



Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
<p>Science Skills</p>	<p>Identify Hazard symbols, and understand the need for their use</p> <p>Name scientific apparatus and describe which equipment should be used to accurately measure in a variety of different situations</p>	<p>Hazard symbols</p> <p>Investigation</p> <p>Observation</p> <p>Prediction</p> <p>Variables</p> <p>Method</p> <p>Conclusion</p> <p>Accurate</p> <p>Precise</p> <p>Reliable</p>	<p>This topic covers the introduction to working in a Science laboratory, the equipment and required safety knowledge needed to use the equipment.</p> <p>Within in this topic pupils will look at the Bunsen burner, the parts of the Bunsen and how to use a Bunsen.</p>	<p>The topic builds upon the foundation provided in KS1 on working scientifically, by following methods, perform simple tests and gather data.</p> <p>This learning will provide a foundation for the Required Practicals which are embedded into all of the AQA GCSE topics.</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>
<p>Cells</p>	<p>Describe the function of the key organelles (parts) of plant, animal, bacteria and specialised cells</p> <p>Describe how the structure of an animal cell differs from that of a plant cell</p> <p>Look at cells using a microscope and describe how to use one</p> <p>Describe simply how and why body cells divide by mitosis</p> <p>Describe the processes of diffusion and Osmosis</p>	<p>nucleus</p> <p>cell membrane</p> <p>cytoplasm</p> <p>mitochondria</p> <p>cell wall</p> <p>Vacuole</p> <p>chloroplast</p> <p>Ribosomes</p> <p>Flagella</p> <p>Protein synthesis</p> <p>Photosynthesis</p>	<p>This is an introduction to Biology, covering Prokaryotic and Eukaryotic Cells. Pupils will learn about the structure of an basic Animal and Plant cell as well as specialised Animal and Plant Cells.</p> <p>Within this topic pupils will look at Light Microscopes, the parts of the microscope and how to prepare and view specimens under the microscope.</p>	<p>The topic builds upon the foundation provided in KS1 and KS2 on the basics of 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 Cell Biology, Organisation and Infection and Response</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>Particles</p>	<p>Describe the properties of the three states of matter with reference to the particle model (forces, bonds, energy, arrangement and movement)</p> <p>Recall and apply the density equation to Calculate the density of a range of regular shaped objects</p> <p>Use the particle model to describe and explain pressure, diffusion and changes of state</p>	<p>Melting</p> <p>Boiling</p> <p>Subliming</p> <p>Condensing</p> <p>Freezing</p> <p>Density</p> <p>Evaporation</p> <p>Pressure</p> <p>Volume</p> <p>Diffusion</p>	<p>This topic covers the introduction to states of matter, the movement of particles and energy needed to change states.</p> <p>It also incorporates the concept of density or regular and irregular objects. Within this pupils will draw and interpret graphs to interpret heating and cooling of objects.</p>	<p>This topic builds on previous learning about states of matter at KS2 and introduces the concept of particles.</p> <p>It incorporates the key learning the of Science National curriculum for Key Stage 3 and provides a foundation for the AQA GCSE specification, including the subtopics of Atomic Structure, the Periodic Table and Particles.</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>



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Cells	<p>Describe the function of the key organelles (parts) of plant, animal, bacteria and specialised cells</p> <p>Describe how the structure of an animal cell differs from that of a plant cell</p> <p>Look at cells using a microscope and describe how to use one</p> <p>Describe simply how and why body cells divide by mitosis</p> <p>Describe the processes of diffusion and Osmosis</p>	<p>nucleus</p> <p>cell membrane</p> <p>cytoplasm</p> <p>mitochondria</p> <p>cell wall</p> <p>Vacuole</p> <p>chloroplast</p> <p>Ribosomes</p> <p>Flagella</p> <p>Protein synthesis</p> <p>Photosynthesis</p>	<p>This is an introduction to Biology, covering Prokaryotic and Eukaryotic Cells. Pupils will learn about the structure of an basic Animal and Plant cell as well as specialised Animal and Plant Cells.</p> <p>Within this topic pupils will look at Light Microscopes, the parts of the microscope and how to prepare and view specimens under the microscope.</p>	<p>The topic builds upon the foundation provided in KS1 and KS2 on the basics of 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 Cell Biology, Organisation and Infection and Response</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>
Particles	<p>Describe the properties of the three states of matter with reference to the particle model (forces, bonds, energy, arrangement and movement)</p> <p>Recall and apply the density equation to Calculate the density of a range of regular shaped objects</p> <p>Use the particle model to describe and explain pressure, diffusion and changes of state</p>	<p>Melting</p> <p>Boiling</p> <p>Subliming</p> <p>Condensing</p> <p>Freezing</p> <p>Density</p> <p>Evaporation</p> <p>Pressure</p> <p>Volume</p> <p>Diffusion</p>	<p>This topic covers the introduction to states of matter, the movement of particles and energy needed to change states.</p> <p>It also incorporates the concept of density or regular and irregular objects. Within this pupils will draw and interpret graphs to interpret heating and cooling of objects.</p>	<p>This topic builds on previous learning about states of matter at KS2 and introduces the concept of particles.</p> <p>It incorporates the key learning the of Science National curriculum for Key Stage 3 and provides a foundation for the AQA GCSE specification, including the subtopics of Atomic Structure, the Periodic Table and Particles.</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>



