

CURRICULUM MAP: Combined/Triple Science Year 11 Long Term Plan 2019 - 2020

EXAM BOARD: Edexcel – Biology



At Oriiel, we teach the Pearson Edexcel GCSE (9-1) Combined Sciences 2-Year route split into the 3 different disciplines (Biology, Chemistry & Physics) that are taught alongside each other by specialist teachers within that area of study allowing crossing-over of ideas, concepts and principles throughout the students' academic journey at GCSE level. The Pearson Edexcel Level 1/Level 2 GCSE (9–1) in Combined Science consists of six externally examined papers. These are available at foundation tier and higher tier containing a mixture of different question styles, including multiple-choice questions, short answer questions, calculations and extended open-response questions. GCSE study in the sciences provides the foundation for understanding the material world. Scientific understanding is changing our lives and is vital to the world's future prosperity. All students should learn essential aspects of the knowledge, methods, processes and uses of science. They should gain appreciation of how the complex and diverse phenomena of the natural world can be described in terms of a small number of key ideas that relate to the sciences and that are both inter-linked and of universal application.

	Autumn Term 1 Weeks: 8	Autumn Term 2 Weeks: 7	Spring Term 1 Weeks: 6	Spring Term 2 Weeks: 6	Summer Term 1 Weeks: 5	Summer Term 2 Weeks: 7
Key Concepts	CB6. Plant Structures & Their Function	C7. Animal Coordination, Control & Homeostasis	CB8. Exchange & Transport in Animals	CB9. Ecosystems & Material Cycles	GCSE Revision & Exam Focus	
Themes	This unit will help you learn about the process of photosynthesis and its importance, how plant structures are adapted to their functions and how water, mineral ions and sugar are transported through plants.	This unit introduces you to hormones, metabolic rate, the menstrual cycle, blood glucose and diabetes.	This unit introduces you to diffusion, different kinds of respiration, how the lungs are adapted to their functions, and calculating cardiac output.	This unit introduces you to ecosystems, abiotic and biotic factors and communities, parasitism, biodiversity, and the water, carbon and nitrogen cycles.	Revision techniques and exam techniques Study of examiner reports, how to use mark schemes and common misconceptions.	
The Learning Journey (Previous KS3 & KS4 Learning)	Photosynthesis. CB1: Plant cells	Causes of obesity. Structure & function of the human reproductive systems. The menstrual cycle. CB1: Specialised cells (gametes). Enzymes	Digestion. Respiratory system. Circulatory system. Aerobic/anaerobic respiration. CB1: Diffusion. Animal cells & adaptations.	Photosynthesis. Interdependence & food webs. How organisms are affected by their environment. CB6: Photosynthesis. CB8:	CB1-9. All Content.	

				Respiration.		
Maths Focus	<p>Carry out rate calculations for chemical reactions</p> <p>Use simple compound measures such as rate</p> <p>Plot, draw and interpret appropriate graphs</p> <p>Construct and interpret frequency tables and diagrams, bar charts and histograms</p> <p>Understand the principles of sampling as applied to scientific data</p> <p>Use a scatter diagram to identify a correlation between two variables</p> <p>Understand and use simple compound measures such as the rate of a reaction</p> <p>Understand and use inverse proportion – the inverse square law and light</p>	<p>Use simple compound measures such as rate</p> <p>Plot, draw and interpret appropriate graphs</p> <p>Translate information between numerical and graphical forms</p> <p>Construct and interpret frequency tables and diagrams, bar charts and histograms</p> <p>Understand and use percentiles</p> <p>Extract and interpret data from graphs, charts and tables</p>	<p>Demonstrate an understanding of number, size and scale and the quantitative relationship between units</p> <p>Calculate with numbers written in standard form</p> <p>Calculate surface area : volume ratios Plot, draw and interpret appropriate graphs</p> <p>Translate information between numerical and graphical forms</p> <p>Construct and interpret frequency tables and diagrams, bar charts and histograms</p> <p>Extract and interpret information from graphs, charts and tables</p> <p>Use percentiles and calculate percentage gain and loss of mass</p>	<p>Calculate surface area : volume ratios</p> <p>Plot, draw and interpret appropriate graphs</p> <p>Understand and use percentiles and calculate percentage gain and loss of mass</p> <p>Translate information between numerical and graphical forms</p> <p>Construct and interpret frequency tables and diagrams, bar charts and histograms</p> <p>Understand the principles of sampling as applied to scientific data</p> <p>Use a scatter diagram to identify a correlation between two variables Calculate the percentage of mass</p>	All demonstrated skills.	

