


YEAR 8 SCIENCE CURRICULUM MAP

Beths Grammar School

Subject	INTENT	IMPLEMENTATION	IMPACT
	<p>Substantive Knowledge</p> <p>This is the specific, factual content for the topic, which should be connected into a careful sequence of learning.</p>	<p>Disciplinary Knowledge (Skills)</p> <p>This is the action taken within a particular topic in order to gain substantive knowledge.</p>	<p>Assessment opportunities</p> <p>What assessments will be used to measure student progress? Evidence of how well students have learned the intended content.</p>
<p>Biology</p>	<p>B2.1 – Health and Lifestyle (Typically covered within 6 weeks, with 2 double lessons per fortnight)</p> <ul style="list-style-type: none"> • Nutrients • Food tests • Unhealthy diet • Digestive system • Bacteria and enzymes in digestion • Drugs • Alcohol • Smoking 	<ul style="list-style-type: none"> • Describe the components of a balanced diet (carbohydrates, proteins, lipids, vitamins, minerals, water and fibre). • Describe the role of nutrients. • Describe how to test for starch, sugar, proteins and lipids. • Describe the consequences of an unhealthy diet (underweight, overweight and deficiencies). • Plan and investigate the energy content of food. • Calculate the energy content of food. • Describe the structure and function of the digestive system (mouth, gullet, stomach, small and large intestines, rectum, anus and liver (bile)). • Describe the process of digestion. • Explain the role of villi in absorption. • Describe the roles of carbohydrase, protease and lipase in digestion. • Explain how enzymes denature. • Describe the different types of drugs (medicinal and recreational). • Describe how drugs can lead to addiction and withdrawal. • Describe how alcohol affects health, behaviour and pregnancy. • Describe the components of cigarettes (tar, nicotine and carbon monoxide). • Explain how smoking effects the airways, alveoli, cilia and mucus. • Explain how smoking can lead to heart disease, emphysema and respiratory infections. 	<ul style="list-style-type: none"> • B2.1 end-of-unit test • Year 8 end-of-year exam

<p>Biology</p>	<p><u>B2.2 – Ecosystem Processes</u> <i>(Typically covered within 6 weeks, with 2 double lessons per fortnight)</i></p> <ul style="list-style-type: none"> • Ecosystems • Food chains and webs • Disruption to food chains and webs • Photosynthesis • Leaves • Plant minerals • Chemosynthesis • Aerobic and anaerobic respiration 	<ul style="list-style-type: none"> • Define the terms <i>ecosystem, habitat, community, population</i> and <i>niche</i>. • Describe food chains in terms of producers and consumers. • Explain interdependence between organisms in food chains and webs. • Explain how bioaccumulation affects food chains. • Describe the process of photosynthesis. • Write and balance the symbol equation for photosynthesis. • Explain the factors affecting photosynthesis (temperature and light intensity) • Describe the roles of the xylem and phloem. • Describe the structure and function of leaves (palisade and spongy layers, and stomata). • Describe and explain the adaptations of leaves (chlorophyll, thin, large surface area and veins). • Describe the roles of nitrates (proteins and DNA), phosphates (proteins and DNA) and magnesium (chlorophyll). • Explain how fertilisers can be used to treat mineral deficiencies in plants. • Describe the process of chemosynthesis. • Describe symbioses/mutualisms between organisms. • Write and balance the symbol equation for aerobic respiration. • Describe and explain the role of the blood (oxygen, glucose and carbon dioxide transport). • Plan and investigate exercise and the rate of aerobic respiration. • Describe lactic acid and alcoholic fermentation and the oxygen debt. • Write the word equations for anaerobic respiration. • Describe the uses of alcoholic fermentation. 	<ul style="list-style-type: none"> • B2.2 end-of-unit test • Year 8 end-of-year exam
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<p>Chemistry</p>	<p><u>C2.1 & C2.2 – The Periodic Table and Separation Techniques</u> <i>(Typically covered within 7 weeks, with 2 double lessons a fortnight)</i></p> <ul style="list-style-type: none"> • Metals and non-metals • Groups and periods • The elements of Group 1, 7 and 0 • Mixtures • Solutions and solubility • Filtration, evaporation and distillation • Chromatography 	<ul style="list-style-type: none"> • Use the Periodic table to identify elements and their properties. • Describe how the Periodic table is split into metals and non-metals. • Describe the physical and chemical properties of metals and non-metals. • Identify and describe the general patterns and trends of groups and periods. • Describe the physical and chemical properties of elements in Groups 1, 7 and 0. • Identify and describe patterns and trends in Groups 1, 7 and 0 (melting and boiling points, reactivity and density) • Describe the chemical reactions between alkali metals and water. • Predict the products of halogen displacement reactions. • Write and balance simple chemical equations. • Explain the differences between mixtures and compounds. • Identify pure substances using graphical data. • Describe dissolution in terms of the particle model. • Explain how temperature affects solubility. • Describe the uses of filtration, evaporation and distillation. • Plan and investigate filtration and evaporation to obtain salt. • Describe the uses of chromatography. • Use chromatography to identify an unknown substance. 	<ul style="list-style-type: none"> • C2.1 & C2.2 end-of-unit test • Year 8 end-of-year exam
<p>Chemistry</p>	<p><u>C2.3 – Acids and Alkalis</u> <i>(Typically covered within 6 weeks, with 2 double lessons a fortnight)</i></p> <ul style="list-style-type: none"> • Metals acids, oxygen and water • Metal displacement reactions • Extracting metals • Ceramics • Polymers • Composites 	<ul style="list-style-type: none"> • Use state symbols in chemical equations. • Describe chemical reactions between metals and acids. • Identify and describe trends in the reactivity series. • Plan and investigate reactions between metals and hydrochloric acid followed by testing for hydrogen. • Describe chemical reactions between metals and oxygen. • Describe chemical reactions between metals and water. • Predict the products of metals displacement reactions. • Write and balance simple chemical equations. • Describe how metals can be extracted from ores. • Calculate the mass of metals in ores. • Describe the uses and properties of ceramics, polymers (natural and synthetic) and composites. 	<ul style="list-style-type: none"> • C2.3 end-of-unit test • Year 8 end-of-year exam

