**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
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| **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
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| **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
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| **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
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| **Week 6**W/C 12th Oct**Note:** Monday CPD  | Progress check one feedback | **Title: Water**Lesson Objectives:To know the chemical Structure of waterTo understand how the properties of water make it an important biological moleculesTo 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
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**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
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| **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
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| **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
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| **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
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| **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
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| **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
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| **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 formsTo understand the need to exercise and its effect on the bodyTo be able to describe the causes and symptoms of asthma  | Title: Protein synthesis and the genetic codeLesson 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 drugsTo understand the effect that drugs have on the bodyTo be able to create a campaign for drug misuse |
| **Week 5**W/C 1st Feb**Topic/Module:** Chemistry | Title: The Heart and CalculationsLesson 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 - XylemLesson 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 –p199-200Lesson Objectives:* To know
* To understand

To be able to | Title: DNA and RNALesson 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 selectionLesson 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 behaviourLesson 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: BiodiversityLesson 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 |