

## Biology paper 1 revision list

- Cell structure
  - Animal cells
  - Plant cells
  - Eukaryotes and prokaryotes
  - Bacterial cells
- Investigating cells
  - The size of cells
  - Using microscopes to look at cells
  - Calculating magnification
- Cell division
  - Chromosomes
  - Mitosis and the cell cycle
  - Stem cells
  - Uses of stem cells
- Transport in and out of cells
  - Diffusion
  - Factors affecting diffusion
  - Osmosis
  - Active transport
  - Comparing processes
- Levels of organisation
  - Specialised cells
  - Tissues, organs and systems
- Digestion
  - Enzymes
  - Enzymes in digestion
  - Bile in digestion
- Blood and circulation
  - Blood
  - Blood vessels
  - The heart
  - Gaseous exchange
- Non communicable disease
  - Health and disease
  - Risk factors
  - Diseases of the heart
  - cancer
- Transport in plants
  - Plant tissues
  - Water transport
  - translocation
- Pathogens and disease
  - Pathogens and disease
  - Viral diseases
  - Bacterial diseases
  - Fungal diseases
  - Protist diseases
- Human defences against disease
  - Preventing entry to pathogens
  - The immune system
  - Vaccines
- Treating disease
  - Antibiotics
  - Developing new drugs
- Photosynthesis
  - Photosynthesis
  - Factors effecting photosynthesis
  - Converting glucose
- Respiration and exercise
  - The importance of respiration
  - Aerobic respiration
  - Anaerobic respiration
  - Exercise and respiration
  - Metabolism

## Higher tier

- Inverse square law
- Multiple factors affecting photosynthesis
- Oxygen debt

## Single science

- Culturing microorganisms
- Required practical investigating zones of inhibition
- Plant disease and deficiency
- Plant physical, chemical and mechanical defences

## Single science higher

- Monoclonal antibodies
- Uses of monoclonal antibodies
- Plant disease detection and identification

## Biology paper 2 revision list

- Homeostasis
  - The importance of homeostasis
  - Control systems
  - The nervous system
- Hormones and homeostasis
  - The endocrine system
  - Control of blood glucose
- Hormones and reproduction
  - Sex hormones
  - Controlling the menstrual cycle
  - Reducing fertility
- Sexual and asexual reproduction
  - Asexual reproduction
  - Sexual reproduction and meiosis
  - The genome
- Patterns of inheritance
  - Genetic inheritance
  - Genetic crosses
  - Inherited disorders
  - Sex determination
- Variation and evolution
  - Variation
  - Evolution
  - Evidence for evolution
- Manipulating genes
  - Selective breeding
  - Genetic engineering
- Classification
  - Principles of classification
  - Extinction
  - Evolutionary trees
- Ecosystems
  - Relationships between organisms
  - Adaptations
  - Transect lines
  - Quadrat sampling
- Cycles and feeding relationships
  - Carbon cycle
  - Water cycle
  - Cycling materials

- Disrupting ecosystems

- Biodiversity
- Pollution
- Overexploitation
- Conserving biodiversity

## Higher tier

- Low glucose levels
- Negative feedback cycles
- Interactions of FSH, LH, oestrogen and progesterone
- Hormone levels in the menstrual cycle
- In vitro fertilisation IVF
- Adrenaline negative feedback cycle
- Thyroxine negative feedback cycle
- Process of genetic engineering using enzymes

## Single science

- The brain
- The eye
- Eye accommodation
- Controlling body temperature
- Maintaining water levels in the body
- The kidneys and filtration
- Kidney dialysis
- Required practical – investigating light and gravity on germinating seeds
- Phototropism and geotropism
- Advantages and disadvantages of asexual and sexual reproduction
- DNA structure
- Cloning
- Darwin, Wallace and Lamarck's theories of evolution
- Speciation
- Gregor Mendel's experiments and genetics
- Decomposition and decay
- Required practical – the effect of temperature on the rate of decay using pH probes
- Trophic levels
- Pyramids of biomass

- Transfer of biomass
- Factors effecting food security
- Intensive farming
- Sustainable fisheries
- Role of biotechnology

### **Single science higher**

- Investigating brain function and treating brain disease
- Increasing and decreasing body temperature
- Deamination
- Antidiuretic hormone negative feedback cycle
- Plant hormones
- Protein synthesis
- Mutations and enzyme structure
- Impact of environmental change