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Magnets	<p>Recall and describe the difference between magnets and magnetic materials</p> <p>Experimentally demonstrate, illustrate and describe a magnetic field and its effects (bar magnet and Earth)</p> <p>Describe the differences between permanent and induced magnets and how to produce them</p> <p>Describe the principle of electromagnetism, its applications, advantages and disadvantages, and deduce how to vary the strength (including a demonstration of the motor effect)</p>	Pole Attract Repel Permanent Induced Field Force Electromagnetism Motor Effect Magnetic material Geomagnetism	<p>This topic covers the principles of magnets, what makes a material magnetic and understanding a magnetic field.</p> <p>Within this topic pupils will learn about the applications of magnets, the uses of electromagnets and how motors work.</p>	<p>This topic builds on the year 3 programme of study topic of Forces and Magnets, and the year 5 topic of Properties and Changes of Materials.</p> <p>It incorporates aspects of the KS3 Forces and Motion topic (non-contact forces) and the Electricity and Electromagnetism topic.</p> <p>It provides the foundation for the AQA GCSE topic of Magnetism and Electromagnetism</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>
The Periodic Table	<p>Explain why some elements are more reactive than others.</p> <p>Describe properties of elements in the periodic table, including metals and non-metals, group 1 elements and group 7 elements.</p> <p>Describe and Explain why the periodic table has changed throughout the years.</p>	Element Periodic table Metal Non-metal Physical property Chemical property Group Period Halogen Displace	<p>In this topic pupils will cover an introduction to the Periodic Table developed by Mendeleev and understanding how the periodic table has evolved.</p> <p>Pupils will be able to draw the atomic structure of the first 20 elements and be able to distinguish between protons, neutrons and electrons.</p> <p>Within this topic pupils will practice writing chemical formula for elements and compounds, including balancing equations,</p>	<p>This topic builds on previous learning about materials at KS2 and introduces the concept of elements in the periodic table.</p> <p>It incorporates the key learning the of Science National curriculum for Key Stage 3 and provides a foundation for the AQA GCSE specification, including the subtopic of Atomic Structure and the Periodic Table.</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>



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Motion and Forces	<p>Recall typical forces (contact and non-contact) and describe their effects</p> <p>Demonstrate how to measure a range of forces, including Weight and Friction, and how to calculate Work Done and Pressure</p> <p>Illustrate the forces acting on objects using free body diagrams</p> <p>Identify the overall (resultant) force on balanced and unbalanced objects and the effects this will have (Newton's 1st and 2nd laws), including $F=ma$)</p> <p>Investigate and explain the deformation of elastic objects and Hooke's Law.</p> <p>Describe the motion of objects quantitatively (particularly speed) and in graphical form</p> <p>Investigate and explain the principle of terminal velocity</p> <p>Recall what is meant by stopping distance and describe the factors that affect it</p>	<p>Newton</p> <p>Speed</p> <p>Moment</p> <p>Weight</p> <p>Friction</p> <p>Drag</p> <p>Work Done</p> <p>Pressure</p> <p>Gravity</p> <p>Mass</p> <p>Acceleration</p> <p>Tension</p> <p>Extension</p> <p>Terminal Velocity</p> <p>Stopping Distance</p> <p>Upthrust</p>	<p>This topic covers an introduction to Forces, including what forces do, how forces can be described and being introduced to different types of forces.</p> <p>Pupils will practice measuring forces using a Newton meter and the work of Sir Isaac Newton with his laws of motion.</p> <p>Pupils will practice their mathematical skills by calculating speed, velocity and Hooke's law.</p>	<p>It builds on the year 3 programme of study topic of Forces and Magnets and the year 5 Forces topic.</p> <p>It incorporates the KS3 Motion and Forces programme of study.</p> <p>It provides the foundation for the AQA GCSE Forces topic, plus some overlap with the Energy, Electricity, Magnetism and Electromagnetism and Space Physics (triple only) topics.</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>



