

Science Long Term Programme of Study Year 9 2023-2024

Temperance Term

W/C	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	HALF TERM
Area of Study	C1 Atomic Structure and the Periodic Table and B1 Cell Biology							
Core Learning	<p>C1 – Describe the development and structure of the atom and periodic table. -Represent chemical reactions as word and symbol equations. -AT4 Safe use of a range of equipment to separate chemical mixtures -WS 1.1,1.6 Describe how scientific methods and theories develop over time</p> <p>B1 -Students should be able to, explain how the structure of different types of cell relate to their function in a tissue, an organ or organ system, or the whole organism. -Describe the structure of eukaryotic and prokaryotic cells, including the structure and function of specialised cells. -WS 4.4 Use prefixes centi, milli, micro ad nano. -WS 1.2 Recognise, draw and interpret images of cells. -RP 1 – Use microscopes to observe and draw animal and plant cells. -Explain the process of cell division and the cell cycle. -WS 1.2 Use models and analogies to develop explanations of how cells divide. -WS 1.3 Evaluate the practical risks and benefits of the use of stem cells. -WS 1.2 Draw and interpret diagrams that model diffusion and osmosis -RP3 Investigate the effect of concentration on the mass of plant tissue. -MS Confidently plot, draw and interpret graphs</p>							
Opportunities for Challenge	<p>C1 - Experimentally determine the empirical formula of an ionic compound from a given model or diagram that shows the ions in the structure B1 - Use estimations and explain when they should be used to judge the relative size or area of sub-cellular structures.</p>							
Assessment	End of Topic Tests							

W/C	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	CHRISTMAS
Area of Study	C1 Atomic Structure and the Periodic Table and B1 Cell Biology			P1 Energy and B2 Organisation			

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<p>Core Learning</p>	<p>C1 – Describe the development and structure of the atom and periodic table. -Represent chemical reactions as word and symbol equations. -AT4 Safe use of a range of equipment to separate chemical mixtures -WS 1.1,1.6 Describe how scientific methods and theories develop over time</p> <p>B1 -Students should be able to, explain how the structure of different types of cell relate to their function in a tissue, an organ or organ system, or the whole organism. -Describe the structure of eukaryotic and prokaryotic cells, including the structure and function of specialised cells. -WS 4.4 Use prefixes centi, milli, micro ad nano. -WS 1.2 Recognise, draw and interpret images of cells. -RP 1 – Use microscopes to observe and draw animal and plant cells. -Explain the process of cell division and the cell cycle. -WS 1.2 Use models and analogies to develop explanations of how cells divide. -WS 1.3 Evaluate the practical risks and benefits of the use of stem cells. -WS 1.2 Draw and interpret diagrams that model diffusion and osmosis -RP3 Investigate the effect of concentration on the mass of plant tissue. -MS Confidently plot, draw and interpret graphs</p>	<p>P1 - There are changes in the way energy is stored when a system changes. Students should be able to describe all the changes involved in the way energy is stored when a system changes, for common situations. For example:</p> <ul style="list-style-type: none"> • an object projected upwards • a moving object hitting an obstacle • an object accelerated by a constant force • a vehicle slowing down • bringing water to a boil in an electric kettle. <p>-WS1.2, 4.3 Calculate the amount of energy associated with a moving object or a stretched spring -MS 3b,c Calculate kinetic energy, elastic potential energy and gravitational potential energy -RP1 Investigate the specific heat capacity of one or more materials -MS 3b, c Calculate power -Investigate thermal conductivity using rods of different materials -MS 1a,c, 3b,c Calculate and use efficiency values as a decimal or as a percentage</p> <p>B2 - Students should know the structure and functioning of the human digestive system and the respiratory system. Students should be able to describe the relationship between health and disease and the interactions between different types of disease. -MS Develop an understanding of size and scale in relation to cells, tissues, organs and systems -Describe and explain the role of the digestive system -WS 1.2 Use models, such as the lock and key theory to explain enzyme action. -RP 4 Use qualitative reagents to test for a range of carbohydrates, lipids and proteins. -RP 5 Investigate the effect of pH on the rate of reaction of amylase. -Describe and explain the structure and function of the heart and lungs -WS 1.3 and 1.4 Evaluate the methods of treating cardiovascular disease. -Describe the relationship between health and disease -MS Construct and interpret frequency tables and graphs. -Describe the effect of lifestyle on some non-communicable diseases -Explain how the structures of plant tissues are related to their functions</p>	
<p>Opportunities for Challenge</p>	<p>C1 - Experimentally determine the empirical formula of an ionic compound from a given model or diagram that shows the ions in the structure B1 - Use estimations and explain when they should be used to judge the relative size or area of sub-cellular structures.</p>	<p>P1 - Experimentally compare and contrast two electric motors that both lift the same weight through the same height but one does it faster than the other</p> <p>B2 - Students should be able to evaluate the advantages and disadvantages of treating cardiovascular diseases by drugs, mechanical devices or transplant.</p>	

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Assessment	End of Topic Tests and Temperance Term Assessment	
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Justice Term

