

Advance information June 2022

GCSE Combined Science: Trilogy (8464)

Version 1.0

Because of the ongoing impacts of the Coronavirus (COVID-19) pandemic, we are providing advance information on the focus of June 2022 exams to help students revise.

This is the advance information for GCSE Combined Science: Trilogy (8464).

Information

- The format/structure of the papers remains unchanged.
- This advance information covers all examined components.
- For each paper the list shows the major focus of the content of the exam.
- Each paper may cover some, or all, of the content in the listed topic.
- Another list shows which required practical activities will be assessed.
- Topics **not** assessed either directly or through 'linked' content have also been listed.
- The information is presented in specification order and not in question order.
- Assessment of practical skills, maths skills, and Working Scientifically skills will occur throughout all the papers.
- It is **not** permitted to take this advance information into the exam.

Advice

- It is advised that teaching and learning should still cover the entire subject content in the specification, so that students are as well prepared as possible for progression to the next stage of their education.
- Topics not explicitly given in any list may appear in low tariff questions or via 'linked' questions. Linked questions are those that bring together knowledge, skills and understanding from across the specification.
- Students will still be expected to apply their knowledge to unfamiliar contexts.

Focus of the June 2022 exam

Paper Biology 1F 8464/B/1F

For this paper, the following list shows the major focus of the content of the exam:

- 4.1.2 Cell division
- 4.2.2 Animal tissues, organs and organ systems
- 4.3.1 Communicable diseases
- 4.4.1 Photosynthesis

Required practical activities that **will be assessed**:

- Required practical activity 1: use of a light microscope.
- Required practical activity 3: use qualitative reagents to test for a range of carbohydrates, lipids and proteins.
- Required practical activity 5: investigate the effect of light on the rate of photosynthesis of an aquatic plant such as pondweed.

Topics **not assessed** in this paper:

- 4.1.3.2 Osmosis
- 4.1.3.3 Active transport
- 4.2.2.4 Coronary heart disease: a non-communicable disease
- 4.4.1.3 Uses of glucose from photosynthesis
- 4.4.2 Respiration

Paper Biology 1H 8464/B/1H

For this paper, the following list shows the major focus of the content of the exam:

- 4.1.2 Cell division
- 4.2.2 Animal tissues, organs and organ systems
- 4.4.1 Photosynthesis

Required practical activities that **will be assessed**:

- Required practical activity 3: use qualitative reagents to test for a range of carbohydrates, lipids and proteins.
- Required practical activity 4: investigate the effect of pH on the rate of reaction of amylase enzyme.
- Required practical activity 5: investigate the effect of light on the rate of photosynthesis of an aquatic plant such as pondweed.

Topics **not assessed** in this paper:

- 4.1.1.5 Microscopy
- 4.1.3 Transport in cells
- 4.2.3 Plant tissues, organs and systems
- 4.3.1.2 Viral diseases
- 4.3.1.4 Fungal diseases
- 4.3.1.5 Protist diseases
- 4.3.1.6 Human defence systems
- 4.4.1.3 Uses of glucose from photosynthesis
- 4.4.2.2 Response to exercise

Paper Biology 2F 8464/B/2F

For this paper, the following list shows the major focus of the content of the exam:

- 4.5.3 Hormonal control in humans
- 4.6.1 Reproduction
- 4.7.1 Adaptations, interdependence and competition
- 4.7.2 Organisation of an ecosystem

Required practical activity that **will be assessed**:

- Required practical activity 7: measure the population size of a common species in a habitat. Use sampling techniques to investigate the effect of a factor on the distribution of this species.

Topics **not assessed** in this paper:

- 4.5.2 The human nervous system
- 4.5.3.3 Hormones in human reproduction
- 4.5.3.4 Contraception
- 4.6.1.1 Sexual and asexual reproduction
- 4.6.1.2 Meiosis
- 4.6.1.6 Sex determination
- 4.6.2.1 Variation
- 4.6.2.2 Evolution
- 4.6.2.3 Selective breeding
- 4.6.3.3 Extinction
- 4.6.3.4 Resistant bacteria
- 4.7.1.4 Adaptations
- 4.7.3.1 Biodiversity
- 4.7.3.3 Land use
- 4.7.3.4 Deforestation
- 4.7.3.5 Global warming
- 4.7.3.6 Maintaining biodiversity

Paper Biology 2H 8464/B/2H

For this paper, the following list shows the major focus of the content of the exam:

- 4.5.3 Hormonal control in humans
- 4.7.2 Organisation of an ecosystem
- 4.7.3 Biodiversity and the effect of human interaction on an ecosystem

Required practical activity that **will be assessed**:

- Required practical activity 7: measure the population size of a common species in a habitat. Use sampling techniques to investigate the effect of a factor on the distribution of this species.

