

Science Year 7

Cycle 1: Chemistry	Cycle 2: Physics	Cycle 3: Biology
<p>Core knowledge:</p> <ul style="list-style-type: none"> • Chemical reactions • Reaction Profiles • The periodic table • Electrons & reactivity • CPAC - graphs & research <p>Assessment:</p> <p>→ Factual recall, retrieval practice and exam style questions on above core content.</p> <p>Curriculum sequence: Build on Y6 knowledge of reactions, aspirational KS4 content on structure of the atom to prepare pupils to understand bonding.</p>	<p>Core knowledge:</p> <ul style="list-style-type: none"> • Forces & Moments • Newton's Laws • Waves & Light • Space • CPAC - variables <p>Assessment:</p> <p>→ Factual recall, retrieval practice and exam style questions on above core content.</p> <p>Curriculum sequence: Build on KS2 knowledge of forces, aspirational KS4 content of moments to strengthen pupils approach to maths in physics.</p>	<p>Core knowledge:</p> <ul style="list-style-type: none"> • Food Chains & Webs • Photosynthesis & Respiration • Ecosystems & Cycles • Adaptation & Competition • DNA & Inheritance <p>Assessment:</p> <p>→ Factual recall, retrieval practice and exam style questions on above core content.</p> <p>Curriculum sequence: Build on Y6 knowledge of cells, aspirational KS4 content on inheritance to ensure pupils understand the link between genetics and characteristics.</p>
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Science Year 8

Cycle 1: Physics	Cycle 2: Biology	Cycle 3: Chemistry
<p>Core knowledge:</p> <ul style="list-style-type: none"> • Electricity • Power • Magnetism • The national grid • CPAC - Methods <p>Assessment:</p> <p>→ Factual recall, retrieval practice and exam style questions on above core content.</p> <p>Curriculum sequence: Build on KS2 knowledge, aspirational KS4 content on magnetism to stretch pupils KS3 knowledge.</p>	<p>Core knowledge:</p> <ul style="list-style-type: none"> • The circulatory system • Plant transport • Immunity & pathogens • Reproduction & Fertility • CPAC - equipment <p>Assessment:</p> <p>→ Factual recall, retrieval practice and exam style questions on above core content.</p> <p>Curriculum sequence: Build on KS2 knowledge, aspirational KS4 content on immunity to prepare pupils for GCSE.</p>	<p>Core knowledge:</p> <ul style="list-style-type: none"> • Atmosphere & rock cycle • Reactions of metals • Earth's resources • Climate change & pollutants • CPAC - Risk assessments <p>Assessment:</p> <p>→ Factual recall, retrieval practice and exam style questions on above core content.</p> <p>Curriculum sequence: Build on KS2 knowledge, aspirational KS4 content on reactions of metals to prepare pupils to to predict products of reactions in KS4.</p>
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Science Year 9

Biology	Chemistry	Physics
<p>Core knowledge:</p> <ul style="list-style-type: none"> • Microscopes & Cells • Transport & Exchange • Digestion & enzymes • Respiration & photosynthesis • Reproduction & Inheritance <p>Assessment:</p> <p>→ Factual recall, retrieval practice and exam style questions on above core content.</p> <p>Curriculum sequence: Bridging course to develop understanding of links between KS3 and KS4 content</p>	<p>Core knowledge:</p> <ul style="list-style-type: none"> • Formulas & equations • Displacement reactions • Neutralisation Reactions • Rates of reaction • Oxidation & Combustion <p>Assessment:</p> <p>→ Factual recall, retrieval practice and exam style questions on above core content.</p> <p>Curriculum sequence: Bridging course to develop understanding of how and why chemicals react with each other</p>	<p>Core knowledge:</p> <ul style="list-style-type: none"> • Energy stores & transfers • Power & efficiency • Energy supplies • Forces & motion • Acceleration & Momentum <p>Assessment:</p> <p>→ Factual recall, retrieval practice and exam style questions on above core content.</p> <p>Curriculum sequence: Bridging course to prepare pupils to succeed at GCSE.</p>
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Science Year 10

Biology	Chemistry	Physics
<p>Core knowledge:</p> <ul style="list-style-type: none"> ● Cell structure & transport ● Cell division ● Organisation & the digestive system ● Organisation: Animals & plants ● Communicable disease ● Preventing & treating disease ● Non-communicable disease ● Bioenergetics ● Nervous system <p>Assessment:</p> <p>→ Factual recall & exam style questions</p> <p>Curriculum sequence: Follow AQA GCSE</p> <p>Links to triple specification, combined specification</p>	<p>Core knowledge:</p> <ul style="list-style-type: none"> ● Atomic Structure ● The periodic table ● Bonding ● Chemical calculations ● Chemical changes ● Electrolysis ● Energy changes ● Rates & Equilibrium ● Crude oil & fuels <p>Assessment:</p> <p>→ Factual recall & exam style questions</p> <p>Curriculum sequence: Follow AQA GCSE</p> <p>Links to triple specification, combined specification</p>	<p>Core knowledge:</p> <ul style="list-style-type: none"> ● Energy ● Particle model of matter ● Atomic structure ● Electricity <p>Assessment:</p> <p>→ Factual recall & exam style questions</p> <p>Curriculum sequence: Follow AQA GCSE</p> <p>Links to triple specification, combined specification</p>