W/C	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	HALF TERM
Area of Study	P1 Energy and B2 Organisation						
Core Learning	<p>P1 - There are changes in the way energy is stored when a system changes. Students should be able to describe all the changes involved in the way energy is stored when a system changes, for common situations. For example:</p> <ul style="list-style-type: none"> • an object projected upwards • a moving object hitting an obstacle • an object accelerated by a constant force • a vehicle slowing down • bringing water to a boil in an electric kettle. <p>-WS1.2, 4.3 Calculate the amount of energy associated with a moving object or a stretched spring -MS 3b,c Calculate kinetic energy, elastic potential energy and gravitational potential energy -RP1 Investigate the specific heat capacity of one or more materials -MS 3b, c Calculate power -Investigate thermal conductivity using rods of different materials -MS 1a,c, 3b,c Calculate and use efficiency values as a decimal or as a percentage</p> <p>B2 - Students should know the structure and functioning of the human digestive system and the respiratory system. Students should be able to describe the relationship between health and disease and the interactions between different types of disease.</p> <p>-MS Develop an understanding of size and scale in relation to cells, tissues, organs and systems -Describe and explain the role of the digestive system -WS 1.2 Use models, such as the lock and key theory to explain enzyme action. -RP 4 Use qualitative reagents to test for a range of carbohydrates, lipids and proteins. -RP 5 Investigate the effect of pH on the rate of reaction of amylase. -Describe and explain the structure and function of the heart and lungs -WS 1.3 and 1.4 Evaluate the methods of treating cardiovascular disease. -Describe the relationship between health and disease -MS Construct and interpret frequency tables and graphs. -Describe the effect of lifestyle on some non-communicable diseases -Explain how the structures of plant tissues are related to their functions</p>						
Opportunities for Challenge	<p>P1 - Experimentally compare and contrast two electric motors that both lift the same weight through the same height but one does it faster than the other B2 - Students should be able to evaluate the advantages and disadvantages of treating cardiovascular diseases by drugs, mechanical devices or transplant.</p>						



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Assessment	End of Topic Tests	
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W/C	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	EASTER
Area of Study	P1 Energy and B2 Organisation						
Core Learning	<p>P1 - There are changes in the way energy is stored when a system changes. Students should be able to describe all the changes involved in the way energy is stored when a system changes, for common situations. For example:</p> <ul style="list-style-type: none"> • an object projected upwards • a moving object hitting an obstacle • an object accelerated by a constant force • a vehicle slowing down • bringing water to a boil in an electric kettle. <p>-WS1.2, 4.3 Calculate the amount of energy associated with a moving object or a stretched spring</p> <p>-MS 3b,c Calculate kinetic energy, elastic potential energy and gravitational potential energy</p> <p>-RP1 Investigate the specific heat capacity of one or more materials</p> <p>-MS 3b, c Calculate power</p> <p>-Investigate thermal conductivity using rods of different materials</p> <p>-MS 1a,c, 3b,c Calculate and use efficiency values as a decimal or as a percentage</p> <p>B2 - Students should know the structure and functioning of the human digestive system and the respiratory system. Students should be able to describe the relationship between health and disease and the interactions between different types of disease.</p> <p>-MS Develop an understanding of size and scale in relation to cells, tissues, organs and systems</p> <p>-Describe and explain the role of the digestive system</p>						



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	<ul style="list-style-type: none">-WS 1.2 Use models, such as the lock and key theory to explain enzyme action.-RP 4 Use qualitative reagents to test for a range of carbohydrates, lipids and proteins.-RP 5 Investigate the effect of pH on the rate of reaction of amylase.-Describe and explain the structure and function of the heart and lungs-WS 1.3 and 1.4 Evaluate the methods of treating cardiovascular disease.-Describe the relationship between health and disease-MS Construct and interpret frequency tables and graphs.	
Opportunities for Challenge	<p>P1 - Experimentally compare and contrast two electric motors that both lift the same weight through the same height but one does it faster than the other</p> <p>B2 - Students should be able to evaluate the advantages and disadvantages of treating cardiovascular diseases by drugs, mechanical devices or transplant.</p>	
Assessment	End of Topic Tests and Justice Term Assessment	

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Courage Term

W/C	Week 26	Week 27	Week 28	Week 29	Week 30	Week 31	HALF TERM	
Area of Study	P2 Electricity and Revision							EOY Assessments
Core Learning	P2-Describe how to calculate resistance and the factors which can alter it. Describe how electricity is delivered to our homes and businesses. -Recognise standard circuit symbols -MS 3b,c Calculate charge flow and potential difference -RP 3 Investigate the factors affecting the resistance of electrical circuits -Draw and interpret resistance graphs for lamps, diodes, thermistors and LDRs.							
Opportunities for Challenge	P2-Conduct multi step calculations							
Assessment	End of Topic Test and End of Year Assessment.							

W/C	Week 32	Week 33	Week 34	Week 35	Week 36	Week 37	SUMMER
Area of Study	P2 Electricity and C2 Bonding, Structure, and the Properties of Matter						
Core Learning	P2-Describe how to calculate resistance and the factors which can alter it. Describe how electricity is delivered to our homes and businesses. -Recognise standard circuit symbols -MS 3b,c Calculate charge flow and potential difference -RP 3 Investigate the factors affecting the resistance of electrical circuits -Draw and interpret resistance graphs for lamps, diodes, thermistors and LDRs. C2 – Explain how atoms are held together in structures and describe their properties. <ul style="list-style-type: none"> - Describe and draw ionic, covalent and metallic bonding. - MS 5b Represent 2D and 3D forms of bonding - Draw dot and cross diagrams for ionic and covalent bonds. - Describe the structures of covalent and ionic bonds, including giant structures. 						



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Opportunities for Challenge	P2-Conduct multi step calculations C2 - Students should consider advantages and disadvantages of the applications of these nanoparticulate materials, but do not need to know specific examples or properties other than those specified.	
Assessment	End of Topic Tests	