

What is in the exam?

Biology Paper 1 F	Chemistry Paper 1 F	Physics Paper 1 F
17 May 2022	27 May 2022	9 June 2022
<p>Focus</p> <p>Cell division</p> <ul style="list-style-type: none"> • Chromosomes • Mitosis • Stem cells <p>Animal tissues, organs and organ systems</p> <ul style="list-style-type: none"> • Digestion and Enzymes • Heart and blood vessels • Blood composition <p>Communicable diseases</p> <ul style="list-style-type: none"> • Infectious diseases • Viral diseases • Fungal diseases • Protist disease • Human defences • Vaccines • Painkillers and Antibiotics • Drug development <p>Photosynthesis</p> <ul style="list-style-type: none"> • Reaction • Rate of reaction and limiting factors 	<p>Focus</p> <p>The periodic table</p> <ul style="list-style-type: none"> • Structure of modern table • Development of periodic table • Metals and non metals • Group 1 • Group 7 • Group 0 <p>How bonding and structure are related to the properties of substances</p> <ul style="list-style-type: none"> • Ionic bonding and properties • Covalent bonding and properties Giant covalent and simple molecules. • Diamond, Graphite, Fullerenes and Graphene • Metallic bonding and properties • States of matter • Metals and Alloys <p>Structure and bonding of carbon</p> <ul style="list-style-type: none"> • Diamond, Graphite, Fullerenes and Graphene • Polymers <p>Reactivity of metals</p> <ul style="list-style-type: none"> • Metal oxides • Reactivity series and displacement • Oxidation and extraction of metals <p>Reactions of acids</p> <ul style="list-style-type: none"> • Reaction with metals • Neutralisation and salt formation • Soluble salts • pH scale <p>Electrolysis</p> <ul style="list-style-type: none"> • Process • Molten ionic compounds • Extracting metals • Aqueous ionic solutions 	<p>Focus</p> <p>Energy changes in a system</p> <ul style="list-style-type: none"> • Energy stores and systems • Changes in energy • Calculate kinetic, elastic, gravitational energy • Specific heat capacity • Power <p>National and global Energy resources</p> <ul style="list-style-type: none"> • Renewable and non renewable • Advantages and disadvantages of sources <p>Current, potential difference and resistance</p> <ul style="list-style-type: none"> • Circuit diagrams and symbols • Electric charge and current • Ohm's law: Current, potential difference and resistance • Resistors, diodes and filament lamps current- voltage relationship <p>Changes of state and the particle model</p> <ul style="list-style-type: none"> • Density • Changing state. <p>Atoms and nuclear radiation</p> <ul style="list-style-type: none"> • Radioactive decay and nuclear radiation • Nuclear equations • Half life and the random nature of decay. • Contamination and irradiation
<p>Required practicals</p> <p>1: use of a light microscope.</p> <p>3: use qualitative reagents to test for a range of carbohydrates, lipids and proteins.</p> <p>5: investigate the effect of light on the rate of photosynthesis of an aquatic plant such as pondweed.</p>	<p>Required practicals</p> <p>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.</p> <p>9: investigate what happens when aqueous solutions are electrolysed using inert electrodes. This should be an investigation involving developing a hypothesis.</p> <p>10: investigate the variables that affect temperature changes in reacting solutions such as, eg, acid plus metals, acid plus carbonates, neutralisations, displacement of metals.</p>	<p>Required practicals</p> <p>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. •</p> <p>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.</p>
<p>Not in the exam</p> <p>Osmosis</p> <p>Active transport</p> <p>Coronary heart disease: a non-communicable disease</p> <p>Uses of glucose from photosynthesis</p> <p>Respiration</p>	<p>Not in the exam</p> <p>The human nervous system</p> <p>Contraception</p> <p>Sexual and asexual reproduction •</p> <p>DNA and the genome</p> <p>Genetic inheritance</p> <p>Inherited disorders</p> <p>Sex determination</p> <p>Variation and evolution</p> <p>The development of understanding of</p>	<p>Not in the exam</p> <p>Domestic electricity and safety</p> <p>Particle model and pressure</p> <p>Atoms and isotopes</p>