	<p>intensity in the context of factors affecting photosynthesis.</p> <p>Use percentiles and calculate percentage gain and loss of mass</p> <p>Calculate arithmetic means</p> <p>Carry out rate calculations</p>			<p>Calculate arithmetic means</p> <p>Extract and interpret information from charts, graphs and tables</p>		
Core Practical Skills	<p>6.5 Investigate the effect of light intensity on the rate of photosynthesis</p>		<p>8.11 Investigate the rate of respiration in living organisms</p>	<p>9.5 Investigate the relationship between organisms and their environment using field-work techniques, including quadrats and belt transects</p>	<p>Revisit practical skills through use of demonstrations and video-resources</p>	
Spiritual, Moral, Social and Cultural theme (SMSC) Fundamental British Values (FBV)	<p>Spiritual & Social through presentations and practical work</p>	<p>Spiritual & Social through presentations and practical work</p>	<p>Spiritual & Social through presentations and practical work</p>	<p>Spiritual & Social through presentations and practical work</p>	<p>Spiritual & Social through presentations and practical work</p>	
Key Assessment Focuses, Suggested Assessments and Feedback Week	<p>EOU (Plant Structures & Their Functions)</p> <p>'Book DIRT' Feedback</p> <p>'Assessment DIRT' Feedback</p>	<p>EOU (Animal Coordination & Homeostasis)</p> <p>Summative Assessment</p> <p>'Assessment DIRT' Feedback</p> <p>Year 11 Nov PPE</p>	<p>EOU (Exchange & Transport in Animals)</p> <p>Summative Assessment</p> <p>'Book DIRT' Feedback</p> <p>'Assessment DIRT' Feedback</p>	<p>EOU (Ecosystems & Material Cycles)</p> <p>Summative Assessment</p> <p>'Assessment DIRT' Feedback</p> <p>Year 11 May PPE</p>	<p>GCSE Assessments (6 x External Examinations)</p>	

An 'Assessment DIRT' will also be completed after each assessment where students identify strengths and areas for improvement using their PLC documents and will attempt to turn their PLC statement into a question and complete the answer.
Students will self-assess their work with purple highlighters.

Special Events					Science Week	
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CURRICULUM MAP: Combined/Triple Science Year 11 Long Term Plan 2019 - 2020

EXAM BOARD: Edexcel – Chemistry



At Oriol, we teach the Pearson Edexcel GCSE (9-1) Combined Sciences 2-Year route split into the 3 different disciplines (Biology, Chemistry & Physics) that are taught alongside each other by specialist teachers within that area of study allowing crossing-over of ideas, concepts and principles throughout the students' academic journey at GCSE level. The Pearson Edexcel Level 1/Level 2 GCSE (9–1) in Combined Science consists of six externally examined papers. These are available at foundation tier and higher tier containing a mixture of different question styles, including multiple-choice questions, short answer questions, calculations and extended open-response questions. GCSE study in the sciences provides the foundation for understanding the material world. Scientific understanding is changing our lives and is vital to the world's future prosperity. All students should learn essential aspects of the knowledge, methods, processes and uses of science. They should gain appreciation of how the complex and diverse phenomena of the natural world can be described in terms of a small number of key ideas that relate to the sciences and that are both inter-linked and of universal application.

