



GCSE Science at Kingsdale School

- Students begin *GCSE Science* in Year 9 with 4 hours a week of Science. In Year 10 and Year 11 they have 5 hours a week, and may also be able to have extra one-hour sessions a week in Year 11 if their timetable allows.
- Initially all students in Year 9 and 10 follow the *AQA Combined Science: Trilogy* course, which will enable them achieve a *Double Award* in Science
- *Triple Science* is available to students and students will get three separate *GCSE* grades for this
- All *GCSEs* are now linear rather than modular. This means all exams will take place at the end of the course. There will be no controlled assessment, although practical lessons will help you answer questions in the exams.

Combined Science: Trilogy

(double award)

Summary of content

Biology

- Cell biology
- Organisation
- Bioenergetics
- Infection and response
- Homeostasis and response
- Inheritance, variation and evolution
- Ecology

Chemistry

- Atomic structure and the periodic table
- Bonding, structure, and the properties of matter
- Quantitative chemistry
- Chemical changes
- Energy changes
- The rate and extent of chemical change
- Organic chemistry
- Chemical analysis
- Chemistry of the atmosphere
- Using resources

Physics

- Energy
- Electricity
- Particle model of matter
- Atomic structure
- Forces
- Waves
- Magnetism and electromagnetism

Programme of Study:

Topics 1-4 in Biology, 1-5 in Chemistry and 1-3 in Physics will be taught in Year 9, with the remainder being covered in Year 10.

Time in Year 11 is dedicated to revision and exam practise.

Exams:

- There will be six exams: two biology, two chemistry and two physics papers.
- Each exam is 1 hour and 15 minutes, 70 marks.

Each paper will cover different subject content to help students prepare

Further reading and recommended websites:

<http://www.aqa.org.uk/subjects/science/gcse/combined-science-trilogy-8464>

<http://www.s-cool.co.uk/>

<http://www.bbc.co.uk/education/levels/z98jmp3>

Separate (Triple) sciences – Biology, Chemistry and Physics

Exams
The questions will be more straightforward and the higher tier papers will stretch the most able.
Paper 1 <ul style="list-style-type: none">• Questions on topics 1–4• 1 hour 45 minutes, 100 marks• Questions: multiple choice, structured, closed short answer, and open-response. Similar to our current GCSE.
Paper 2 <ul style="list-style-type: none">• Questions on topics 5–7• 1 hour 45 minutes, 100 marks• Questions: multiple choice, structured, closed short answer, and open-response. Similar to our current GCSE.

Summary of content

- 1 Cell biology
- 2 Organisation
- 3 Infection and response
- 4 Bioenergetics
- 5 Homeostasis and response
- 6 Inheritance, variation and evolution
- 7 Ecology

Exams
The exam questions will be more straightforward and the higher tier papers will stretch the most able.
Paper 1 <ul style="list-style-type: none">• Questions on topics 1–5• Likely to be 1 hour 45 minutes, 100 marks• Questions: multiple choice, structured, closed short answer, and open-response. Similar to our current GCSE
Paper 2 <ul style="list-style-type: none">• Questions on topics 6–10• Likely to be 1 hour 45 minutes, 100 marks• Questions: multiple choice, structured, closed short answer, and open-response. Similar to our current GCSE

Summary of content

- 1 Atomic structure and the periodic table
- 2 Bonding, structure, and the properties of matter
- 3 Quantitative chemistry
- 4 Chemical changes
- 5 Energy changes
- 6 The rate and extent of chemical change
- 7 Organic chemistry
- 8 Chemical analysis
- 9 Chemistry of the atmosphere
- 10 Using resources

Exams
The exam questions will be more straightforward and the higher tier papers will stretch the most able.
Paper 1 <ul style="list-style-type: none">• Questions on topics 2, 4, 6, 7• 1 hour 45 minutes, 100 marks• Questions: multiple choice, structured, closed short answer, and open-response. Similar to our current GCSE.
Paper 2 <ul style="list-style-type: none">• Questions on topics 1, 3, 5, 8• 1 hour 45 minutes, 100 marks• Questions: multiple choice, structured, closed short answer, and open-response. Similar to our current GCSE.