## Chemistry paper 1 revision list

- Atom, elements, compounds and mixtures
  - Atoms, elements and compounds
  - Word equations
  - Balancing equations
  - Separating mixtures
- Atoms and the periodic table
  - Models of the atom
  - Subatomic particles
  - Isotopes and ions
  - Electron configuration
- The periodic table
  - The development of the periodic table
  - Group 0
  - Group 1 alkali metals
  - Group 7 halides
- States of matter
  - Three states of matter
  - Changing states
  - Identifying states
  - State symbols
- Ionic compounds
  - Chemical bonds
  - Ionic bonding
  - Ionic properties
- Covalent compounds
  - Covalent bonding
  - Small molecules
  - Giant covalent structures
  - Diamond and graphite
- Metals and special materials
  - Graphene
  - Fullerenes
  - Polymers
  - Metallic bonding
  - Properties of metals
  - Alloys
- Conservation of mass
  - The conservation of mass
  - Relative formula mass
  - Percentage abundance
  - Changes in mass
  - Concentration
- Reactivity of metals
  - Oxidation and reduction
  - The reactivity series
  - Displacement reactions
  - Extraction of metals
- The pH scale and salts
  - pH scale
  - neutralisation of acids
  - soluble salts from insoluble bases
- Electrolysis
  - Molten electrolysis
  - Aqueous electrolysis
  - Aluminium electrolysis
- Endothermic and exothermic reactions
  - Energy transfers
  - Reaction profiles

## Higher tier

- Limitations of models
- Moles
- Amounts of substances
- Using moles to balance equations
- Using moles to find the limiting reactant
- Using moles to calculate concentration
- Oxidation and reduction in terms of electrons
- Redox equations
- Strong and weak acids
- Half equations
- Bond energies
- Making and breaking bonds

## **Single science**

- Properties of transition metals
- Nanoparticles and coarse particles
- Uses of nanoparticles
- Percentage yield
- Atom economy
- Required practical – Titrations
- Chemical cells and fuel cells

## **Single science higher**

- Calculating theoretical mass
- Explaining why specific reaction pathways are chosen
- Calculating concentration using moles, and volume (titration)
- Calculating mass from concentration (titration)
- Calculating the volume of gas from mass and relative formula mass
- Half equations for hydrogen fuel cells

## Chemistry paper 2 revision list

- Rate of reaction
  - Calculating rate of reaction
  - Collision theory
  - Plotting reaction rates
- Reversible reactions
  - Catalysts
  - Reversible reactions
  - Closed systems
- Alkanes
  - Crude oils and hydrocarbons
  - Fractional distillation
  - Alkanes
  - Burning fuels
- Cracking hydrocarbons
  - Cracking hydrocarbons
  - Bromine water
- Chemical analysis
  - Pure and impure substances
  - Formulations
  - Chromatography
  - Gas tests
- The earths atmosphere
  - The early atmosphere
  - The atmosphere today
  - Increasing oxygen
  - Decreasing carbon dioxide
- Greenhouse gasses
  - Greenhouse gasses
  - The impact of human activities
  - Global climate change
  - Carbon footprints
- Earths resources
  - Sustainable development
  - Potable water
  - Waste water treatment
- Using resources
  - Life cycle assessments
  - Reducing the use of resources

## Higher tier

- Calculating rate using a tangent on a graph
- Le Chatelier's principle
- Changing effects on equilibrium
- Changing temperature on equilibrium
- Changing pressure on equilibrium
- Changing concentration on equilibrium
- Alternative methods of metal extraction
- Bioleaching
- Phyto mining

## Single science

- Alkenes and alcohols
- Addition polymerisation
- DNA as a monomer
- Flame tests
- Sulfate tests
- Halide tests
- Hydroxide tests
- Carbonate testing
- Required practical – testing for unknown chemicals
- Flame emission spectroscopy
- Corrosion and prevention
- Alloys as useful materials
- Ceramics, polymers, composites
- Thermosetting and thermosetting plastics
- The Haber process
- NPK fertilisers

## Single science higher

- Condensation polymerisation
- Amino acid polymerisation
- Dynamic equilibrium and Le Chatelier's principle in the Haber process

