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Principal: Mrs C Stanyer

Subject: Science

Year 11 Curriculum Map 2024 - 25

Week Commencing	Topic (including links to additional resources)	Assessment Window
Staff INSET 02/09 Students Return 03/09	<p>Health and Reproduction 4 (B5)</p> <p>Homeostasis</p> <ul style="list-style-type: none"> explain that homeostasis is the regulation of the internal conditions of a cell or organism to maintain optimum conditions for function in response to internal and external changes. <p>The human nervous system</p> <ul style="list-style-type: none"> explain how the structure of the nervous system is adapted to its functions. explain how the various structures in a reflex arc – including the sensory neurone, synapse relay neurone and motor neurone – relate to their function. understand why reflex actions are important. extract and interpret data from graphs, charts and tables, about the functioning of the nervous system. translate information about reaction times between numerical and graphical forms. <p>Required practical activity 6: plan and carry out an investigation into the effect of a factor on human reaction time.</p>	
09/09/2024	<p>Human endocrine system</p> <ul style="list-style-type: none"> describe the principles of hormonal coordination and control by the human endocrine system. identify the position of the following on a diagram of the human body: <ul style="list-style-type: none"> pituitary gland pancreas thyroid adrenal gland ovary testes. 	

Ormiston Meridian Academy is committed to safeguarding and promoting the welfare of children and young people and expects all staff and volunteers to share this commitment.



	<p>Control of blood glucose concentration</p> <ul style="list-style-type: none"> • explain how insulin controls blood glucose (sugar) levels in the body. • compare Type 1 and Type 2 diabetes and explain how they can be treated. • extract information and interpret data from graphs that show the effect of insulin in blood glucose levels in both people with diabetes and people without diabetes. <p>Hormones in human reproduction</p> <ul style="list-style-type: none"> • describe the roles of hormones in human reproduction, including the menstrual cycle. <ul style="list-style-type: none"> • (HT only) explain the interactions of FSH, oestrogen, LH and progesterone, in the control of the menstrual cycle. • (HT only) extract and interpret data from graphs showing hormone levels during the menstrual cycle. 	
16/09/2024	<p>Contraception</p> <ul style="list-style-type: none"> • evaluate the different hormonal and non-hormonal methods of contraception. • (HT only) explain the use of hormones in modern reproductive technologies to treat infertility. <p>Feedback systems (HT only)</p> <ul style="list-style-type: none"> • explain the roles of thyroxine and adrenaline in the body. 	Learning Checkpoint
23/09/2024	<p>Reactions 6 (C6)</p> <ul style="list-style-type: none"> • calculate the mean rate of a reaction from given information about the quantity of a reactant used or the quantity of a product formed and the time taken • draw, and interpret, graphs showing the quantity of product formed or quantity of reactant used up against time draw tangents to the curves on these graphs and use the slope of the tangent as a measure of the rate of reaction • (HT only) calculate the gradient of a tangent to the curve on these graphs as a measure of rate of reaction at a specific time. • recall how changing these factors affects the rate of chemical reactions. <p>Required practical activity 11: investigate how changes in concentration affect the rates of reactions by a method involving measuring the volume of a gas produced and a method involving a change in colour or turbidity.</p>	

30/09/2024	<p>Collision Theory and Activation Energy</p> <ul style="list-style-type: none"> • predict and explain using collision theory the effects of changing conditions of concentration, pressure and temperature on the rate of a reaction • predict and explain the effects of changes in the size of pieces of a reacting solid in terms of surface area to volume ratio • use simple ideas about proportionality when using collision theory to explain the effect of a factor on the rate of a reaction. • identify catalysts in reactions from their effect on the rate of reaction and because they are not included in the chemical equation for the reaction. • explain catalytic action in terms of activation energy. <p>Required practical activity 11: investigate how changes in concentration affect the rates of reactions by a method involving measuring the volume of a gas produced and a method involving a change in colour or turbidity.</p> <ul style="list-style-type: none"> • make qualitative predictions about the effect of changes on systems at equilibrium when given appropriate information. 	Learning Checkpoint
07/10/2024	<p>WAVES 2 (P6)</p> <ul style="list-style-type: none"> • Identify the direction of energy of the wave and the direction of oscillations • Describe examples of the different wave types • Explain rarefaction and compressions • Define wavelength, amplitude, frequency, peak trough and period • Calculate wavelength, frequency and speed of a wave when given two values to find the unknown • Required practical - Finding the speed of sound • State the names of the 7 types of EM wave (Longest to shortest wavelength) • Describe the properties of the waves in the EM spectrum (compare and contrast the properties) • Recall refraction of a wave at the boundary between 2 different media • Draw ray diagrams accurately using the normal line • Explain refraction of different waves due to velocity • Investigate how the colour/type of a surface affects how quickly it cools 	
14/10/2024	<ul style="list-style-type: none"> • Describe how EM waves are generated • Explain the dangers of some EM waves • Recall the order of the EM spectrum • Describe the use of each wave in the EM spectrum • Explain the suitability of each waves for its use 	Learning Checkpoint