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Science Year 11

Biology	Chemistry	Physics
<p>Core knowledge:</p> <ul style="list-style-type: none"> • Hormonal coordination • Homeostasis • Reproduction • Variation & Evolution • Adaptation & competition • Organising an ecosystem • Biodiversity <p>Assessment:</p> <p>→ Factual recall & exam style questions</p> <p>Curriculum sequence: Follow AQA GCSE</p> <p>Links to triple specification, combined specification</p>	<p>Core knowledge:</p> <ul style="list-style-type: none"> • Rates of reaction • Organic chemistry • Chemical Analysis • Chemistry of the atmosphere • Using resources <p>Assessment:</p> <p>→ Factual recall & exam style questions</p> <p>Curriculum sequence: Follow AQA GCSE</p> <p>Links to triple specification, combined specification</p>	<p>Core knowledge:</p> <ul style="list-style-type: none"> • Motion • Forces & Motion • Waves • Electromagnetic waves • Magnetism • Triple only: Space <p>Assessment:</p> <p>→ AQA GCSE assessment</p> <p>Curriculum sequence: Follow AQA GCSE</p> <p>Links to triple specification, combined specification</p>
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Biology Year 12

Cycle 1:	Cycle 2:	Cycle 3:
<p>Core knowledge:</p> <ul style="list-style-type: none"> • Biological molecules • DNA & replication • Cell structure • Cell cycle • Cell membranes & Transport <p>Assessment:</p> <ul style="list-style-type: none"> → End of topic tests and AP1 course suitability assessment → Required practical 1, 2 & 4 <p>Curriculum sequence: Cycle 1 introduces students to biochemistry, the molecules behind life and how they interact. It also builds on GCSE knowledge of cells and transport.</p>	<p>Core knowledge:</p> <ul style="list-style-type: none"> • Digestion & absorption • Cell recognition & immunity • Genetics & variation • Gas Exchange • Relationships between organisms <p>Assessment:</p> <ul style="list-style-type: none"> → End of topic tests and AP2 exam style assessment → Required practical 3, 6 & 5 <p>Curriculum sequence: Pupils build on GCSE knowledge of digestion utilising new knowledge of transport. Students look at gas exchange in alternative organisms to GCSE such as insects and fish.</p>	<p>Core knowledge:</p> <ul style="list-style-type: none"> • Diversity of organisms • Mass transport in plants • Mass transport in animals • Photosynthesis • Respiration <p>Assessment:</p> <ul style="list-style-type: none"> → End of topic tests and AP3 full set of AS papers → Required practical 7 & 8 <p>Curriculum sequence: This cycle builds on prior knowledge from GCSE in all areas and relies on a strong understanding of cycle 1 knowledge to be successful.</p>

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Link to AQA [specification](#).

Biology Year 13

Cycle 1:	Cycle 2:	Cycle 3:
<p>Core knowledge:</p> <ul style="list-style-type: none"> • Response • Genes & inheritance • Muscles & movement • Populations & ecosystems <p>Assessment:</p> <ul style="list-style-type: none"> → End of topic tests and AP4 full set of AS papers and A2 content insert → Required practical 9 & 10 <p>Curriculum sequence: Knowledge builds on GCSE content to develop pupils understanding of how ecologists study living organisms.</p>	<p>Core knowledge:</p> <ul style="list-style-type: none"> • Homeostasis • Osmoregulation • Gene expression • Gene technology <p>Assessment:</p> <ul style="list-style-type: none"> → End of topic tests and AP5 (mocks) full set of A level papers → Required practical 11 & 12 <p>Curriculum sequence: Content on genetics builds on GCSE and Y12 understanding of DNA and technologies. Homeostasis covers content from GCSE in more detail.</p>	<p>Core knowledge:</p> <ul style="list-style-type: none"> • Review and recap previous content • Catch-up required practicals • Focus on exam practice and technique in lesson time <p>Assessment:</p> <ul style="list-style-type: none"> → Final AQA A level assessment

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Link to AQA [specification](#).

