



**Year 11**

**Class of 2018**



**GCSE Combined Science**

**AQA Trilogy**

**Home Support Pack**

## Examination Dates:

- ⇒ **15<sup>th</sup> May:** Exam for GCSE Combined Science: Trilogy - **Biology Paper 1** (both tiers) (8464/B/1F and 1H) June 2018 series. Duration: 1h 15m
- ⇒ **17<sup>th</sup> May:** Exam for GCSE Combined Science: Trilogy - **Chemistry Paper 1** (both tiers) (8464/C/1F and 1H) June 2018 series. Duration: 1h 15m
- ⇒ **23<sup>rd</sup> May:** Exam for GCSE Combined Science: Trilogy - **Physics Paper 1** (both tiers) (8464/P/1F and 1H) June 2018 series. Duration: 1h 15m
- ⇒ **11<sup>th</sup> June:** Exam for GCSE Combined Science: Trilogy - **Biology Paper 2** (both tiers) (8464/B/2F and 2H) June 2018 series. Duration: 1h 15m
- ⇒ **13<sup>th</sup> June:** Exam for GCSE Combined Science: Trilogy - **Chemistry Paper 2** (both tiers) (8464/C/2F and 2H) June 2018 series. Duration: 1h 15m
- ⇒ **15<sup>th</sup> June:** Exam for GCSE Combined Science: Trilogy - **Physics Paper 2** (both tiers) (8464/P/2F and 2H) June 2018 series. Duration: 1h 15m

If you require any further information or support for your child, please make contact with his/her teacher in the first instance. The best way to make contact with your son/daughters science teacher is to contact them direct by email:

Mrs L Asquith (Head of Science)	<a href="mailto:lasquith@asap.org.uk">lasquith@asap.org.uk</a>
Mrs H Lethbridge (Head of KS4 Science)	<a href="mailto:hlethbridge@asap.org.uk">hlethbridge@asap.org.uk</a>
Ms L Cordrey (Head of KS3 Science)	<a href="mailto:lcordrey@asap.org.uk">lcordrey@asap.org.uk</a>
Mr A Weymouth (Teacher of Science)	<a href="mailto:aweymouth@asap.org.uk">aweymouth@asap.org.uk</a>
Mrs S Tuft (Teacher of Science)	<a href="mailto:stuft@asap.org.uk">stuft@asap.org.uk</a>

## Examination Content

Students will be sitting 2 papers for each of the science disciplines; biology, chemistry and physics. The tables below outline the content they will be examined on.

### Biology Examination Content

<b>Biology Paper 1</b>	<b>Biology Paper 2</b>
<p><u>Cell Biology</u> Cell Structure (the structure and function of a typical plant and animal cell, prokaryotic and eukaryotic cells, bacterial cell structure, especially location of genetic information) Investigating Cells (size of cells (cm, mm, <math>\mu\text{m}</math>, nm), using a microscope, calculating magnification) Cell Division (chromosomes, mitosis and cell cycle, stem cells and uses) Transport in and out of Cells (diffusion, factors affecting diffusion, osmosis, active transport and comparing the processes)</p> <p><u>Organisation</u> Levels of Organisation (specialised cells, tissues, organs, organ systems, enzymes, enzymes in digestion, blood, blood vessels, heart, gaseous exchange) Transport in Plants (plant tissues, water transport, translocation)</p> <p><u>Infection and Response</u> Non-Communicable Diseases (health &amp; disease, risk factors, diseases of the heart, cancer) Pathogens and Disease (pathogens and disease, risk factors, disease of the heart, cancer) Human Defences against Disease (preventing entry of pathogens, the immune system, boosting immunity (vaccinations and antibodies) Treating Disease (Antibiotics, developing new drugs)</p> <p><u>Bioenergetics</u> Photosynthesis (photosynthesis word and symbol equation, factors affecting photosynthesis, converting glucose, how reactants get into plant) Respiration and Exercise (the importance of respiration, aerobic respiration, anaerobic respiration, exercise and respiration, metabolism)</p>	<p><u>Homeostasis and Response</u> Homeostasis and The Nervous System (the importance of homeostasis, control systems, the nervous system) Hormones and Homeostasis (the endocrine system, control of blood glucose) Hormones and Reproduction (the sex hormones, control of menstrual cycle, reducing fertility)</p> <p><u>Inheritance, Variation &amp; Evolution</u> Sexual and asexual Reproduction (asexual reproduction, sexual reproduction and meiosis, the genome) Patterns of Inheritance (genetic inheritance, genetic crosses, inherited disorders, sex determination) Variation and Evolution (variation, evolution, evidence for evolution) Manipulating Genes (selective breeding, genetic engineering) Classification (principles of classification, extinction, evolutionary trees)</p> <p><u>Ecology</u> Ecosystems (relationships between organisms, adaptations, studying ecosystems) Cycles and Feeding Relationships (recycling materials, feeding relationships) Disrupting Ecosystems (biodiversity, pollution, overexploitation, conserving biodiversity)</p>

