

KS4 WJEC Double award.

Biology year 10

[WJEC question bank](#) (past questions and mark schemes)

[Double Award Science Specification](#)

[Past Exam Papers](#)

[BBC Bitesize Website](#)

Term	Topic	Content/Assessments	Home learning opportunities
1a	1.1 Cells and movement across membranes	<ul style="list-style-type: none"> Cell structure, levels of organisation and microscopy The processes involved in transport of substances in and out of cells How enzymes catalyse biological reactions, and their role in digestion. <u>Specified practicals</u> Microscopy, magnification and plan diagrams Investigating the effect of temperature on enzyme catalysed reactions Additional higher tier only content to include protein structure and folding linked to specificity, active transport and the formation of enzyme-substrate complexes. AP1 Exam on content covered above 	Biology Revision Resources
1b	1.2 Respiration and the respiratory system in humans	<ul style="list-style-type: none"> Aerobic and anaerobic respiration The structure, function, adaptations and requirement of the respiratory system. The mechanism of ventilation. Modelling and evaluating ventilation. Comparing inhaled to exhaled air. The effects and possible consequences of smoking. Additional higher tier only content to include comparing aerobic to anaerobic respiration in terms of ATP release and the accumulation of lactic acid/ oxygen debt 	Biology Revision Resources
Christmas Holidays			
2a	1.3 Digestion and the digestive system in humans	<ul style="list-style-type: none"> The structure, organisation and adaptations of the digestive system. The products of digestion, their uses and the enzymes that catalyse their reactions The roles of bile and hydrochloric acid How food is moved along the intestine by peristalsis The need for a balanced diet and the implications of malnutrition, be it over or under. <u>Specified practical</u> – calculating the energy content of foods 	Biology Revision Resources

		<ul style="list-style-type: none"> • AP2 Exam on content covered since September 	
2b	<p>1.4 Circulatory system in humans</p> <p>1.5 Plants and photosynthesis</p>	<ul style="list-style-type: none"> • The components of the blood • The structure of the heart and the passage of blood through the pulmonary and systemic branches. • How capillaries facilitate exchanges between the blood and the cells. • Risk factors associated with heart disease <hr/> <ul style="list-style-type: none"> • The reactants and products of photosynthesis • The fates of glucose produced in photosynthesis • The practical techniques used to investigate photosynthesis • <u>Specified practical – investigation into the rate of photosynthesis.</u> • Additional higher tier only content to include the inverse square law and limiting factors of photosynthesis. • AP3 Exam on content covered since September 	Biology Revision Resources
Easter Holidays			
3a	<p>1.6 Ecosystems and human impact on the environment</p> <p>Revision and exam preparation.</p>	<ul style="list-style-type: none"> • Energy flow through ecosystems as represented by pyramids, food chains and food webs. • Food production methods, considering their pros and cons and their effects on ecosystems. • Eutrophication, bioaccumulation and biomagnification. • The use of organisms as bioindicators of pollution. 	Biology Revision Resources
3b	<p>Revision and exam preparation.</p> <p>External Exams</p> <p>-----</p> <p>4.1 Classification and biodiversity</p>	<p style="text-align: center; background-color: yellow;">External exams on all content covered this year.</p> <p>-----</p> <p>Yr11 content to be studied after completion of Year 10 external exams.</p> <ul style="list-style-type: none"> • How organisms are classified into groups based on their similarities. • The binomial system • How organisms have evolved to be adapted to the ecosystem in which they live. • Examples of behavioural and structural adaptations. • The factors which affect population size 	BBC bitesize