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Body Systems	<p>Explain the link between cell/tissue/organ/organ system</p> <p>Recall the different body systems and the components of each system (digestive, respiratory, circulatory, reproductive)</p> <p>Describe the roles of the key organs in each system and explain how they are adapted to their functions</p> <p>Explain how blood vessels are adapted to their function</p> <p>Describe the difference between inhaled and exhaled air</p> <p>Explain how the alveoli are adapted for efficient gas exchange</p> <p>Describe the development of a foetus during pregnancy and understand the role of the umbilical cord.</p>	<p>Cell</p> <p>Tissue</p> <p>Organ</p> <p>Organ system</p> <p>Respiration</p> <p>Enzymes</p> <p>Denatured</p> <p>Puberty</p> <p>Menstruation</p> <p>Ovulation</p> <p>Circulatory</p>	<p>This topic build on previous knowledge from the Cells topic taught in half term 1 or 2.</p> <p>Within this topic pupils learn the organisation of organisms, including how cells, form tissues, tissues make organs and organs work together to form organ systems, with specific emphasis on the Digestive system.</p> <p>Pupils will name the 3 main enzymes involved in digestion, investigate the role of enzymes in the digestive system and explain how enzyme activity can be affected by temperature and pH.</p> <p>Pupils will also participate in a heart dissection to learn the structure of the heart, the role of the blood vessels and blood and observe the lungs.</p> <p>Pupils will also be introduced to the reproductive systems in humans, including puberty, the menstrual cycle and development of a baby.</p>	<p>This topic builds on the KS1/ and topics of Living things and their habitats. It incorporates the KS3 Cells and Organisation topic alongside the introduction to key organs of the body and reproduction. It provides the foundation for the AQA GCSE Organisation topic.</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>



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Plants	<p>To know the structure and function of Palisade cells and how leaves are adapted for Photosynthesis</p> <p>Recall the reactants and products of Photosynthesis</p> <p>Describe the factors that limit photosynthesis</p> <p>To know the organ structures within plants and their functions</p> <p>Explain the role of the stomata in gas exchange</p> <p>Describe reproduction in plants, including the structure and function of plant sexual organs.</p>	<p>Palisade cell</p> <p>Photosynthesis</p> <p>Glucose</p> <p>Chloroplasts</p> <p>Chlorophyll</p> <p>Limiting Factors</p> <p>Xylem</p> <p>Phloem</p> <p>Root Hair Cells</p> <p>Stomata</p> <p>Transpiration</p>	<p>This is the 3rd Biology topic of the academic year and focusses on Plants and Photosynthesis.</p> <p>Pupils will learn how plants covert carbon dioxide, water and sunlight into glucose and oxygen. The will investigate how the rate of photosynthesis can be limited and by which factors.</p> <p>Pupils will be able to compare different types of plant cells and describe how they are adapted to their function.</p> <p>Finally pupils will dissection flowers, look at seed dispersal and germination.</p>	<p>The topic builds upon the foundation provided in KS1 and KS2 on basic plant structure.</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 Cell Biology, Organisation and Bioenergetics.</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>
Chemical Reactions	<p>Explain the conservation of mass in a chemical reaction.</p> <p>Write word and symbol equations for reactions with acids and bases, including state symbols.</p> <p>Describe and explain observations when chemical reactions are carried out.</p> <p>Compare and contrast the different ways to extract metals from their ore, explaining why they cannot all be extracted by heating with carbon.</p>	<p>Oxidation</p> <p>Thermal decomposition</p> <p>Exothermic change</p> <p>Reactivity series</p> <p>Displace</p> <p>Displacement</p>	<p>This is the final chemistry topic of the academic year and builds upon their knowledge of atoms, compounds, mixtures and formula already covered.</p> <p>In this topic pupils will investigate chemical and physical reactions, the pH scale (acids and alkali's) and the reactivity series.</p> <p>Within this topic pupils have the opportunity to complete lots of practical lessons, looking at testing household substances and reactions of metals linked to the reactivity series.</p>	<p>This topic builds on previous learning about materials at KS2 and introduces the concept of a chemical reaction.</p> <p>It incorporates the key learning the of Science National curriculum for Key Stage 3 and provides a foundation for the AQA GCSE specification, including the subtopics of Chemical Changes, Energy Changes and The Rate and Extent of Chemical Change.</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>



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Space	<p>Describe and explain the effect of the Earth's tilt (seasons)</p> <p>Recall different models of the Solar System</p> <p>Describe and explain patterns in the Solar System including Weight and distance (light year)</p> <p>Describe and (simply) explain the orbits of objects in the Solar System</p> <p>Describe and evaluate the Big Bang theory (using redshift and CMBR for top sets)</p> <p>Describe and explain the different stages in the life of a star</p>	<p>Satellite</p> <p>Orbit</p> <p>Planet</p> <p>Star</p> <p>Solar System</p> <p>Galaxy</p> <p>Redshift</p> <p>Gravity</p> <p>Weight</p> <p>Big Bang</p> <p>Fusion</p> <p>Axis</p> <p>Light year</p>	<p>This is a introduction to Space. In this topic pupils will look at the structure of the solar system, the planets and satellites.</p> <p>Within this topic pulps will be introduced to the theory of red-shift and the a brief introduction to life cycle of a star.</p>	<p>It builds on the year 5 programme of study 'Earth and Space' topic.</p> <p>It incorporates aspects of the KS3 forces topic (gravity) as well as Space Physics.</p> <p>This topic provides the foundation for the AQA GCSE Space Physics topic (triple only) and also links to the Forces topic in terms of circular motion. It also provides opportunity to prepare for questions on 'how science works' and practise a key equation ($W=mg$).</p>	<p>This will be set as either a Vocabulary test or as consolidation questions on a weekly basis.</p>