

AS Level Paper 1 and 2. A2 Level Paper 1 and 3 - Topics 1-4 Required Practicals

Section 3.1: Biological Molecules

3.1.1 Monomers and Polymers

3.1.2 Carbohydrates

3.1.3 Lipids

3.1.4.1 Proteins

3.1.4.2 Enzymes

3.1.5.1 Nucleic acid structure

3.1.5.2 DNA Replication

3.1.6 ATP

3.1.7 Water

3.1.8 Inorganic Ions

Section 3.2: Cells

3.2.1.1 Eukaryotic cells

3.2.1.2 Prokaryotic cells and viruses

3.2.1.3 Studying cells

3.2.2 All cells arise from other cells

3.2.3 Transport across cell membranes

3.2.4 Cell recognition and the immune system

Section 3.3 Organisms exchange substances with their environment

3.3.1 Surface area to volume ratio

3.3.2 Gas exchange

3.3.3 Digestion and absorption

3.3.4.1 Mass transport in animals

3.3.4.2 Mass transport in plants

Section 3.4 Genetic information, variation and relationships between organisms

3.4.1 DNA, genes and chromosomes

3.4.2 DNA and protein synthesis

3.4.3 Genetic diversity - mutations and meiosis

3.4.4 Genetic diversity and adaptation – natural selection

3.4.5 Species and taxonomy

3.4.6 Biodiversity

3.4.7 Investigating biodiversity

Required Practicals (p581-585)

Can you describe how you would investigate the effect of a named variable on the rate of an enzyme-controlled reaction:

Can you describe how you would prepare squashes of cells from plant root tips and set up and use an optical microscope to identify the stages of mitosis in these stained squashes and how you would calculate a mitotic index:

Required Practicals (p581-585)

Can you describe how you would produce a dilution series of a solute to produce a calibration curve with which to identify the water potential of plant tissue:

Can you describe how you would investigate the effect of a named variable on the permeability of cell-surface membranes:

Required Practicals (p581-585)

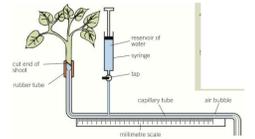
Can you describe how you would dissect an animal or plant gas exchange system, a mass transport system or an organ within such a system:

Can you describe how you would use aseptic technique to investigate the effect of antimicrobial substances on microbial growth:

Required Practical Techniques – Can you give a brief overview of how you would do the following:

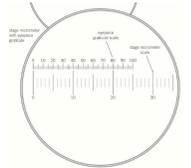
a) use appropriate apparatus to record a range of quantitative measurements (to include mass, time, volume, temperature, length and pH)

b) use appropriate instrumentation to record quantitative measurements, such as a colorimeter or potometer



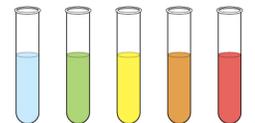
c) use laboratory glassware apparatus for a variety of experimental techniques to include serial dilutions

d) use of light microscope at high power and low power, including use of a graticule



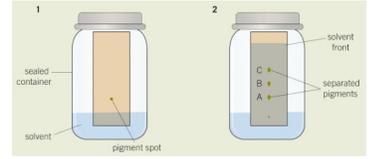
e) produce scientific drawing from observation with annotations

f) use qualitative reagents to identify biological molecules



Required Practical Techniques – Can you give a brief overview of how you would do the following:

g) separate biological compounds using thin layer/paper chromatography or electrophoresis



h) safely and ethically use organisms to measure: plant or animal responses and/or physiological functions

i) use microbiological aseptic techniques, including the use of agar plates and broth

j) safely use instruments for dissection of an animal organ, or plant organ

k) use sampling techniques in fieldwork

l) use ICT such as computer modelling, or data logger to collect data, or use software to process data