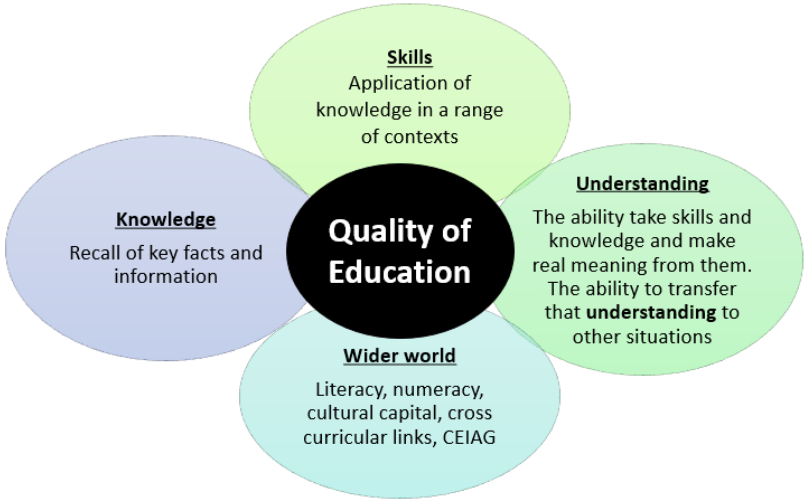
CIM - Curriculum Intent Map Biology
Exam board - GCSE: AQA Exam board - A'Level: AQA

Curriculum objectives:
To inspire a love of scientific discovery, developing curiosity that empowers learners to meet the challenges of education, work and life.

Curriculum values and context
Developing an understanding of each topic and an awareness of where the topic fits in to everyday life and career opportunities.

Curriculum sequencing and structure
Biology will be delivered as A spiral structure, which allows skills to be introduced at KS3 and worked on and revisited throughout KS3 and into KS4. Providing the opportunity for skills to be introduced at KS3 and built upon, allowing for practice and revisiting with further complexity.

Retrieval practice across all year groups, random topics recall starters. Prior knowledge is revisited as recall where it builds on previous topics. Using the specification and linking current topics to previous topics to support development of further understanding.



Development of students' cultural capital, FBV's, personal development
Topics in biology are cross curricular with PSHE topics e.g. sexual reproduction, contraception, drugs genetic engineering, cloning and pre-implantation genetic diagnosis. questions covered across the topic.

Curriculum equality and access
There is the opportunity to support students, making the content accessible and relatable through giving wider world scenarios that students can understand and see the relevance in. KS3 Focus around 10 big ideas each with big questions covered across the topic.

Meeting the needs of SEND students within the classroom
Intent: • Identification of key fundamental building blocks based on student need **Implementation:** • Knowledge of SEND need - knowing who they are, targeted T&L and classroom strategies to meet need. • Staff trained to meet needs of SEND students specifically to their subject area • Adaptive teaching methods

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

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- Differentiated teaching and resources based on identified needs
- Targeted live marking and questioning
- Deploying TA's to support wider group to allow subject specialist support for SEND (helicopter approach)
- Personalised home learning – targeted using educake
- Access arrangements – identification and application

Impact:

- Grading below Grade 1 to monitor progress
- Structured accessible assessments.

	Knowledge	Skills	Understanding	Wider world
Year 13	**AQA Biology** **Section 8 The Control of Gene Expression** **Gene expressions** • Gene mutations • Stem cells & totipotency • Regulating transcription and translation • Epigenetic control of gene expression **Recombinant DNA Technology** • DNA Fragments • Cloning **Section 7 Genetics, populations, evolution and ecosystems** • Population genetics • Phenotypic variation • Natural selection • Evolution • Speciation and isolation • inheritance **Section 6 Organisms respond to changes in their environment** • survival and response • plant growth factors • reflex arcs • receptors • control of heart rate • neurones and nervous control	**Development of practical skills** ⊄ Practical skills linked to Required Practical's: **Planning** ▫ Experimental design ▫ Identification of variables ▫ Evaluation of experimental method **Implementing** ▫ Use of practical apparatus ▫ Appropriate units for measurement ▫ Presenting observations and data **Analysis** ▫ Processing, analysing and interpreting results ▫ Appropriate mathematical skills of data analysis ▫ Use of appropriate number of significant figures ▫ Plotting and interpreting graphs **Evaluation** – ▫ Evaluate results to draw conclusions ▫ Identify anomalies ▫ Explain limitations in method ▫ Precision and accuracy of measurements ▫ Uncertainties and errors ▫ Suggest improvements to help improve the experimental design	**Section 8 The Control of Gene Expression** • Gene expression • Recombinant DNA technology **Section 7** • **Genetics** • **populations** • **evolution** • **ecosystems** **Section 6** • Response to stimuli • Nervous coordination and muscles • Homeostasis **Section 5** • Photosynthesis • Respiration • Energy and ecosystems	• Genetic screening • Genetic counselling • Genetic fingerprinting • Epigenetics • Stem cells • Diabetes • Agriculture • Fertilisers • Eutrophication **Careers** • GP, sports scientist, PE teacher, biology teacher, lab technician, forensics, physiotherapy, nurse, conservation, horticulture, environmental sciences, nursing, dietician • Excellent foundation for progression to higher education and advanced apprentices. **Extra-curricular activities** ⊄ Biology Olympiad ⊄ Visits from a scientist working in clinical trials discussing careers and career progression

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

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	• action potentials • synapses • skeletal muscle • Homeostasis • Hormones • Blood glucose regulation • Diabetes • Kidneys • Osmoregulation **Section 5 Energy transfer in-between organisms** • Photosynthesis • Respiration • Food chains • Energy transfer and productivity • Nutrient cycles – nitrogen and phosphorous • Fertilisers • Environmental issues of using fertilisers	**Required practical's** ∉ 7. Chromatography of leaf pigments ∉ 8. Chloroplast and dehydrogenase ∉ 9. Temperature and respiration in yeast ∉ 10 Maggots and choice chambers ∉ 11. Dilution series and glucose **List of practical procedures** ∉ PCR • Revision of practical skills from y12 **Practical skills** **Independent thinking** – investigating and analysing the methods used in practicals in order to solve problems **Use and application of scientific methods and practices** ▫ Using practical equipment safely ▫ Following written instructions, recording observations, taking measurements and presenting data scientifically ▫ Using appropriate software and technology throughout **Research and referencing** – using information available from a variety of different sources including websites, scientific journals and textbooks to help provide context and background for the practical. Using many sources and citing correctly Instruments and equipment – correct and appropriate use of a wide range of equipment, instruments and technique **Maths skills** ∉ statistics (standard deviation, chi squared, students t-test, Spearmans rank correlation coefficient).		∉ University visit to Lincoln University

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		∉ % change ∉ Calculating bacterial density ∉ Hardy-Weinberg Principle ∉ Lincoln Index ∉ Simpsons Index of Diversity ∉ Calculating RQ ∉ Evaluating ∉ Analysis of data presented in various formats. ∉ Punnet squares ∉ Probability ∉ Ratios ∉ Phenotypic ratio ∉ Population growth graphs – animals and microorganisms, application in industry ∉ Standard form ∉ Logs		
Year 12	**AQA Biology** **Section 1 – Biological molecules** ∉ Monomers and polymers; Carbohydrates; Lipids; Proteins; Enzymes ∉ DNA; RNA; DNA Replication; ATP; Water; Ions **Section 2 - Cells** ∉ Methods of studying cells; Electron microscopes; Microscopic measurements and calculations; Eukaryotic cell structure; Cell specialisation and organisation; Prokaryotic cells; Viruses; Mitosis; Cell cycle ∉ Cell surface membrane structure; Diffusion; Osmosis; Active transport; Co-transport; Absorption of glucose in the ileum ∉ Defence mechanisms; Phagocytosis; Cell mediated immunity; Humoral immunity; Antibodies; Vaccination; HIV **Section 3 – Organisms exchange substances with their environment**	**Module 1 Development of practical skills** ∉ Practical skills linked to PAGs: 1. **Planning** 2. **Implementing** 3. **Analysis** 4. **Evaluation** **Required practical's** ∉ 1. Enzymes ∉ 2. Root tip squash ∉ 3. Osmosis ∉ 4. Cell membranes ∉ 5. Biological drawings ∉ 6. Microbial growth ∉ 12. Quadrats **List of practical procedures:** ∉ Microscopy, Dissection (heart, lungs, stem, insect, fish gills), use of colorimeter, serial dilutions, sampling ecosystems - measuring distribution and abundance of species,	**Section 1 Biological molecules** • Biological molecules • Nucleic acids **Section 2 Cells** • Cells • Transport across cell membranes • Cell recognition and the immune system **Section 3 Organisms exchange substances with their environment** • Exchange • Mass transport	**Careers** • GP, sports scientist, PE teacher, biology teacher, lab technician, forensics, physiotherapy, nurse, conservation • Excellent foundation for progression to higher education and advanced apprentices. **Extra-curricular activities** ∉ Biology Olympiad ∉ Visit from scientist working in clinical trials to discuss careers ∉ University of Lincoln visit

