



# Medium Term Planning – AC2

## Curriculum: Science

**Excellence.  
No Excuses.**

Year	Topic Detail and Sequence	Pre-requisite Knowledge	Key Vocabulary	Demonstrable Skills
7	<ol style="list-style-type: none"> <li>Reactions</li> <li>Metals and non-metals</li> <li>Acids and alkalis</li> <li>pH Scale</li> <li>Indicators</li> <li>Catalysts</li> <li>Chemical energy</li> <li>Endothermic and exothermic Reactions</li> <li>Types of reaction</li> <li>Respiration</li> <li>Photosynthesis</li> <li>Limiting Factors</li> <li>Leaves and their adaptations</li> </ol>	<p>Students should know the following: Properties of solids, liquids and gases can be described in terms of particles in motion but with differences in the arrangement and movement of these same particles: closely spaced and vibrating (solid), in random motion but in contact (liquid), or in random motion and widely spaced (gas).</p> <p>Observations where substances change temperature or state can be described in terms of particles gaining or losing energy</p> <p>A pure substance consists of only one type of element or compound and has a fixed melting and boiling point.</p> <p>Mixtures may be separated due to differences in their physical properties.</p> <p>The method chosen to separate a mixture depends on which physical properties of the individual substances are different.</p> <p>Most substances are not pure elements, but compounds or mixtures containing atoms of different elements. They have different properties to the elements they contain.</p>	<p><b>Product</b> <b>Acid</b> <b>Alkaline</b> <b>Neutralise</b> <b>Reactants</b> <b>Product</b> <b>Endothermic</b> <b>Exothermic</b> <b>Catalysts</b> <b>Diffusion</b> <b>Photosynthesis</b> <b>Mitochondria</b> <b>Respiration</b></p>	<p>Identify the reactants and products in a chemical reaction</p> <p>Describe the properties, reactions and their products of metals.</p> <p>Explain how metals can be placed in a reactivity series.</p> <p>Define acids and alkalis in terms of ions.</p> <p>Describe the pH scale and place common chemicals on there.</p> <p>Name common indicators and state the colours for different pH values.</p> <p>Describe the process of bond breaking as requiring energy and the making of bonds as releasing energy.</p> <p>Define endo and exothermic reactions in terms of energy transfer to or from the surroundings.</p> <p>Differentiate between types of reactions such as combustion or thermal decomposition.</p> <p>Model chemical reactions in different ways.</p> <p>Describe the respiration and photosynthesis reactions and explain their importance to living organisms</p>
8	<ol style="list-style-type: none"> <li>The periodic table</li> <li>Development of the periodic table</li> <li>Metals and non-metals</li> <li>Reactivity</li> <li>Ceramics, polymers and composites</li> <li>Pressure</li> <li>Pressure in gases</li> <li>Atmospheric pressure</li> <li>Pressure in liquids</li> <li>The Skeleton</li> <li>Biomechanics</li> <li>Muscles</li> <li>Antagonistic pairs</li> </ol>	<p>Students should know the following: Identify the reactants and products in a chemical reaction</p> <p>Describe the properties, reactions and their products of metals.</p> <p>Explain how metals can be placed in a reactivity series.</p> <p>Define acids and alkalis in terms of ions.</p> <p>Understand forces and their effects.</p> <p>Understand the effects of turning forces.</p>	<p><b>Periodic table</b> <b>Physical properties</b> <b>Chemical properties</b> <b>Groups</b> <b>Periods</b> <b>Displacement</b> <b>Oxidation</b> <b>Reactivity</b> <b>Fluid</b> <b>Pressure</b> <b>Upthrust</b> <b>Joints</b> <b>Ligaments</b> <b>Tendons</b> <b>Cartilage</b> <b>Antagonistic</b></p>	<p>Know that the elements in a group all react in a similar way and sometimes show a pattern in reactivity.</p> <p>Explain how as you go down a group and across a period the elements show patterns in physical properties.</p> <p>Understand the idea that pressure acts in a fluid in all directions. It increases with depth due to the increased weight of fluid, and results in an upthrust.</p> <p>Objects sink or float depending on whether the weight of the object is bigger or smaller than the upthrust.</p> <p>Explain how different stresses on a solid object can be used to explain observations where objects scratch, sink into or break surfaces</p>



