

AQA COMBINED SCIENCE: TRILOGY (8464)

Two-Year Curriculum Map

A professional overview of curriculum sequence, required practical activities, assessment, mathematical development and accessible participation

Qualification	AQA GCSE Combined Science: Trilogy (8464)
Programme duration	Two years; twelve six-week rotating blocks
Teaching allocation	Approximately eight lessons per week
Curriculum coverage	Biology, Chemistry and Physics across all source-plan topics
Inclusive design	ACE medical-needs education strategies embedded throughout

Created from the supplied Combined Science Scheme of Work and cross-checked against AQA practical-assessment guidance

Curriculum overview

This curriculum map details the supplied AQA Combined Science: Trilogy (8464) two-year scheme of work. The source programme is organised into twelve six-week rotating subject blocks and is timetabled for approximately eight lessons per week. It deliberately cycles Biology → Chemistry → Physics in Year 1 before returning to higher-density, synoptic blocks in Year 2.

Curriculum intent

The sequence develops secure disciplinary knowledge while building the habits required for GCSE success: use of models, application of equations, data analysis, practical competence, evaluation of evidence and precise scientific communication. The curriculum starts with core cellular, atomic and energy models; applies these to systems, chemical change and electrical circuits; then develops further biological, chemical and physics ideas through increasingly integrated and examination-focused contexts. The source scheme embeds adaptive teaching so that pupils with medical needs can access practical science, sensitive content and assessment without lowering ambitious curriculum end points. [1]

Two-year block structure

Year	Term	Block	Subject	Curriculum topic(s)	Specification focus
Year 1	Autumn 1	Block 1	Biology	Cell Biology	Biology Topic 1
Year 1	Autumn 2	Block 2	Chemistry	Atomic Structure and the Periodic Table	Chemistry Topic 8
Year 1	Spring 1	Block 3	Physics	Energy	Physics Topic 18
Year 1	Spring 2	Block 4	Biology	Organisation	Biology Topic 2
Year 1	Summer 1	Block 5	Chemistry	Bonding, Structure and Properties of Matter	Chemistry Topic 9
Year 1	Summer 2	Block 6	Physics	Electricity	Physics Topic 19
Year 2	Autumn 1	Block 7	Biology	Infection and Response; Bioenergetics	Biology Topics 3–4
Year 2	Autumn 2	Block 8	Chemistry	Quantitative Chemistry; Chemical Changes	Chemistry Topics 10–11
Year 2	Spring 1	Block 9	Physics	Particle Model of Matter; Atomic Structure	Physics Topics 20–21
Year 2	Spring 2	Block 10	Biology	Homeostasis and Response; Inheritance, Variation and Evolution; Ecology	Biology Topics 5–7
Year 2	Summer 1	Block 11	Chemistry	Energy Changes; Rate and Extent; Organic Chemistry; Chemical Analysis; Chemistry of the Atmosphere; Using Resources	Chemistry Topics 12–17
Year 2	Summer 2	Block 12	Physics	Forces; Waves; Magnetism and Electromagnetism; Examination Revision	Physics Topics 22–24 + synoptic revision

Assessment, retrieval and revision

The source scheme expects ongoing formative assessment through diagrams, calculations, models, practical outcomes and data tasks. The final physics block includes whole-course revision, command-word teaching, timed practice and mock examination preparation. The map therefore makes assessment evidence and retrieval/progression explicit for every block, while recommending that teachers use question-level information to plan responsive reteaching and catch-up following absence.

Year 1: detailed sequence and progression

The Year 1 map shows the six rotating blocks in the order given by the source scheme. It identifies the substantive knowledge, mathematical and Working Scientifically opportunities, assessment evidence, progression links and medically inclusive access approaches within each block. [1]

