AQA

GCSE Separate Science

Course Handbook

2021

BUDMOUTH
ACADEMY WEYMOUTH
AN ASPIRATIONS ACADEMY

AQA GCSE Separate Science

Students study Biology, Chemistry and Physics and are awarded three GCSE grades, one for each separate science.

Specifications

The specifications can be found via a Google search for “AQA GCSE Chemistry, Biology or Physics” and then clicking on download specification, or by using the QR code below

Past Exam Papers

The exam papers from 2018 can be found via a Google search for “AQA Trilogy GCSE Combined Science past papers” or by using the QR codes below.

Exam Papers

Paper	Duration
Biology Paper 1	1hr 45 min
Chemistry Paper 1	1hr 45 min
Physics Paper 1	1hr 45 min
Biology Paper 2	1hr 45 min
Chemistry Paper 2	1hr 45 min
Physics Paper 2	1hr 45 min

Recommended Revision Resources

CGP Books publish a wide range of revision resources for AQA GCSE Separate Sciences. They are widely available.

HIGHER Tier

Revision Guides	ISBN	CGP Code
New GCSE Biology AQA Complete Revision & Practice	9781782945833	BAS46
New GCSE Chemistry AQA Complete Revision & Practice	9781782945840	CAS46
New GCSE Physics AQA Complete Revision & Practice	9781782945857	PAS48

Revision Question Cards		
9-1 GCSE Biology AQA Revision Question Cards	9781789080520	BAF41
9-1 GCSE Chemistry AQA Revision Question Cards	9781789080537	CAF41
9-1 GCSE Physics AQA Revision Question Cards	9781789080544	PAF41

All Courses - Maths Skills	ISBN	CGP Code
Grade 9-1 GCSE Science: Essential Maths Skills - Study & Practice	9781782947042	SMR42

Online Revision

BBC Bitesize

BBC Bitesize has a comprehensive series of revision materials specifically for AQA Separate Science. These include notes, videos and tests. These can be found, for all three sciences by doing a Google search for “BBC Bitesize AQA separate science” or by using the QR codes below.

My-gcsescience

my-gcsescience.com is a website that offers a series of packages of science revision materials. The most basic is free but, still worth signing up for. There are two paid packages. However, there are also a number of AQA specific videos available free on Youtube which you can find by using the QR code below.

Primrose Kitten

Don't be fooled by the name, primrosekitten.com is full of useful resources for science revision. The website is the homepage for a Youtube channel of a science teacher.

Physics and Maths Tutor

Not just a website for Physics and Maths but, Chemistry and Biology too. Go to the homepage physicsandmathstutor.com and click on the science you want to revise. Remember you're doing AQA.

Maths Skills

Up to 20% of the marks on Separate Science exam papers are awarded for the application of maths skills such as drawing and interpreting graphs, percentages, ratios, rearranging equations and significant figures. Edexcel have produced a useful guide that can be obtained by using the QR code below. (It's also relevant to AQA)

Content examined on Biology papers

Topics 1 to 4 are on Paper 1. Topics 5 to 7 are on Paper 2
Separate content is in *underlined italics*.

