




Year 11 Triple Science – Main Topic Overview

This list contains the main topics which will be covered in each paper of the GCSE. This is to help you focus your revision on the areas you are finding the most difficult. Not everything that needs to be covered will be on this list, just the main concepts. For a more detailed specification go to:




<https://qualifications.pearson.com/en/qualifications/edexcel-gcses/sciences-2016.html>

*are topics which will appear on both papers

Biology Paper 1 – Tuesday 14th May




Topic			
Cell Structure (Plants cells, animal cells, bacteria)*			
Specialised cells*			
Microscopes*			
Enzymes*			
Osmosis and diffusion*			
Mitosis			
Stem cells			
Neurons and reflex arcs			
The Brain and Eye			
Meiosis			
DNA			
Protein Synthesis			
Inheritance			
Natural selection			
Evolution			
Classification			
Selective breeding and genetic engineering			
Pathogens			
Cardiovascular disease and obesity			
Defending against pathogens (animals)			
Defending against pathogens (plants)			
Immunisation			
Bacterial Cultures			
Antibody use and production			

Chemistry Paper 1 – Thursday 16th May




Topic			
States of matter			
Mixtures and separation			
Chromatography and distillation			
Structure of the atom and isotopes*			
Elements and the periodic table*			
Electron configurations*			
Ionic bonding and properties of ionic compounds*			
Covalent bonding and simple covalent molecules*			
Allotropes of carbon and giant covalent structures*			
Relative formula mass*			
Moles*			
Acids and bases (strength)			
Reactions of acids			
Production and Properties of salts			
Electrolysis			
Reactivity series and displacement reactions			

Obtaining metals from ores (iron and aluminium)			
Reversible reactions and equilibria			
Dynamic Equilibrium and the Haber Process			
Transition metals, alloys and corrosion			
Titrations			
Yield, atom economy			
Molar volume of gases			
The Haber process and fertiliser production			
Fuel Cells			

Physics Paper 1 – Wednesday 22nd May




Topic			
Units, prefixes and rearranging equations*			
Vectors and scalars			
Speed and Acceleration			
Speed/time and Distance/time graphs			
Forces			
Newton's Laws			
Momentum			
Stopping distances and crash safety			
Kinetic Energy			
Gravitational Potential Energy			
Efficiency			
Renewable and non-renewable energy sources			
Describing and measuring waves			
Refraction and Reflection			
The ear and ultrasound			
Total internal reflection			
Lenses			
The Electromagnetic spectrum – uses and dangers			
Absorption and Radiation (Including Greenhouse effect)			
Types of Nuclear radiation			
Alpha, beta-, beta+ and gamma decays			
Half-life			
Radioactive safety and dangers			
Uses and dangers of Radioactivity			
Medical uses of radioactive sources			
Fission			
Fusion			
The solar system			
Satellites and Orbits			
Evidence for the Big Bang and Steady State (CMB and Redshift)			
Stellar Evolution			

Biology Paper 2 – Friday 7th June



Topic			
Cell Structure (Plants cells, animal cells, bacteria)*			
Specialised cells*			
Microscopes*			
Enzymes*			
Osmosis and diffusion*			
Photosynthesis and its limiting factors			

Transport in plants			
Stomata and transpiration			
Plant adaption and plant hormones			
Hormones			
The menstrual cycle			
Homeostasis			
Thermoregulation			
Diabetes			
The urinary System and ADH			
Exchanging chemicals in animals			
The lungs			
Blood and blood vessels			
The heart			
Respiration			
Defining and Investigating ecosystems			
Interactions between organisms and energy efficiency			
Biodiversity and conservation			
Carbon cycle			
Water cycle			
Nitrogen cycle			
Indicator Species and Decomposition			