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

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	∉ Exchange; Gas exchange in singe celled organisms and insects; Gas exchange in fish; Gas exchange in the leaf of a plant; Limiting water loss; Human gas exchange system; Breathing; Gas exchange in the lungs; Enzymes and digestion; Absorption of the products of digestion ∉ Haemoglobin; Transport of oxygen by haemoglobin; circulatory system of a mammal; heart; cardiac cycle; blood vessels; transport of waer in the xylem; transport of organic molecules in the phloem; investigating transport in plants **Section 4 – Genetic information, variation and relationships between organisms** ∉ Genes and the triplet code; DNA; Chromosomes; RNA; Protein synthesis – transcription and translation ∉ Mutations; Meiosis; Genetic variation; Genetic diversity; Adaptation; Types of selection; Species ∉ Taxonomy; Diversity within a community; Species diversity and human activity; Investigating diversity; Quantitative investigation of variation **Section 7 –Genetics, populations, evolutions and ecosystems** • Populations in ecosystems; Variation in population size; Competition; Predation; Investigating populations; Succession; Conservation of habitats	Simpsons index of diversity, DNA extraction, factors affecting membrane fluidity, movement across membranes, Biochemical tests for biological molecules, Antibiotic effectiveness, Aseptic skills, Chromatography, Investigating enzyme activity. ∉ Measuring ventilation ∉ Measuring transpiration ∉ Histology of exchange surfaces ∉ Histology of blood vessels ∉ Observing xylem vessels **Maths skills** ● statistics (standard deviation, Spearman's rank correlation coefficient, Students t-test) ● Normal distribution curves ● SA:V ratios ● Volume of a sphere ● Evaluating. ● Recognise and make use of appropriate units in calculations ● Recognise and use expressions in decimal and standard form ● Estimate results ● Changing the subject of an equation ● Converting units ● Working with negative numbers ● Use rations, fractions and percentages ● Analysis of data presented in various formats. ● Representing variation graphically – continuous and discontinuous data ● Calculating biodiversity ● Calculating genetic biodiversity – polymorphic gene loci ● Ecological efficiency		

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

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Year 11

AQA Separate Science Biology

B11 Hormonal coordination

- Hormones, controlling blood glucose, controlling water content, kidney failure, puberty and the menstrual cycle, contraceptives, increasing fertility, thyroxine and adrenaline,
- plant hormones; uses of plant hormones; Infertility treatments (seps)

B12 Homeostasis in action (seps)

- ∉ Controlling body temperature, removing waste products, human kidney, dialysis, kidney transplants

B13 Reproduction (seps)

- Types of reproduction, cell division in sexual reproduction, DNA and the genome, DNA structure and protein synthesis, inheritance in action, inherited disorders, screening for genetic disorders

B14 Variation and Evolution (seps)

- Variation, evolution by natural selection, selective breeding, genetic engineering, cloning, adult cell cloning, ethics of genetic technologies

B15 Genetics and evolution (seps)

- History of genetics, theories of evolution, Darwins ideas, evolution and speciation, evidence for evolution, fossils and extinction, antibiotic resistant bacteria, classification and new systems of classification

B18 Biodiversity and Ecosystems

- Trophic levels and biomass, factors affecting food security, making food production efficient, sustainable food production.

AQA Trilogy Combined Sciences Biology

B11 Hormonal coordination

- Hormones, controlling blood glucose, controlling water content, kidney failure, puberty and the

Practical skills

- Required practicals – revision of each RP
- Following a method
- Collecting results
- Making observations
- Analysing results
- Use of specialised biological equipment - microscopes, .

Literacy

- Using scientific vocabulary
- Developing writing long answers for 6 mark questions

Numeracy

- Calculations and using formula triangles
- Drawing graphs
- Recall of answers
- Numbers in standard form
- Calculations
- Appropriate number of significant figures
- Data in decimals, fractions and ratios

- Movement of substances
- Cells and cell structure
- Mitosis and Meiosis
- Genes and Genetics
- Theory of evolution
- Natural selection and genetic engineering
- Health and disease
- Plants and Photosynthesis
- Respiration
- Ecosystems
- Global issues - climate change

- Kidney dialysis
- Genetic disorders
- Literacy - structuring answers to long answer questions
- Numeracy - maths in science
- PSHCE - STI and health and disease
- Sports science - respiration, spirometry, BMI, Waist-to-hip ratio, healthy diet
- Geography - ecosystems, habitats and conservation

Careers

- GP, sports scientist, PE teacher, biology teacher, lab technician, forensics, farming, genetic engineering, horticulturist

Extra-curricular activities

- ∉ Revision sessions
- ∉ Enrichment science club

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

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	menstrual cycle, contraceptives, increasing fertility, thyroxine and adrenaline, • plant hormones; uses of plant hormones; Infertility treatments (seps) **B12 Reproduction (combined)** • Types, cell division in sexual reproduction, DNA and the genome, inheritance in action, genetics, inherited disorders **Variation and Evolution B13 (combined)** • Variation, evolution by natural selection, selective breeding, genetic engineering, ethics of genetic engineering **Genetics and evolution B14 (combined)** ⊄ Evidence of evolution, fossils and extinction, antibiotic resistant bacteria.			
Year 10	**B4 Organisation** • The blood; blood vessels; heart; breathing and gas exchange tissues and organs in plants; transport systems in plants; evaporation and transpiration; factors affecting transpiration **B5 Communicable disease** • Health and diseases, pathogens and disease, growing bacteria in a lab (seps), preventing bacterial growth (seps), preventing infections, viral diseases, bacterial diseases, diseases caused by fungi and protists, human defence responses, more about plant disease (seps), plant defence mechanisms (seps) **B6 Preventing and treating disease** • Vaccination, antibiotics and painkillers, discovering drugs, developing drugs, making monoclonal antibodies (seps), uses of monoclonal antibodies (seps) **B7 Non-communicable disease** • Non-communicable disease; cancer; smoking and the risk of disease; diet, exercise and disease; alcohol and other carcinogens	**Practical skills** • Required practical's ▫ **RP5** - Investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed. ▫ **RP6** - Plan and carry out an investigation into the effect of a factor on human reaction time. • Following a method • Collecting results • Making observations • Analysing results • Use of specialised biological equipment - microscopes, water baths, potometers, plant hormones, tissue culture, reflex testing, agar plates, photosynthesis, respirometer, transpiration **Literacy** • Using scientific vocabulary • Developing writing long answers for 6 mark	• Health and disease - transmission of disease and examples of pathogens • Plants and Photosynthesis – interpretation of graphs and factors affecting rate • Respiration - methods of respiration, impact of exercise • The menstrual cycle	• Literacy - structuring answers to long answer questions • Numeracy - maths in science • PSHCE - STI and health and disease • Sports science - respiration, spirometry, BMI • Geography - ecosystems, habitats and conservation Careers - • archaeologist, farming, forest scientist Extra-curricular activities ⊄ Biology Challenge ⊄ Silverstone Museum