Topics **not assessed** in this paper:

- 4.5.2 The human nervous system
- 4.5.3.4 Contraception
- 4.6.1.1 Sexual and asexual reproduction
- 4.6.1.3 DNA and the genome
- 4.6.1.4 Genetic inheritance
- 4.6.1.5 Inherited disorders
- 4.6.1.6 Sex determination
- 4.6.2 Variation and evolution
- 4.6.3 The development of understanding of genetics and evolution
- 4.7.1.4 Adaptations
- 4.7.3.3 Land use
- 4.7.3.4 Deforestation

Paper Chemistry 1F 8464/C/1F

For this paper, the following list shows the major focus of the content of the exam:

- 5.1.2 The periodic table
- 5.2.2 How bonding and structure are related to the properties of substances
- 5.2.3 Structure and bonding of carbon
- 5.4.1 Reactivity of metals
- 5.4.2 Reactions of acids
- 5.4.3 Electrolysis

Required practical activities that **will be assessed**:

- Required practical activity 8: preparation of a pure, dry sample of a soluble salt from an insoluble oxide or carbonate, using a Bunsen burner to heat dilute acid and a water bath or electric heater to evaporate the solution.
- Required practical activity 9: investigate what happens when aqueous solutions are electrolysed using inert electrodes. This should be an investigation involving developing a hypothesis.
- Required practical activity 10: investigate the variables that affect temperature changes in reacting solutions such as, eg, acid plus metals, acid plus carbonates, neutralisations, displacement of metals.

Topics **not assessed** in this paper:

- Not applicable

Paper Chemistry 1H 8464/C/1H

For this paper, the following list shows the major focus of the content of the exam:

- 5.2.2 How bonding and structure are related to the properties of substances
- 5.3.2 Use of amount of substance in relation to masses of pure substances
- 5.4.1 Reactivity of metals
- 5.4.2 Reactions of acids
- 5.4.3 Electrolysis
- 5.5.1 Exothermic and endothermic reactions

Required practical activities that **will be assessed**:

- Required practical activity 8: preparation of a pure, dry sample of a soluble salt from an insoluble oxide or carbonate, using a Bunsen burner to heat dilute acid and a water bath or electric heater to evaporate the solution.
- Required practical activity 9: investigate what happens when aqueous solutions are electrolysed using inert electrodes. This should be an investigation involving developing a hypothesis.
- Required practical activity 10: investigate the variables that affect temperature changes in reacting solutions such as, eg, acid plus metals, acid plus carbonates, neutralisations, displacement of metals.

Topics **not assessed** in this paper:

- Not applicable

Paper Chemistry 2F 8464/C/2F

For this paper, the following list shows the major focus of the content of the exam:

- 5.6.1 Rate of reaction
- 5.6.2 Reversible reactions and dynamic equilibrium
- 5.7.1 Carbon compounds as fuels and feedstock
- 5.8.1 Purity, formulations and chromatography
- 5.9.1 The composition and evolution of the Earth's atmosphere
- 5.9.3 Common atmospheric pollutants and their sources
- 5.10.1 Using the Earth's resources and obtaining potable water

Required practical activities that **will be assessed**:

- Required practical activity 11: investigate how changes in concentration affect the rates of reactions by a method involving measuring the volume of a gas produced and a method involving a change in colour or turbidity. This should be an investigation involving developing a hypothesis.
- Required practical activity 12: investigate how paper chromatography can be used to separate and tell the difference between coloured substances. Students should calculate R_f values.