1. **Cell Biology**
   Eukaryotes and prokaryotes, animal and plant cells, cell division, transport in cells, *culturing microorganisms*
   Required practical activity 1: use a light microscope.
2. **Organisation**
   Principles of organisation, animal tissues, organs and organ systems, plant tissues, organs and systems.
3. **Infection and Response**
   Viral and bacterial diseases, vaccination, antibiotics and painkillers, *monoclonal antibodies*, *plant disease*.
   Required practical activity 2 (biology only): Investigate the effect of antiseptics or antibiotics on bacterial growth using agar plates and measuring zones of inhibition.
4. **Bioenergetics**
   Photosynthesis, respiration.
   Required practical activity 3: investigate the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue.
   Required practical activity 4: use qualitative reagents to test for a range of carbohydrates, lipids and proteins.
   Required practical activity 5: investigate the effect of pH on the rate of reaction of amylase enzyme.
   Required practical activity 6: Effect of light intensity on the rate of photosynthesis
5. **Homeostasis and Response**
   Homeostasis, the human nervous system, hormonal coordination in humans, hormones in human reproduction, *the brain*, *the eye*, *control of body temperature*, *maintaining water and nitrogen balance in the body*, *plant hormones*
   Required practical activity 7: plan and carry out an investigation into the effect of a factor on human reaction time.
6. **Inheritance, variation and evolution**
   Reproduction, variation and evolution, development of genetics and evolution, classification of living organisms, *advantages and disadvantages of sexual and asexual reproduction* , *DNA structure*, *cloning, theory of evolution, speciation, the understanding of genetics*.
   Required practical activity 8 (biology only): Investigate the effect of light or gravity on the growth of newly germinated seedlings.
7. **Ecology**
   Adaptations, interdependence and competition, organisation of an ecosystem, biodiversity, decomposition, Impact of environmental change, trophic levels in an ecosystem, food production,
   Required practical activity 9: measure the population size of a common species in a habitat.

Content examined on Chemistry papers

Topics 8 to 12 are on Paper 1. Topics 13 to 17 are on Paper 2
Separate content is in *underlined italics*.

1. **Atomic Structure and the Periodic Table**
   A simple model of the atom, symbols, relative atomic mass, electronic charge and isotopes, the periodic table, *properties of transition metals*
2. **Bonding, Structure and Properties of Matter**
   Chemical bonds, ionic, covalent and metallic, how bonding and structure are related to the properties of substances, structure and bonding of carbon, *bulk and surface properties of matter including nanoparticles*.
3. **Quantitative Chemistry**
   Chemical measurements, conservation of mass and balanced chemical equations, relative formula mass, use of amount of substance in relation to masses of pure substances, mole (HT only), amounts of substances in equations (HT only), concentration of solutions, *yield and atom economy of chemical reactions*, *using concentrations of solutions in mol/dm^3*, *use of amount of substance in relation to volumes of gases*.
4. **Chemical Changes**
   Reactivity of metals, reactions of acids, electrolysis, titrations
   Required practical activity 1: preparation of a pure, dry sample of a soluble salt.
   Required practical activity 2: (Chemistry only) titration.
   Required practical activity 3: investigate what happens when aqueous solutions are electrolysed.
5. **Energy Changes**
   Exothermic and endothermic reactions, reaction profiles, *chemical cells and fuel cells*
   Required practical activity 4: investigate the variables that affect temperature changes.
6. **Rate and Extent of Chemical Change**
   Rate of reaction, reversible reactions and dynamic equilibrium.
   Required practical activity 5: investigate how changes in concentration affect the rates of reactions.
7. **Organic Chemistry**
   Carbon compounds as fuels and feedstock, crude oil, hydrocarbons and alkanes, fractional distillation, properties of hydrocarbons, cracking and alkenes, *reactions of alkenes and alcohols*, *synthetic and naturally occurring polymers*.
8. **Chemical Analysis**
   Purity, formulations and chromatography, *identification of common gases, Identification of ions by chemical and spectroscopic means*.
   Required practical activity 6: investigate how paper chromatography can be used.
   Required practical activity 7: Use of chemical tests to identify the ions in unknown ionic compounds.
   Required practical activity 8: analysis and purification of water samples from different sources, including pH, dissolved solids and distillation.
9. **Chemistry of the Atmosphere**
   The composition and evolution of the Earth's atmosphere, carbon dioxide and methane as greenhouse gases, common atmospheric pollutants and their sources.
10. **Using Resources**
    Potable water, alternative methods of extracting metals (HT only), life cycle assessment and recycling, *using materials*, *corrosion and its prevention, alloys*, *ceramics and polymers*, *the Haber process and the use of NPK fertilisers*.

Content examined on Physics Combined Science papers

Topics 18 to 21 are on Paper 1. Topics 22 to 24 are on Paper 2.
Separate content is in *underlined italics*.