21/10/2024	<p>The Earth (C7)</p> <ul style="list-style-type: none"> recognise substances as alkanes given their formulae in these forms. explain how fractional distillation works in terms of evaporation and condensation. write balanced equations for the complete combustion of hydrocarbons with a given formula. <p>(Knowledge of trends in properties of hydrocarbons is limited to:</p> <p style="padding-left: 40px;">boiling points</p> <p style="padding-left: 40px;">viscosity flammability.)</p> <ul style="list-style-type: none"> recall the colour change when bromine water reacts with an alkene. balance chemical equations as examples of cracking given the formulae of the reactants and products. give examples to illustrate the usefulness of cracking. explain how modern life depends on the uses of hydrocarbons. 	Learning Checkpoint
October Half Term		
04/11/2024		
11/11/2024		OAT Eng / Maths / Sci
18/11/2024		Achievement Round 1
25/11/2024		Achievement Round 1
02/12/2024	<p>Matter 8 (C8)</p> <ul style="list-style-type: none"> use melting point and boiling point data to distinguish pure from impure substances. identify formulations given appropriate information. explain how paper chromatography separates mixtures suggest how chromatographic methods can be used for distinguishing pure substances from impure substances interpret chromatograms and determine R_f values from chromatograms Required practical activity 12: investigate how paper chromatography can be used to separate and tell the difference between coloured substances. Students should calculate R_f values. describe how to test for common gases <ul style="list-style-type: none"> oxygen carbon dioxide chlorine 	Learning Checkpoint

	<ul style="list-style-type: none"> hydrogen 	
09/12/2024	<p>Matter 9 (P4)</p> <p>Students should be able to apply their knowledge to the uses of radiation and evaluate the best sources of radiation to use in a given situation.</p> <p>Students should be able to use the names and symbols of common nuclei and particles to write balanced equations that show single alpha (α) and beta (β) decay. This is limited to balancing the atomic numbers and mass numbers. The identification of daughter elements from such decays is not required.</p> <p>Students should be able to explain the concept of half-life and how it is related to the random nature of radioactive decay.</p> <p>Students should be able to determine the half-life of a radioactive isotope from given information.</p> <p>(HT only) Students should be able to calculate the net decline, expressed as a ratio, in a radioactive emission after a given number of half-lives.</p> <p>Students should be able to compare the hazards associated with contamination and irradiation.</p>	Learning Checkpoint
16/12/2024	<p>Health and Reproduction 5 (B6)</p> <p>DNA</p> <ul style="list-style-type: none"> describe the structure of DNA and define genome discuss the importance of understanding the human genome. search for genes linked to different types of disease understanding and treatment of inherited disorders use in tracing human migration patterns from the past. explain the terms: <p><i>gamete</i></p> <p><i>chromosome</i></p> <p><i>gene</i></p> <p><i>allele</i></p> <p><i>dominant</i></p> <p><i>recessive</i></p> <p><i>homozygous</i></p> <p><i>heterozygous</i></p>	

	<p><i>genotype</i></p> <ul style="list-style-type: none"> recall the concept of probability in predicting the results of a single gene cross but recall that most phenotype features are the result of multiple genes rather than single gene inheritance. complete a Punnett square diagram and extract and interpret information from genetic crosses and family trees. make informed judgements about the economic, social and ethical issues concerning embryo screening, given appropriate information carry out a genetic cross to show sex inheritance. understand and use direct proportion and simple ratios in genetic crosses. 	
Christmas Break		
06/01/2025	<p>Variation</p> <ul style="list-style-type: none"> describe simply how the genome and its interaction with the environment influence the development of the phenotype of an organism. state that there is usually extensive genetic variation within a population of a species recall that all variants arise from mutations and that: most have no effect on the phenotype; some influence phenotype; very few determine phenotype. <p>Evolution</p> <ul style="list-style-type: none"> describe evolution as a change in the inherited characteristics of a population over time through a process of natural selection which may result in the formation of a new species. explain how evolution occurs through natural selection of variants that give rise to phenotypes best suited to their environment. explain the impact of selective breeding of food plants and domesticated animals. describe genetic engineering as a process which involves modifying the genome of an organism by introducing a gene from another organism to give a desired characteristic describe the evidence for evolution including fossils and antibiotic resistance in bacteria. 	Learning Checkpoint
13/01/2025	<p>The Earth 4 (C9) Evolution of the Atmosphere</p> <ul style="list-style-type: none"> interpret evidence and evaluate different theories about the Earth's early atmosphere. describe the main changes in the atmosphere over time and some of the likely causes of these changes describe and explain the formation of deposits of limestone, coal, crude oil and natural gas. 	