Topic **not assessed** in this paper:

- 5.9.2 Carbon dioxide and methane as greenhouse gases

Paper Chemistry 2H 8464/C/2H

For this paper, the following list shows the major focus of the content of the exam:

- 5.6.1 Rate of reaction
- 5.6.2 Reversible reactions and dynamic equilibrium
- 5.7.1 Carbon compounds as fuels and feedstock
- 5.8.1 Purity, formulations and chromatography
- 5.9.1 The composition and evolution of the Earth's atmosphere
- 5.10.1 Using the Earth's resources and obtaining potable water

Required practical activities that **will be assessed**:

- Required practical activity 11: investigate how changes in concentration affect the rates of reactions by a method involving measuring the volume of a gas produced and a method involving a change in colour or turbidity. This should be an investigation involving developing a hypothesis.
- Required practical activity 12: investigate how paper chromatography can be used to separate and tell the difference between coloured substances. Students should calculate R_f values.

Topic **not assessed** in this paper:

- 5.8.2 Identification of common gases

Paper Physics 1F 8464/P/1F

For this paper, the following list shows the major focus of the content of the exam:

- 6.1.1 Energy changes in a system, and the ways energy is stored before and after such changes
- 6.1.3 National and global energy resources
- 6.2.1 Current, potential difference and resistance
- 6.3.1 Changes of state and the particle model
- 6.4.2 Atoms and nuclear radiation

Required practical activities that **will be assessed**:

- Required practical activity 14: an investigation to determine the specific heat capacity of one or more materials. The investigation will involve linking the decrease of one energy store (or work done) to the increase in temperature and subsequent increase in thermal energy stored.
- Required practical activity 16: use circuit diagrams to construct appropriate circuits to investigate the I–V characteristics of a variety of circuit elements, including a filament lamp, a diode and a resistor at constant temperature.

Topics **not assessed** in this paper:

- 6.2.3 Domestic uses and safety
- 6.3.3 Particle model and pressure
- 6.4.1 Atoms and isotopes

Paper Physics 1H 8464/P/1H

For this paper, the following list shows the major focus of the content of the exam:

- 6.1.1 Energy changes in a system, and the ways energy is stored before and after such changes
- 6.2.4 Energy transfers
- 6.3.1 Changes of state and the particle model
- 6.3.3 Particle model and pressure
- 6.4.1 Atoms and isotopes
- 6.4.2 Atoms and nuclear radiation

Required practical activities that **will be assessed**:

- Required practical activity 14: an investigation to determine the specific heat capacity of one or more materials. The investigation will involve linking the decrease of one energy store (or work done) to the increase in temperature and subsequent increase in thermal energy stored.
- Required practical activity 16: use circuit diagrams to construct appropriate circuits to investigate the I–V characteristics of a variety of circuit elements, including a filament lamp, a diode and a resistor at constant temperature.

Topics **not assessed** in this paper:

- 6.2.2 Series and parallel circuits
- 6.2.3 Domestic uses and safety
- 6.3.2 Internal energy and energy transfers

Paper Physics 2F 8464/P/2F

For this paper, the following list shows the major focus of the content of the exam:

- 6.5.1 Forces and their interactions
- 6.5.4.1 Describing motion along a line
- 6.5.4.2 Forces, accelerations and Newton's Laws of motion
- 6.5.4.3 Forces and braking
- 6.6.2 Electromagnetic waves
- 6.7.1 Permanent and induced magnetism, magnetic forces and fields
- 6.7.2 The motor effect

Required practical activity that **will be assessed**:

- Required practical activity 21: investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface.

Topic **not assessed** in this paper:

- 6.5.3 Forces and elasticity

Paper Physics 2H 8464/P/2H

For this paper, the following list shows the major focus of the content of the exam:

- 6.5.1 Forces and their interactions
- 6.5.4.1 Describing motion along a line
- 6.5.4.2 Forces, accelerations and Newton's Laws of motion
- 6.5.5 Momentum
- 6.6.2 Electromagnetic waves
- 6.7.2 The motor effect

Required practical activity that **will be assessed**:

- Required practical activity 21: investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface.

Topics **not assessed** in this paper:

- 6.5.3 Forces and elasticity
- 6.5.4.3 Forces and braking
- 6.7.1 Permanent and induced magnetism, magnetic forces and fields

END OF ADVANCE INFORMATION