Chemistry Year 12

<p>Cycle 1: Physical & Organic Chemistry</p> <p>Core knowledge:</p> <ul style="list-style-type: none"> • Atomic structure • Amount of substance • Bonding • Kinetics • Organic nomenclature and conventions • Alkanes <p>Assessment:</p> <ul style="list-style-type: none"> → Weekly factual recall quiz from 100% sheets → Exit tickets/exam questions each week → Required practicals 1 and 3 → Formal assessment - AP1 - Course suitability (mixture of GCSE and A-level questions on content covered to date) 	<p>Cycle 1: Physical, Inorganic & Organic Chemistry</p> <p>Core knowledge:</p> <ul style="list-style-type: none"> • Energetics • Equilibria • Redox • Group 2 • Halogenoalkanes • Alkenes • Alcohols <p>Assessment:</p> <ul style="list-style-type: none"> → Weekly factual recall quiz from 100% sheets → Exit tickets/exam questions each week → Required practicals 5 and 6 → Formal assessment - AP2 - 2 1hr exam papers 	<p>Cycle 3: Inorganic and Organic Chemistry + Y13 Physical Chemistry</p> <p>Core knowledge:</p> <ul style="list-style-type: none"> • Group 7 • Periodicity • Alcohols (cont.) • Organic Analysis • Rate equations (Y13 content) • Thermodynamics (Y13 content) <p>Assessment:</p> <ul style="list-style-type: none"> → Weekly factual recall quiz from 100% sheets → Exit tickets/exam questions each week → Required practicals 2 and 4 → Formal assessment - AP3 - AS Papers 1 and
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<p>Curriculum sequence:</p> <p>The first cycle provides the grounding in chemistry foundations, recapping and extending beyond the GCSE content in all topics.</p> <p>Links to AQA Specification: 3.1.1-3.1.3, 3.1.5 3.3.1-3.3.3</p>	<p>Curriculum sequence:</p> <p>Energetics and equilibria are topics students have touched on a GCSE, but require a more confident approach to complex calculations and must have a secure foundation in conversions of units, especially moles and concentrations. This builds upon Topic 2: Amount of substance from Cycle 1. Students will move beyond familiar organic molecules studied at GCSE and in Cycle 1 to begin describing how organic reaction occur and to draw mechanisms.</p> <p>Links to AQA Specification: 3.1.4,, 3.1.6-3.1.7 3.2.2 3.3.4-3.3.5</p>	<p>2</p> <p>Curriculum sequence:</p> <p>Topics covered in Cycle 3 are largely synoptic and require the knowledge acquired in the first 2 cycles of the year. Students will be required to build on their knowledge of multiple homologous series of organic molecules to analyse IR spectra, and they will refer back to atomic structure, redox and equations when discussing Group 7 and Period 3 trends.</p> <p>We choose to begin the Y13 content at the end of the year that directly extends students' understanding of energetics and rates as this provides revision opportunity of earlier topics and is the most familiar to students at this point in the course.</p> <p>Links to AQA Specification: 3.2.1, 3.2.3 3.3.5-3.3.6 Year 13 content - 3.1.8, 3.1.9</p>
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Chemistry Year 13

<p>Cycle 1: Physical and Organic Chemistry</p> <p>Core knowledge:</p> <ul style="list-style-type: none"> • Optical isomerism • Aldehydes and Ketones • Carboxylic acids and their derivatives • Aromatic Chemistry • Equilibrium and K_p • Acids and bases • Electrochemistry <p>Assessment:</p> <ul style="list-style-type: none"> → AP5 - used for predicted grades in UCAS → Required Practicals 7a, 7b and 9 <p>Curriculum sequence:</p> <p>Students continue to develop understanding of organic chemistry and build schema of reaction schemes and mechanisms. They will also deepen their understanding of equilibria to appreciate gaseous systems. Content in acids and bases and electrochemistry link to some content from GCSE, but are largely novel and require a</p>	<p>Cycle 2: Inorganic and Organic Chemistry</p> <p>Core knowledge:</p> <ul style="list-style-type: none"> • Electrochemistry (cont.) • Amines • Polymers • Amino acids, proteins and DNA • NMR • Chromatography • Organic Synthesis • Transition Metals • Period 3 elements and oxides <p>Assessment:</p> <ul style="list-style-type: none"> → AP6 - full set of 3 A level papers → Optional: Chemistry Olympiad (external) → Required practicals 8, 10a and 10b <p>Curriculum sequence:</p> <p>Students begin to appreciate how organic chemistry links to biochemistry in this cycle. They will also begin to understand how chemists work to deduce chemical structures and the composition of mixtures.</p>	<p>Cycle 3: Synoptic Practice</p> <p>Core knowledge:</p> <ul style="list-style-type: none"> • Review and recap previous content • Catch-up required practicals • Focus on exam practice and technique in lesson time <p>Assessment:</p> <ul style="list-style-type: none"> → Required practicals 11 and 12 → Final AQA A level assessment
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<p>secure ability to manipulate number.</p> <p>Links to AQA Specification: 3.1.10-3.1.12 3.3.7-3.3.10</p>	<p>Finally, they will synthesise their organic chemistry knowledge to suggest chemical routes to produce specific molecules, much as chemists working in industry might. In inorganic chemistry, students will begin to understand the complex nature of transition metals, including their uses, properties and associated colours of TM compounds. This will link back to previous knowledge on bonding and redox chemistry.</p> <p>Links to AQA Specification: 3.2.4-3.2.6 3.3.11-3.3.16</p>	
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Physics Year 12

