

## Separate Science Higher

### Biology Paper 1

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

- 4.1.1 Cell structure
- 4.1.3 Transport in cells
- 4.2.2 Animal tissues, organs and organ systems
- 4.2.3 Plant tissues, organs and systems
- 4.3.1 Communicable diseases
- 4.3.2 Monoclonal antibodies

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

- Required practical activity 1: use a light microscope to observe plant cells.
- Required practical activity 3: investigate the effect of a range of concentrations of salt solution on the mass of plant tissue.
- Required practical activity 4: use qualitative reagents to test for a range of carbohydrates, lipids and proteins.

### **Topics not assessed in this paper:**

- 4.2.2.3 Blood
- 4.2.2.7 Cancer
- 4.3.1.8 Antibiotics and pain killers
- 4.3.1.9 Discovery and development of drugs
- 4.4.2.2 Response to exercise

## Biology Paper 2

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

- 4.5.2 The human nervous system
- 4.5.3 Hormonal control in humans
- 4.5.4 Plant hormones
- 4.6.1 Reproduction
- 4.7.2 Organisation of an ecosystem

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

- Required practical activity 8: investigate the effect of light on the growth of newly germinated seedlings.
- Required practical activity 9: measure the population size of a common species in a habitat.

**Topics not assessed in this paper:**

- 4.5.2.1 Structure and function
- 4.5.2.2 The brain
- 4.5.2.3 The eye
- 4.5.3.4 Hormones in human reproduction
- 4.5.3.5 Contraception
- 4.5.3.6 The use of hormones to treat infertility
- 4.5.3.7 Negative feedback
- 4.5.4.2 Use of plant hormones
- 4.6.1.3 Advantages and disadvantages of sexual and asexual reproduction
- 4.6.1.8 Sex determination
- 4.6.2 Variation and evolution
- 4.6.3 The development of understanding of genetics and evolution
- 4.6.4 Classification of living organisms

- 4.7.1.4 Adaptations
- 4.7.2.4 Impact of environmental change
- 4.7.3.1 Biodiversity
- 4.7.3.4 Deforestation
- 4.7.3.6 Maintaining biodiversity
- 4.7.4.1 Trophic levels
- 4.7.4.2 Pyramids of biomass
- 4.7.5.3 Sustainable fisheries
- 4.7.5.4 Role of biotechnology

## Chemistry Paper 1

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

- 4.1.2 The periodic table
- 4.2.1 Chemical bonds, ionic, covalent and metallic
- 4.2.2 How bonding and structure are related to the properties of substances
- 4.2.3 Structure and bonding of carbon
- 4.3.2 Use of amount of substance in relation to masses of pure substances
- 4.4.1 Reactivity of metals
- 4.4.2 Reactions of acids
- 4.4.3 Electrolysis
- 4.5.1 Exothermic and endothermic reactions

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

- Required practical activity 1: 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 2: determination of the reacting volumes of solutions of a strong acid and a strong alkali by titration.
- Required practical activity 4: investigate the variables that affect temperature changes in reacting solutions such as, eg, acid plus metals, acid plus carbonates, neutralisations, displacement of metals.

**Topic not assessed in this paper:**

- 4.2.4 Bulk and surface properties of matter including nanoparticles

## Chemistry Paper 2

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

- 4.6.1 Rate of reaction
- 4.6.2 Reversible reactions and dynamic equilibrium
- 4.7.1 Carbon compounds as fuels and feedstock
- 4.9.1 The composition and evolution of the Earth's atmosphere
- 4.10.1 Using the Earth's resources and obtaining potable water
- 4.10.4 The Haber process and the use of NPK fertilisers

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

- Required practical activity 5: 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 developing a hypothesis.
- Required practical activity 7: use of chemical tests to identify the ions in unknown single ionic compounds covering the ions from sections Flame tests through to Sulfates.

**Topic not assessed in this paper:**

- 4.9.2 Carbon dioxide and methane as greenhouse gases

## Physics Paper 1

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

- 4.1.1 Energy changes in a system, and the ways energy is stored before and after such changes
- 4.1.2 Conservation and dissipation of energy
- 4.2.4 Energy transfers
- 4.3.1 Changes of state and the particle model
- 4.3.2 Internal energy and energy transfers

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

- Required practical activity 2: investigate the effectiveness of different materials as thermal insulators and the factors that may affect the thermal insulation properties of a material.
- Required practical activity 5: use appropriate apparatus to make and record the measurements needed to determine the densities of regular and irregular solid objects and liquids. Volume should be determined from the dimensions of regularly shaped objects, and by a displacement technique for irregularly shaped objects. Dimensions to be measured using appropriate apparatus such as a ruler, micrometer or Vernier callipers.

**Topics not assessed in this paper:**

- 4.2.1 Current, potential difference and resistance
- 4.2.2 Series and parallel circuits
- 4.2.3 Domestic uses and safety
- 4.3.3 Particle model and pressure
- 4.4.1 Atoms and isotopes
- 4.4.3 Hazards and uses of radioactive emissions and of background radiation
- 4.4.4 Nuclear fission and fusion

## Physics Paper 2

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

- 4.5.1 Forces and their interactions
- 4.5.2 Work done and energy transfer
- 4.5.3 Forces and elasticity
- 4.5.5 Pressure and pressure differences in fluids
- 4.5.6.1 Describing motion along a line
- 4.5.7 Momentum
- 4.6.1 Waves in air, fluids and solids
- 4.8.1 Solar system; stability of orbital motions; satellites
- 4.8.2 Red-shift

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

- Required practical activity 9: investigate the reflection of light by different types of surface and the refraction of light by different substances.

**Topics not assessed in this paper:**

- 4.5.4 Moments, levers and gears
- 4.6.2 Electromagnetic waves
- 4.6.3 Black body radiation
- 4.7.1 Permanent and induced magnetism, magnetic forces and fields