	Autumn Term 1 Weeks: 8	Autumn Term 2 Weeks: 7	Spring Term 1 Weeks: 6	Spring Term 2 Weeks: 6	Summer Term 1 Weeks: 5	Summer Term 2 Weeks: 7
Key Concepts	CC13. Groups in the Periodic Table	CC14. Rates of Reaction / CC15. Heat Energy Changes	CC16. Fuels / CC17. Earth & Atmospheric Science	Revision & Catch Up	GCSE Examination Period	
Themes	This unit introduces you to alkalis, halogens, displacement reactions and noble gases.	This unit introduces you to rates of reaction and catalysts, exothermic and endothermic reactions and energy changes in reactions.	This section introduces you to crude oils and natural gas, hydrocarbons, fractional distillation, the alkane homologous series, combustion, pollution, the earth's atmosphere and climate change.	Revision techniques and exam techniques Study of examiner reports, how to use mark schemes and common misconceptions	Revision techniques and exam techniques Study of examiner reports, how to use mark schemes and common misconceptions	
The Learning Journey (Previous KS3 & KS4 Learning)	Elements, compounds & the Periodic Table. Chemical Reactions. CC3/5/8: Nature of atoms & ions. Balanced chemical equations.	Elements, compounds & the Periodic Table. Chemical Reactions. CC3/5/8: Nature of atoms & ions. Balanced chemical equations.	Mixtures & fractional distillation. Fuels & energy sources. Acidity of non-metal oxides. Production of carbon dioxide by human activity. Climate change.	CC1-17: All topics.	CC1-17: All topics.	

<p>Maths Focus</p>		<p>Arithmetic computation, ratio when measuring rates of reaction</p> <p>Drawing and interpreting appropriate graphs from data to determine rate of reaction</p> <p>Determining gradients of graphs as a measure of rate of change to determine rate</p> <p>Proportionality when comparing factors affecting rate of reaction</p> <p>Arithmetic computation when calculating energy changes</p> <p>Interpretation of charts and graphs when dealing with reaction profiles</p>	<p>Extract and interpret information from charts, graphs and tables</p> <p>Use orders of magnitude to evaluate the significance of data</p>			
<p>Core Practical Skills</p>	<p>7.1 Investigate the effects of changing the conditions of a reaction on the rates of chemical reactions by:</p>					

	a) measuring the production of a gas (in the reaction between hydrochloric acid and marble chips) b) observing a colour change (in the reaction between sodium thiosulfate and hydrochloric acid)					
Spiritual, Moral, Social and Cultural theme (SMSC) Fundamental British Values (FBV)	Spiritual & Social through presentations and practical work	Spiritual & Social through presentations and practical work	Spiritual & Social through presentations and practical work	Spiritual & Social through presentations and practical work	Spiritual & Social through presentations and practical work	
Key Assessment Focuses, Suggested Assessments and Feedback Week	EOU (Groups of the Periodic Table) Summative Assessment 'Book DIRT' Feedback 'Assessment DIRT' Feedback	EOU (Rates of Reaction/Heat Energy Changes) Summative Assessment 'Assessment DIRT' Feedback Year 11 Nov PPE	EOU (Fuels / Earth & Atmospheric Science) Summative Assessment 'Book DIRT' Feedback 'Assessment DIRT' Feedback	'Assessment DIRT' Feedback Year 11 May PPE	GCSE Examination (6 x External Examinations)	
	An 'Assessment DIRT' will also be completed after each assessment where students identify strengths and areas for improvement using their PLC documents and will attempt to turn their PLC statement into a question and complete the answer. Students will self-assess their work with purple highlighters.					

Special Events						
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CURRICULUM MAP: Combined/Triple Science Year 11 Long Term Plan 2019 - 2020

EXAM BOARD: Edexcel – Physics



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	Autumn Term 1 Weeks: 8	Autumn Term 2 Weeks: 7	Spring Term 1 Weeks: 6	Spring Term 2 Weeks: 6	Summer Term 1 Weeks: 5	Summer Term 2 Weeks: 7
Key Concepts	CP7. Energy – Forces Doing Work / CP8. Forces & Their Effects	CP9. Electricity & Circuits	CP10. Magnetism & The Motor Effects / CP11. Electromagnetic Induction	CP12. Particle Model / CP13. Forces & Matter / Revision & Catch Up	Revision & Catch Up GCSE Examination Period	
Themes	This unit introduces you to the ways in which energy can be changed in a system, and how to calculate power and work done. CP8 covers objects affecting each other and vector diagrams.	This unit introduces you to electric circuits, current and potential difference, charge and energy, resistance, transferring energy, and power.	CP10 introduces you to magnets and magnetic fields, electromagnetism and magnetic forces. CP11 covers transformers and energy.	CP12 introduces you to particles and density, energy and changes of state, energy calculations, and gas temperature and pressure. CP13 covers bending and stretching, and extension and energy transfers.	Revision techniques and exam techniques Study of examiner reports, how to use mark schemes and common misconceptions	
The Learning Journey (Previous KS3 & KS4 Learning)	Energy stores & transfers. Force arrow diagrams. Balanced & unbalanced forces. CP1/3: Vector & Scalars GPE & KE calculations	Current & voltage. Circuits. Conductors & resistance.	Magnetic fields. Electromagnets.	Mass conservation. Properties of solids, liquids & gases. Particle arrangements. CP2: Effects of forces on objects	CC1-17: All topics.	