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

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	B8 Photosynthesis ● Photosynthesis, how plants use glucose, rate of photosynthesis, investigating photosynthesis, inverse square law, artificially controlling plant growth **B9 Respiration** ● aerobic respiration, anaerobic respiration, response to exercise, metabolism and the liver **B10 The Human Nervous System** ● Homeostasis, the nervous system, synapses and reflexes, reaction time, controlling body temperature ● The brain, the eye, problems with the eye (seps)	questions **Numeracy** ● Calculations and using formula triangles ● Drawing graphs ● Recall of answers ● Numbers in standard form ● Calculations ● % change ● Stroke Volume ● Appropriate number of significant figures ● Ratios and decimals		
Year 9	**B1 Cell Structure and transport** ● The world of microscopes; animal and plant cells; eukaryotic and prokaryotic cells; specialisation in animal cells; specialisation in plant cells; diffusion; osmosis; osmosis in plants; active transport; exchanging materials **B2 Cell division** ● Cell division; growth and differentiation; stem cells; stem cell dilemmas **B3 Organisation and the digestive system** ● Tissues and organs; the human digestive system; the chemistry of food; catalysts and enzymes; factors affecting enzyme action; how the digestive system works; making digestion efficient **B15 Adaptations, interdependence and competition** ● Communities; organising the environments; distribution and abundance; competition in animals; competition in plants; adapt and survive; adaptation in animals; adaptation in plants **B16 Organising an ecosystem** ● Feeding relationships (seps), materials cycling, carbon cycle, rates of decomposition (seps) **B17 Biodiversity and ecosystems**	**Practical skills** ● Required practical's ▫ **RP1** - Use a light microscope to observe, draw and label a selection of plant and animal cells. A magnification scale must be included. ▫ **RP2** - Investigate the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue. ▫ **RP3** - Use qualitative reagents to test for a range of carbohydrates, lipids and proteins. To include: Benedict's test for sugars; iodine test for starch; and Biuret reagent for protein. ▫ **RP4** - Investigate the effect of pH on the rate of reaction of amylase enzyme. Students should use a continuous sampling technique to determine the time taken to completely digest a starch solution at a range of pH values. Iodine reagent is to be used to test for starch every 30 seconds. Temperature must be controlled by use of a water bath or electric heater.	● Movement of substances across membranes ● Cells and cell structure ● Differences in microscopes ● Mitosis and Meiosis ● Plants and Photosynthesis ● Ecosystems - transfer of energy through ecosystesm ● Global issues – global warming and climate change ● food security ● Population size ● Impact of humans on biodiversity	● Literacy - structuring answers to long answer questions ● Numeracy - maths in science ● PSHCE - STI and health and disease ● Sports science - respiration, spirometry, BMI ● Geography - ecosystems, habitats and conservation Careers - ● cell biologist, lab technician, geneticist Extra-curricular activities ∉ Biology Challenge ∉ Magna Science trip ∉ The Deep Science trip ∉ London residential ∉ Silverstone Careers Event

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

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	• Human population explosion; land and water pollution; air pollution; deforestation and peat destruction; global warming; maintaining biodiversity	▫ **RP7** - 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. ● Following a method ● Collecting results ● Making observations ● Analysing results ● Use of specialised biological equipment - microscopes, water baths, visking tubing, model gut, testing for biological molecules, osmosis, diffusion. **Literacy** ● Using scientific vocabulary ● Developing writing long answers for 6 mark questions **Numeracy** ● Calculations and using formula triangles ● Drawing graphs ● Recall of answers ● Numbers in standard form ● Appropriate number of significant figures ● Calculations ● Ratios and decimals **Years 9, 10 and 11 Maths skills Combined and Separate Sciences** **1 Arithmetic and numerical computation** a Recognise and use expressions in decimal form b Recognise and use expressions in standard form c Use ratios, fractions and percentages d Make estimates of the results of simple calculations **2 Handling data** a Use an appropriate number of significant figures b Find arithmetic means		

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		c Construct and interpret frequency tables and diagrams, bar charts and histograms d Understand the principles of sampling as applied to scientific data (biology questions only) e Understand simple probability (biology questions only) f Understand the terms mean, mode and median g Use a scatter diagram to identify a correlation between two variables (biology and physics questions only) h Make order of magnitude calculations **3 Algebra** A Understand and use the symbols: =, <, <<, >>, >, ∝ , ~ b Change the subject of an equation c Substitute numerical values into algebraic equations using appropriate units for physical quantities (chemistry and physics questions only) d Solve simple algebraic equations (biology and physics questions only) **4 Graphs** a Translate information between graphical and numeric form b Understand that y = mx + c represents a linear relationship c Plot two variables from experimental or other data d Determine the slope and intercept of a linear graph e Draw and use the slope of a tangent to a curve as a measure of rate of change (chemistry and physics questions only) f Understand the physical significance of area between a curve and the x-axis and measure it by counting squares as appropriate (physics questions only) **5 Geometry and trigonometry** a Use angular measures in degrees (physics questions only)		

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		b Visualise and represent 2D and 3D forms including two dimensional representations of 3D objects (chemistry and physics questions only) c Calculate areas of triangles and rectangles, surface areas and volumes of cubes **Working scientifically** covered in y9, 10 and 11 in combined science and separate sciences 1 Development of scientific thinking 2 Experimental skills and strategies 3 Analysis and evaluation 4 Scientific vocabulary, quantities, units, symbols and nomenclature		
Year 8	**AQA Activate** **Organisms (part 2)** 8.3 Breathing – gas exchange, breathing, drugs, alcohol and smoking 8.4 Digestion – nutrients, food testing, diets, digestive system, bacteria and enzymes **Ecosystems (part 2)** 9.3 Respiration – aerobic and anaerobic, biotechnology 9.4 Photosynthesis – photosynthesis, leaves, plant minerals **Genes (part 2)** 10.3 Evolution – Charles Darwin, natural selection, extinction and preserving biodiversity 10.4 Inheritance – inheritance, DNA, genetics and modification	**Practical skills** ● Following a method ● Collecting results ● Making observations ● Analysing results ● Use of specialised biological equipment - microscopes, water baths, pooters, joint models, skeleton model, benedicts solution, iodine, biuret solution, quadrats, reflex testing, agar plates, modelling cell and DNA structure. **Literacy** ● Using scientific vocabulary (Tier 3) ● Developing writing long answers for 6 mark questions **Numeracy** ● Calculations and using formula triangles ● Drawing graphs ● Recall of answers ● Calculations **Enquiry process** 1. **Asking scientific questions** ▫ Explain how and why some questions can be investigated and why some cannot	● Sexual reproduction in animals ● Structure of the skeleton ● Bones and how they work ● Respiration in animals ● Photosynthesis in plants ● Plant reproduction ● Food testing ● Nutritional information in food ● Genetics, inheritance and evolution	● Meal planning ● Gardening and sowing seeds ● Sports science - respiratory problems/skeleton/health and disease ● Health and disease - medical science ● Brewing alcohol, making bread ● PSHCE - sexual education ● Literacy - long answer questions ● Numeracy - calculations ● Climate change Careers - ● sports scientist, farmer, environmentalist, dietician Extra-curricular activities ● Yr7/8 Science Club ● Space Centre ● Big Bang trip (Y8) ● National Video Games Museum ● Yorkshire Wildlife Park ● Magna Science trip
Year 7	**AQA Activate** **Organisms (part 1)** 8.1 Movement – skeleton, muscles and joints 8.2 Cells – animal and plant cells (specialised cells) movement of substances **Ecosystems (part 1)**			

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	9.1 Interdependence – food chains, ecosystems and competition 9.2 Plant reproduction – pollination, fertilisation, germination and seed dispersal **Genes (part 1)** 10.1 Variation – Variation and adapting to change 10.2 Human reproduction – puberty, reproductive systems, fertilisation, development of fetus and the menstrual cycle	▫ Suggest examples of independent, dependent, and control variables in an unfamiliar situation ▫ Explain in detail why a specific question cannot be investigated, suggesting alternative questions that can be investigated **2. Planning investigations** ▫ Write a detailed plan for a hypothetical investigation ▫ Explain the effect of experimental error, and of not controlling all the variables adequately ▫ Identify risks in an experiment and write an appropriate risk ▫ assessment for an investigation and explain why the experiment can, or cannot, be conducted in a science laboratory 3. Recording data ▫ Explain how to collect and record accurate and precise data ▫ Calculate a mean for repeat readings in a range of situations ▫ Explain the choice of graph or chart for different types of data, and plot them **4. Analysing patterns** ▫ Plot data on a graph and draw the line of best fit ▫ Analyse data from an investigation to draw up a detailed conclusion, describe relationships, and suggest alternative explanations where appropriate **5. Evaluating data** ▫ Compare and contrast data, suggesting reasons why the data may be different ▫ Explain ways of improving data in a practical investigation		• The Deep Science trip • London residential

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At The Elizabethan Academy we offer a curriculum that:

- is broad, balanced, inspiring and inclusive
- builds confidence, independence and **resilience**
- encourages students to develop the **skills, knowledge and understanding** required to succeed academically
- encourages students to participate in a wide variety of activities which extend beyond the classroom
- places creativity and imagination at the heart of learning to develop enquiring minds
- enables students to understand the connections and links between different subjects
- raises students' aspirations through promoting academic excellence
- develops students' **social and cultural knowledge**, skills and understanding
- develops students' **respect for spiritual and moral values**, and tolerance towards other races, religions and ways of life.
- gives students the opportunities to put theoretical skills into practice and expand their knowledge beyond the exam specification
- prepares students for the world of work in a rapidly changing world.