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Term	Topic	Content/Assessments	Home learning opportunities
1a	4.1 CLASSIFICATION AND BIODIVERSITY (continued from end of Year 10 summer term)	<ul style="list-style-type: none"> Why and how biodiversity is maintained and conserved. The use of quadrats to estimate population size. The principles of sampling The consequences of invasive species and the use of biocontrol. <u>Specified practical</u> - investigation into factors affecting the distribution and abundance of a species Additional higher tier only content to include the use of capture/mark/release/recapture 	BBC bitesize
1b	4.2 CELL DIVISION AND STEM CELLS	<ul style="list-style-type: none"> Cell division via mitosis and meiosis Chromosomes How cancerous growths may develop Stem cells and their potential applications in therapeutic medicine. AP1 Exam on content since September. 	Cell division Stem cells
Christmas Holidays			
2a	4.3 DNA AND INHERITANCE 4.4 VARIATION AND EVOLUTION	<ul style="list-style-type: none"> The structure of DNA and its relationship with proteins. The gene and alleles. The principles of genetic profiling and its applications. The principles on Mendelian genetics and the inheritance of single characteristics (monohybrid inheritance) Sex determination in humans The completion of Punnett squares and genetic diagrams. How organisms vary and sources of variation to include mutation and sexual reproduction. How some mutant alleles can lead to genetic disorders Heritable mutation as the basis of evolution (change over time) and natural selection as the evidence-based <i>scientific</i> explanation for evolution. Antibiotic resistance, warfarin resistance in rats and industrial melanism as evidence for natural selection. The human genome project and its applications. <u>Specified practical</u>- • Investigation into variation in organisms Additional higher tier only content to include the names of the nucleotides in DNA and the triplet code. 	DNA and inheritance Evolution
2b	4.5 RESPONSE AND REGULATION	<ul style="list-style-type: none"> The human nervous system and the properties and examples of reflex actions Homeostasis and regulation of blood sugar Diabetes type 1 and 2 , their treatment and management 	Response and regulation

		<ul style="list-style-type: none"> • The structure and role of the skin (in thermoregulation) • How drugs and lifestyle choices may affect health • Additional higher tier only content to include the reflex arc and principles of negative feedback. • <u>SPECIFIED PRACTICAL</u> • Investigation into factors affecting reaction time • AP2 Exam on content since September. 	
Easter Holidays			
3a	4.6 DISEASE, DEFENCE AND TREATMENT	<ul style="list-style-type: none"> • The structure of virus and bacteria • Microorganisms as pathogens and how they can be transmitted. • How our bodies defend themselves against potential pathogens, including the roles of phagocytes and lymphocytes. • The principles of vaccination • The use of antibiotics and the selection of antibiotic resistance. • The treatment of conditions with drugs or other therapies. • Research into new drugs and its ethical implications • Additional higher tier only content to include infection and vaccination and the inducing of immunological memory • 	Disease defence and treatment
3b	Revision and exam preparation External exam	<ul style="list-style-type: none"> • Planned revision activities • Final external examinations 	

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Chemistry Year 10

[WJEC question bank](#) (past questions and mark schemes)

[Double Award Science Specification](#)

[Past Exam Papers](#)

[Chemistry BBC Bitesize](#)

[Chemistry revision resources](#)

Term	Topic	Content/Assessments	Home learning opportunities
1a	2.1 The nature of substances and chemical reactions	<ul style="list-style-type: none"> To know the differences between atoms, elements, compounds, molecules and mixtures. The structure of the atom (subatomic particles, masses and charges) How to represent elements, compounds and molecules using chemical symbols, formulae and diagrams. Calculating/working out the formulae of ionic compounds from their individual ions. Calculating relative atomic mass and relative molecular mass Calculating the percentage composition of compounds Methods of different separation techniques: filtration, evaporation, chromatography (including data analysis) and distillation. What chemical reactions are. Writing balanced chemical equations Calculating percentage yield of chemical reactions. Higher tier only: calculating the formulae of compounds from reacting mass data. Calculating the masses of reactants from balanced chemical equations. Calculations involving Avogadro constant and the mole. AP1 Exam on content covered above 	Chemistry revision resources
1b	2.2 Atomic structure and the periodic table	<ul style="list-style-type: none"> Recap- structure of the atoms (d) atoms having no overall electrical charge How elements are arranged in The Periodic Table. Using the periodic table: Symbols, atomic number and mass number Basic properties of metals and non-metals Using The Periodic Table to draw the electronic structures of the first 20 elements 	Chemistry revision resources