Cycle 1:

Core knowledge:

- Measurements and their limitations
- Core physics calculation skills
- Fundamental particles and how they interact
- Electromagnetic radiation and quantum phenomena
- Progressive and stationary waves

Assessment:

- End of topic tests and AP1 course suitability assessment

Curriculum sequence:

students begin by learning the core mathematical and analytical skills that underpin the rest of the course before learning what the fundamental particles of the universe are and how their interactions explain all physical phenomena. We delve more deeply into the specific role of electromagnetic radiation (photons). We also examine what waves are, how they can be described mathematically and what happens when they interfere.

Links to National Curriculum:

Cycle 2:

Core knowledge:

- Refraction, diffraction and interference
- Forces and their effects
- Energy stores and transformation
- Momentum and collisions
- Materials and their properties

Assessment:

- End of topic tests and AP2 exam style assessment

Curriculum sequence: we complete our waves topic by examining the behaviour of light (photons) in particular. Following this, we study the broader topic of mechanics which considers the many factors that can affect an object's motion and the mathematics required to describe this motion as a result. This requires an exploration of forces, energy and momentum. We complete our understanding of forces and energy by looking into the bulk properties of solids when they are subjected to a range

Cycle 3:

Core knowledge:

- Electricity - circuits measurement and calculation
- Resistance and resistivity
- Internal Resistance
- Rutherford scattering
- Radioactivity and nuclear safety
- Mass and energy

Assessment:

- End of topic tests and AP3 full set of AS papers

Curriculum sequence: To complete the AS part of the content we study electricity. This begins with a firm foundational understanding of current, potential difference and resistance before taking a more thorough look at applications such as resistivity and internal resistance. We start the post-AS content by reviewing our prior knowledge of radioactivity and then building on this with a more advanced understanding of nuclear stability, the link between mass and energy and importance nuclear safety factors.

sections 3.1, 3.2 and 3.3.1 from the AQA A Level Physics specification	of conditions. Links to National Curriculum: sections 3.3.2 and 3.4 from the AQA A Level Physics specification	Links to National Curriculum: sections 3.5 and 3.8 from the AQA A Level Physics specification
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Physics Year 13

<p>Cycle 1:</p> <p>Core knowledge:</p> <ul style="list-style-type: none"> • Circular motion • Simple harmonic motion • Gravitational fields • Electric fields • Capacitance • Magnetic fields <p>Assessment:</p> <p>→ End of topic tests and AP4 full set of AS papers and A2 content insert</p> <p>Curriculum sequence: the students' understanding of mechanics is broadening by considering the mathematics behind circular motion and simple harmonic motion. This is followed by the a crucial understanding of the concept</p>	<p>Cycle 2:</p> <p>Core knowledge:</p> <ul style="list-style-type: none"> • Heat transfer • Molecular kinetic theory and ideal gases • Astrophysics: telescopes, stars and cosmology <p>Assessment:</p> <p>→ End of topic tests and AP5 (mocks) full set of A level papers</p> <p>Curriculum sequence: students consider the basics behind thermal physics by learning about how specific heat capacity and specific latent heat can affect that rate at which heat is transferred into or out of different substances. The final topic of the year is</p>	<p>Cycle 3:</p> <p>Core knowledge:</p> <ul style="list-style-type: none"> • Review and recap previous content • Catch-up required practicals • Focus on exam practice and technique in lesson time <p>Assessment:</p> <p>→ Final AQA A level assessment</p> <p>Links to National Curriculum: review of all sections from the AQA A Level Physics specification</p>
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of a force or energy field and how this can help us understand gravitational and electric fields. Capacitors are studied as a application of electric fields. Finally, a knowledge of fields enables students to understand magnetic fields and the link between electricity and magnetism.

Links to National Curriculum: sections 3.6.1 and 3.7 from the [AQA A Level Physics specification](#)

astrophysics. Students learn about how different telescopes have been developed to enable physicists to observe as much of the universe as possible. We finish by examining what astrophysics have found out about celestial objects and how this leads to some theories of how the universe began.

Links to National Curriculum: sections 3.6.2 and 3.9 from the [AQA A Level Physics specification](#)