2025-2026	Year 7 - AQA Activate Part 1 (Biology, Chemistry and Physics)					
	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Knowledge, Skills and Understanding 	Big idea 8 Organisms – movement Big idea 8 Organisms – Cells Big Idea 5 Matter – separating mixtures Big idea 1 Forces Big idea 5 Matter – particle model		Big idea 2 Electromagnets Big Idea 6 Reactions – acids and alkalis Big Idea 6 Reactions – metals and non-metals Big Idea 10 Genes		Big Idea 4 Waves Big Idea 7 Earth Big Idea 9 Ecosystems Big idea 3 Energy	
	Baseline testing (September) Multiple choice recall (November)		Assessment 1 to cover topics from half term 1 and half term 2 (January) Assessment 2 to cover all previous topics (March)		Multiple choice recall (May) **PPE (Pre-public exam/end of year exam) (June)**	

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 **Embed your knowledge**	**Mandatory homework tasks:** • Educake - one homework set each week on a Monday and due the following Monday, maximum of 6 per half term **Enrichment homework tasks to further your understanding:** • **Big Idea 8** - Make a model of a cell and bring it into school • **Big Idea 5** – Create a states of matter comic strip and share it with your teacher • **Big Idea 1** - Research the famous story of Galileo dropping objects from the Leaning Tower of Pisa. Then summarise what he discovered. Test it yourself (safely!) by dropping two objects of different weights. What happens? Feedback in class. Knowledge organiser hyperlinks: 5 Matter knowledge organiser.pdf 1 Forces knowledge organiser.pdf 8 Organisms knowledge organiser.pdf	**Mandatory Homework tasks:** • Educake – one homework set each week on a Monday and due the following Monday, maximum of 6 per half term **Enrichment homework tasks to further your understanding:** • **Big Idea 6** - Acids and Alkalis - Investigate the type of soil in your garden • **Big Idea 10** Inheritance - Research the features you share with your family. • **Big Idea 2 -** Research a famous scientist who worked with electricity (e.g., Michael Faraday, Nikola Tesla, Thomas Edison). Create a short fact file and hand in to your teacher Knowledge organiser hyperlinks: 2 Electromagnets knowledge organiser.pdf 6 Reactions knowledge organiser.pdf 10 Genes knowledge organiser.pdf	**Mandatory Homework tasks:** • Educake – one homework set each week on a Monday and due the following Monday, maximum of 6 per half term • Individual revision for end of year exams **Enrichment homework tasks to further your understanding:** • **Big Idea 7** - Make a model of the Earth, bring your amazing model into school • **Big Idea 7** - Make a model of the Solar System, show your brilliant model to your teacher • **Big Idea 9** – Survey your garden or local park, record what plant and animal species you find • **Big Idea 4 -** Create a piece of art (drawing, collage, or digital) that shows how light or sound waves travel. Knowledge organiser hyperlinks: 4 Waves knowledge organiser.pdf 9 Ecosystems knowledge organiser.pdf 3 Energy knowledge organiser.pdf 7 Earth knowledge organiser.pdf

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Extend your learning 	**Cell Superhero** *Task:* Design a superhero based on a type of cell (e.g., red blood cell, nerve cell, white blood cell). Include: • Powers based on the cell's function • A costume inspired by its structure • A short comic strip showing it in action **Explain It!** Write a short paragraph explaining the difference between **balanced** and **unbalanced** forces. Use an example to help explain your answer.	**Acid Rain Investigation** *Task:* Research what causes acid rain and how it affects the environment. Write a short report or create a presentation that includes: • Causes (e.g., sulfur dioxide, nitrogen oxides) • Effects on buildings, plants, and animals • Solutions to reduce it **Key Concept Recap** Write a short explanation (2–3 sentences) for each of the following: • What is an electric circuit? • What is the difference between a conductor and an insulator? • What happens in a series circuit if one component is removed?	**Plant Reproduction Comic Strip** *Task:* Create a comic strip showing the journey of a pollen grain from one flower to another. Include: • Pollination • Fertilisation • Seed formation and dispersal **Energy from Food** Research and answer the following: • What is a **calorie** (or kilojoule) and how does it relate to energy? • Why does your body need energy? • Which food groups provide the most energy? 👉 **Challenge:** Find out how many calories are in a banana, a slice of bread, and a chocolate bar. Which one gives the most energy?

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

CIM - Curriculum Intent Map Biology
Exam board - GCSE: AQA Exam board - A'Level: AQA

2025-2026	Year 8 – AQA Activate Part 2 (Biology, Chemistry and Physics)					
	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Knowledge, Skills and Understanding 	Big Idea 5 Matter Big Idea 1 Forces Big Idea 8 Organisms – Breathing Big Idea 3 Energy		Big Idea 8 Organisms – digestion Big Idea 2 Electromagnets Big Idea 6 Reactions Big Idea 9 Ecosystems - respiration		Big Idea 9 Ecosystems - photosynthesis Big Idea 4 Waves Big Idea 7 Earth Big Idea 10 Genes	
	Assessment 1 (October) Multiple choice recall (December)		Assessment 2 (February) Multiple choice recall (March)		Multiple choice recall (November) **PPE (Pre-public exam/end of year test) (June)**	

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

CIM - Curriculum Intent Map Biology
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Embed your knowledge

Mandatory homework tasks:

- Educake - one homework set each week on a Monday and due the following Monday, maximum of 6 per half term

Enrichment homework tasks to further your understanding:

- **Big Idea 5** - Create a 3D model of an atom using craft materials (e.g., beads, paper, pipe cleaners). Choose a simple element like hydrogen, helium, or carbon.
- **Big Idea 1** - Research and describe 3 real-life applications of Hooke's Law. Examples:
- Car suspension systems
- Trampolines
- Archery bows
- **Big Idea 8** - Make a simple model of the lungs using everyday materials (e.g., plastic bottles, balloons, straws).
- **Big Idea 3** - Create a colourful poster showing different types of energy (e.g., kinetic, thermal, chemical, sound, light) and how they can be transferred or transformed.

Hyperlink to knowledge organiser:
5 Matter y8 knowledge organiser.pdf
1 Forces y8 knowledge organiser.pdf
8 Organisms y8 knowledge organiser.pdf
3 Energy y8 knowledge organiser.pdf

Mandatory homework tasks:

- Educake - one homework set each week on a Monday and due the following Monday, maximum of 6 per half term

Enrichment homework tasks to further your understanding:

- **Big Idea 8** - Create a comic strip or character profile for 3 "Nutrient Superheroes" (e.g., Captain Carbohydrate, Protein Power, Vitamin V).
- **Big Idea 2** - Make a simple compass using a needle, a magnet, and a bowl of water (with adult supervision). Then:
- Describe how you made it
- Explain how it works
- Test it by turning in different directions
- **Big Idea 6** - Create a card game or quiz where players match:
- The name of a reaction (e.g., combustion, photosynthesis)
- The type of reaction (exothermic or endothermic)
- A real-life example or use
- You could make physical cards or a digital version using PowerPoint or Google Slides.
- **Big Idea 9** - Write a comic strip or short story where a glucose molecule goes on a journey through the body and gets broken down during respiration.