		<ul style="list-style-type: none"> Group 1 Chemistry. Their physical and chemical properties, reactivity, reactions in water, with halogens and with oxygen. Flame tests Group 7 Chemistry. Their physical and chemical properties, uses, reactivity, reaction with the alkali metals and with iron (Halogen displacement reactions) Chemical tests to identify ions. Group 0 chemistry. Higher Tier only: Explaining trends in reactivity (readiness to lose or gain electrons). 	
Christmas Holidays			
2a	2.3. Water	<ul style="list-style-type: none"> AP2 Exam on content covered since September Composition of water The need for a sustainable water supply The treatment of the public water supply Evaluating fluoridation of the water supply Distillation Solubility and solubility curves Hard and soft water Specified practical on hard and soft water. 	Chemistry revision resources
2b	2.4 The ever-changing earth	<ul style="list-style-type: none"> The structure of the Earth The theory of plate tectonics and theory of continental drift including plate boundaries The formation of the original atmosphere and how the atmosphere has changed to present day. Climate change Gas tests AP3 Exam on content covered since September 	Chemistry revision resources
Easter Holidays			
3a	2.5 Rate of chemical change Revision and exam preparation.	<ul style="list-style-type: none"> Practical methods used to determine the rate of reaction How the rate of reaction can be changed The particle Catalysts in reactions Catalysts and activation energy 	Chemistry revision resources
3b	Revision and exam preparation. External Exams -----	<p style="text-align: center;">External exams on all content covered this year.</p> <p>-----</p> <p>Yr11 content to be studied after completion of Year 10 external exams.</p>	Chemistry revision resources

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Term	Topic	Content/Assessments	Home learning opportunities
1a	5.1 Bonding, structure and properties	<ul style="list-style-type: none"> Ionic bonding. Explaining the structure, properties, function and bonding in ionic compounds Covalent bonding. Explaining the structure, properties, function and bonding in covalent compounds Metallic bonding. Explaining the structure, properties, function and bonding in metallic compounds Simple molecular substances. Explaining the structure, properties, function and bonding in simple molecular substances Properties, structure and bonding in allotropes of carbon Nano particles. Structure, properties, uses and functions. Evaluating the use of nano particles The properties and uses of smart materials 	Chemistry BBC Bitesize
1b	5.2 Acids, bases and salts Preparation for practical exam	<ul style="list-style-type: none"> Acidic, alkaline and neutral substances. The pH scale Reactions of dilute acids with bases and carbonates Equation for neutralisation Preparation of crystals from reactions with insoluble bases and carbonates Naming salts Chemical tests Titrations AP1 Exam on content since September. 	Chemistry BBC Bitesize
Christmas Holidays			
2a	Preparation for practical exam 5.3 Metals and their extraction	Preparation for practical exam Coursework practical exam. <ul style="list-style-type: none"> Metal ores Reactivity series of metals Metal displacement reactions REDOX reactions. Oxidation and reduction. The industrial extraction of iron in the blast furnace The industrial extraction of aluminium The general properties of metals and transition metals Evaluating factors affecting economic viability and sustainability of extraction processes 	Chemistry BBC Bitesize
2b	5.4 Chemical reactions and energy	<ul style="list-style-type: none"> Exothermic and endothermic reactions Energy profiles for exothermic and endothermic reactions 	Chemistry BBC Bitesize

	5.5. Crude oil, fuels and carbon compounds	<ul style="list-style-type: none"> Using bond energy data to calculate overall energy change for a reaction AP2 Exam on content since September. 	
Easter Holidays			
3a	5.5 Crude oil, fuels and carbon compounds	<ul style="list-style-type: none"> Formation of crude oil Fractional distillation of crude oil (process, uses of fractions and properties) Evaluating the importance of the oil industry Combustion reactions of hydrocarbons and other fuels Determine experimentally the energy per gram released by a burning fuel The fire triangle in fire-fighting and fire prevention Cracking hydrocarbon molecules 	Chemistry BBC Bitesize
3b	Revision and exam preparation External exam	<ul style="list-style-type: none"> Planned revision activities <p>External exams on all content covered this year.</p>	Chemistry BBC Bitesize

KS4 Physics

[Click here for link to subject specification](#)