Term / block	Subject and sequence	Key substantive knowledge	Mathematics & Working Scientifically	Assessment evidence	Retrieval / progression	Medical-needs access and adaptive teaching	Core practical context
Autumn 1 Block 1	Biology — Cell Biology Cell types and organelles → differentiation and stem cells → cell cycle and mitosis → diffusion, osmosis and active transport → microscopy/magnification and osmosis investigation.	Eukaryotic and prokaryotic cells; organelles; differentiation; stem cells; chromosomes, DNA and mitosis; diffusion, osmosis, active transport; microscopy, magnification and resolution.	Magnification and unit conversion; percentage change in osmosis; variables, control and graphing; accurate biological drawing; evaluation.	Cell diagrams; magnification fluency; transport comparison; practical write-up/data task; retrieval of essential vocabulary.	Creates the foundational cell, enzyme and transport models that support later organisation, infection, bioenergetics, homeostasis and inheritance.	High-contrast diagrams; digital microscopy; pre-prepared slides; stepwise magnification scaffold; defined practical roles; advance notice for medical/ethical discussion of stem cells.	Microscopy; osmosis; model-based cell work.
Autumn 2 Block 2	Chemistry — Atomic Structure and the Periodic Table Protons, neutrons and electrons → development of atomic models → electronic configuration → periodic table → Group 1, 7 and 0 trends → elements, compounds, mixtures and separation.	Atoms, isotopes, ions and relative mass; atomic models; electronic configuration; groups, periods and reactivity trends; elements, compounds and mixtures; filtration, crystallisation, distillation and chromatography.	Atomic/mass-number calculations; use of models; observation and pattern recognition; separation methods; comparing evidence.	Atomic-structure calculations; electronic-configuration diagrams; group-trend explanation; method selection/evaluation for mixtures.	Establishes particle and electronic models required for bonding, quantitative chemistry, chemical changes, particle physics and radiation.	Physical atom models; partially completed electronic-configuration diagrams; colour-coded periodic table; teacher-led reactivity demonstrations; virtual flame-free alternatives and clear apparatus routines.	Separation and reactivity observation/simulation.
Spring 1 Block 3	Physics — Energy Energy stores/pathways → kinetic, gravitational and elastic potential energy → specific heat capacity → power and efficiency → renewable and non-renewable resources.	Energy stores, pathways and dissipation; kinetic, gravitational and elastic potential energy; specific heat capacity; power and efficiency; energy resources and their environmental, economic and social implications.	Equation use and rearrangement; unit conversion; specific-heat-capacity calculations; percentage efficiency; chart/data interpretation; evidence-based evaluation.	Energy-transfer diagrams; equation application; efficiency calculation; comparative evaluation of energy-resource options.	Builds confident use of equations and energy-transfer models before electricity, particle physics, forces and climate/atmosphere contexts.	Formula sheets and equation triangles; numbered calculation steps; calculator use; concrete demonstrations; short regulation breaks; balanced discussion of climate risks and technological solutions.	Specific heat capacity; energy-transfer activities.
Spring 2 Block 4	Biology — Organisation Organisation hierarchy → digestive system and enzymes → circulatory system, heart and blood → coronary heart disease/treatments → plant tissues, xylem/phloem and transpiration.	Tissues, organs and systems; enzymes, digestion and pH; circulatory system and blood; cardiovascular disease and treatments; plant tissues; transport; transpiration.	Rates of reaction; qualitative food tests; variables and control; interpreting process/flow diagrams; comparative evaluation of treatments.	Digestive and circulatory annotations; enzyme explanation; treatment-evaluation response; plant-transport and transpiration application questions.	Applies cell structure and transport to organism-level systems. Provides enzyme, blood and plant knowledge reused in bioenergetics and homeostasis.	3D/interactive anatomy; colour-coded flowcharts; health-positive language; advance notice and alternative written route for sensitive content; accessible food-test and enzyme-practical roles.	Food tests; enzyme pH investigation; system models.
Summer 1 Block 5	Chemistry — Bonding, Structure and Properties of Matter Ionic bonding → covalent bonding and simple molecules → giant covalent structures → metallic bonding and alloys → structure–property relationships.	Ions and electron transfer; covalent sharing; metallic bonding; lattices; simple molecules; diamond, graphite, graphene and fullerenes; polymers; alloys; conductivity and melting points.	Interpretation of models and diagrams; comparison/classification; relating evidence of properties to bonding and structure.	Dot-and-cross diagrams; structure–property explanations; comparison of carbon forms; prediction of properties from an unfamiliar structure.	Uses Year 1 atomic models to prepare for reactivity, electrolysis, organic chemistry and materials/resource decisions in Year 2.	Pre-drawn electron-diagram templates; tactile/3D lattice models; clear comparison matrices; familiar material examples; reduced-copying options.	Structure/bonding models and property comparisons.
Summer 2 Block 6	Physics — Electricity Symbols and circuit construction → current, potential difference and resistance → $V = IR$ → series/parallel circuits → I–V characteristics and sensors → power, energy, AC/DC and National Grid → static electricity.	Circuit diagrams; current, potential difference and resistance; Ohm's law; series/parallel behaviour; resistors, lamps, diodes, thermistors and LDRs; electrical power; AC/DC; National Grid; static charge.	$V = IR$; $P = IV$ and $P = I^2R$; circuit measurement; graph interpretation; comparison of current/potential difference in circuit configurations.	Symbol fluency; circuit build/check; equation calculation; series/parallel explanation; application of National Grid model.	Extends energy models and equation confidence. Forms the basis for magnetism, electromagnetism and later physics interpretation.	Virtual circuit builders; large-terminal/snap components; calm safety briefing; accessible circuit roles; consistent water-flow analogy; calculation scaffolds.	Circuit construction, resistance and I–V investigation.