# Medium Term Planning – AC2

## Curriculum: Science

***Excellence.  
No Excuses.***

Year	Topic Detail and Sequence	Pre-requisite Knowledge	Key Vocabulary	Demonstrable Skills
9	<ol style="list-style-type: none"> <li>1. The composition of the atmosphere</li> <li>2. The earth's early atmosphere</li> <li>3. How oxygen increased</li> <li>4. How carbon dioxide decreases</li> <li>5. Properties of waves</li> <li>6. Transverse and longitudinal waves</li> <li>7. Reflection of waves</li> <li>8. Sound waves</li> <li>9. Waves for detection and exploration</li> <li>10. Types of electromagnetic waves</li> <li>11. Properties of electromagnetic waves</li> <li>12. Uses and applications of electromagnetic waves</li> <li><b>13. Lenses</b></li> <li><b>14. Visible light</b></li> <li><b>15. Emission and absorption of infrared radiation</b></li> <li><b>16. Perfect black bodies and radiation</b></li> </ol>	<p>Students should know the following: Recognise that light appears to travel in straight lines use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye</p> <p>Describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>Carbon is recycled through natural processes in the atmosphere, ecosystems, oceans and the Earth's crust (such as photosynthesis and respiration) as well as human activities (burning fuels).</p> <p>Greenhouse gases reduce the amount of energy lost from the Earth through radiation and therefore the temperature has been rising as the concentration of those gases has risen.</p>	<p><b>Global warming</b> <b>Fossil fuels</b> <b>Carbon sink</b> <b>Greenhouse effect</b> <b>Medium</b> <b>Oscillation</b> <b>Longitudinal</b> <b>Transverse</b> <b>Compression</b> <b>Rarefaction</b> <b>Crest</b> <b>Trough</b></p>	<p>Describe the composition of the modern atmosphere.</p> <p>Describe the likely composition of the earth's early atmosphere, likening it to other planets current atmosphere's.</p> <p>Describe and explain the processes that increased the concentration of oxygen in the atmosphere.</p> <p>Describe and explain the processes that removed carbon dioxide from the atmosphere.</p> <p>Define waves, their different types, behaviours and uses.</p> <p>Name the electromagnetic waves giving their uses and hazards. Link frequency to hazard.</p> <p>Describe the behaviour of convex and concave lenses both qualitatively and quantitatively using appropriate ray diagrams.</p> <p>Describe the features of black body radiation.</p>



# Medium Term Planning – AC2

## Curriculum: Science

***Excellence.  
No Excuses.***

Year	Topic Detail and Sequence	Pre-requisite Knowledge	Key Vocabulary	Demonstrable Skills
<p style="font-size: 2em; font-weight: bold; text-align: center;">10</p>	<ol style="list-style-type: none"> <li>1. Chemical bonds</li> <li>2. Ionic bonding</li> <li>3. Ionic compounds</li> <li>4. Covalent bonding</li> <li>5. Metallic bonding</li> <li>6. Properties of ionic compounds</li> <li>7. Properties of small molecules</li> <li>8. Polymers</li> <li>9. Giant covalent structures</li> <li>10. Properties of metals and alloys</li> <li>11. Metals as conductors</li> <li>12. Structure and bonding of carbon</li> <li>13. Nanoparticles</li> <li>14. Efficiency</li> <li>15. National and global energy resources</li> <li>16. Series and parallel circuits</li> <li>17. Domestic uses and safety</li> <li>18. Electrical energy transfers</li> <li>19. Static electricity</li> <li>20. Greenhouse gases</li> <li>21. pollutants</li> <li>22. Using the Earth's resources and sustainable development</li> <li>23. Potable Water</li> <li>24. Waste water treatment</li> <li>25. Alternative methods of extracting metals</li> <li>26. Life cycle assessments</li> <li>27. Alloys, Ceramics, polymers and composites</li> <li>28. The Haber process</li> <li>29. NPK fertilisers</li> </ol>	<p>Students should know the following: Chemical reactions as the rearrangement of atoms</p> <p>Representing chemical reactions using formulae and using equations</p> <p>The varying physical and chemical properties of different elements</p> <p>The principles underpinning the Mendeleev Periodic Table</p> <p>The Periodic Table: periods and groups; metals and non-metals</p> <p>How patterns in reactions can be predicted with reference to the Periodic Table</p> <p>The properties of metals and non-metals</p> <p>Calculation of fuel uses and costs in the domestic context</p> <p>Energy changes and transfers chemical reactions as the rearrangement of atoms</p> <p>Representing chemical reactions using formulae and using equations</p> <p>Combustion, thermal decomposition, oxidation and displacement reactions</p>	<p><b>Ion</b> <b>Covalent</b> <b>Charge</b> <b>Intermolecular</b> <b>Delocalised</b> <b>Current</b> <b>Fuse</b> <b>Useful</b> <b>Waster</b> <b>Sustainable</b> <b>Renewable</b> <b>Potable</b> <b>Distillation</b></p>	<p>Define the different bonds in terms of electrons</p> <p>Link the type of bonding to the properties</p> <p>Calculate efficiencies</p> <p>Evaluate different methods of energy generation</p> <p>Identify the energy transfers that take place in different appliances</p> <p>Identify forms of energy that are useful or wasted</p> <p>Describe how a static charge forms in terms of movement of electrons</p> <p>Describe the impact on the environment of human activities</p>