Hyperlink to knowledge organiser:
6 Reactions y8 knowledge organiser.pdf
2 Electromagnets y8 knowledge organiser.pdf
8 Organisms y8 knowledge organiser.pdf

Mandatory homework tasks:

- Educake - one homework set each week on a Monday and due the following Monday, maximum of 6 per half term
- Independent revision for end of year exams

Enrichment homework tasks to further your understanding:

- **Big Idea 9** – grow some seeds at home, place in different environmental conditions and report back to your class on how their growth was affected e.g. water vs no water, light vs dark
- **Big Idea 4** – make a wave model
- **Big Idea 7** - research how climate change is affecting your local area or the UK e.g. flooding/extreme weather, wildlife or plant changes, energy use/pollution.
- **Big Idea 10** – Build a DNA model and share it with your class

Hyperlink to knowledge organiser:
9 Ecosystems y8 knowledge organiser.pdf
7 Earth y8 knowledge organiser.pdf
4 Waves y8 knowledge organiser.pdf
10 Genes y8 knowledge organiser.pdf

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

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		9 Ecosystems y8 knowledge organiser.pdf	
Extend your learning 	**Periodic Table Treasure Hunt** *Task:* Pick 5 elements from the periodic table and research: • Their symbol and atomic number • Where they're found in everyday life • One interesting fact about each **Design a Friction-Fighting Invention** Invent a product that either **reduces** or **increases** friction for a specific purpose (e.g., sports shoes, ice skates, car tyres). Draw and label your design, and explain: • What it does • How it uses friction • Why it's useful	**Journey of a Cheese Sandwich** *Task:* Create a storyboard or comic strip showing the journey of a cheese sandwich through the digestive system. Include: • Mouth, oesophagus, stomach, small and large intestines • Enzymes involved (e.g., amylase, protease, lipase) • Nutrient absorption **Baking bread** Investigate how the amount of yeast added to bread affects its structure	**Science in the News** *Task:* Find a recent science-related news story. Summarise it and explain how it links to something you've learned in class. **Light Maze Challenge** *Task:* Design a maze that a beam of light must travel through using mirrors. Draw the path and explain how reflection helps it reach the end.

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

CIM - Curriculum Intent Map Biology
Exam board - GCSE: AQA Exam board - A'Level: AQA

2025-2026	Year 9 – Combined Science (AQA Trilogy) (Biology, Chemistry and Physics)					
	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Knowledge, Skills and Understanding 	B1 Cell structure C1 Atomic structure C2 The Periodic Table P9 Motion P1 Conservation and dissipation of energy		B2 Cell division B3 Organisation and the digestive system C3 Structure and bonding P11 Wave properties		B15 Adaptations, interdependence and competition B16 Organising an ecosystem B17 Biodiversity and ecosystems P8 Forces in balance C8 Rates and equilibrium	
	Biology 1 wc. 29.9.25 teacher 1 Chemistry 1 wc. 13.10.25 – teacher 2 Mixed wc. 24.11.25 – teacher 1 Teacher 1 mixed assessments cover both biology and chemistry. Teacher 2 mixed assessments cover chemistry and physics.		Mixed wc. 5.1.26 – teacher 2 Mixed wc. 26.1.26 – teacher 1 Mixed wc.2.3.26 – teacher 2		Mixed wc. 13.4.26 - teacher 1 Mixed wc. 20.4.26 – teacher 2 **End of year exams covering biology, chemistry and physics in half term 6**	
 **Embed your knowledge**	**Mandatory homework tasks:** • Educake - one homework set each week on a Monday and due the following Monday, maximum of 6 per half term • Independent revision for assessments Knowledge organisers: available on teams https://www.bbc.co.uk/bitesize/subjects/zrkw2hv		**Mandatory homework tasks:** • Educake - one homework set each week on a Monday and due the following Monday, maximum of 6 per half term • Independent revision for assessments Knowledge organisers: available on teams https://www.bbc.co.uk/bitesize/subjects/zrkw2hv		**Mandatory homework tasks:** • Educake - one homework set each week on a Monday and due the following Monday, maximum of 6 per half term • Independent revision for end of year exams Knowledge organisers: available on teams https://www.bbc.co.uk/bitesize/subjects/zrkw2hv	

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

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Extend your learning 	**Atomic Structure Quiz Creation** *Task:* Create a 10-question quiz on atomic structure for your classmates. Include: • Multiple choice • True/false • Short answer Provide an answer key and explanations. **Cell Recap** Answer the following in your own words: 1. What are the main parts of an animal cell and their functions? 2. What are the main parts of a plant cell that are not found in animal cells? 3. What is the function of the nucleus, mitochondria, and cell membrane? **Real-Life Motion** Choose a moving object (e.g., car, cyclist, train, animal). Research or estimate: How far it travels in a certain time Its average speed Whether its motion is constant or changing 👉 Challenge: Create a short report or poster showing your findings.	**Waves** ***Task:*** Create a short animation or diagram sequence showing: • Reflection • Refraction • Diffraction Label each part and explain how the wave changes in each case. **Bonding Comparison Table** Create a table comparing **ionic**, **covalent**, and **metallic** bonding. Include: • Types of elements involved • How electrons are used • Structure formed • Melting/boiling points • Electrical conductivity • Example substances 👉 **Challenge:** Add a column explaining *why* each property occurs based on the bonding.	**Local Ecosystem Study** *Task:* Visit a local park or garden and record the types of organisms you see. Create a food web and describe the roles of producers, consumers, and decomposers. **Real-Life Reactions** Find **three examples** of chemical reactions that happen in everyday life (e.g., cooking, rusting, fireworks). For each one: • Describe what's happening • Suggest which factors might affect the rate of the reaction • Explain whether a fast or slow reaction is more useful in that situation **Mini Investigation – Tug of War** **Question:** What happens when two forces are equal or unequal? **Instructions:** 1. Use a rope or string and have two people pull from each end. 2. Try pulling with equal force, then with one side pulling harder. 3. Observe and record what happens. 👉 **Challenge:** Explain your observations using the idea of **resultant force**. Work safely and with supervision to avoid any

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

CIM - Curriculum Intent Map Biology
Exam board - GCSE: AQA Exam board - A'Level: AQA

2025-2026	Year 10 – Combined Science (AQA Trilogy) (Biology, Chemistry and Physics)					
	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Knowledge, Skills and Understanding 	B4 Organising animals and plants B5 Communicable disease C5 Chemical changes C4 Chemical calculations P2 Energy transfer by heating P4 Electric circuits C6 Electrolysis		B6 Preventing and treating disease B7 Non-communicable diseases B8 Photosynthesis B9 Respiration P6 Molecules and matter P7 Radioactivity C7 Energy changes		B10 The human nervous system C11 The Earth's atmosphere C9 Crude oil and fuels P10 Forces and motion P5 Electricity in the home	
	22.9.25 B4 (Teacher 1) 22.9.25 P2 (Teacher 2) 13.10.25 C5 (Teacher 1) 17.11.25 P4 (Teacher 2) 8.12.25 B5 (Teacher 1)		26.1.26 C4 and B6 (Teacher 1) 2.2.26 C6 and P6 (Teacher 2) 9.3.26 P7 (Teacher 2) 23.3.26 B7, B8 and B9 (Teacher 1)		13.4.26 C7 (Teacher 2) 4.5.26 C10 and B10 (Teacher 1) **End of year exams half term 6, paper 1 for biology, chemistry and physics.**	
 **Embed your knowledge**	**Mandatory homework tasks:** • Educake - one homework set each week on a Monday and due the following Monday, maximum of 6 per half term • Independent revision for assessments Knowledge organiser: Shared on teams by class teachers. Websites https://www.primrosekitten.com/pages/gcse-science https://www.bbc.co.uk/bitesize/subjects/zrkw2hv		**Mandatory homework tasks:** • Educake - one homework set each week on a Monday and due the following Monday, maximum of 6 per half term • Independent revision for assessments Knowledge organiser: Shared on teams by class teachers. **Science in the News** *Task:* Find a recent science-related news article. Summarise it and explain how it links to GCSE content. Include: • The science behind the story • Why it matters • Any ethical or environmental issues		**Mandatory homework tasks:** • Educake - one homework set each week on a Monday and due the following Monday, maximum of 6 per half term • Independent revision for assessments Knowledge organiser: Shared on teams by class teachers. **Teach It to a Year 7** *Task:* Choose a tricky GCSE topic and explain it in a way a Year 7 student could understand. Use simple language, analogies, and diagrams. You could present it as: • A comic strip • A short video • A one-page guide	