Year 2: detailed sequence and progression

The Year 2 map shows the six rotating blocks in the order given by the source scheme. It identifies the substantive knowledge, mathematical and Working Scientifically opportunities, assessment evidence, progression links and medically inclusive access approaches within each block. [1]

Term / block	Subject and sequence	Key substantive knowledge	Mathematics & Working Scientifically	Assessment evidence	Retrieval / progression	Medical-needs access and adaptive teaching	Core practical context
Autumn 1 Block 7	Biology — Infection and Response; Bioenergetics Pathogens/transmission → body defences, vaccination and medicines → drug testing → photosynthesis and limiting factors → respiration, anaerobic pathways and oxygen debt.	Pathogens and communicable disease; immune response; vaccination; antibiotics, resistance and trials; photosynthesis; limiting factors; aerobic/anaerobic respiration; fermentation, lactic acid and oxygen debt.	Rate and graph interpretation in photosynthesis; balanced word/symbol equations; practical variables and evaluation; clinical-trial evidence.	Disease/defence explanations; vaccine/medicine evaluation; photosynthesis/respiration equations; practical data and limiting-factor tasks.	Revisits cells, enzymes, energy and transport, then establishes the biological energy models needed in homeostasis and ecology.	Advance notice and check-ins for health-sensitive disease content; factual evidence-led vaccine discussion; virtual pondweed practical; sensory-aware lighting options; positive framing around medical progress.	Photosynthesis rate investigation; disease/evidence models.
Autumn 2 Block 8	Chemistry — Quantitative Chemistry; Chemical Changes Relative formula mass and conservation → moles, limiting reactants and yields → reactivity series/displacement → acids, alkalis, salts and neutralisation → extraction/reduction → electrolysis.	Mr, conservation, moles, limiting reactants and yield; reactivity series; displacement; oxidation/reduction; acids, alkalis and neutralisation; salts; electrolysis and electrode products.	Multi-step calculation; molar reasoning; percentage yield; ionic equations; hypothesis development; safe micro-scale practical methods.	Mr/mole calculation sets; reactivity predictions; ionic equations; electrolysis product explanation; written method/evaluation tasks.	Applies atomic and bonding knowledge to quantification and chemical change. Enables subsequent rate, equilibrium and organic chemistry studies.	Concrete mole analogies; annotated calculation templates; worked examples before independent practice; micro-scale chemistry; teacher demonstration option; clear safety and pacing supports.	Salt preparation; electrolysis; acid/alkali and quantitative tasks.
Spring 1 Block 9	Physics — Particle Model of Matter; Atomic Structure Particle model → density → change of state and latent heat → gases and pressure → atomic structure and radioactivity → alpha, beta and gamma → half-life, hazards and uses → fission/fusion.	Solids/liquids/gases; density; Brownian motion; latent heat; gas pressure; isotopes and decay; alpha/beta/gamma; half-life; irradiation/contamination; fission/fusion.	Density and latent-heat equations; volume/displacement measurement; half-life graphs; nuclear equations; risk evaluation based on evidence.	Particle-model explanations; density/latent-heat calculations; half-life graph questions; radiation-risk and safety application.	Extends chemistry particle/atomic models and Year 1 physics energy calculations, establishing foundations for final forces/waves/electromagnetism application.	Explicit positive/medical uses of radiation; physical half-life models; pre-drawn graph axes; sensitive handling of nuclear/medical contexts; calculations chunked into steps.	Density; latent-heat/particle models; radiation simulation.