## Physics paper 1 revision list

- Energy stores and transfers
  - Energy stores and systems
  - Calculating energy changes
  - Specific heat capacity
  - Internal energy
- Energy transfers and resources
  - Energy transfers
  - National and global energy resources
- Electricity
  - Circuit symbols
  - Electric charge and current
  - Resistance and potential difference
- Circuits and resistance
  - Resistors
  - IV characteristics
  - Thermistors and LDRs
- Circuits and power
  - Series and parallel circuits
  - Power in circuits
- Domestic uses of electricity
  - Direct and alternating potential difference
  - Mains energy
  - Plugs
  - Dangers of mains electricity
  - Power and efficiency
- Electrical energy in devices
  - Energy transfers in appliances
  - The national grid
- Particle model of matter
  - States of matter
  - Density
  - Changes of state
  - Specific latent heat
  - Particle motion and pressure in gasses
- Atoms and isotopes
  - The structure of the atom
  - Isotopes
  - The plum pudding model
  - Rutherford, Geiger and Marsden

- Alpha particle scattering
- Nuclear radiation
  - Alpha, beta and gamma
  - Decay equations
  - Nuclear decay
  - Contamination and irradiation
- Half life
  - Half life
  - Nuclear equations

## Higher tier

- Ways to increase efficiency
- Calculate half life as a ratio
- Forces acting on an isolated system

## Single science

- Required practical – investigating thermal properties of insulators
- Static electricity
- Electric fields
- Pressure in gasses
- Hazards and used or radiation and background radiation
- Nuclear fission
- Nuclear fusion

## Single science higher

- Work done, temperature, pressure and internal energy of gasses

## Physics paper 2 revision list

- Forces introduction
  - Scalar and vector quantities
  - contact and non contact forces
  - gravity
  - resultant forces
- Forces in action
  - Work done and energy transfer
  - Forces and elasticity
- Forces and motion
  - Distance and displacement
  - Speed
  - Velocity
  - Newtons first law
  - Distance time graphs
- Forces and acceleration
  - Acceleration
  - Velocity time graphs
  - Newtons second law
- Terminal velocity, total stopping distance
  - Terminal velocity
  - Newtons 3<sup>rd</sup> law
  - Stopping distance
  - Reaction time
  - Factors effecting braking distance
- Wave and wave properties
  - Transverse and longitudinal waves
  - Properties of waves
  - Wave speed
- Electromagnetic waves
  - Electromagnetic waves
  - Refraction
  - Ray diagrams
- The electromagnetic spectrum
  - Uses and applications of electromagnetic waves
  - Hazards of electromagnetic waves
- Magnetism and electromagnetism
  - Magnetic poles and fields
  - Electromagnetism and solenoids

## Higher tier

- Resolving resultant forces using vector diagrams
- Explain velocity
- Calculate distance using a velocity time graph
- Inertia
- Inertial mass
- Typical road vehicle decelerations
- Momentum
- Refraction and wavelength
- Wave front diagrams
- Radio wave transmission and absorption
- Explaining electromagnetic uses
- Fleming's left hand rule
- Electric motors
- Magnetic flux density

## Single science

- Moments, levers and gears
- Pressure in fluids
- Atmospheric pressure and height
- Draw and interpret velocity time graphs
- Estimate distances for emergency stops in vehicles over a range of speeds
- How velocity, frequency and wavelength are affected travelling between mediums
- Required practical - Reflection
- Diffuse and spectral reflection
- Sound waves
- Concave and convex lenses
- Visible light and colour filters
- Black body radiation
- Perfect black bodies
- Absorption and emission at constant temperature
- Absorption and emission of earth
- How electromagnetic devices work
- The solar system and satellites
- Life cycle of a star
- Pressure and gravity equilibrium in stars
- Forming new elements in stars
- Orbit motions
- Redshift and wavelength
- Evidence for space expansion
- Big bang theory
- Dark mass and dark energy

## Single science higher

- Pressure in a column of water
- Pressure in partially submerged objects
- Calculating momentum following a collision
- Calculating a change in momentum
- Calculating force as the rate of change of momentum
- Seismic waves
- Uses and exploration of sound waves
- How loudspeakers work
- Induced potential
- Uses of the generator effect
- How microphones work
- Step up and step down transformers
- Explaining velocity changes for planets
- Explaining orbit radius with speed changes