### Required Practical Activities

Required practical activities are the experiments that the examination board states the students must complete. As there is no longer an element of coursework, students will have their practical knowledge and skills assessed within the examination paper. It is therefore imperative that students are familiar with the experiments and the linked knowledge and principles behind them.

#### Biology Required Practical Activities

Microscopy

Osmosis

Enzymes

Food Tests

Photosynthesis

Reaction Times

Ecology Field Investigations

## Chemistry Examination Content

Chemistry Paper 1	Chemistry Paper 2
<p><u>Atomic Structure and The Periodic Table</u> Atoms, Elements, Compounds and Mixtures (atoms, elements, compounds, separating mixtures) Atoms and the Periodic Table (scientific models of the atom, subatomic particles, isotopes and ions, electron configuration) The Periodic Table (development of the periodic table, group 0, group 1, group 7)</p> <p><u>Bonding, Structure and Properties of Matter</u> States of Matter (3 states of matter, changing states, identifying the state of a substance, state symbols) Ionic Compounds (chemical bonds, ionic bonding, properties of ionic compounds) Covalent Compounds (covalent bonding, small molecules, giant covalent structures) Metals and Special Metals (graphene, fullerenes, polymers, metallic bonding, properties of metals, alloys)</p> <p><u>Quantitative Chemistry</u> Conservation of Mass (the conservation of mass, relative formula mass, apparent changes in mass, concentration)</p> <p><u>Chemical Changes</u> Reactivity of Metals (oxidation and reduction, reactivity series, displacement reactions, extraction of metals) The pH Scale and Salts (the pH scale, neutralisation of acids, soluble salts from insoluble bases) Electrolysis (electrolysis, extraction of metals, electrolysis of aqueous solutions)</p> <p><u>Energy Changes</u> Exothermic and Endothermic Reactions (energy transfers, energy level diagrams)</p>	<p><u>Rate and Extent</u> Rate of Reaction (calculating the rate of a reaction, collision theory, plotting reaction rates) Reversible Reactions (catalysts, reversible reactions, closed systems)</p> <p><u>Organic Chemistry</u> Alkanes (crude oil and hydrocarbons, fractional distillation, alkanes, burning fuels) Cracking Hydrocarbons (cracking hydrocarbons, bromine water)</p> <p><u>Chemical Analysis</u> The Earth's Atmosphere (the earth's early atmosphere, the atmosphere today, increase in oxygen levels, decrease in carbon dioxide levels) Greenhouse Gasses (greenhouse gasses, the impact of human activities, global climate change, carbon footprints)</p> <p><u>Using Resources</u> Earth's Resources (sustainable development, drinking water, waste water treatment) Using Resources (life cycle assessment (LCA), reducing the use of resources)</p>