1. **Energy**
   Energy stores and systems, energy changes in systems, power, conservation and dissipation of energy, national and global energy resources.
   Required practical activity 1: an investigation to determine the specific heat capacity of materials.
   Required practical activity 2 (physics only): Investigate the effectiveness of thermal insulators.
2. **Electricity**
   Current, potential difference and resistance, series and parallel circuits, domestic uses and safety, energy transfers, the National Grid, *static electricity*.
   Required practical activity 3: use circuit diagrams to set up and check appropriate circuits to investigate the factors affecting the resistance of electrical circuits.
   Required practical activity 4: use circuit diagrams to construct appropriate circuits.
3. **Particle Model of Matter**
   Changes of state and the particle model, internal energy and energy transfers, particle model and pressure, *pressure in gases*, *increasing the pressure of a gas*.
   Required practical activity 5: make and record the measurements needed to determine densities of regular and irregular solid objects and liquids.
4. **Atomic Structure**
   Atoms and isotopes, atoms and nuclear radiation, *hazards and uses of radioactive emissions and of background radiation*, *nuclear fission and fusion*.
5. **Forces**
   Forces and their interactions, work done and energy transfer, forces and elasticity, forces and motion, momentum (HT only), *moments, levers and gears*, *pressure and pressure differences in fluids*, *changes in momentum*.
   Required practical activity 6: the relationship between force and extension for a spring.
   Required practical activity 7**:** investigate the effect of varying the force on the acceleration of an object of constant mass.
6. **Waves**
   Transverse and longitudinal waves, electromagnetic waves, *reflection of waves*, *sound waves*, *waves for detection and exploration*, *lenses*, *visible light*, *black body radiation*.
   Required practical activity 8: make observations to identify the suitability of apparatus to measure the frequency, wavelength and speed of waves in a ripple tank.
   Required practical activity 9 (physics only): Investigate the reflection of light by different types of surface and the refraction of light by different substances.
   Required practical activity 10: how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface
7. **Magnetism and Electromagnetism**
   Permanent and induced magnetism, magnetic forces and fields, the motor effect, loudspeakers, induced potential, *transformers and the National Grid*
8. **Space Physics**
   Solar system; stability of orbital motions; satellites, *the life cycle of a star*, *red shift*.

AQA GCSE Science Command Words

These command words tell you what to you need to do when you are doing exam questions.

Balance	Students need to balance a chemical equation.
Calculate	Students should use numbers given in the question to work out the answer.
Choose	Select from a range of alternatives.
Compare	This requires the student to describe the similarities and/or differences between things, not just write about one.
Complete	Answers should be written in the space provided, for example, on a diagram, in spaces in a sentence or in a table.
Define	Specify the meaning of something.
Describe	Students may be asked to recall some facts, events or process in an accurate way.
Design	Set out how something will be done.
Determine	Use given data or information to obtain and answer.
Draw	To produce, or add to, a diagram.
Estimate	Assign an approximate value.
Evaluate	Students should use the information supplied, as well as their knowledge and understanding, to consider evidence for and against when making a judgement.
Explain	Students should make something clear, or state the reasons for something happening.
Give	Only a short answer is required, not an explanation or a description.
Identify	Name or otherwise characterise.
Justify	Use evidence from the information supplied to support an answer.
Label	Provide appropriate names on a diagram.
Measure	Find an item of data for a given quantity.
Name	Only a short answer is required, not an explanation or a description. Often it can be answered with a single word, phrase or sentence.
Plan	Write a method.
Plot	Mark on a graph using data given.
Predict	Give a plausible outcome.
Show	Provide structured evidence to reach a conclusion.
Sketch	Draw approximately.
Suggest	This term is used in questions where students need to apply their knowledge and understanding to a new situation.
Use	The answer must be based on the information given in the question. Unless the information given in the question is used, no marks can be given. In some cases students might be asked to use their own knowledge and understanding.
Write	Only a short answer is required, not an explanation or a description.