



West Park School

Combined Science

Mock Examination 2023

In readiness for your mock examination in Science you must **LEARN** and **REVISE** the following content and skills:

Biology: Paper 1

Cell Biology

Cell structure - animal, plant and bacterial cells.

Cell specialisation and differentiation.

Microscopy – light and electron microscopes.

Cell division – Chromosomes, mitosis and the cell cycle, stem cells.

Transport in cells – Diffusion, osmosis and active transport.

Organisation

Principles of organisation – cells, tissues, organs, organ systems.

The human digestive system.

The heart, blood vessels, blood and coronary heart disease.

Health issues including the effect of lifestyle on health.

Cancer – benign and malignant tumours.

Plant Tissues, Organs and Systems

Plant tissues – epidermal tissue, palisade and spongy mesophyll and xylem and phloem.

Plant organs e.g. leaves and plant organ systems.

Infection and Response

Communicable (infectious) disease – bacteria, viruses, protists and fungi.

Antibiotics and painkillers – uses of these types of drug and the problems associated with antibiotic resistance.

Human defence systems and vaccination.

Discovery and development of drugs – the stages used to develop and test new drugs. Traditional drugs and their origins.

Bioenergetics

Photosynthesis – the equation, rate, limiting factors and use of glucose.

Respiration – types of respiration (aerobic and anaerobic), the equations, the purpose of respiration and uses of the energy generated.

The body's response to exercise and metabolism.

RPA's

Microscopy.

Osmosis.

Testing for carbohydrates, lipids and proteins.

Investigating the effect of pH on the rate of reaction of amylase.

Investigating the effect of light on the rate of photosynthesis.

Chemistry: Paper 1

Atomic Structure and the Periodic Table

Atoms, elements, compounds and mixtures.

The development of the model of the atom.

Subatomic particles.

The development of the periodic table.

Metals and non-metals.

Properties and trends of groups in the periodic table.

Structure and Bonding

Ionic, covalent and metallic bonding.

The states of matter and state symbols.

Properties of matter e.g. ionic compounds, small molecules, polymers, metals and alloys.

Giant covalent compounds and fullerenes.

Chemical calculations

Conservation of mass and balanced chemical equations.

Relative formula mass and moles.

Apparent changes in mass, chemical measurements and limiting reactants.

Reacting masses (recipe) calculations. (HT only).

Concentrations of solutions.

Chemical Changes

The reactivity series, metal extraction, oxidation and reduction.

Reactions of acids with metals, alkalis and bases.

Making salts.

The pH scale and neutralisation.

Strong and weak acids (HT only).

Electrolysis – molten ionic compounds, aqueous solutions, extraction of metals.

Half-equations (HT only).

Energy Changes

Exothermic and endothermic reactions and reaction profiles.

Bond energy calculations (HT only).

RPAs

Preparation of a soluble salt from an insoluble oxide or carbonate.

Electrolysis of aqueous solutions.

Investigating the variables that affect temperature changes in a reaction e.g. metal plus acid.

Physics: Paper 1

Energy

Energy stores and systems and changes in energy.

Specific heat capacity.

Power, conservation and dissipation of energy and efficiency.

Renewable and finite energy sources.

Electricity

Current, potential difference, resistance and electrical charge.

Circuit symbols and circuit drawing.

Resistors and IV graphs.

Series and parallel circuits, including resistance in series and parallel.

Mains electricity – Inc. wiring a plug and energy transfers in everyday electrical appliances.

The National Grid.

Particles

Changes of state and density.

Internal energy, specific heat capacity and specific latent heat.

The particle model and kinetic theory, i.e. linking temperature and pressure in a gas.

Radioactivity

The structure of an atom, mass number, atomic structure and isotopes.

The development of the model of the atom (common content with chemistry).

Radioactive decay, nuclear radiation, decay equations and half-lives.

Radioactive contamination irradiation and safety.

RPAs

Investigation to determine the specific heat capacity of a material.

Investigating the effect of length of conductor on resistance and resistance in series and parallel circuits

I – V characteristic graphs.

Determining the density of regular and irregularly shaped objects. Also determining the density of liquids.