



Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Fast and Furious	<p>Describe collision theory and activation energy</p> <p>Using collision theory describe how changing the temperature, concentration and surface area affect the rate of reaction.</p> <p>Define the term catalyst and explain how a catalyst affects the activation energy in a chemical reaction.</p> <p>Explain reversible and irreversible reactions, identify examples of each and write word equations for both</p> <p>Know the difference between Exothermic and Endothermic reactions, and recognise these reactions based on temperature changes.</p>	<p>Tier 2</p> <p>Particles</p> <p>Temperature</p> <p>Concentration</p> <p>Dependant</p> <p>Control</p> <p>Tier 3</p> <p>Collision Theory</p> <p>Exothermic</p> <p>Endothermic</p> <p>Catalysts</p> <p>Surface Area</p> <p>Independent variable</p>	<p>In this topic pupils will cover the concept of chemical reactions. They will investigate key factors that can impact on the rate of a reaction, explain Collision theory and the requirement of activation energy.</p> <p>Pupils will also be introduced into Exothermic and Endothermic reactions.</p>	<p>The topic builds upon the foundation provided in KS2 on the properties and changes of materials.</p> <p>This topic incorporates the key learning the of Science National curriculum for Key Stage 3.</p> <p>This learning will provide a foundation for the AQA GCSE specification including the subtopics of The rate and extent of chemical change and energy changes.</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>



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Living Together	<p>Explain the effect of competition on the individual or population</p> <p>Describe some adaptations and how they help an organism survive in their environment</p> <p>Explain how an extremophile is adapted to their environment</p> <p>Draw and interpret food chains, webs and pyramids</p> <p>Explain how the population of a prey species would be affected by changes in its predator numbers</p> <p>Apply knowledge of food webs to explain how toxic substances may accumulate in human food</p> <p>Explain the importance of having great biodiversity</p> <p>Explain how human activities are reducing biodiversity, land use, deforestation and global warming</p>	<p>Tier 2</p> <p>Environment</p> <p>Tier 3</p> <p>Ecosystems</p> <p>Organisms</p> <p>Habitat</p> <p>Food Web</p> <p>Producers</p> <p>Biodiversity</p> <p>Adaptations</p>	<p>In this topic pupils will cover Ecosystems, within this topic pupils will learn about the relationship between plants and animals within an ecosystem, linked to Food chains and webs.</p> <p>Pupils will also cover the importance of biodiversity and this needs to be maintained in the future to prevent extinction.</p>	<p>Academic Text :</p> <p>https://www.sciencejournalforkids.org/articles/how-could-baby-dinosaurs-live-in-the-arctic/</p> <p>The topic builds upon the foundation provided in KS1 and KS2 on living things are their habitats</p> <p>This topic incorporates the key learning the of Science National curriculum for Key Stage 3.</p> <p>This learning will provide a foundation for the AQA GCSE specification including the subtopics of Ecology</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>



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Fitness and Health	<p>Describe the effects of exercise on pulse rate and how this can measure fitness</p> <p>Explain how nutrients contributes to a healthy, balanced diet and the role of each nutrient on the body</p> <p>Explain the effects of obesity on human health</p> <p>Describe how to test foods for starch, lipids, sugar, and protein. Including the solutions and how to use them and know the positive results for each test.</p> <p>Explain the role of the blood in supplying and removing substances to cells</p> <p>Explain that glucose is transported in the blood to other parts of the body, including specific cells, e.g. muscle cells, where glucose can become an energy resource</p>	<p>Tier 2</p> <p>Diet</p> <p>Tier 3</p> <p>Starch</p> <p>Protein</p> <p>Amino Acid</p> <p>Carbohydrates</p> <p>Iodine</p> <p>Obesity</p>	<p>In this topic pupils will cover the concept of healthy diet and lifestyle.</p> <p>They will investigate the effect of alcohol and smoking on the body, as well as communicable diseases.</p> <p>Pupils will learn the differences between Aerobic and Anaerobic respiration.</p>	<p>Academic Text :</p> <p>https://www.sciencejournalforkids.org/articles/can-viruses-save-lives/</p> <p>The topic builds upon the foundation provided in KS2 on Living things.</p> <p>This topic incorporates the key learning the of Science National curriculum for Key Stage 3.</p> <p>This learning will provide a foundation for the AQA GCSE specification including the subtopics of Organisation, Infection and Response and Bioenergetics.</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>
Electricity	<p>Draw a simple circuit when provided with a list of components and recall circuit symbols</p> <p>Recall the difference between Series and Parallel Circuits</p>	<p>Tier 2</p> <p>Current</p> <p>Resistance</p> <p>Series</p> <p>Parallel</p> <p>Charge</p>	<p>In this topic pupils will cover the concept of electricity, building circuits to show how electric current flows.</p>	<p>Academic Text:</p> <p>https://kids.frontiersin.org/articles/10.3389/frym.2020.00118</p> <p>This topic builds upon the foundation provided in KS2 Year 4 programme of study looking at electricity.</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>