	Energy transfer diagrams					
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Maths Focus	<p>Make calculations using ratios and proportional reasoning to convert units and to compute Rates</p> <p>Make calculations of the energy changes associated with changes in a system, recalling or selecting the relevant equations for mechanical, electrical, and thermal processes; thereby express in quantitative form and on a common scale the overall redistribution of energy in the system</p> <p>Calculate relevant values of stored energy and energy transfers; convert between newton-metres and joules</p> <p>Make calculations using ratios and proportional reasoning to convert units and to compute</p>	<p>Make calculations using ratios and proportional reasoning to convert units and to compute Rates</p> <p>Apply the equations relating p.d., current, quantity of charge, resistance, power, energy, and time, and solve problems for circuits which include resistors in series, using the concept of equivalent resistance</p> <p>Use graphs to explore whether circuit elements are linear or non-linear and relate the curves produced to their function and properties</p> <p>Make calculations of the energy changes associated with changes in a system, recalling or selecting the relevant equations for mechanical, electrical, and thermal processes; thereby</p>	<p>Make calculations using ratios and proportional reasoning to convert units and to compute rates</p> <p>Make calculations using ratios and proportional reasoning to convert units and to compute rates</p> <p>Make calculations of the energy changes associated with changes in a system, recalling or selecting the relevant equations for mechanical, electrical, and thermal processes; thereby express in quantitative form and on a common scale the overall redistribution of energy in the system</p>	<p>Make calculations using ratios and proportional reasoning to convert units and to compute rates</p> <p>Make calculations of the energy changes associated with changes in a system, recalling or selecting the relevant equations for mechanical, electrical, and thermal processes; thereby express in quantitative form and on a common scale the overall redistribution of energy in the system</p> <p>Calculate relevant values of stored energy and energy transfers; convert between newton metres and joules</p> <p>Apply the relationship</p>		
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	<p>Rates</p> <p>Use vector diagrams to illustrate resolution of forces, a net force, and equilibrium situations (scale drawings only)</p>	<p>express in quantitative form and on a common scale the overall redistribution of energy in the system</p>		<p>between density, mass and volume to changes where mass is conserved</p> <p>Apply the relationship between change in internal energy of a material and its mass, specific heat capacity and temperature change to calculate the energy change involved; apply the relationship between specific latent heat and mass to calculate the energy change involved in a change of state</p> <p>Make calculations using ratios and proportional reasoning to convert units and to compute rates</p> <p>Calculate relevant values of stored energy and energy transfers; convert between newton-metres and joules</p> <p>Make calculations of the energy changes associated with</p>		
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				changes in a system, recalling or selecting the relevant equations for mechanical, electrical, and thermal processes; thereby express in quantitative form and on a common scale the overall redistribution of energy in the system		
Core Practical Skills		10.17 Construct electrical circuits to: a) investigate the relationship between potential difference, current and resistance for a resistor and a filament lamp b) test series and parallel circuits using resistors and filament lamps		14.3 Investigate the densities of solid and liquids. 14.11 Investigate the properties of water by determining the specific heat capacity of water and obtaining a temperature-time graph for melting ice. 15.6 Investigate the extension and work done when applying forces to a spring.		
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Key Assessment Focuses, Suggested Assessments and Feedback Week	EOU (Energy – Forces Doing Work & Effects) Summative Assessment	EOU (Electricity) Summative Assessment	EOU (Magnetism) Summative Assessment	EOU (Particle Model, Forces & Matter) Summative Assessment	GCSE Examination (6 x External Examinations)	
	'Book DIRT' Feedback 'Assessment DIRT' Feedback	'Assessment DIRT' Feedback Year 11 Nov PPE	'Book DIRT' Feedback 'Assessment DIRT' Feedback	'Assessment DIRT' Feedback Year 11 May PPE		
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