Spring 2 Block 10	Biology — Homeostasis and Response; Inheritance, Variation and Evolution; Ecology Homeostasis, nervous/endocrine coordination and control → DNA/inheritance and Punnett squares → variation, natural selection and evolution → ecosystems, cycles, biodiversity and human impact.	Homeostasis; nervous system, reflexes and hormones; blood glucose, temperature and water control; DNA, genes, alleles and inheritance; variation/evolution; biodiversity; food webs; material cycles and ecosystems.	Reaction-time data; Punnett-square probability; graph/data interpretation; sampling; evidence-based evaluation of ecological and genetic claims.	Reflex/control-system explanations; genetic-cross calculations; natural-selection extended response; ecosystem/cycle and biodiversity evaluation.	Connects Year 1 cell division and transport with the final biological systems content. Supports holistic understanding of biological adaptation and environmental evidence.	Sensitive non-medical trait examples where appropriate; visual block overview and mini-topic chunking; individual check-ins around inherited conditions; virtual/accessible fieldwork; conservation success narratives.	Reaction-time investigation; accessible ecology sampling.
Summer 1 Block 11	Chemistry — Energy Changes; Rate and Extent; Organic Chemistry; Chemical Analysis; Chemistry of the Atmosphere; Using Resources Exothermic/endothermic and reaction profiles → rates, catalysts and equilibrium → hydrocarbons, cracking and polymers → analysis/chromatography → atmosphere and climate → potable water, life cycle and sustainability.	Energy profiles and bond energy; rates and collision theory; reversible reactions/equilibrium; alkanes, alkenes, crude oil and cracking; polymers; chromatography/Rf; atmosphere/climate; potable water; life-cycle assessment and sustainability.	Reaction profiles; Rf calculation; rate-data graphs; variable control; life-cycle comparison; quantitative evidence in environmental decision making.	Energy-profile/kinetics explanations; Rf tasks; rate graph/data application; atmosphere/resource evaluation and sustainability reasoning.	Culminates chemistry by applying atomic, quantitative, energy and materials knowledge in unfamiliar industrial/environmental contexts.	Topic-by-topic revision mats; prioritised learning sequence; regular retrieval; audio recordings for missed lessons; pace adjustments and rest breaks; constructive, solution-focused climate teaching.	Temperature change; rate; chromatography; water-analysis tasks.
Summer 2 Block 12	Physics — Forces; Waves; Magnetism and Electromagnetism; Examination Revision Scalars/vectors, motion and Newton's laws → momentum → waves and wave equation → electromagnetic spectrum → fields, electromagnets, motors, generators and transformers → cross-science revision and examination practice.	Vectors, speed, velocity, acceleration and graphs; Newton's laws; resultant force, drag and momentum; wave properties/equation; EM spectrum; magnetic fields; electromagnets, motor/generator effect and transformers.	Motion and velocity-time graphs; $F = ma$; momentum; $v = f\lambda$; vector representation; planning/evaluating practical evidence; equation selection in novel contexts.	Equation and graph application; multi-mark explanations; required-practical retrieval; command-word practice; progressive timed work and mock examinations.	Culminates physics and the whole qualification through purposeful retrieval, equation fluency and synoptic examination practice across biology, chemistry and physics.	Low-stakes confidence-building retrieval; comprehensive equation sheet; structured timed practice with planned rest/breathing breaks; explicit command-word teaching; individual revision plans and access arrangements.	Springs; acceleration; waves; electromagnetic investigations.