Chemistry Paper 2 –Wednesday 12th June

Topic			
Structure of the atom and isotopes*			
Elements and the periodic table*			
Electron configurations*			
Ionic bonding and properties of ionic compounds*			
Covalent bonding and simple covalent molecules*			
Allotropes of carbon and giant covalent structures*			
Relative formula mass*			
Moles*			
Alkali Metals (Group 1)			
Halogens (Group 7)			
Noble Gasses (Group 0)			
Rates of reaction			
Investigating and calculating rates of reaction			
Collision Theory			
Catalysts			
Endothermic and exothermic reactions			
Bond energies			
Fractional distillation			
Hydrocarbons and cracking			
The Atmosphere and pollutants			
Greenhouse effect and climate change			
Testing for ions			
Hydrocarbons (alkanes and alkenes)			
Production and uses of polymers			
Alcohols and Carboxylic acids			
Nonparticles			

Physics Paper 2 – Friday 14th June




Topic			
Units, prefixes and rearranging equations*			
Energy transfers			
Work done and power			
Forces and vector diagrams			
Rotation, moments and levers			
Current			
Potential difference			
Resistance and components			
Series and parallel circuits			
Energy and power in circuits			
Fuses and electrical safety			
Causes, uses and dangers of Static electricity			
Electric fields			
Magnets and magnetic fields			
Electromagnetism			
Motor effect			
Electromagnetic induction			
Dynamos, Alternators, Microphones and Transformers			
Density			
Specific heat capacity			
Specific latent heat			
Particle motion in Gases			
Elasticity			
Pressure in Fluids			
Upthrust			

Required Practicals




There are several required practicals that you need to know. For each one you need to learn:

- The names of the equipment and how it is used.
- Which quantities are measured and how the measurements are taken.
- A basic method, including all the main steps (about 5 bullet points worth)




Biology:

Description			
Investigate biological specimens using microscopes including magnification calculations and labelled scientific drawings from observations			
Investigate the effect of pH on enzyme activity			
Investigate the use of chemical reagents to identify starch, reducing sugars, proteins and fats			
Investigate osmosis in potatoes			
Investigate the effects of antiseptics, antibiotics or plant extracts on microbial cultures			
Investigate the effect of light intensity on the rate of photosynthesis			
Investigate the rate of respiration in living organisms			
Investigate the relationship between organisms and their environment using fieldwork techniques, including quadrats and belt transects			

Chemistry:

Description			
Investigate the composition of inks using simple distillation and paper chromatography			
Investigate the change in pH on adding powdered calcium hydroxide or calcium oxide to a fixed volume of dilute hydrochloric acid			
Investigate the preparation of pure, dry hydrated copper sulfate crystals starting from copper oxide including the use of a water bath			
Investigate the electrolysis of copper sulfate solution with inert electrodes and copper electrodes			
Carry out an accurate acid-alkali titration, using burette, pipette and a suitable indicator			
Investigate the effects of changing the conditions of a reaction on the rates of chemical reactions by measuring the production of a gas (in the reaction between hydrochloric acid and marble chips)			
Investigate the effects of changing the conditions of a reaction on the rates of chemical reactions by observing a colour change (in the reaction between sodium thiosulfate and hydrochloric acid)			
Identify the ions in unknown salts, using the tests for the specified cations and anions (gas tests, flame tests and precipitation tests)			
Investigate the temperature rise produced in a known mass of water by the combustion of the alcohols ethanol, propanol, butanol and pentanol			

Physics:

Description			
Investigate the relationship between force, mass and acceleration by varying the masses added to trolleys			
Investigate the suitability of equipment to measure the speed, frequency and wavelength of a wave in a solid and a fluid			
Investigate refraction in rectangular glass blocks in terms of the interaction of electromagnetic waves with matter			
Investigate how the nature of a surface affects the amount of thermal energy radiated or absorbed			
Construct electrical circuits to investigate the relationship between potential difference, current and resistance for a resistor and a filament lamp			
Construct electrical circuits to test series and parallel circuits using resistors and filament lamps			
Investigate the densities of solid and liquids			
Investigate the properties of water by determining the specific heat capacity of water and obtaining a temperature-time graph for melting ice			
Investigate the extension and work done when applying forces to a spring			