# Medium Term Planning – AC2

## Curriculum: Science

**Excellence.  
No Excuses.**

Year	Topic Detail and Sequence	Pre-requisite Knowledge	Key Vocabulary	Demonstrable Skills
<h1>11</h1>	<p><b>Inheritance Variation and Evolution</b></p> <ol style="list-style-type: none"> <li>1. Sexual and asexual reproduction</li> <li>2. Meiosis</li> <li>3. <b>Advantages and disadvantages of sexual and asexual reproduction (Biology)</b></li> <li>4. DNA and the Genome</li> <li>5. <b>DNA structure (Biology only*onwards)</b></li> <li>6. Genetic inheritance</li> <li>7. Inherited disorders.</li> <li>8. Sex Determination</li> <li>9. Variation</li> <li>10. Evolution</li> <li>11. Selective breeding</li> <li>12. Genetic Engineering</li> <li>13. <b>Cloning (Biology only)</b></li> <li>14. Theory of Evolution</li> <li>15. Speciation</li> <li>16. Evidence for Evolution</li> <li>17. Fossils</li> <li>18. Extinction</li> <li>19. Resistant bacteria</li> <li>20. Classification of Living Organisms</li> <li>21. Communities</li> <li>22. Biotic and Abiotic Factors</li> <li>23. Adaptations</li> <li>22. Sampling Techniques</li> <li>24. How Materials are Cycled</li> <li>25. <b>Decomposition (Biology only)</b></li> <li>26. <b>Impact of environmental change (Biology &amp; HT only)</b></li> <li>27. Biodiversity</li> <li>28. Waste management</li> <li>29. Land Use</li> <li>30. Deforestation</li> <li>31. Global Warming</li> <li>32. <b>Food production (Biology only)</b></li> <li>33. Properties of waves</li> <li>34. Transverse and longitudinal waves</li> <li>35. Reflection of waves</li> <li>36. Sound waves</li> <li>37. Waves for detection and exploration</li> <li>38. Types of electromagnetic waves</li> <li>39. Properties of electromagnetic waves</li> <li>40. Uses and applications of electromagnetic waves</li> <li>41. <b>Lenses</b></li> <li>42. <b>Visible light</b></li> <li>43. <b>Emission and absorption of infrared radiation</b></li> <li>44. <b>Perfect black bodies and radiation</b></li> <li>15. Communicable (infectious) diseases</li> <li>16. Viral diseases</li> <li>17. Bacterial diseases</li> <li>18. Fungal diseases</li> <li>19. Protist diseases</li> <li>20. Human defence systems</li> <li>21. Vaccination</li> <li>22. Antibiotics and painkillers</li> <li>23. Discovery and development of drugs</li> <li>24. <b>Monoclonal antibodies)</b></li> <li>25. <b>Plant disease</b></li> </ol>	<p>Students should know the following:</p> <p>The structural adaptations of some unicellular organisms</p> <p>The hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms.</p> <p>Reproduction</p> <p>The interdependence of organisms in an ecosystem, including food webs and insect pollinated crops</p> <p>Heredity as the process by which genetic information is transmitted from one generation to the next</p> <p>A simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model</p> <p>Differences between species the order of metals and carbon in the reactivity series</p> <p>The use of carbon in obtaining metals from metal oxides</p> <p>Properties of ceramics, polymers and composites (qualitative).</p>	<p><b>Chromosome</b>  <b>DNA</b>  <b>Double helix</b>  <b>Gene</b>  <b>Gamete</b>  <b>Haploid</b>  <b>Diploid</b>  <b>Mitosis</b>  <b>Meiosis</b>  <b>Sexual</b>  <b>Asexual</b>  <b>Zygote</b>  <b>Dominant</b>  <b>Recessive</b>  <b>Phenotype</b>  <b>Genotype</b>  <b>Heterozygous</b>  <b>Homozygous</b>  <b>Evolution</b>  <b>Species</b></p>	<p>Define, describe and explain types of reproduction.</p> <p>Explain DNA an the Genome</p> <p>Explain how characteristics are inherited and how genetic conditions are passed on.</p> <p>Link together the ideas of variation, evolution, selective breeding and genetic engineering.</p> <p>Use antibiotic resistance as evidence for evolution</p> <p>Explain how fossils are formed and how they support evolution.</p> <p>Describe how populations of organisms interact with each other and their environment.</p> <p>Describe how the systems of the human body are organised.</p>