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Electricity	<p>Explain how current flows in a circuit, the equipment used to measure current and the units.</p> <p>Describe what is meant by resistance.</p> <p>Describe how current and potential difference vary in series and parallel circuits</p> <p>Describe how we are able to generate electricity.</p> <p>Describe the structure of a plug, label the wires correctly and understand the role of the fuse.</p>	<p>Tier 2</p> <p>Renewable resources</p> <p>Tier 3</p> <p>Potential Difference</p> <p>Voltage</p> <p>National Grid</p>	<p>Pupils will build series and parallel circuits, they will measure the current and potential difference and describe how both behave in circuits.</p> <p>They will also cover the National grid, plugs and static electricity.</p>	<p>This topic incorporates the key learning the of Science National curriculum for Key Stage 3.</p> <p>This learning will provide a foundation for the AQA GCSE specification including the subtopic of Electricity.</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>



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Earth Chemistry	<p>Recall the structure of the Earth.</p> <p>Describe how fossils are formed.</p> <p>Describe the properties of sedimentary, igneous and metamorphic rocks and explain how they are formed in the rock cycle.</p> <p>Explain how the composition of the Earth's atmosphere has changed over time.</p> <p>Recall the reactants and products of combustion.</p> <p>Describe how global warming occurs using the greenhouse effect model.</p> <p>Describe how acid rain is formed, it's detrimental effects and possible solutions.</p> <p>Describe some advantages and disadvantages of reducing, reusing and recycling.</p>	<p>Tier 2</p> <p>Core</p> <p>Crust</p> <p>Tier 3</p> <p>Sedimentary</p> <p>Metamorphic</p> <p>Igneous</p> <p>Rock Cycle</p> <p>Convection</p> <p>Mantle</p> <p>Weathering</p>	<p>This is the 2nd Chemistry topic of the academic year and focusses on the Earth's structure, atmosphere, resources and global warming.</p> <p>Pupils will learn how the Earth's atmosphere has changed over time and how it continues to change due to the demand on resources and combustion of fossil fuels. They will analyse data on how carbon dioxide levels have changed and how this links to global warming.</p> <p>Pupils will be able to compare different types of rocks/fossils, describe how they formed and linked within the rock cycle.</p> <p>Finally pupils will expand on what they can do to reduce the effects of global warming, acid rain and the demand on the Earth's resources, specifically reduce, reuse, recycle.</p>	<p>Academic Text :</p> <p>https://www.sciencejournalforkids.org/articles/can-computers-help-us-recycle-more-plastic/</p> <p>The topic builds upon the foundation provided in KS2 on Rocks.</p> <p>This topic incorporates the key learning the of Science National curriculum for Key Stage 3.</p> <p>This learning will provide a foundation for the AQA GCSE specification including the subtopics of Chemistry of the atmosphere and using resources.</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>



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<p>Waves</p>	<p>Recall and label the features of transverse and longitudinal waves.</p> <p>Describe what happens when light is reflected and refracted and apply this to ray diagrams.</p> <p>Describe how the eye works</p> <p>Describe sound as the transfer of energy through vibrations .</p> <p>Recall and apply the equation for measuring wave speed.</p> <p>Describe how the ear works and explain how to prevent damage to the ear.</p> <p>Describe how waves that form the electromagnetic spectrum are grouped in terms of their wavelength and their frequency.</p>	<p>Tier 2</p> <p>Peak</p> <p>Trough</p> <p>Frequency</p> <p>Reflection</p> <p>Tier 3</p> <p>Refraction</p> <p>Electromagnetic</p> <p>Wavelength</p> <p>Amplitude</p> <p>Transverse</p> <p>Longitudinal</p>	<p>This is the 2nd Physics topic of the academic year and focusses on different types of waves and how we see and hear.</p> <p>Pupils will learn about how light travels and what happens when it hits different surfaces.</p> <p>Using practical apparatus, they will investigate the laws of reflection and refraction.</p> <p>They will learn how the eye works and how poor vision can be corrected.</p> <p>Pupils will learn how sound travels and how to represent the wave depending on its amplitude and pitch.</p> <p>They will learn how the ears work and compare the hearing ranges of different animals.</p> <p>Finally, pupils will learn how to measure and calculate the speed of a wave.</p>	<p>The topic builds upon the foundation provided in KS2 on Light and Sound.</p> <p>This topic incorporates the key learning the of Science National curriculum for Key Stage 3.</p> <p>This learning will provide a foundation for the AQA GCSE specification including the subtopic of Waves.</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>