<p>Physics</p>	<p><u>P2.1 – Electricity and Magnetism</u> <i>(Typically covered within 7 weeks, with 2 double lessons a fortnight)</i></p> <ul style="list-style-type: none"> • Charging up • Circuits and current • Potential difference • Resistance • Magnets and magnetic fields • Electromagnets 	<ul style="list-style-type: none"> • Describe the structure of the atom (protons, neutrons and electrons). • Describe how charged objects interact (attraction and repulsion). • Describe electric fields. • Explain how static electricity is generated. • Identify circuit components and their symbols (cell, battery, bulb, switch, ammeter, voltmeter, motor and wires). • Define the terms <i>current</i>, <i>potential difference</i> and <i>resistance</i>. • Draw and assemble a range of simple circuits (series and parallel). • Measure current and potential difference in a range of series and parallel circuits. • Describe how current and potential difference are distributed in series and parallel circuits. • Recall and apply the equation: potential difference = <i>current</i> × <i>resistance</i> • Explain the differences between conductors and insulators. • Describe how magnetic objects interact (attraction and repulsion). • Describe magnetic fields and how they can be generated when an electric current flows through a wire. • Describe the differences between permanent and electromagnets. • Explain the factors affecting the strength of an electromagnet (current, number of turns and type of core) • Plan and investigate the factors affecting the strength of an electromagnet. • Describe the uses of electromagnets. 	<ul style="list-style-type: none"> • P2.1 end-of-unit test • Year 8 end-of-year exam
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Physics	<p>P2.2 – Energy <i>(Typically covered within 6 weeks, with 2 double lessons a fortnight)</i></p> <ul style="list-style-type: none"> • Food and fuels • Energy and temperature • Energy transfer • Energy resources • Power • Work, energy and machines 	<ul style="list-style-type: none"> • Describe the daily energy requirements for a person. • Explain how energy balance affects body mass. • Describe the different energy stores (chemical, thermal, kinetic, gravitational potential and elastic potential energy stores) • Explain the law of conservation of energy. • Describe thermal energy in terms of the particle model. • Describe the different types of thermal energy transfer (conduction, convection and radiation). • Explain the differences between conductors and insulators. • Describe the use of infrared radiation in thermal imaging. • Describe the differences between renewable and non-renewable energy resources. • Explain how a thermal power station generates electricity. • Define the terms <i>power</i> and <i>work</i>. • Recall and apply the equation: $power = energy / time$ • Convert between kilowatt hours and joules. • Recall and apply the equation: $work\ done = force \times distance$ • Describe how simple machines (levers and gears) work. 	<ul style="list-style-type: none"> • P2.2 end-of-unit test • Year 8 end-of-year exam
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N.B. Due to timetabling, the time of year in which the above topics are taught will vary between classes.