	genetics and evolution Adaptations, Land use, Deforestation	
Biology Paper 1 H	Chemistry Paper 1 H	Physics Paper 1 H
Focus Cell division <ul style="list-style-type: none"> Chromosomes Mitosis Stem cells Animal tissues, organs and organ systems <ul style="list-style-type: none"> Digestion and Enzymes Heart and blood vessels Blood composition Photosynthesis <ul style="list-style-type: none"> Reaction Rate of reaction and limiting factors 	Focus How bonding and structure are related to the properties of substances <ul style="list-style-type: none"> Ionic bonding and properties Covalent bonding and properties Giant covalent and simple molecules. Diamond, Graphite, Fullerenes and Graphene Metallic bonding and properties States of matter Metals and Alloys Use of amount of substances in relation to masses of pure substances <ul style="list-style-type: none"> Relative formula mass Moles Moles balancing equation Reacting masses Limiting reactants Concentration of solutions Reactivity of metals <ul style="list-style-type: none"> Metal oxides Reactivity series and displacement Oxidation and extraction of metals Reduction and oxidation in terms of electrons Reactions of acids <ul style="list-style-type: none"> Reaction with metals Neutralisation and salt formation Soluble salts pH scale Strong and weak acids Electrolysis <ul style="list-style-type: none"> Process Molten ionic compounds Extracting metals Aqueous ionic solutions Half equations 	Focus Energy changes in a system <ul style="list-style-type: none"> Energy stores and systems Changes in energy Calculate kinetic, elastic, gravitational energy Specific heat capacity Power Energy Transfers <ul style="list-style-type: none"> Power (electrical) PVI, EQV EPT National grid and transformers Current, potential difference and resistance <ul style="list-style-type: none"> Circuit diagrams and symbols Electric charge and current Charge flow QIt Ohms law: Current, potential difference and resistance Resistors, diodes and filament lamps current- voltage relationship Changes of state and the particle model <ul style="list-style-type: none"> Density Changing state. Particle model and pressure <ul style="list-style-type: none"> Particle motion and pressure Atoms and isotopes <ul style="list-style-type: none"> Structure and size of an atom Mass number, atomic number and isotopes Development of atomic model Atoms and nuclear radiation <ul style="list-style-type: none"> Radioactive decay and nuclear radiation Nuclear equations Half life and the random nature of decay. Contamination and irradiation
Required practicals 1: use of a light microscope. 3: use qualitative reagents to test for a range of carbohydrates, lipids and proteins. 5: investigate the effect of light on the rate of photosynthesis of an aquatic plant such as pondweed.	Required practicals 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. 9: investigate what happens when aqueous solutions are electrolysed using inert electrodes. This should be an investigation <u>involving developing a hypothesis.</u> 10: investigate the variables that affect temperature changes in reacting solutions such as, eg, acid plus metals, acid plus carbonates, neutralisations, displacement of metals.	Required practicals 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. • 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.
<u>Not in the exam</u> Microscopy Transport in cells Plant tissues, organs and systems • Viral diseases, Fungal diseases • Protist diseases Human defence systems Uses of glucose from photosynthesis Response to exercise	<u>Not in the exam</u> Nothing!	<u>Not in the exam</u> Series and parallel circuits Domestic use of electricity and safety Internal energy and transfers

Biology Paper 2 F	Chemistry Paper 2 F	Physics Paper 2 F
15 June 2022	20 June 2022	23 June 2022
<p>Focus</p> <p>Hormonal control in humans</p> <ul style="list-style-type: none"> • Human endocrine system • Control of blood glucose concentration • Feedback systems <p>Reproduction</p> <ul style="list-style-type: none"> • DNA and Genome • Inheritance • Genetic disorders <p>Adaptations, interdependence and competition</p> <ul style="list-style-type: none"> • Ecosystems and communities • Biotic and Abiotic Factors • Intra and interspecific competition for resources <p>Organisation of an ecosystem</p> <ul style="list-style-type: none"> • Levels of organisation and food chains • Cycling of carbon and water 	<p>Focus</p> <p>Rate of reaction</p> <ul style="list-style-type: none"> • Calculating rates • Factors affecting rate • Collision theory and Activation energy • Catalysts <p>Reversible reactions and dynamic equilibrium</p> <ul style="list-style-type: none"> • Reversible reactions • Energy and reversible reactions • Equilibrium <p>Carbon compounds as fuels and feedstock</p> <ul style="list-style-type: none"> • Crude oil, hydrocarbons and alkanes • Fractional distillation • Properties and chain length • Cracking and alkenes <p>Purity, formulations and chromatography</p> <ul style="list-style-type: none"> • Purity and melting and boiling points • Formulations • Chromatography calculating R_F value <p>The composition and evolution of the Earth's atmosphere</p> <ul style="list-style-type: none"> • Proportions of gases in air • Early atmosphere • How oxygen increased • How carbon dioxide decreased. <p>Common atmospheric pollutants and their sources</p> <ul style="list-style-type: none"> • Atmospheric pollutants from fuels • Properties and effects of pollutants <p>Using the Earth's resources and obtaining potable water</p> <ul style="list-style-type: none"> • Earth's resources and sustainable development • Potable water • Wastewater treatment 	<p>Focus</p> <p>Forces and their interactions</p> <ul style="list-style-type: none"> • Scalar and vectors • Contact and non contact • Gravity • Resultant forces <p>Describing motion along a line</p> <ul style="list-style-type: none"> • Distance and displacement • Speed and velocity • Distance time relationship • Acceleration <p>Forces, accelerations and Newton's Laws of motion</p> <ul style="list-style-type: none"> • Newton's first, second and third laws <p>Forces and braking</p> <ul style="list-style-type: none"> • Stopping distance • Thinking time • Factors affecting braking distance <p>Electromagnetic waves</p> <ul style="list-style-type: none"> • Types, properties and uses of electromagnetic waves <p>Permanent and induced magnetism, magnetic forces and fields</p> <ul style="list-style-type: none"> • Poles of a magnet • Magnetic fields <p>The motor effect</p> <ul style="list-style-type: none"> • Electromagnetism
<p>Required practicals</p> <p>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.</p>	<p>Required practicals</p> <p>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.</p> <p>12: investigate how paper chromatography can be used to separate and tell the difference between coloured substances. Students should calculate R_f values.</p>	<p>Required practicals</p> <p>21: investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface</p>
<p><u>Not in the exam</u></p> <p>The human nervous system Hormones in human reproduction Contraception Sexual and asexual reproduction Meiosis Sex determination Variation Evolution Selective breeding •Extinction • Resistant bacteria • Adaptations Biodiversity Land use Deforestation • Global warming</p>	<p><u>Not in the exam</u></p> <p>Carbon dioxide and methane as greenhouse gases.</p>	<p><u>Not in the exam</u></p> <p>Forces and elasticity</p>

