**CURRICULUM PLAN: 2020 – 2021 (Autumn 1) Year 12**

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|  | **Monday 3+4** | **Tuesday 5+6** | **Thursday 1+2** |
| **Week 1**  W/C 7th Sept  **Topic/Module:** Biology |  | **Title: An Introduction biological molecules and sugars**  Lesson Objectives:   * To know what is meant by monomers and polymers * To understand how monomers and polymers are produced and broken down * To be able to illustrate how monosaccharides are joined together |  |
| **Week 2**  W/C 14th Sept  **Topic/Module:** Biology | **Title: Polysaccharides**  Lesson Objectives:   * To know how a polysaccharides is formed * To understand the structure and function of 3 named polysaccharides * To be able to apply the structure of polysaccharides to living organisms | **Title: Lipids**  Lesson Objectives:   * To know what lipids are and the types * To understand the structure and function of triglycerides and phospholipids * To be able to carry out the test for lipids | **Title: Proteins and Enzymes**  Lesson Objectives:   * To know that proteins are made from many amino acids joined together * To understand the four levels of protein structure * To be able explain how enzymes work to lower activation energy |
| **Week 3**  W/C 21st Sept  **Topic/Module:** Biology | **Title: Biochemical tests**  Lesson Objectives:   * To know the biochemical tests * To understand and investigate biochemical tests including intensity * To be able to apply knowledge of biochemical tests to exam questions | **Title: Enzyme Activity**  Lesson Objectives:   * To know the factors that enzyme function can be affected * To understand how four factors can affect how an enzyme works * To be able to explain how the introduction of an inhibitor can affect the rate of a reaction | **Title: Enzyme Activity (2)**  Lesson Objectives:   * To know the factors that enzyme function can be affected * To understand how four factors can affect how an enzyme works * To be able to explain how the introduction of an inhibitor can affect the rate of a reaction |
| **Week 4**  W/C 28th Sept  **Topic/Module:** Biology | **Title: PSA One: Enzyme Controlled Reactions**  Lesson Objectives:   * To know the basic structure and function of an enzyme * To understand how varying temperatures can affect enzyme controlled reactions * To investigate the effect of temperature on the action of trypsin | **Title: Section Test 1A – Peer marked**  **Title: Processing Data and Statistical Tests**  Lesson Objectives:   * To know how to process data from results * To understand how to calculate mode, median and ratios * To be able to explain what statistical test should be used and why | **Progress check one – Assessed on Section 1A** |
| **Week 5**  W/C 5th Oct  **Topic/Module:** Biology | **Title: Investigating unknown sucrose concentration**  Lesson Objectives:   * To know the equipment needed to find an unknown concentration of a solution * To understand the necessity for a calibration curve * To be able to identify through investigation the concentration of sucrose x | **Title: DNA Replication**  Lesson Objectives:   * To Know the structure of DNA and RNA * To understand how DNA is produced and replicated * To be able to explain and interpret the work of Meselson and Stahl experiment for semi-conservative replication | **Title: ATP and Inorganic Ions**  Lesson Objectives:   * To Know the structure of ATP and how its formed * To understand the importance of water as a biological molecule * To be able to explain the properties of water and relate them to living organisms |
| **Week 6**  W/C 12th Oct  **Note:** Monday CPD | Progress check one feedback | **Title: Water**  Lesson Objectives:  To know the chemical Structure of water  To understand how the properties of water make it an important biological molecules  To be able to explain why water has a high latent heat vaporisation and specific heat capacity | Title: Section 1B Consolidation inc knowledge test |
| **Week 7**  W/C 19th Oct  **Topic/Module:** Biology | **Title: Eukaryotic Cells**  Lesson Objectives:   * To know the structure of eukaryotic cells * To understand the functions of the organelles in eukaryotic cell * To be able to construct models of eukaryotic cells | **Title: Prokaryotic Cells**  Lesson Objectives:   * To know the structure of prokaryotic cells * To understand how prokaryotic cells replicate   To be able to explain the process of viral replication | **Title: Microscopes**   * To know the different types of microscopes and their limitations * To understand how carry out cell fractionation including homogenisation |



