| **HT1 (7 weeks)** | **25** |
|---|---|
| **1. Biological molecules (3.1.1)** | |
| Monomers, polymers, metabolism, moles and molar solutions, types of bonding (covalent, ionic, hydrogen) Formation of ions | 2 |
| Maths for Biology:<br>Determine percentage change in mass number of an atom. | |
| Carbohydrates | 3 |
| Lipids | 2 |
| **End of topic test – Lipids and Carbs** | **2** |
| General proteins | 2 |
| Enzymes plus tangents to a curve | 5 |
| **RP1 Rate of an enzyme reaction** | **3** |
| Maths for Biology:<br>Tangents to curves<br>Calculating rates of reaction<br>Calculating **relative** rates of reaction<br>Plotting graphs.<br>Understand y=mx + C and determine the intercept of a graph. Work out m from an enzyme graph and calculate how much product is formed using y=mx +c.<br>Concentration of precipitate in food tests.<br>Mean, mode, median<br>Uncertainty of a mean result = range / 2<br>(GCSE) and answer is +- the answer.<br>Calculate percentage error from uncertainty of measuring volume of solution using a measuring cylinder and a graduated syringe when measuring Benedict's solution to calculate percentage error. Q 3.5 AS paper 1 June 19 (only measuring from one end so uncertainty only +/- one unit. Given in question.) | |
| **End of topic test – Proteins & Enzymes** | **2** |
| **2. Nucleic acids (3.1.5.1)** | |
| Structures DNA and RNA | 1 |
| Maths for Biology:<br>Calculating percentages of DNA bases<br>Calculating % of light and heavy strands of DNA in evidence of semi conservative replication.<br>Calculate number of codons or amino acids from a DNA base sequence.<br>Calculate the length of DNA in each chromosome from the length of the who DNA. | |
| DNA replication | 2 |
| **HT2 (7 weeks)** | **28** |
| **Block A assessment** | **3** |
| Energy and ATP | 1 |
| Maths for Biology:<br>Energy calculations<br>(e.g. How much energy released from the hydrolysis of 3 6 ATP molecules?) | |
| Water and inorganic ions | 1 |
| **End of topic test – Biological molecules** | **2** |
| **8. DNA, genes and protein synthesis (3.4.1)** | |
| Genes and the genetic code<br>DNA, chromosomes, alleles | 1 |
| Structure of RNA<br>Comparison of DNA, mRNA and tRNA | 1 |
| Protein synthesis | 3 |
| **End of topic test - Protein synthesis** | **2** |

| | |
|---|---|
| **6. Enzymes and digestion (3.3.3)** | |
| Enzymes and digestion | 3 |
| **End of topic test - Digestion** | **2** |
| **6. Exchange (3.3.1)** | |
| Exchange between organisms and their environment. SA:V calculations | 1 |
| Features of a specialised gas exchange system | 1 |
| Lung structure<br>mechanism of breathing | 1.5 |
| Role of alveoli in gas exchange, correlation v causation, risk factors for lung disease, smoking and lung cancer. | 2 |
| Gas exchange in organisms in single celled organisms and insects | 1.5 |
| Gas exchange in fish (if including dissection and biological drawing) | 1 (2) |
| Gas exchange in the leaf of a plant<br>Limiting water loss (xerophytes) | 1 |
| Maths for Biology:<br>Surface area to volume ratio<br>Converting units using areas $mm^2$ to $\mu m^3$<br>Calculating surface area to volume ratio of cells with different shapes. Rectangular prisms, cylindrical prisms, circles and spheres.<br>Understand y=mx + C and determine intercept of graph. Gas exchange data.<br>Calculate rate of gas exchange.<br>Calculate **relative** rate of gas exchange.<br>Calculate pulmonary ventilation.<br>Interpret spirometer graphs.<br>Understand volume and pressure.<br>Calculate how many times greater. (Surface area of alveoli or smokers data on graphs)<br>Standard deviation and error bars on bar charts. | |
| **HT3 (6 weeks)**<br>**w/c 17/01/20 catch up Y12 required practicals after school** | **24** |
| **Block B Assessment** | 4 |
| **End of topic test - Gas exchange** | **2** |
| **7. Mass Transport in animals (3.3.4.1)** | |
| Circulatory system of a mammal, features of a transport system, why have a transport system. | 1 |
| Structure of the heart | 1 |
| **RP5 Dissection of the heart and biological drawing** | **2** |
| The cardiac cycle | 1 |
| Cardiac cycle pressure graphs and ECGs | 1 |
| Maths for Biologists:<br>Calculate heart rate<br>Calculate cardiac out put<br>Interpret pressure graphs<br>Interpret ECG traces<br>Percentage increase/decrease<br>Calculate how many times greater the risk using graphs.<br>Calculate changes in systolic pressure as activity levels increase.<br>Standard form. | |
| Control of heart rate (spec: 3.6.1.3) from Y13 to be taught here. | 2 |
| Blood vessels and their function plus blood pressure in vessels graphs | 1 |
| Tissue fluid formation | 1 |
| **End of topic test - Mass Transport Heart** | **2** |
| **9. Genetic diversity (3.4.3)** | |
| Mutations | 1 |
| Meiosis and genetic variation | 3 |

| | |
|---|---|
| Maths for Biology<br>Calculate possible chromosome combinations. $(2^n)^2$where n=number of homologous pairs<br>Interpret pie charts of the cell cycle<br>Calculate how many minutes in each stage of cell cycle<br>Calculate percentages from a pie chart knowing 360 degrees in a circle.<br>Calculate what percentage of the cells are in each stage. | |
| **HT4 (6 weeks)** | 24 |
| Types of selection | 2 |
| Genetic diversity and adaptation | **1** |
| Maths for Biology:<br>Construct and interpret frequency tables and diagrams and bar charts and histograms for genetic diversity data and stabilising selection data..<br>Calculate allele frequency. | |
| **RP6 Aseptic techniques** | 4 |
| **End of topic test – Genetic diversity** | **2** |
| **10. Biodiversity (3.4.5)** | |
| Species and taxonomy | 2 |
| Diversity within a community | 1 |
| Species diversity and human activities | 2 |
| Maths for Biology<br>Index of Diversity<br>Calculate areas of habitats<br>Comparison of DNA calculations | |
| Investigating diversity | **4** |
| Maths for Biology<br>Mean, mode, median<br>Calculate Standard deviation<br>Estimating results<br>Significant figures<br>Percentages<br>Substituting values in algebraic equations. | |
| **End of topic test - Biodiversity** | **2** |
| **HT5 (6 weeks)** | **24** |
| **A2 Essay prep 6 mark answers for all areas of AS specification.** | **9** |
| **Block C revision** | |
| Revisit cell structure and mitosis | 3 |
| Revisit immunity | 2 |
| Revisit gas exchange in lungs, insects, fish and plants | 3 |
| Revisit Haemoglobin and dissociation curves | **2** |
| Revisit Biological molecules | 2 |
| Revisit Protein synthesis | **2** |
| Compare and contrast mitosis and meiosis | 1 |
| **HT6 (6 weeks)** | **24** |
| **19 Populations in ecosystems (3.7.4)** | |
| Populations and ecosystems key terms | 1 |
| Variation in population size (plotting growth curves) | 1 |
| Competition | 1 |
| Predation | 1 |
| Investigating populations (sampling techniques) | 1 |
| Succession | 4 |
| Conservation of habitats | 1 |
| **RP12 Investigate an environmental factor on the distribution of a species.** | **3** |