<p>•Maintaining biodiversity</p>		
<p>Biology Paper 2 H</p>	<p>Chemistry Paper 2 H</p>	<p>Physics Paper 2 H</p>
<p>Focus Hormonal control in humans</p> <ul style="list-style-type: none"> • Human endocrine system • Control of blood glucose concentration • Feedback systems <p>Organisation of an ecosystem</p> <ul style="list-style-type: none"> • Levels of organisation and food chains • Cycling of carbon and water <p>Biodiversity and the effect of human interaction on an ecosystem</p> <ul style="list-style-type: none"> • Biodiversity and ecosystem stability • Waste management • Global warming • Maintaining biodiversity 	<p>Focus Rate of reaction</p> <ul style="list-style-type: none"> • Calculating rates • Factors affecting rate • Collision theory and Activation energy • Catalysts <p>Reversible reactions and dynamic equilibrium</p> <ul style="list-style-type: none"> • Reversible reactions • Energy and reversible reactions • Equilibrium • Changing conditions and equilibrium- le chatelier's principles • Effect of changing conditions_ temperature, pressure and concentration <p>Carbon compounds as fuels and feedstock</p> <ul style="list-style-type: none"> • Crude oil, hydrocarbons and alkanes • Fractional distillation • Properties and chain length • Cracking and alkenes <p>Purity, formulations and chromatography</p> <ul style="list-style-type: none"> • Purity and melting and boiling points • Formulations • Chromatography calculating Rf value <p>The composition and evolution of the Earth's atmosphere</p> <ul style="list-style-type: none"> • Proportions of gases in air • Early atmosphere • How oxygen increased • How carbon dioxide decreased. <p>Using the Earth's resources and obtaining potable water</p> <ul style="list-style-type: none"> • Earth's resources and sustainable development • Potable water • Wastewater treatment • Alternate method of extracting metals 	<p>Focus Forces and their interactions</p> <ul style="list-style-type: none"> • Scalar and vectors • Contact and non contact • Gravity • Resultant forces <p>Describing motion along a line</p> <ul style="list-style-type: none"> • Distance and displacement • Speed and velocity • Distance time relationship • Acceleration <p>Forces, accelerations and Newton's Laws of motion</p> <ul style="list-style-type: none"> • Newton's first, second and third laws • Inertia <p>Momentum</p> <ul style="list-style-type: none"> • Momentum as a property • Conservation of momentum <p>Electromagnetic waves</p> <ul style="list-style-type: none"> • Types, properties and uses of electromagnetic waves <p>Permanent and induced magnetism, magnetic forces and fields</p> <ul style="list-style-type: none"> • Poles of a magnet • Magnetic fields <p>The motor effect</p> <ul style="list-style-type: none"> • Electromagnetism • Flemings left hand rule • Magnetic flux density • Electric motors
<p>Required practicals</p> <p>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.</p>	<p>Required practicals</p> <p>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.</p> <p>12: investigate how paper chromatography can be used to separate and tell the difference between coloured substances. Students should calculate Rf values.</p>	<p>Required practicals</p> <p>21: investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface</p>
<p>Not in the exam The human nervous system Contraception Sexual and asexual reproduction • DNA and the genome Genetic inheritance Inherited disorders • Sex determination Variation and evolution The development of understanding of genetics and evolution Adaptations • Land use Deforestation</p>	<p>Not in the exam Identification of common gases</p>	<p>Not in the exam Forces and elasticity Forces and braking Permanent and induced magnetism, magnetic forces and fields</p>