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

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Extend your learning 	**Outbreak Investigation** *Task:* Research a historical or recent disease outbreak (e.g., Ebola, COVID-19). Create a case study including cause, transmission, prevention, and treatment. **Real-Life Applications** Research and describe **two real-life uses** of electrolysis. For each one: • What is being electrolysed? • What are the products? • Why is electrolysis important in this process? **Examples to consider:** • Electrolysis of brine (salt water) • Extraction of aluminium from bauxite • Electroplating metals **Design a Thermally Efficient Home** Draw and label a diagram of a house that uses **thermal insulation** to reduce energy loss. Include: • Double glazing • Loft insulation • Wall insulation • Draught excluders 👉 **Challenge:** Explain how each feature reduces energy transfer.	**Photosynthesis in Action** *Task:* Investigate how light intensity affects the rate of photosynthesis using online simulations or practical data. Plot a graph and explain the trend. **Radiation Penetration Simulation** Use an online simulation (e.g., PhET Interactive Simulations) to explore: • How alpha, beta, and gamma radiation behave • What materials block each type • How distance affects radiation detection 👉 Record your findings in a table and explain which type is most dangerous outside vs. inside the body. **Real-Life Applications** Research and describe **two real-world uses** of energy changes in reactions. For each one: • Is the reaction exothermic or endothermic? • What is the reaction used for? • Why is the energy change important? **Examples to consider:** • Self-heating cans • Instant cold packs • Combustion in engines • Photosynthesis and respiration	**Reflexes in Real Life** *Task:* Design a simple experiment to test reaction times. Collect data from family or classmates and analyse the results. **Timeline of the Atmosphere** Create a **timeline** showing how the Earth's atmosphere has changed over billions of years. Include: • Formation of the early atmosphere (volcanic activity) • Appearance of simple life and oxygen production • Development of the ozone layer • Modern atmosphere composition 👉 **Challenge:** Add estimated time periods and key events. **Key Concept Recap** Answer the following: 1. What is the difference between **AC** and **DC** electricity? 2. What is the **UK mains voltage** and frequency? 3. What is the purpose of the **earth wire** in a plug? **Environmental Impact** Research and describe **two environmental issues** related to crude oil. For each one: • What causes the issue? • What are the effects on people and ecosystems? • What can be done to reduce the impact? **Examples to consider:** • Oil spills • Air pollution from burning fuels • Climate change

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

CIM - Curriculum Intent Map Biology
Exam board - GCSE: AQA Exam board - A'Level: AQA

2025-2026	Year 10 – Separate Sciences (AQA) (Biology, Chemistry and Physics)					
	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Knowledge, Skills and Understanding 	B4 Organising animals and plants B5 Communicable disease C5 Chemical changes C4 Chemical calculations P2 Energy transfer by heating P4 Electric circuits C6 Electrolysis		B6 Preventing and treating disease B7 Non-communicable diseases B8 Photosynthesis B9 Respiration P6 Molecules and matter P7 Radioactivity C7 Energy changes		B10 The human nervous system C11 The Earth's atmosphere C9 Crude oil and fuels P10 Forces and motion P5 Electricity in the home	
	29.9.25 B4 (Teacher 1) 13.10.25 P2 and P4 (Teacher 2) 10.11.25 C5 (Teacher 1)		5.1.26 P6 (Teacher 2) 26.1.26 B4 and C4 (Teacher 1) 23.2.26 P7 (Teacher 2) 9.3.26 B5, B6 and B7 (Teacher 1)		20.4.26 B8, B9 (Teacher 1) **End of year exams half term 6, paper 1 for biology, chemistry and physics (3 x 1hr45).**	
 **Embed your knowledge**	**Mandatory homework tasks:** • Educake - one homework set each week on a Monday and due the following Monday, maximum of 6 per half term • Independent revision for assessments Knowledge organiser: Shared on teams by class teachers. Websites https://www.primrosekitten.com/pages/gcse-science https://www.bbc.co.uk/bitesize/subjects/zrkw2hv		**Mandatory homework tasks:** • Educake - one homework set each week on a Monday and due the following Monday, maximum of 6 per half term • Independent revision for assessments Knowledge organiser: Shared on teams by class teachers. **Science in the News** *Task:* Find a recent science-related news article. Summarise it and explain how it links to GCSE content. Include: • The science behind the story • Why it matters • Any ethical or environmental issues		**Mandatory homework tasks:** • Educake - one homework set each week on a Monday and due the following Monday, maximum of 6 per half term • Independent revision for assessments Knowledge organiser: Shared on teams by class teachers. **Teach It to a Year 7** *Task:* Choose a tricky GCSE topic and explain it in a way a Year 7 student could understand. Use simple language, analogies, and diagrams. You could present it as: • A comic strip • A short video • A one-page guide	

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

CIM - Curriculum Intent Map Biology
Exam board - GCSE: AQA Exam board - A'Level: AQA

Extend your learning 	**Outbreak Investigation** *Task:* Research a historical or recent disease outbreak (e.g., Ebola, COVID-19). Create a case study including cause, transmission, prevention, and treatment. **Real-Life Applications** Research and describe **two real-life uses** of electrolysis. For each one: • What is being electrolysed? • What are the products? • Why is electrolysis important in this process? **Examples to consider:** • Electrolysis of brine (salt water) • Extraction of aluminium from bauxite • Electroplating metals **Design a Thermally Efficient Home** Draw and label a diagram of a house that uses **thermal insulation** to reduce energy loss. Include: • Double glazing • Loft insulation • Wall insulation • Draught excluders 👉 **Challenge:** Explain how each feature reduces energy transfer.	**Photosynthesis in Action** *Task:* Investigate how light intensity affects the rate of photosynthesis using online simulations or practical data. Plot a graph and explain the trend. **Radiation Penetration Simulation** Use an online simulation (e.g., PhET Interactive Simulations) to explore: • How alpha, beta, and gamma radiation behave • What materials block each type • How distance affects radiation detection 👉 Record your findings in a table and explain which type is most dangerous outside vs. inside the body. **Real-Life Applications** Research and describe **two real-world uses** of energy changes in reactions. For each one: • Is the reaction exothermic or endothermic? • What is the reaction used for? • Why is the energy change important? **Examples to consider:** • Self-heating cans • Instant cold packs • Combustion in engines • Photosynthesis and respiration	**Reflexes in Real Life** *Task:* Design a simple experiment to test reaction times. Collect data from family or classmates and analyse the results. **Timeline of the Atmosphere** Create a **timeline** showing how the Earth's atmosphere has changed over billions of years. Include: • Formation of the early atmosphere (volcanic activity) • Appearance of simple life and oxygen production • Development of the ozone layer • Modern atmosphere composition 👉 **Challenge:** Add estimated time periods and key events. **Key Concept Recap** Answer the following: 4. What is the difference between **AC** and **DC** electricity? 5. What is the **UK mains voltage** and frequency? 6. What is the purpose of the **earth wire** in a plug? **Environmental Impact** Research and describe **two environmental issues** related to crude oil. For each one: • What causes the issue? • What are the effects on people and ecosystems? • What can be done to reduce the impact? **Examples to consider:** • Oil spills • Air pollution from burning fuels • Climate change

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

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CIM - Curriculum Intent Map Biology
Exam board - GCSE: AQA Exam board - A'Level: AQA

2025-2026	Year 11 Combined Science (AQA Trilogy) (Biology, Chemistry, Physics)					
	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Knowledge, Skills and Understanding 	B11 Hormonal communication B12 Reproduction P13 Electromagnetism P12 Electromagnetic waves P3 Energy resources C1 Atomic structure - revisit C2 The Periodic Table - revisit C3 Structure and bonding - revisit C12 The Earth's resources		B13 Variation and evolution B14 Genetics and evolution C10 Chemical analysis C8 Rates and equilibrium		Revision and preparation for external exams	
	Paper 1 PPE (October/November) **Biology paper 1 (1hr15)** **Chemistry Paper 1 (1hr15)** **Physics Paper 1 (1hr15)**		Paper 2 PPE (February) **Biology paper 2 (1hr15)** **Chemistry Paper 2 (1hr15)** **Physics Paper 2 (1hr15)**		External exams **Biology paper 1 (1hr15)** **Chemistry Paper 1 (1hr15)** **Physics Paper 1 (1hr15)**	**External exams** **Biology paper 2 (1hr15)** **Chemistry Paper 2 (1hr15)** **Physics Paper 2 (1hr15)**
 **Embed your knowledge**	Mandatory Homework tasks • revision • Educake every Monday Knowledge organiser: AQA Inheritance, Variation and Evolution Knowledge Organiser.pdf Websites https://www.primrosekitten.com/pages/gcse-science		Mandatory Homework tasks: • revision • Educake every Monday Knowledge organiser: AQA Inheritance, Variation and Evolution Knowledge Organiser.pdf		Mandatory Homework tasks: • revision • Educake every Monday **Teach It to a Year 7** *Task:* Choose a tricky GCSE topic and explain it in a way a Year 7 student could understand. Use simple language, analogies, and diagrams. You could present it as: • A comic strip • A short video • A one-page guide	