**CURRICULUM PLAN: 2020 – 2021 (Autumn 2) Year 12**

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|  | **Monday 3+4** | **Tuesday 5+6** | **Thursday 1+2** |
| **Week 1**  W/C 2nd Nov  **Topic/Module:** Biology | **Title: Calculating Cell Size**  Lesson Objectives: | **Title: Mitosis**  Lesson Objectives:   * To know the components off the cell cycle * To understand and describe what happens at each stage of the cell cycle * To be able to calculate the length of a cell cycle | Review assessment |
| **Week 2**  W/C 9th Nov  **Topic/Module:** Biology | **Title: PSA 2 - Investigating Mitosis**  Lesson Objectives:   * To know hot carry out and prepare a root tip squash * To understand how to calculate mitotic index * To be able to interpret microscope images identifying stages of mitosis | **Title: Eyepiece Graticule and further cell calculations** | **Title: Cell Membranes**  Lesson Objectives:   * To know the basic structure of all cell membranes * To understand why membranes behave like they do * To be able to explain the effect of pH and temperature on cell membranes |
| **Week 3**  W/C 16th Nov  **Topic/Module:** Biology | **Title: PSA 4- Investigating cell membrane permeability**  Lesson Objectives:   * To know that beetroot can be used to demonstrate membrane permeability * To understand the method to investigate membrane permeability * To be able to investigate changing membrane permeability due to temperature | **Title: PSA 4- Investigating cell membrane permeability** – write up. Processing results and questions | **Title: Diffusion and Osmosis**  Lesson Objectives:   * To know the processes of diffusion * To understand how different substances move by diffusion * To be able to explain how factors affect the rate of diffusion |
| **Week 4**  W/C 23rd Nov  **Topic/Module:**  Biology | **Title: PSA 3 – Investigating Osmosis**  Lesson Objectives:   * To Know how to produce a dilution series of solute * To understand how plot results to investigate change in mass * To be able to investigate osmosis in potato’s and explain results | **Title: Active Transport**  Lesson Objectives:   * To know what is meant by active transport * To understand the steps of active transport including the role of carrier proteins and co-transporters * To be able to model co-transport and the absorption of glucose | **Title: Cell transport Graphs (lockdown lesson)** |
| **Week 5**  W/C 30th Nov  **Module:** Assessment Week | **Title: Section test 2a+2b (peer marked)** | **Title: Calculating rates of reaction and tangents**  Lesson Objectives:   * To know that reaction rates can be calculated using graphs * To understand the different ways to work out the reaction rates using tangents * To be able to plot results and interpret graphs to work out rates of reactions | **Title: Antigens and phagocytosis**  Lesson Objectives:   * To know what is meant by the term antigen * To understand that the immune response is made up of four main stages * To be able to describe the process of phagocytosis |
| **Week 6**  W/C 7th Dec  **Topic/Module:** Mastery | **Title: T-cells and B-Cells**  Lesson Objectives:   * To know what happens after phagocytosis * To understand the role of T and B cells * To be able to explain graphs of antibody concentration | **Title: Immunity, Vaccines and antigenic variation**  Lesson Objectives:   * To know the different types of immunity * To understand the use of vaccines to provide protection for individuals and how antigenic variation provides challenges   To be able to discuss ethical issues associated with use of vaccines | **Title: Antibodies in medicine**  Lesson Objectives:   * To know different examples of how antibodies are used in medicine * To understand the ELISA test * To be able to interpret data about vaccines and antibodies |
| **Week 7**  W/C 14th Dec  **Topic/Module:** Chemistry | **Title: HIV and Viruses**  Lesson Objectives:   * To know what HIV is and how it can lead to AIDS * To understand how HIV structure aids with its ability to replicate * To be able to explain why antibiotics are ineffective against HIV and how it should be controlled | **Title: Stop Gap** | **Title: Practical** |