Required practical activity delivery tracker

AQA's current specification lists 21 required practical activities for GCSE Combined Science: Trilogy, and written-examination questions draw on practical knowledge and skills. [2] The supplied scheme contains the topic contexts for these activities but does not label each individual practical. The tracker below therefore assigns each activity to the most coherent source-aligned block; it is a planning and audit tool, and departments should confirm final delivery dates, risk assessments and contemporaneous practical records locally. [1] [2]

RP	Science	Required practical activity	Recommended block	Curriculum topic	Tracking status
1	Biology	Microscopy: observe, draw and label plant and animal cells; include a magnification scale.	Y1 B1	Cell Biology	Recommended source-aligned placement
2	Biology	Osmosis: effect of salt/sugar concentration on the mass of plant tissue.	Y1 B1	Cell Biology	Recommended source-aligned placement
3	Biology	Food tests: qualitative reagents for carbohydrates, lipids and proteins.	Y1 B4	Organisation	Recommended source-aligned placement
4	Biology	Amylase: effect of pH on the rate of reaction using continuous sampling.	Y1 B4	Organisation	Recommended source-aligned placement
5	Biology	Photosynthesis: effect of light intensity on the rate using an aquatic organism such as pondweed.	Y2 B7	Bioenergetics	Recommended source-aligned placement
6	Biology	Reaction time: plan and carry out an investigation into the effect of a factor on human reaction time.	Y2 B10	Homeostasis and Response	Recommended source-aligned placement
7	Biology	Ecology: sample population size and distribution using quadrats and transects.	Y2 B10	Ecology	Recommended source-aligned placement
8	Chemistry	Prepare a pure, dry sample of a soluble salt from an insoluble oxide or carbonate.	Y2 B8	Chemical Changes	Recommended source-aligned placement
9	Chemistry	Electrolyse aqueous solutions using inert electrodes; develop and test a hypothesis.	Y2 B8	Chemical Changes	Recommended source-aligned placement
10	Chemistry	Investigate variables that affect temperature changes in reacting solutions.	Y2 B11	Energy Changes	Recommended source-aligned placement
11	Chemistry	Investigate how concentration affects reaction rate using gas volume and colour/turbidity methods.	Y2 B11	Rate and Extent of Chemical Change	Recommended source-aligned placement
12	Chemistry	Use paper chromatography to separate and distinguish substances in a mixture.	Y2 B11	Chemical Analysis	Recommended source-aligned placement
13	Chemistry	Analyse and purify water samples, including pH, dissolved solids and distillation.	Y2 B11	Using Resources	Recommended source-aligned placement
14	Physics	Determine the specific heat capacity of one or more materials.	Y1 B3	Energy	Recommended source-aligned placement
15	Physics	Use circuits to investigate factors affecting the resistance of electrical circuits.	Y1 B6	Electricity	Recommended source-aligned placement
16	Physics	Construct circuits to investigate I–V characteristics of circuit elements.	Y1 B6	Electricity	Recommended source-aligned placement
17	Physics	Determine the density of regular and irregular solid objects and liquids.	Y2 B9	Particle Model of Matter	Recommended source-aligned placement
18	Physics	Investigate the relationship between force and extension for a spring.	Y2 B12	Forces	Recommended source-aligned placement
19	Physics	Investigate how force affects acceleration at constant mass, and how mass affects acceleration at constant force.	Y2 B12	Forces	Recommended source-aligned placement
20	Physics	Make observations to identify suitable apparatus for measuring wave frequency, wavelength and speed.	Y2 B12	Waves	Recommended source-aligned placement
21	Physics	Investigate how infrared radiation absorbed or radiated depends on surface colour and texture.	Y1 B3	Energy	Recommended source-aligned placement

Working Scientifically, mathematics and assessment

The curriculum is designed so that practical competence, mathematical fluency and evaluative reasoning recur across all three sciences. These threads should be revisited explicitly in retrieval, modelling, practical planning and assessment feedback. [1] [2]