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

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Extend your learning 	**Dangers of EM Radiation** *Task:* Research the potential dangers of ultraviolet, X-rays, and gamma rays. Create a safety guide explaining: • What the risks are • How exposure can be reduced • Real-life examples of protection (e.g., lead aprons, sunscreen) **Plant vs Human Reproduction** Create a comparison table showing the differences between **plant** and **human** reproduction. Include: • Type of gametes • Site of fertilisation • Method of pollination or mating • Type of offspring produced (genetically identical or varied) 👉 **Challenge:** Add diagrams of a flower and the human reproductive system with labels. **Life Cycle of a Product** Pick a household item (e.g. **plastic bottle**, **aluminium can**, or **paper bag**) and research: • Where the raw materials come from • How it's made	**Natural Selection Case Study** *Task:* Research a real-world example of natural selection (e.g., peppered moths, antibiotic resistance in bacteria, Darwin's finches). Create a case study that includes: • The environmental pressure • The variation in the population • The outcome over generations **Gas Test Scenarios** For each scenario, identify the gas and explain how you would test for it: 1. A metal reacts with acid and produces a colourless gas that makes a squeaky pop. 2. A gas is collected from a reaction and relights a glowing splint. 3. A gas turns damp red litmus paper blue and smells strongly. 4. A gas turns limewater cloudy. 5. A greenish-yellow gas bleaches damp litmus paper. **Create a Spectrum Poster** Design a colourful **poster or infographic** showing: • The full electromagnetic spectrum • Wavelength and frequency trends • One use and one danger for each wave • A diagram showing how the waves differ in energy	***Genetic Engineering Research*** *Task:* Research how genetic engineering is used in medicine or agriculture (e.g., insulin production, GM crops). Create a fact sheet explaining: • The process • Benefits and risks • Public opinion and regulation **Required Practical Skills** Describe how you would carry out the following required practical: Investigating the effect of pH on the rate of enzyme activity. Include: • Equipment needed • Variables (independent, dependent, control) • How you would measure the results • How to ensure reliability	

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

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	• How it's used • How it's disposed of or recycled **Create a poster or digital presentation** showing the life cycle and its environmental impact.			

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

CIM - Curriculum Intent Map Biology
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2025-2026	Year 11 Separate Sciences (AQA) (Biology, Chemistry and Physics)					
	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Knowledge, Skills and Understanding 	**GCSE Biology** B11 Hormonal communication B12 Homeostasis in action B13 Reproduction B14 Variation and evolution **GCSE Chemistry** C10 Organic reactions C11 Polymers C12 Chemical analysis **GCSE Physics** P3 Energy resources P11 Force and Pressure P14 Light		**GCSE Biology** B13 Reproduction B14 Variation and evolution B15 Genetics and evolution **GCSE Chemistry** C14 The Earth's resources C15 Using our resources **GCSE Physics** P15 Electromagnetism P16 Space P8 Forces in balance		Revision and preparation for external exams	
	Paper 1 PPE Biology Paper 1 (1hr45) Chemistry Paper 1 (1hr45) Physics Paper 1 (1hr45)		Paper 2 PPE **Biology paper 2 (1hr45)** **Chemistry Paper 2 (1hr45)** **Physics Paper 2 (1hr45)**		**External exams:** **Biology paper 1 (1hr45)** **Chemistry Paper 1 (1hr45)** **Physics Paper 1(1hr45)**	**External exams:** **Biology paper 2 (1hr45)** **Chemistry Paper 2 (1hr45)** **Physics Paper 2 (1hr45)**

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

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 **Embed your knowledge**	Mandatory Homework tasks • revision • Educake every Monday Knowledge organisers – provided on teams by class teachers **Websites** https://www.primrosekitten.com/pages/gcse-science BBC Bitesize	Mandatory Homework tasks • revision • Educake every Monday Knowledge organisers – provided on teams by class teachers **Teach It to a Year 7** *Task:* Choose a tricky GCSE topic and explain it in a way a Year 7 student could understand. Use simple language, analogies, and diagrams. You could present it as: • A comic strip • A short video • A one-page guide	Mandatory Homework tasks • revision • Educake every Monday Knowledge organisers – provided on teams by class teachers **Concept Map Challenge** *Task:* Create a concept map linking key ideas from a topic (e.g., atomic structure, energy transfers, or cell biology). Include: • Keywords • Definitions • Diagrams • Links between ideas	

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

CIM - Curriculum Intent Map Biology
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Extend your learning 	**Dangers of EM Radiation** *Task:* Research the potential dangers of ultraviolet, X-rays, and gamma rays. Create a safety guide explaining: • What the risks are • How exposure can be reduced • Real-life examples of protection (e.g., lead aprons, sunscreen) **Explain It!** Write a paragraph answering: "Why is hormonal communication important for maintaining homeostasis?" Use scientific terms like **target organ**, **negative feedback**, **endocrine gland**, and **regulation**. **Polymer Examples** Choose **three polymers** and for each one: • Name the **monomer** it is made from • Describe its **properties** (e.g. flexible, strong, waterproof) • Give **one use** in everyday life **Examples to consider:** • Poly(ethene) • Poly(propene) • Nylon • Polyester • DNA (as a natural polymer)	**Natural Selection Case Study** *Task:* Research a real-world example of natural selection (e.g., peppered moths, antibiotic resistance in bacteria, Darwin's finches). Create a case study that includes: • The environmental pressure • The variation in the population • The outcome over generations **Flame Test Research** Research the **flame test colours** for the following metal ions: • Lithium (Li^+) • Sodium (Na^+) • Potassium (K^+) • Calcium (Ca^{2+}) • Copper (Cu^{2+}) 👉 **Challenge:** Create a colour-coded chart or poster showing each metal ion and its flame colour. **Redshift and Distance** Create a table or graph showing how **redshift increases with distance** from Earth. You can: • Use real data from galaxy observations (optional) • Or create a simple model showing that the further away a galaxy is, the greater its redshift 👉 **Challenge:** Explain how this supports the **Big Bang theory**.	***Genetic Engineering Research*** *Task:* Research how genetic engineering is used in medicine or agriculture (e.g., insulin production, GM crops). Create a fact sheet explaining: • The process • Benefits and risks • Public opinion and regulation **Required Practical Skills** Describe how you would carry out the following required practical: Investigating the effect of pH on the rate of enzyme activity. Include: • Equipment needed • Variables (independent, dependent, control) • How you would measure the results • How to ensure reliability	

Extracurricular activities **Careers links** **Curriculum links** **Threshold topics (bold)** **PSHE, PD and cultural capital links**