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Energy	<p>Recall the different energy stores.</p> <p>Be able to draw energy transfer diagrams and identify the useful and wasted energy.</p> <p>Apply the equation for calculating efficiency.</p> <p>Describe the difference between thermal energy and temperature.</p> <p>Describe how heat is transferred through a solid (conduction).</p> <p>Explain how convection currents work.</p>	<p>Tier 2</p> <p>Power</p> <p>Tier 3</p> <p>Kinetic</p> <p>Efficiency</p> <p>Work Done</p> <p>Joules</p> <p>Conservation of energy</p> <p>Insulation</p>	<p>This is the 3rd Physics topic of the academic year. It focuses on the different types of energy stores and gives opportunity to practice some difficult equations needed for the GCSE course.</p> <p>Pupils will learn how to calculate the efficiency of energy transfers and understand how to reduce the amount of wasted energy.</p> <p>They will work scientifically to investigate the most effective insulators give a range of materials.</p> <p>Pupils will focus on kinetic energy and gravitation potential energy and apply the equation to these energy stores.</p> <p>Finally pupils will complete experiments to learn about conduction and convection.</p>	<p>Academic Text :</p> <p>https://www.sciencejournalforkids.org/articles/how-can-we-turn-ocean-water-into-renewable-energy/</p> <p>The topic builds upon the foundation provided in KS2 on properties and changes of materials and working Scientifically.</p> <p>This topic incorporates the key learning of the Science National curriculum for Key Stage 3.</p> <p>This learning will provide a foundation for the AQA GCSE specification including the subtopic of Energy.</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>



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Bonding and separating	<p>Recall the structure of an atom and describe how ions are formed.</p> <p>Describe that ionic bonding takes place between a metal and non-metal to produce a new compound. Recall some properties of these compounds.</p> <p>Describe that covalent bonding takes place between non metallic substances to form new compounds. Recall some properties of these compounds.</p> <p>Describe that metallic bonding takes place between metallic substances Recall some properties of these compounds.</p> <p>Describe how filtration and evaporation can be used to separate a mixture.</p> <p>Explain how chromatography works.</p> <p>Explain how distillation works.</p>	<p>Tier 2</p> <p>Pure</p> <p>Shells</p> <p>Tier 3</p> <p>Ion</p> <p>Covalent</p> <p>Metallic</p> <p>Alloy</p> <p>Chromatography</p> <p>Sharing electrons</p> <p>Particles</p>	<p>This is the 3rd Chemistry topic of the academic year and focusses on how mixtures can be separated using various techniques. It also looks at how new substances are formed by the bonding of atoms.</p> <p>Pupils will recap the structure of the atom and how atoms are transformed into ions by the loss or gain of electrons.</p> <p>They will learn how atoms of different elements bond together to form compounds, including Ionic, covalent and metallic bonding.</p> <p>Pupils will complete a series of experiments to learn how mixtures can be separated using chromatography, filtration and distillation.</p>	<p>The topic builds upon the foundation provided in KS2 on Properties and changes of materials.</p> <p>This topic incorporates the key learning the of Science National curriculum for Key Stage 3.</p> <p>This learning will provide a foundation for the AQA GCSE specification including the subtopics of Bonding, structure and the properties of matter and Chemical analysis.</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>



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Inheritance	<p>Recall where genetic information is stored within cells.</p> <p>Describe the difference between inherited and environmental variation</p> <p>Draw a diagram to show the relationship between DNA, chromosomes and Genes</p> <p>Describe that DNA is a polymer made up of two strands forming a double helix .</p> <p>Describe what is meant by biodiversity, the importance of it and reasons why it might decrease</p> <p>Classify animals into groups based on their shared characteristics.</p> <p>Describe the key processes of Darwin's theory of Natural selection and how that leads to evolution.</p> <p>Explain some of the factors that cause/contribute to the extinction of organisms.</p>	<p>Tier 3</p> <p>DNA</p> <p>Genes</p> <p>Chromosomes</p> <p>Natural Selection</p> <p>Extinction</p> <p>Darwin</p> <p>Fossils</p> <p>Inheritance</p>	<p>This is the 3rd Biology topic of the academic year. It focuses on the structure of DNA and how genes are responsible for our characteristics along with other environmental factors. Pupils will use their understanding of genes to explore how animals have evolved and the conditions drive extinction and survival.</p>	<p>Academic Text :</p> <p>https://www.sciencejournalforkids.org/articles/what-can-ancient-dna-tell-us-about-stone-age-people/</p> <p>The topic builds upon the foundation provided in KS2 on Living things and their habitat, Evolution and inheritance.</p> <p>This topic incorporates the key learning the of Science National curriculum for Key Stage 3.</p> <p>This learning will provide a foundation for the AQA GCSE specification including the subtopic of Inheritance, variation and evolution</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>