	<ul style="list-style-type: none"> describe the greenhouse effect in terms of the interaction of short and long wavelength radiation with matter. recall two human activities that increase the amounts of each of the greenhouse gases carbon dioxide and methane. 	
20/01/2025	<p>Human Activities</p> <ul style="list-style-type: none"> evaluate the quality of evidence in a report about global climate change given appropriate information describe uncertainties in the evidence base recognise the importance of peer review of results and of communicating results to a wide range of audiences. <p>Global Climate Change</p> <ul style="list-style-type: none"> describe briefly four potential effects of global climate change discuss the scale, risk and environmental implications of global climate change. <p>Carbon Footprint</p> <ul style="list-style-type: none"> describe actions to reduce emissions of carbon dioxide and methane give reasons why actions may be limited. <p>Pollutants from fuels</p> <ul style="list-style-type: none"> describe how carbon monoxide, soot (carbon particles), sulfur dioxide and oxides of nitrogen are produced by burning fuels predict the products of combustion of a fuel given appropriate information about the composition of the fuel and the conditions in which it is used. describe and explain the problems caused by increased amounts of these pollutants in the air. 	Learning Checkpoint
27/01/2025		Achievement Round 2
03/02/2025		Achievement Round 2
10/02/2025		Achievement Round 2
February Half Term		
24/02/2025	<p>The Earth 5 (C10)</p> <ul style="list-style-type: none"> state examples of natural products that are supplemented or replaced by agricultural and synthetic products distinguish between finite and renewable resources given appropriate information. extract and interpret information about resources from charts, graphs and tables distinguish between potable water and pure water 	Learning Checkpoint

	<ul style="list-style-type: none"> describe the differences in treatment of ground water and salty water give reasons for the steps used to produce potable water. Required practical activity 13: analysis and purification of water samples from different sources, including pH, dissolved solids and distillation. evaluate alternative biological methods of metal extraction, given appropriate information. carry out simple comparative LCAs for shopping bags made from plastic and paper. 	
03/03/2025	<p>Ecology 2 (B7) Communities</p> <ul style="list-style-type: none"> describe different levels of organisation in an ecosystem from individual organisms to the whole ecosystem describe the importance of interdependence and competition in a community. suggest the factors for which organisms are competing in a given habitat suggest how organisms are adapted to the conditions in which they live. extract and interpret information from charts, graphs and tables relating to the interaction of organisms within a community. explain how a change in an abiotic factor would affect a given community given appropriate data or context. explain how a change in a biotic factor might affect a given community given appropriate data or context. 	
10/03/2025	<p>Adaptations</p> <ul style="list-style-type: none"> explain how organisms are adapted to live in their natural environment, given appropriate information. <p>Levels of Organisation</p> <ul style="list-style-type: none"> understand that photosynthetic organisms are the producers of biomass for life on Earth. <p>Required practical activity 7: measure the population size of a common species in a habitat. Use sampling techniques to investigate the effect of a factor on the distribution of this species.</p> <p>Maintaining Biodiversity</p> <ul style="list-style-type: none"> describe both positive and negative human interactions in an ecosystem and explain their impact on biodiversity. 	Learning Checkpoint
17/03/2025	<p>Electricity 4 (P7)</p> <ul style="list-style-type: none"> describe the attraction and repulsion between unlike and like poles for permanent magnets describe the difference between permanent and induced magnets. describe how to plot the magnetic field pattern of a magnet using a compass 	

	<ul style="list-style-type: none"> draw the magnetic field pattern of a bar magnet showing how strength and direction change from one point to another explain how the behaviour of a magnetic compass is related to evidence that the core of the Earth must be magnetic. describe how the magnetic effect of a current can be demonstrated 	
24/03/2023	<ul style="list-style-type: none"> draw the magnetic field pattern for a straight wire carrying a current and for a solenoid (showing the direction of the field) explain how a solenoid arrangement can increase the magnetic effect of the current. 	Learning Checkpoint
31/03/2025	Paper 1 Revision	
07/04/2025	Paper 1 Revision	
Easter Break		
28/04/2025	Paper 1 Revision	
05/05/25	Paper 2 Revision	GCSE
12/05/2025	Paper 2 Revision	GCSE
19/05/2025	Paper 2 Revision	GCSE
May Half Term		
02/06/2025		GCSE
09/06/2025		GCSE
16/06/2025		GCSE
23/06/2025		
30/06/2025		
07/07/2025		
14/07/2025		
21/07/2025		