### Chemistry Required Practical Activities

Making Salts

Temperature Changes

Rates of Reactions

Chromatography

Water Purification

Electrolysis

## Physics Examination Content

Physics Paper 1	Physics Paper 2
<p><u>Energy</u> Energy Stores and Transfers (energy stores and systems, calculating energy changes, specific heat capacity and internal energy) Energy Transfers and Resources (energy transfers, national and global energy resources)</p> <p><u>Electricity</u> Electricity (standard circuit symbols, electric charge and current, resistance and potential difference) Circuits and Resistance (resistors and other components) Circuits and Power (series and parallel circuits, power in circuits) Domestic use of Electricity (direct and alternating potential difference, mains electricity, dangers of mains electricity, power and efficiency) Electrical Energy in Devices (energy transfers in appliances, the national grid)</p> <p><u>Magnetism and Electromagnetism</u> Magnetism and Electromagnetism (magnetic poles and fields, plotting fields, electromagnetism and solenoids, electromagnetic devices)</p> <p><u>Particle Model of Matter</u> Particle Model of Matter (states of matter, density, change of state and specific latent heat, particle motion and pressure in gasses)</p> <p><u>Atomic Structure</u> Atoms and Isotopes (the structure of the atom, isotopes, the plum pudding model, Rutherford, Geiger and Marsden, further developments) Nuclear Radiation (nuclear decay and radiation, alpha, beta and gamma decay, radioactive contamination) Half Life (half-life, nuclear equations)</p>	<p><u>Forces</u> Forces - Basics (scalar and vector quantities, contact, non-contact forces, gravity, resultant forces,) Forces in Action (work done and energy transfer, forces and elasticity) Forces and Motion (distance and displacement, speed, velocity, Newton's first law, distance-time graphs) Forces and Acceleration (acceleration, velocity-time graphs, Newton's second law) Terminal Velocity, Stopping and Breaking (terminal velocity, Newton's third law, stopping distance, reaction time, factors affecting breaking distance)</p> <p><u>Waves</u> Waves and Wave Properties (transverse and longitudinal waves, properties of waves, wave speed) Electromagnetic Waves (electromagnetic waves, refraction, reflection, ray diagrams) The Electromagnetic Spectrum (uses and applications of electromagnetic (EM) waves, hazards of EM waves)</p>

### Physics Required Practical Activities

Specific Heat Capacity

Resistance

I-V Characteristics

Density

Force and Extension

Acceleration

Waves

Radiation and Absorption

## Extra Support & Intervention Sessions

### Tuesday revision sessions

Tuesday revision and support sessions have been running since September and are open to all year 11 students. There are some students that have been asked to attend these sessions, this will be because they are below target in science and require extra support to help them to achieve their full potential. During these sessions we will be going through the required practical activities, there are 21 required practical activities set out by the exam board:

Biology		Chemistry		Physics	
Date/TBCIC/HW		Date/TBCIC/HW		Date/TBCIC/HW	
Microscopy	TBCIC	Making Salts	06-01-208	Specific Heat Capacity	TBCIC
Osmosis	23-01-2018	Temperature Changes	24-04-2018	Resistance	01-05-2018
Enzymes	27-03-2018	Rates of Reaction	20-02-2018	I-V Characteristics	14-04-2018
Photosynthesis	HW – Jan 2018	Chromatography	HW – Feb 2018	Density	30-01-2018
Reaction Times	16-01-2018	Water Purification		Force & Extension	06-02-2018
Ecology Field Investigations	TBCIC	Electrolysis	TBCIC	Acceleration	HW – Mar 2018
				Waves	TBCIC
				Radiation & Absorption	TBCIC

(TBCIC – to be covered in class, HW - Homework)

Sessions run from 3.10 and refreshments are provided.

### Easter Revision Sessions:

There will be 3 sessions running over the Easter break, one for Biology, Chemistry and Physics. This will give students the opportunity to attend all 3 sessions to improve/secure their knowledge and skills to leave them better prepared for their examinations. Your son/daughter may receive an invitation to attend, again this will be because they would have been identified as requiring a little extra support. Each and every student will be more than welcome to attend any of the sessions.

### Dates to be confirmed

<b>Date:</b> 10/04/2018 <b>Time:</b> 10.00 – 1400	<b>Date:</b> 11/04/2018 <b>Time:</b> 10.00 - 1400	<b>Date:</b> 12/04/2018 <b>Time:</b> 10.00-1400
<b>Biology:</b> Mrs Lethbridge	<b>Biology:</b> Mrs Lethbridge / Miss Cordrey	<b>Biology:</b> Mrs Lethbridge
<b>Chemistry:</b> Mrs Tuft	<b>Chemistry:</b> Mrs Tuft	<b>Chemistry:</b> Mrs Tuft
<b>Physics:</b> Miss Asquith	<b>Physics:</b> Miss Asquith	<b>Physics:</b> Miss Asquith

### Show My Homework (SMHW)

Extra revision resources will be uploaded to SMHW; these may not have been set by the class teacher so please do not disregard them. The resources that will be uploaded will include past paper questions (PPQs). PPQs are an invaluable resource as they help students to prepare themselves for the final examinations in the summer term.