**CURRICULUM PLAN: 2020 – 2021 (Spring 1) Year 12**

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|  | **Monday 3+4** | **Tuesday 5+6** | **Thursday 1+2** |
| **Week 1**  W/C 4th Jan  **Topic/Module:** Chemistry |  | **Title: Size and Surface Area**  Lesson Objectives:   * To know how an organisms size and volume affects how quickly substances are exchanged * To understand the difference between single celled and multi celled organisms * To be able to explain behavioural and physiological adaptations to aid exchange | **Title: Gas Exchange**  Lesson Objectives:   * To know the adaptations of gas exchange surfaces * To understand the role of counter current system, tracheal system and leaves in gas exchange * To be able to explain how insects and plants control the loss of water |
| **Week 2**  W/C 11th Jan  **Topic/Module:** Chemistry | **Title: Gas Exchange – Humans**  Lesson Objectives:   * To know the gross structure of the human gas exchange system * To understand ventilation and the exchange of gases in the lungs * To be able to interpret information relating to the effects of lung disease on gas exchange and/or ventilation | **Title: Digestion and Absorption**  Lesson Objectives:   * To know that during digestion larger molecules are hydrolysed * To understand the digestion in mammals * To be able to explain how the products of digestion are absorbed | **Title: Haemoglobin (lockdown lesson)**  Lesson Objectives:   * To know the structure of haemoglobin and its affinity for oxygen * To understand the dissociation curves for oxygen and the bohr affect * To be able to explain how different organisms dissociation curves changes due to size and environment |
| **Week 3**  W/C 18st Jan  **Topic/Module:** Chemistry | **Title: The Circulatory System & Tissue Fluid**  Lesson Objectives:   * To know the structure of the circulatory * To understand how the structure of arteries, arterioles, veins and capillaries helps with function * To be able to explain how tissue fluid is formed | Title: The Cardiac cycle (on drive) | **Title: The Heart inc calculations (lockdown lesson)** |
| **Week 4**  W/C 25th Jan  **Topic/Module:**  Chemistry | **Title: Exercise & Asthma**  Lesson Objectives:  To know that exercise can come in many different forms  To understand the need to exercise and its effect on the body  To be able to describe the causes and symptoms of asthma | Title: Protein synthesis and the genetic code  Lesson Objectives:   * To know the stages of protein synthesis * To understand the need for splicing   To be able relate the sequence of nucleic acids to the genetic code | **Title: Drugs**  Lesson Objectives:  To know what is meant by the term drugs  To understand the effect that drugs have on the body  To be able to create a campaign for drug misuse |
| **Week 5**  W/C 1st Feb  **Topic/Module:** Chemistry | Title: The Heart and Calculations  Lesson Objectives:   * To know the structure of the heart * To understand the changes that happen during each heart beat   To be able to calculate SV, HR and CO using graphs and data | End of Topic Test | Title: Transport in Plants - Xylem  Lesson Objectives:   * To know the structure of the xylem * To understand how water moves up the plant and factors affecting transpiration   To be able to estimate transpiration rate using potometer |
| **Week 6**  W/C 8th Feb  **Topic/Module:**  Chemistry | Title: Transport in Plants – Phloem  Lesson Objectives:   * To know the structure and function of the phloem * To understand the mass flow hypothesis of movement of solutes   To be able to evaluate evidence for mass flow | Title: End of Chapter Exam- Style Questions 3B –p199-200  Lesson Objectives:   * To know * To understand   To be able to | Title: DNA and RNA  Lesson Objectives:   * To know how DNA is stored * To understand the function of genes and chromosomes   To be able to explain the need for different types of RNA |



**CURRICULUM PLAN: 2020 – 2021 (Spring 2) Year 12**

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|  | **Monday 3+4** | **Tuesday 5+6** | **Thursday 1+2** |
| **Week 1**  W/C 22nd Feb  **Topic/Module:**  Physics |  | Title: Meiosis and Genetic variation  Lesson Objectives:   * To know the process of fertilisation * To understand and describe the process of meiosis   To be able to explain how genetic variation is created in gametes | PC3 Feedback |
| **Week 2**  W/C 1st Mar  **Topic/Module:** Physics | Title: Mutations and genetic diversity  Lesson Objectives:   * To know how a mutation is caused * To understand the effects of a mutation   To be able to explain how genetic diversity | Title: Natural selection and types of selection  Lesson Objectives:   * To know the process of natural selection * To understand the importance of adaptations in organisms   To be able to interpret data relation to the effects of selection | Title: PSA 6: Investigation Selection  Lesson Objectives:   * To know what is meant by aseptic techniques * To understand and test the effect of antibiotics   To be able to evaluate results from agar |
| **Week 3**  W/C 8th Mar  **Topic/Module:**  Physics | Title: Classification of organisms inc courtship behaviour  Lesson Objectives:   * To know the phylogenetic classification system * To understand how organisms are classified using courtship behaviour   To be able interpret diagrams to show the classification system | Title: Classification using DNA and variation  Lesson Objectives:   * To know how DNA can be used to clarify evolutionary relationships * To understand how to and not to investigate variation   To be able to calculate standard deviation | Title: Biodiversity  Lesson Objectives:   * To know what is meant by biodiversity and hot it is measured * To understand the impact of agriculture on biodiversity   To be able to analyse results of biodiversity using statistics |
| **Week 4**  W/C 15th Mar  **Topic/Module:**  Physics | Revision packs | Revision packs | Revision packs |
| **Week 5**  W/C 22nd Mar  **Topic/Module:**  Physics | Revision packs | Revision packs | Revision packs |
| **Week 6**  W/C 29th Mar  **Topic/Module:** Physics | Revision packs | Revision packs | Revision packs |

**CURRICULUM PLAN: 2020 – 2021 (Summer 1) Year 12**

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|  | **Monday 3+4** | **Tuesday 5+6** | **Thursday 1+2** |
| **Week 1**  W/C 19th Apr  **Topic/Module:**  Physics | Revision packs | Revision packs | Revision packs |
| **Week 2**  W/C 26th Apr  **Topic/Module:** Physics | Revision packs | Revision packs | Revision packs |
| **Week 3**  W/C 3rd May  **Topic/Module:** Physics | Revision packs | Revision packs | Revision packs |
| **Week 4**  W/C 10th May  **Topic/Module:**  Physics | Revision packs | Revision packs | Revision packs |
| **Week 5**  W/C 17th May  **Topic/Module:**  Physics | Revision packs | Revision packs | Revision packs |
| **Week 6**  W/C 24th May  **Topic/Module:**  Physics | Revision packs | Revision packs | Revision packs |