Read ‘The Immortal Life of Henrietta Lacks’</p> <p>Discussion of Grandparents dominant characteristics that have been passed down e.g. noses or hair colour. Family trees (create own family trees)</p>	Revision Guides and testing	Revision Guides and testing
<b>Year 11 – Chemistry</b>	<p><b>Recap of Prior Learning</b></p> <p><b>C8 Chemical Analysis</b></p>	<b>C10 Using Resources</b>	<b>Revision</b>
<b>Why?</b>	<p><b>C8 Chemical Analysis</b> – Pupils build on their understanding of pure and impure substances and learn about qualitative tests</p>	<b>C10 Using Resources</b> – Pupils will bring together all of their knowledge on the Earth’s resources and consider how	This time will allow pupils to consolidate their five years of Chemistry learning making links between each of the topics.

	used to detect specific chemicals. They will also consider why forensic scientists and drug control scientists rely on instrumental methods instead.	industries use them to manufacture new and useful products. They will consider the impact of the material at each stage of the life of a product and new ways of dealing with materials.	
<b>How parents / carers can support</b>	<b>C8</b> - Chromatography at home using felt pens or food pastes/dyes Watching fireworks	<b>C10</b> - Purifying water at home Carrying out a Life Cycle Assessment on paper vs plastic bags.	Revision Guides and testing
<b>Year 11 – Physics</b>	<b>Recap of Prior Learning</b> <b>P6 Waves</b>	<b>P7 Magnetism &amp; Electromagnetism</b> <b>P8 Space</b>	<b>Revision</b>
<b>Why?</b>	<b>P6 Waves</b> – This will build on ideas of waves from KS3 and energy from KS4 to consider how wave behaviour is common in both natural and man-made systems. They will consider how energy and information can be passed along waves so that they can be used in a vast range of technologies.	<b>P7 Magnetism &amp; Electromagnetism</b> – This will build on ideas of magnets and electromagnets from KS3 as well as concepts from energy, electricity, and waves so that pupils can understand how electromagnetic effects are used in a wide variety of devices. <b>P8 Space Physics</b> – Pupils build on their understanding of the universe from KS3 to question where we are and where we came from. They will consider the structure of the solar system, the life cycle of stars and the evidence we have for the universe expanding.	This time will allow pupils to consolidate their five years of Physics learning making links between each of the topics.
<b>How parents / carers can support</b>	<b>P6 Waves</b> – View the effects of refraction through glass objects and light/water.	<b>P7</b> – Consider looking at the mechanisms inside hairdryers and motorised toys. <b>P8</b> – Make models of the solar system. Observe the night sky. Visit Jodrell Bank or the National Space Centre.	Revision Guides and testing