Thread	Where it develops in the two-year programme	Evidence of secure application
Models, diagrams and representations	Cell and atomic models; electron/bonding diagrams; energy stores; system flow diagrams; circuit symbols; particle and radiation models; vectors, waves and fields.	Accurate, labelled representation; precise explanation of what the model shows; appropriate application to a new context.
Measurement and practical apparatus	Microscopy, osmosis, food/enzyme tests, energy, circuits, density, waves and ecology. Apparatus use is adapted where needed while maintaining the scientific purpose.	Safe, purposeful equipment use; valid method and records; appropriate units and significant figures; evidence of risk awareness.
Equations, calculation and data	Magnification; energy, electricity, density and motion equations; chemical quantities; rates, yields, Rf and ecology estimates; graphs and probability.	Correct formula selection/rearrangement/substitution; a transparent method; sensible units; graph/data interpretation that is biologically, chemically or physically coherent.
Variables, evaluation and evidence	Osmosis, enzyme activity, photosynthesis, reaction time, electrolysis, rates, circuits, density, forces, waves and IR investigations.	Identification/control of variables; conclusion tied to data; anomaly/limitation awareness; feasible, science-specific improvement.
Scientific literacy and examination application	Vocabulary is introduced in every block; final Block 12 makes command words, extended responses, equations and cross-science application explicit.	Clear use of key terms; structured multi-mark response; distinction between describe, explain, compare, evaluate and calculate; improved response after feedback.

End-of-course curriculum outcomes

By the end of the programme, pupils should be able to connect biological, chemical and physics models; apply equation and data skills; evaluate practical methods and evidence; and select knowledge accurately in unfamiliar examination contexts. The final block provides a structured bridge from topic knowledge to synoptic GCSE application through low-stakes retrieval, targeted practical revision, command-word instruction and progressively timed practice. [1]

ACE medical-needs education: curriculum access and adaptive teaching

The supplied scheme places medical-needs access at the centre of its curriculum design. The approaches below retain shared scientific end points while adapting participation, communication, sensory environment, pacing, practical handling and assessment. Implementation must be individualised through established health plans, school policy, risk assessment and access arrangements. [1]

Access principle	How it appears in the source plan	Professional curriculum implementation
Practical participation without reduced ambition	The scheme offers digital microscopy, virtual laboratories/circuit builders, teacher demonstrations, pre-prepared materials, larger components, micro-scale chemistry, pooled data and accessible/virtual fieldwork.	Keep the same scientific question and learning outcome. Adapt the handling, setting, sensory demand, timing, recording route or group role; agree predictable safety and participation plans before practical lessons.
Cognitive load, fatigue and missed learning	The plan uses formula sheets, step-by-step calculation templates, worked examples, visual guides, retrieval, audio recordings and explicit topic maps.	Teach in short, clearly signposted stages. Use regular retrieval to reconnect after absence, provide concise catch-up materials, and reduce unnecessary copying while preserving the intellectual demand of the task.
Sensory, physical and neurodivergent access	The source identifies risks from close microscopy work, flames, noise/bright demonstrations, small equipment, odours, outdoor fieldwork and dense abstract representations.	Offer accessible equipment, high-contrast/large-print resources, simulation or observer routes, sensory-aware alternatives and a predictable visual schedule. Avoid unexpected sensory demands; provide choice where possible.
Pacing, regulation and wellbeing	The scheme recommends short brain breaks, rest breaks in timed practice, low-stakes retrieval and clear safety briefings.	Build planned pacing into calculation-heavy, practical and revision lessons. Offer brief, optional calm breathing or grounding routines as pre-agreed regulation tools; provide a quiet re-entry route after breaks without drawing attention to the pupil.
Health-sensitive, ethical and environmental contexts	Stem cells, disease, vaccination, heart conditions, radiation, genetics, reproduction, climate change and extinction may be personally significant or anxiety-provoking.	Give advance notice; use factual, non-judgemental language; do not require personal disclosure; provide anonymous question routes and an equivalent alternative task when needed. Balance risks with evidence, protective action and scientifically credible solutions.
Assessment access and confidence	The final block uses no-stakes quizzing, explicit command-word instruction, equation sheets, structured timed practice and individual revision plans.	Implement agreed access arrangements consistently. Build confidence gradually through topic-based practice, specific feedback and progress recognition; use assessment evidence to direct reteaching rather than solely to rank attainment.

References

[1] Supplied document: AQA Combined Science: Trilogy (8464), 2-Year Scheme of Work — ACE-Medical Needs Education, uploaded by the user.

[2] AQA. GCSE Combined Science: Trilogy (8464): Specification and Practical Assessment.

<https://www.aqa.org.uk/subjects/science/gcse/science-8464/specification/practical-assessment> (accessed 15 September 2026).