

YEAR 8 SCIENCE CURRICULUM MAP

Beths Grammar School

Subject	INTENT	IMPLEMENTATION	IMPACT
	Substantive Knowledge This is the specific, factual content for the topic, which should be connected into a careful sequence of learning.	Disciplinary Knowledge (Skills) This is the action taken within a particular topic in order to gain substantive knowledge.	Assessment opportunities What assessments will be used to measure student progress? Evidence of how well students have learned the intended content.
Biology	B2.1 – Health and Lifestyle <i>(Typically covered within 6 weeks, with 2 double lessons per fortnight)</i> - Nutrients - Food tests - Unhealthy diet - Digestive system - Bacteria and enzymes in digestion - Drugs - Alcohol - Smoking	- 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 affects the airways, alveoli, cilia and mucus. - Explain how smoking can lead to heart disease, emphysema and respiratory infections.	- B2.1 end-of-unit test - Year 8 end-of-year exam

Biology	<u>B2.2 – Ecosystem Processes</u> <i>(Typically covered within 6 weeks, with 2 double lessons per fortnight)</i> • Ecosystems • Food chains and webs • Disruption to food chains and webs • Photosynthesis • Leaves • Plant minerals • Chemosynthesis • Aerobic and anaerobic respiration	• 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. Sustainability links: Analyse how organisms are interdependent on each other. Evaluate the environmental impacts of chemical fertilisers and the use of sustainable alternatives.	• B2.2 end-of-unit test • Year 8 end-of-year exam
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Chemistry	<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> - Metals and non-metals - Groups and periods - The elements of Group 1, 7 and 0 - Mixtures - Solutions and solubility - Filtration, evaporation and distillation - Chromatography	- 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.	- C2.1 & C2.2 end-of-unit test - Year 8 end-of-year exam
Chemistry	<u>C2.3 – Acids and Alkalis</u> <i>(Typically covered within 6 weeks, with 2 double lessons a fortnight)</i> - Metals acids, oxygen and water - Metal displacement reactions - Extracting metals - Ceramics - Polymers - Composites	- 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.	- C2.3 end-of-unit test - Year 8 end-of-year exam

		• Calculate the mass of metals in ores. • Describe the uses and properties of ceramics, polymers (natural and synthetic) and composites. Sustainability links: Analyse the use of non-sustainable materials and the effects on the environment. Explain examples of the three Rs of recycling (Reduce, Reuse, Recycle) and describe how these strategies could be used to reduce waste in schools.	
Physics	<u>P2.1 – Electricity and Magnetism</u> <i>(Typically covered within 7 weeks, with 2 double lessons a fortnight)</i> • Charging up • Circuits and current • Potential difference • Resistance • Magnets and magnetic fields • Electromagnets	• 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.	• P2.1 end-of-unit test • Year 8 end-of-year exam

Physics	P2.2 – Energy <i>(Typically covered within 6 weeks, with 2 double lessons a fortnight)</i> • Food and fuels • Energy and temperature • Energy transfer • Energy resources • Power • Work, energy and machines	• 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. Sustainability links: Describe the energy resources used in the UK and how they are becoming more sustainable.	• P2.2 end-of-unit test • Year 8 end-of-year exam

N.B. Due to timetabling, the time of year in which the above topics are taught will vary between classes.