Summary of content

- 1 Forces
- 2 Energy
- 3 Waves
- 4 Electricity
- 5 Magnetism and electromagnetism
- 6 Particle model of matter
- 7 Atomic structure
- 8 Space physics

AQA GCSE (9-1) Biology for Combined Science: Trilogy



Authors: John Beeby, Anne Pilling, Series editor: Ed Walsh
Publisher: Collins
ISBN-13: 9780008175047
Price: £12.99
Publication date: June 2016 - out now
Digital version available: TBC

AQA GCSE (9-1) Chemistry for Combined Science: Trilogy



Authors: Ann Daniels, Series editor: Ed Walsh
Publisher: Collins
ISBN-13: 9780008175054
Price: £12.99
Publication date: June 2016 - out now
Digital version available: TBC

AQA GCSE (9-1) Physics for Combined Science: Trilogy



Authors: Sandra Mitchell, Series editor: Ed Walsh
Publisher: Collins
ISBN-13: 9780008175061
Price: £12.99
Publication date: 24 June 2016
Important information about AQA GCSE (9-1) Physics; Digital version available: TBC

Students can also access online versions of the textbooks using their School Collins Connect details that are unique to each user:

<https://connect.collins.co.uk/school/defaultlogin.aspx>

Simply click on the link and follow the instructions

Extra- Curricular Opportunities

In previous years we have supplemented our Science teaching with additional extracurricular opportunities, including:

- KS3 Science club
- Year 9 Science Club
- STEM club
- STEM HS2 Engineering Day
- Science Week activities
- Trips to:
 - Farnborough Air Show
 - Chemistry in Action at the Institute of Education
 - Battersea Power Station
 - Science Museum
 - Natural History Museum

The lessons are normally split by two teacher; the following example below is for the Year 9 Programme of Study (1st year):

Term	Topic	Opportunities for Skills Development
Autumn 1	1.1.1 - 1.1.2 Eukaryotes, Prokaryotes, Plant & Animal Cells	Bio Core Prac 1 Microscopes
	1.1.5 Microscopy; 1.1.3 Cell Specialisation	MS 1c Size and scale of cells, tissues, etc
	2.1.1 Organisational Hierarchy	WS 1.2 Use models to explain enzyme action
	2.2.1 The Human Digestive System	Bio Core Prac 6 Enzymes
	2.2.2 - 2.2.3 Circulatory System (lungs and heart)	MS 1a, 1c Carry Out Rate Calculations
	2.2.2 - 2.2.3 Blood Vessels, Blood	WS 1.5 Risks of blood products
Half Term		
Autumn 2	2.2.4 Coronary Heart Disease	WS 1.4 pros&cons of different methods to treat cardiovascular disease
	2.3.1 Plant Tissues and Organs	AT 7 Microscope: cross-section of leaf
	2.3.2 Plant Organ Systems	
	1.1.4 Cell Differentiation	
	1.2.2 - 1.2.3 Mitosis; Stem Cells	WS 1.3 Use of Stem Cells evaluation
	1.3.1 Diffusion	MS 1c, 5c Surface Area vs Volume Ratio
	1.3.2 Osmosis	Bio Core Prac 5 Osmosis
1.3.3 Active Transport	WS 1.4 kidney dialysis; WS 1.5 sports drinks	
Xmas		
Spring 1	3.1.1 Communicable Diseases / Spread & Control	WS 1.4 Preventing spread of disease
	3.1.6 Human Defence Systems	
	3.1.7 - 3.1.9 Vaccination, Antibiotics and Painkillers, Drug Development	WS 1.4 The global use of vaccines discussion
	3.1.7 - 3.1.9 Vaccination, Antibiotics and Painkillers, Drug Development	WS 1.6 Drug trials, peer-reviews
	3.1.2 - 3.1.5 Viral, Bacterial, Fungal & Protist Diseases	
2.2.5 Health Issues		
Half Term		
Spring 2	2.2.6 The effect of lifestyle on non-communicable disease	
	2.2.7 Cancer	
	4.1.1 - 4.1.3 Photosynthesis	MS 1a, 1c, 2c, 4a, 4c; WS 1.4
	4.1.1 - 4.1.3 Photosynthesis	Bio Core Prac 8 Photosynthesis
4.2.1 - 4.2.3 Respiration	AT 1, 3, 4 the effects of exercise in the body	