[Click here for link to exam question bank](#)

[Click here for revision website with notes and questions](#)

Items in **bold** are higher tier only

Year 10

Term	Topic	Content/Assessments	Home learning opportunities
1a	Electric Circuits	<ul style="list-style-type: none"> • Circuit symbols • Current and voltage in series and parallel circuits • How to connect ammeters and voltmeters in circuits. • Resistance calculations ($R=V/I$) • Resistance in series and parallel. • Resistance in filament bulbs, resistors and diodes. • How resistance varies with temperature in thermistors. • Electrical power ($E=Pt$) • Power calculations ($P=IV$ and $P=I^2R$) <p>AP1 Exam on content covered above</p>	Bitesize revision website
1b	Generating Electricity	<ul style="list-style-type: none"> • Advantages and disadvantages of renewable energy resources (solar, wind, geothermal, biomass, hydroelectricity, etc..) • Advantages and disadvantages of non-renewable energy resources (fossil fuels, nuclear) • How fossil fuel power stations work. • Sankey diagrams and efficiency. • The national grid and what makes it reliable and efficient. • The purpose of step-up and step-down transformers. 	Bitesize revision website
Christmas Holidays			
2a	Making use of energy	<ul style="list-style-type: none"> • Heat transfer by conduction, convection and radiation. • Explanation of conduction in terms of molecular motion and free electrons. • Explanation of convection in terms of molecular behaviour and changes in volume and density. • Density: what is it, and how is it calculated ($D=m/V$) • How heat loss from homes can be reduced. • Calculating payback time. 	Bitesize revision website

		AP2 Exam on content covered since September	
2b	Domestic Electricity	<ul style="list-style-type: none"> • Unit of electricity: KWhr • Calculating the cost of electricity. • Difference between AC and DC. • How fuses, miniature circuit breakers (mcb), and residual current circuit breakers (rccb) work. • Purpose of the live, neutral and earth wires. <p>AP3 Exam on content covered since September.</p>	Bitesize revision website
Easter Holidays			
3a	Features of Waves	<ul style="list-style-type: none"> • Longitudinal and transverse waves. • Features of waves including wavelength, amplitude, frequency, wave speed. • Reflection • Refraction • Electromagnetic spectrum: the uses and dangers of each type of radiation. • Satellite communication using geosynchronous orbits. 	Bitesize revision website
3b	Revision and Exam Prep	Revision External exam	

Year 11

Term	Topic	Content/Assessments	Home learning opportunities
1a	Distance, Speed and Acceleration	<ul style="list-style-type: none"> • Understanding and calculating speed, velocity and acceleration. • Using distance-time and speed-time graphs. • Stopping distance: understanding reaction time, thinking distance, braking distance and the factors which affect them. 	Bitesize revision website
1b	Newton's Laws	<ul style="list-style-type: none"> • Understand the concept of inertia. • Be able to explain Newton's three laws. • Difference between mass and weight. • Forces acting on objects. • Terminal velocity and how the forces acting on falling objects change. <p>AP1 Exam on content since September.</p>	Bitesize revision website

Christmas Holidays			
2a	Work and Energy	<ul style="list-style-type: none"> • Work done = force x distance moved • Work is a measure of energy. • Relationship between force applied and the extension of a spring. (Hooke's Law) • Force-Extension graphs • Safety features in cars: air bags, crumple zones. 	Bitesize revision website
2b	Stars and Planets	<ul style="list-style-type: none"> • Main features of the Solar System: planets, satellites, asteroids. • Features of observable universe. • Life cycle of a star. • Hertzprung-Russell Diagram. <p>AP2 Exam on content covered since September.</p>	Bitesize revision website
Easter Holidays			
3a	Types of Radiation & Half life	<ul style="list-style-type: none"> • Structure of an atom. • What is radioactive active decay and what causes it. • Background radiation. • Features of alpha, beta and gamma radiation. What is each made of? Penetrating power of each? • Producing balanced nuclear equations. • Half-life calculations and graphs. 	Bitesize revision website1 Bitesize revision website2
3b	Revision and Exam Prep	<p>Revision</p> <p>External exam</p>	