**Year 12 Biology Homework Tasks**

**Module 1 – Development of practical skills in biology**

This is completed as practical tasks throughout the year.

**Module 2 – Foundations in Biology**

* Basic Components of Living Systems (p.8-39)
  + *Model of a cell – plant or animal - OR large poster. Both need to include the functions of the organelles*
  + *Comparison table of the microscope types*
* Biological Molecules (p.40-67)
  + *Mind map for properties and uses of water*
  + *Fact file for the biological molecules: starch, glycogen, cellulose, haemoglobin, collagen*
  + *Table comparing the different biological molecules: carbohydrates, proteins, fats. To include: similarities, differences and testing.*
  + *Make a crossword on biological molecules, using definitions and clues*
* *Nucleotides and Nucleic Acids (p. 68-83)*
  + *Flow chart for DNA replication*
  + *Storyboard for transcription and translation*
* Enzymes (p.84-100)
  + *Storyboard on lock and key and induced fit models including key definitions*
  + *Poster of how enzyme activity can be investigated – with limitations of practical’s and how these can be improved*
  + *Comparison table for the different cofactors*
* Plasma Membranes (p.101-119)
  + *Poster on the structure of plasma membranes*
  + *Comparison table of different transport processed*
  + *Storyboard on endocytosis*
* Cell Division (p.120-145)
  + *Storyboard for mitosis and meiosis*
  + *Table with the different specialised cells, functions, adaptations with detailed description’s*
  + *Stem cell evaluation article*

**Module 3 – Exchange and Transport**

* Exchange Surfaces and Breathing (p.150-169)
  + *Poster of the gaseous exchange system and the tissues, including flow chart of inhalation and exhalation*
  + *Comparison table for: human, fish and insects*
* Transport in Animals (p.170-193)
  + *Flow chart for the cardiac cycle*
  + *Find graphs of a normal ECG and an ECG for the conditions: tachycardia, bradycardia, fibrillation and ectopic heartbeat. Annotate the graphs with the features that explain how you know what condition the people have.*
  + *Poster on the different blood vessels including diagrams and annotations and comparison table*
  + *Flow chart for the transport of carbon dioxide with reactions*
  + *Glossary of key terms*
* Transport in Plants (p.194-216)
  + *Mind map on using potometers*
  + *Comparison table on xylem and phloem structure*
  + *EMSBook page on transport of water in plants*
  + *Poster on hydrophytes and xerophytes*

**Module 4 – Biodiversity, Evolution and Disease**

* Classification and Evolution (p.222-261)
  + *Mind map on the different kingdoms and key features*
  + *Newspaper article on the change in classification*
  + *Draw a phylogenetic tree for a chosen example and annotate key features*
  + *Evolution flow chart, including two examples e.g. antibiotic resistance*
  + *Fact sheet on the evidence for evolution*
* Biodiversity (p.262-293)
  + *Magazine article on maintaining biodiversity: factors that affect, reasons for maintaining, in and ex situ methods, international & local conservation agreements*
  + *Write a series of multiple choice questions (at least 15) and answers for the biodiversity topic for your peers*
* Communicable Diseases (p.294-325)
  + *Fact sheet on the different pathogens and their associated diseases. One for each: bacteria, virus, protoctista, fungi.*
  + *Poster on the structure of antibodies and function*
  + *Poster on phagocytosis*
  + *Summary on first line of defence*
  + *Comparison of humoral and cell mediated immunity*
  + *Poster on how plants fight diseases*
  + *Write a debate speech on the benefits and risks of using antibiotics and the potential sources for new medicines.*

**Year 13 Biology Homework Tasks**

**Module 5 – Communication, homeostasis and energy**

* Communication and homeostasis (p.68-76)
  + *Article on endotherms and ectotherms*
* Excretion as an example of homeostatic control (p.77-101)
  + *Poster with the structure of the liver and kidney*
  + *Detailed drawing of a nephron, with information about control of*
  + *Newspaper article about urine and diagnostic tests*
  + *Mind map on kidney failure and treatments – to include +/- points*
* Neuronal communication (p.4-21)
  + *Comparison table, including diagrams, of the different neurones*
  + *Storyboard for synapses*
  + *Newspaper article on the effect of different chemicals on synapses*
  + *Poster/annotated graph to explain how action potentials work*
* Hormonal communication (p.44-67)
  + *Flow chart on the regulation of blood glucose*
  + *Newspaper article on diabetes*
  + *Differences between mode of action of peptide and steroid hormones*
* Animal responses (p.22-43)
  + *Storyboard on the sliding filament model*
  + *Flow chart on reflex actions for knee jerk and blinking*
  + *Comparison table on the different types of muscle to include a diagram*
* Plant responses (p.102-121)
  + *Leaflet on plant hormones and their uses*
  + *Mind map on the experimental evidence and practical investigations for plant hormones*
* Photosynthesis (p.122-141)
  + *Poster on the LDR and LIR of photosynthesis OR a flow chart*
  + *Mind map on factors affecting photosynthesis and practical investigations*
* Respiration (p.142-159)
  + *Poster on the structure and function of the chloroplast and mitochondria*
  + *Flow chart on respiration*
  + *Mind map on practical investigations for respiration*
  + *Comparison table of aerobic and anaerobic respiration*

**Module 6 – Genetics, evolution and ecosystems**

* Cellular control (p.168-181)
  + *Flow chart of the lac operon and include a labelled diagram*
  + *Mind map on mutations, homeobox genes, gene regulation and apoptosis*
* Patterns of inheritance (p.182-213)
  + *Mind map on variation*
  + *Key word glossary*
  + *Sets of instructions on how to tackle different types of genetic crosses*
  + *Speciation cartoon*
* Manipulating genomes (p.214-239)
  + *Step-by-step method (or flow chart) for DNA profiling (including details on PCR, electrophoresis) and DNA sequencing*
  + *Write a list of how DNA sequence is used*
* Cloning and biotechnology (p.240-269)
  + *Leaflet on the different methods of cloning – including advantages and disadvantages*
  + *Article on genetic engineering including the process, examples and ethics*
  + *Fact sheets on the uses of microorganisms in biological processes*
  + *Step-by-step technique for culturing microorganisms with diagrams – explaining the importance of each step*
  + *Comparison table for isolated enzymes and immobilised enzymes, including advantages, disadvantages and uses*
* Ecosystems (p.270-293)
  + *Mind map on ecosystems: factors that affect it, trophic levels, efficiency and human activity*
  + *Poster on nitrogen cycle and carbon cycle*
  + *Labelled diagram to explain succession*
* Populations and sustainability (p.294-319)
  + *Mind map on populations and factors that affect it, competition*
  + *Article on conservation and preservation and how an ecosystem can be managed (including case studies)*