	4.2.1 - 4.2.3 Respiration	
Easter		
Summer 1	2.2.1 Energy transfers in a system	
	2.2.2 Efficiency	
	2.1.1 Energy stores and system	
	2.1.2 Changes in energy GPE and KE	
	2.1.2/4 Changes in energy EPE and Work	
	2.1.3 Energy changes in systems (Required practical 13)	
	2.1.5 Power	
Half Term		
Summer 2	4.2.3 National and global energy resources	
	7.1.1/2 The structure of an atom and Mass Numbers	
	7.1.3 The development of the model of the atom	
	7.2.1 Radioactive decay and nuclear radiation	
	7.2.2/3 Nuclear equations and Half Life	
	Revision	
	Revision	
Summer		

Term	Topic	Opportunities for Skills Development
Autumn 1	1.1.1 - 1.1.2 Atoms, Elements & Compounds / Mixtures	WS 2.2, 2.3 AT 4 using a range of equipment to separate mixtures
	1.1.4 - 1.1.6 Charge, size, mass of sub-atomic particles & Electronic Structure	(see spec and/or tasks in folder)
	1.2.1 - 1.2.3 The Periodic Table, Development, Metals & Non-Metals	WS 1.1, 1.2
	1.2.4 - 1.3.2 Group 0, 1, 7 & Transition Metals	WS 1.2, AT6 Displacement rxn
	2.1.1 - 2.1.2 Ionic Bonding	MS 5b 2D & 3D representations
	2.1.3 & 2.2.3 Ionic Compounds and Properties	WS 1.2
	Half Term	
	2.1.4 Covalent Bonding	WS 1.2 recognise simple and giant structures from diagrams
	2.2.4 - 2.2.6 Covalent Compounds	
	2.3.1 - 2.3.3 Diamond, Graphite, Fullerenes	

Autumn 2	2.3.1 - 2.3.3 Diamond, Graphite, Fullerenes	WS 1.2, 1.4
	2.1.5 Metallic Bonding	WS 1.2 recognise simple and giant structures from diagrams
	2.2.7 - 2.2.8 Properties of Metals and Alloys	WS 1.2 hardness of alloys compared with pure metals
Xmas		
Spring 1	2.2.1 - 2.2.2 States of Matter and State Symbols	WS 1.2 recognise simple and giant structures from diagrams
	4.2.4 - 4.2.5 pH, Neutralisation, Strong & Weak Acids	Chem Core Prac 4 Temperature
	4.2.1 - 4.2.3 Acids with Metals, Acids and Salts, Soluble Salts	
	4.2.1 - 4.2.3 Acids with Metals, Acids and Salts, Soluble Salts	Chem Core Prac 1 Making Salts
	4.1.1; 4.1.4 Metals and Oxygen, REDOX	
4.1.2 - 4.1.3 Reactivity Series and Extraction of Metals	AT 6 mixing of reagents to explore chemical changes	
Half Term		
Spring 2	4.1.2 - 4.1.3 Reactivity Series and Extraction of Metals	
	4.3.1 - 4.3.5 Electrolysis	Practical: Electrolysis of copper chloride
	4.3.1 - 4.3.5 Electrolysis, OILRIG	Chem Core Prac 3 Electrolysis
	3.1.1 - 3.2.5 Quantitative Chemistry	
	3.1.1 - 3.2.5 Quantitative Chemistry	
3.1.1 - 3.2.5 Quantitative Chemistry		
Easter		
Summer 1	6.1.2 Changes of state	
	6.1.1 Density of materials (Core Prac 16)	
	6.2.1 Internal energy	
	6.2.2 Temperature changes in a system and specific heat capacity	
	6.2.3 Changes of heat and specific latent heat	
	3.1 Particle motion in gases	
	3.1.1 Transverse and longitudinal waves	
Half Term		
	3.1.2 Properties of Waves	

Summer 2	3.2.1 Types of electromagnetic waves	
	3.2.1 Types of electromagnetic waves	
	3.2.4 Uses and applications of electromagnetic waves	
	7.2.4 Dangers of Radiation	
	Revision	
	Revision	
Summer		

Key: MS = maths skill

WS = working scientifically ("how science works")

AT = apparatus and techniques (Practical skills)