

GCSE (9-1) Science

Key features

Our four specifications in GCSE Combined Science, GCSE Biology, GCSE Chemistry and GCSE Physics are all laid out in the same way, with clear links to core practicals and mathematical skills throughout.

Topic 6 – Plant structures and their functions		
Students should:		Maths skills
6.1	Describe photosynthetic organisms as the main producers of food and therefore biomass	
6.2	Describe photosynthesis in plants and algae as an endothermic reaction that uses light energy to react carbon dioxide and water to produce glucose and oxygen	
6.3	Explain the effect of temperature, light intensity and carbon dioxide concentration as limiting factors on the rate of photosynthesis	2c, 2d, 2g 4a, 4c
6.4	Explain the interactions of temperature, light intensity and carbon dioxide concentration in limiting the rate of photosynthesis	4b, 4c, 4d
6.5	<i>Core Practical: Investigate the effect of light intensity on the rate of photosynthesis</i>	2c, 2f, 2g 4a, 4c
6.6	Explain how the rate of photosynthesis is directly proportional to light intensity and inversely proportional to the distance from a light source, including the use of the inverse square law calculation	2g 3a 4a, 4b, 4c, 4d
6.7	Explain how the structure of the root hair cells is adapted to absorb water and mineral ions	
6.8	Explain how the structures of the xylem and phloem are adapted to their function in the plant, including: a lignified dead cells in xylem transporting water and minerals through the plant b living cells in phloem using energy to transport sucrose around the plant	
6.9	Explain how water and mineral ions are transported through the plant by transpiration, including the structure and function of the stomata	
6.10	Describe how sucrose is transported around the plant by translocation	
6.11B	Explain how the structure of a leaf is adapted for photosynthesis and gas exchange	2d 5c

Assessments at a glance

The table below shows how we have structured our assessments in GCSE Combined Science and the separate sciences GCSE Biology, Chemistry and Physics.

	GCSE Combined Science	GCSE Biology GCSE Chemistry GCSE Physics
Assessments	<ul style="list-style-type: none">2 biology papers2 chemistry papers2 physics papers Each paper: 60 marks 1hr 10 mins	<ul style="list-style-type: none">GCSE Biology: 2 papersGCSE Chemistry: 2 papersGCSE Physics: 2 papers Each paper: 100 marks 1hr 45 mins
Question types	multiple-choice questions, scaffolded and short answer questions, calculations, and extended open response questions	
How is content split across the papers?	<ul style="list-style-type: none">Papers are split according to topic, with half the content for each discipline in one paper (e.g. Biology 1) and half the content in the second paper (e.g. Biology 2).The first topic in each specification lists key ideas that may be assessed in both paper 1 and paper 2. These are either fundamental ideas of the science, e.g. cells in Biology or atomic structure and bonding in Chemistry, or skills, e.g. handling units in Physics.	

All papers are available at foundation and higher tier. Foundation tier papers are for candidates aiming at grades 1-5. Higher tier papers are for candidates aiming at grades 4-9 (there is an allowed grade 3 for those candidates who just miss the pass mark for the qualification).

GCSE Biology/Combined Science

Table showing topics assessed in each biology paper:

Paper 1	Paper 2
Key Concepts in Biology	Key Concepts in Biology
Cells and Control	Plant structures and their functions
Genetics	Animal coordination, control and homeostasis
Natural selection and genetic modification	Exchange and transport in animals
Health, disease and development of medicines	Ecosystems and material cycles

Within each topic, there's some content that is common to combined science, and some content that goes into extra depth that is only assessed if a student is taking the separate biology GCSE.

There's one topic that is assessed across both papers, 'Key concepts in Biology'. This topic covers fundamental concepts in biology such as cells which will be drawn upon in other topics, for example this could be included as part of a question on photosynthesis where a candidate would need to understand cells in paper 2, but also in cells and control or genetics in paper 1.

GCSE Chemistry/Combined Science

Table showing topics assessed in each chemistry paper:

Paper 1	Paper 2
Key concepts in Chemistry	Key concepts in Chemistry
States of matter and mixtures	Groups in the periodic table
Chemical changes (acids and electrolytic processes)	Rates of reaction and energy changes
Extracting metals and equilibria	Fuels and Earth science
*Separate chemistry 1 (transition metals, quantitative analysis, dynamic equilibria, chemical cells and fuel cells)	*Separate chemistry 2 (Qualitative analysis, hydrocarbons, polymers, alcohols and carboxylic acids, bulk and surface properties of matter including nanoparticles)

The first four topics in each paper are common to combined science, and the final topic in each paper is separate science content only. The 'Key concepts in Chemistry' cover aspects such as atomic structure, which is fundamental knowledge for chemistry and so could be assessed in both papers within the context of the other topics e.g. atomic structure in fuels and hydrocarbons in paper 2, but also understanding activity of acids in chemical changes in paper 1.

GCSE Physics/Combined Science

Table showing topics assessed in each physics paper:

Paper 1	Paper 2
Key concepts in Physics	Key concepts in Physics
Motion and forces	Energy – forces doing work
Conservation of energy	Forces and their effects
Waves	Electricity and circuits
Light and electromagnetic spectrum	Static electricity*
Radioactivity	Magnetism and the motor effect
Astronomy*	Electromagnetic induction
	Particle model
	Forces and matter

*separate science topics only

Within each topic, there's some content that is common to combined science, and some content that is separate science only. Two topics are only covered if you are teaching separate GCSE Physics only - Astronomy in paper 1, and Static electricity in paper 2.

The 'Key concepts in Physics' cover fundamental skills that will be woven throughout the topics, such as being able to convert between units, or using significant figures.

Our approach to core practicals

We've integrated our core practicals into the main specification content so you can see exactly how these investigations can be included alongside the content to bring theoretical learning to life.

Practical assessment (15% of marks in exams)

We have **8 core practicals in each separate science GCSE**, and **18 in Combined Science**.

Mapping documents from your current exam board

To help make the transition from your current exam board as easy and straightforward as possible, we have created three mapping documents for you to download:

Our focus on accessibility

Nigel English, our Overarching Chair of Examiners, has summarised examples of questions asked and some commentary from senior examiners, including how well students performed and how the question enabled students to access it.

Past exam papers and mark schemes

We know how important it is to see examples of exam papers, questions and mark schemes when looking at switching exam boards.