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2025-2026	Year 12 Biology (AQA)					
	Half term 1	**Half term 2**	**Half term 3**	**Half term 4**	**Half term 5**	**Half term 6**
Knowledge, Skills and Understanding 	**Big Topics** 1 Biological Molecules 3 Cell structure **Practical skills** RP1 – Enzymes Testing for biological molecules **Maths skills** Rearranging equations Standard form Tangents Calculating rates Unit conversion IAM	**Big Topics** 2. Nucleic acids 4 Transport across membranes **Practical skills** RP2 – Root tip squash RP3 Osmosis RP4 Cell membranes **Maths skills** Means Graphs %	**Big Topics** 5. Cell recognition and the immune system 7 Mass transport **Practical skills** RP5 Biological drawings RP6 Microbial growth **Maths skills** Means Graphs Pulmonary ventilation rate	**Big Topics** 6 Exchange 7 Mass transport **Practical skills** Dissection of heart, lungs, fish, stem, using a potometer **Maths skills** Ratios Surface area and volume Haemoglobin dissociation curves Cardiac output Rate of transpiration	**Big Topics** 8 DNA, genes and protein synthesis 9. Genetic diversity 10 Biodiversity **Practical skills** RP6 Microbial growth **Maths skills** Spearman's rank correlation coefficient Students t-test Standard deviation P-values Simpsons index of diversity Mean, median, mode Significant figures Estimating results	**Big Topics** Revision 19 Populations in ecosystems **Practical skills** RP12 Quadrats RP6b Size of bacterial population using serial dilution Random sampling Mark-release-recapture **Maths skills** Logarithmic scales Growth curves Normal distribution curve Powers Orders of magnitude Probability Plotting two variables from experimental data
	Baseline testing (Assessment 1) – September Assessment 2 – November		Assessment 3 – January Assessment 4 – March		Pre-public exams (June) AS Paper 1 (1hr30) AS Paper 2 (1hr 30)	
 **Embed your knowledge**	Exam questions Reading chapters of the text book Notes Weekly wider reading log Researching/Writing up required practical's		Exam questions Reading chapters of the text book Notes Weekly wider reading log Researching/Writing up required practical's		Exam questions Reading chapters of the text book Notes Weekly wider reading log Researching/Writing up required practical's Revision	

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Extend your learning			
	**Wider reading** -Bill Bryson – A Short History of Nearly Everything Journals to keep up with current scientific developments, can use knowledge for the paper 3 essay. **Websites** http://www.ibiblio.org/virtualcell/index.htm – An interactive cell biology site http://www.accessexcellence.org/RC/VL/GG – A web site showing illustrations of many processes of biotechnology http://www.uq.oz.au/nanoworld – Visit the world of electron-microscope https://thealevelbiologist.co.uk/ **Design an experiment** - Propose a controlled experiment to test the effect of a variable on enzyme activity. Include hypothesis, method, and expected results. **Practical Skills Recap** For each required practical: • Write the aim, method, and results • Identify variables and controls • Explain how to improve reliability and accuracy Example: Investigating the effect of temperature on enzyme activity.	**Wider Reading** • Ernst Mayr – This is Biology: The Science of the Living World • James Watson – DNA: The Secret of Life • Ed Young – I Contain Multitudes (The microbes within us and a grander view of life) • Meredith Wadman – The Vaccine Race **Websites** http://www.dnai.org/a/index.html Explore the genetic code https://www.primrosekitten.com/ **Statistical Analysis of Biological Data** *Task:* Use chi-squared or t-tests to analyse biological data (e.g., inheritance patterns or enzyme activity). Interpret results. **Biology in the News** Find a recent news article related to biology (e.g. genetics, disease, biotechnology, ecology). • Summarise the article • Identify the biological concepts involved • Explain how it links to your A-Level studies • Give your opinion on the issue **Keyword Flashcards** Make flashcards for key terms and processes: • Osmosis • Active transport • Semi-conservative replication • Antigen • Monomer vs polymer Use apps like **Quizlet** or **Anki**, or make physical cards. Test yourself regularly.	**Wider reading** • Rachel Carson – Silent Spring • Gaia Appello - 101 ways to help the planet – A one year challenge: make one small change a week to help the environment **Watch** A Life on Our Planet **Websites** http://www.nhm.ac.uk – The London Natural History Museum's website with lots of interesting educational material **Biology and Art** *Task:* Create a piece of art (drawing, sculpture, digital) inspired by a biological structure or process. Include a scientific explanation. **Design a Conservation Plan** *Task:* Choose an endangered species and create a conservation strategy considering habitat, human impact, and genetics. **Topic Summary Sheets** Create a one-page summary for each major topic: • Cell structure • Biological molecules • Enzymes • Cell membranes and transport • DNA and protein synthesis • Cell division • Immunity Include key definitions, diagrams, and processes. Use colour coding and bullet points for clarity.

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2025-2026	Year 13 Biology (AQA)					
	Half term 1	**Half term 2**	**Half term 3**	**Half term 4**	**Half term 5**	**Half term 6**
Knowledge, Skills and Understanding 	**Big Topics** 11 Photosynthesis 14 Response to stimuli 12 Respiration **Practical Skills** RP7 Chromatography and leaf pigments RP8 Chloroplasts and dehydrogenase RP9 Respiration in yeast and the effect of temperature **Maths Skills** • Table and graphs • Translating information between graphical, numerical and algebraic forms	**Big Topics** 13 Energy and ecosystems 15 Nervous coordination and muscles **Practical Skills** RP10 Choice chambers Effect of exercise on heart rate **Maths Skills** • GPP • Efficiency • % Yield • Chi-squared • % change • Translating information between graphical, numerical and algebraic forms	**Big Topics** 16 Homeostasis 17 Inherited change 18 Populations and evolution **Practical Skills** 11 Dilution series of glucose **Maths Skills** • Ratios • % • Calculating probability • Statistical tests – Chi-Squared • Hardy-Weinberg equation • Translating information between graphical, numerical and algebraic forms	**Big Topics** 20 Gene expression 21 Recombinant DNA technology **Practical Skills** RP6b Size of bacterial population using serial dilution In vivo and in vitro cloning Gel electrophoresis **Maths Skills** • Plotting two variables of experimental data • Logarithmic scales • Orders of magnitude • Significant figures • Interpret graphical information • Interpret and understand tabular information	**Big Topics** 21 Recombinant DNA technology **Practical Skills** - Review required practical's **Maths Skills** - Review maths skills - Statistics and interpreting statistical data	

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	Baseline testing (assessment 1) Paper 1 PPE (October/November) Paper 3 PPE (October/November)	PPE (March) Paper 2 PPE (February) Paper 3 PPE (February)		**External Exams:** **Paper 1 (Y12 Content) – 2 hours** **Paper 2 (Y13 Content) – 2 hours** **Paper 3 (Y12/13 Content) – 2 hours**
 **Embed your knowledge**	Exam questions Reading chapters of the text book Notes Weekly wider reading log Researching/Writing up required practical's Revision	Exam questions Reading chapters of the text book Notes Weekly wider reading log Researching/Writing up required practical's Revision	Revision Exam questions	

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Extend your learning 	**Wider Reading** • Daniel Chamovitz – What a plant knows • Rebecca Skloot – The Immortal Life of Henrietta Lacks • Susan Greenfield – The Human Brain • Journals to keep up with current scientific developments, can use knowledge for the paper 3 essay. **Flashcard Challenge** Make flashcards for: • Key definitions (e.g. transcription, allele, osmoregulation) • Processes (e.g. meiosis, synaptic transmission) • Diagrams (e.g. nephron, chloroplast structure) Use apps like **Anki**, **Quizlet**, or physical cards. Test yourself daily and track progress. **Exam Question Breakdown** Pick a long-answer question (6–8 marks) and: • Highlight command words (e.g. explain, evaluate) • Plan your answer using bullet points • Write a full response and self-mark using a mark scheme	**Wider reading** Epigenetics Revolution – Nessa Carey The Selfish Genes – Richard Dawkins Genome: the autobiography of a species in 23 chapters - Matt Ridley **Websites** https://www.primrosekitten.com/ **Simulate Population Genetics** *Task:* Use Hardy-Weinberg equations to model allele frequency changes under different conditions (e.g., selection, mutation). **Concept Mapping** Create a **mind map** for each major topic: • Photosynthesis & Respiration • DNA, Genes & Protein Synthesis • Genetic Inheritance & Variation • Homeostasis • Ecosystems & Energy Transfer Use colour coding, diagrams, and links between ideas to show how concepts connect. **Teach It Back** Choose a topic and **teach it to someone else** (friend, family, or even record yourself): • Use diagrams and analogies • Answer their questions • Reflect on what you found hard to explain Teaching is a powerful way to reinforce your understanding.	Research a recent breakthrough in gene editing (e.g., CRISPR-Cas9) and present its potential applications and ethical implications. **Protein Folding and Disease** *Task:* Investigate how misfolded proteins contribute to diseases like Alzheimer's or Parkinson's. Present findings in a mini-poster format. **Practical Skills Review** Revise core practicals by: • Writing out the method and purpose • Identifying variables and controls • Explaining how results are analysed (e.g. using a calibration curve, calculating rate) Example: Investigating the effect of a named variable on enzyme activity.	

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	You can also swap answers with a peer for feedback.			

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