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| **Biology Trilogy**  |
| **Year 10****Note all KS3 links refer to the year 9 course which was previously studied by these students.** |
| **Term 1 content and skills** | **Term 2 Content and skills** | **Term 3 Content and Skills** | **Extended Curriculum (trips/visits/afterschool activities)** |
| **Module 1: Cell Biology (Links to KS3 T21)** * The structure of animal cells, plant cells and prokaryotic cells.
* The subcellular structures within eukaryotic and prokaryotic cells.
* How microscopy techniques have changed over time and carry out calculations involving magnification, real size and image size.

**Required Practical:** Using a microscope to observe, draw and label cells.* Specialised cells.
* Mitosis and the cell cycle.
* Stem cells, how we can use them and the ethics of this.
* Transport in cells: diffusion, osmosis and active transport.

**Required Practical**: Investigating the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue. **Module 2: Organisation (links to KS3 T11 and T17 and Chemistry GCSE module 7)*** The human digestive system and the enzymes involved in digesting proteins, fats and carbohydrates.
* How enzymes work by the ‘lock and key’ model.

**Required Practical**: use qualitative reagents to test for a range of carbohydrates, lipids and proteins.**Required Practical:** investigate the effect of pH on the rate of reaction of amylase enzyme.* The structure of the heart and blood vessels.
* The constituents of blood.
 | **Module 2: Organisation (links to KS3 T11 and T17 and PSHE)**(Continued from last term)* Coronary heart disease: what it is and how we treat it
* Relationship between health and disease and the interactions between different types of disease
* The effect of lifestyle factors including diet, alcohol and smoking on the incidence of non-communicable diseases
* Different types of cancer
* The structures of plant tissues and organs and how they are related to their functions

**Module 3: Infection and Response** **(links to PSHE)** (taught across this term and next term) * How diseases caused by viruses, bacteria, protists and fungi are spread in animals and plants (and how we try to prevent these diseases from spreading)
* Human defences against pathogens (including non-specific defences and the immune system)
* Vaccinations and antibiotics to protect us from pathogens - Discovery and development of drugs
 | **Module 4: Bioenergetics (links to KS3 T17, T24 and GCSE Chem Module 9)*** Photosynthesis and the conditions which affect the rate of photosynthesis.

**Required Practical**: investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed * Aerobic and anaerobic respiration How the body responds to exercise Metabolism
 | * Medtech challenge – links to engineering, design + tech, business skills. Provide industry mentor.
* Stem Club
* Launchpad- working with Form the Futures and local industry
* Engineering Club
* STEM leaders
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| **Assessment**: Low stakes Microsoft Forms quizzes throughout all topics. Open book end of topic tests and End of term closed book written test | **Assessment:** Low stakes Microsoft Forms quizzes throughout all topics. Open book end of topic tests and End of term closed book written test | **Assessment:** Low stakes Microsoft Forms quizzes throughout all topics. Open book end of topic tests and End of term paper 1 exam |  |

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| **Biology Separate Science** |
| **Year 11** |
| All students are taught in mixed ability teaching groups recording their work on their iPads using their lab books for note taking in practical work. |
| **Term 1 content and skills** | **Term 2 Content and skills** | **Term 3 Content and Skills** | **Extended Curriculum (trips/visits/afterschool activities)** |
| **Module 5:** Homeostasis and response **(links to PSHE)*** Homeostasis
* Structure and function of the human nervous system

**Required Practical**: plan and carry out an investigation into the effect of a factor on human reaction time* Human endocrine system (glands and hormones)
* Control of blood glucose concentration
* Two types of diabetes and how they are treated
* Hormones in reproduction and the menstrual cycle
* Contraception
 | **Module 6:** Inheritance, variation and evolution **(links to KS3 T5 and T20)*** Sexual and asexual reproduction
* Meiosis
* DNA and the genome
* Genetic inheritance and inherited disorders
* Sex determination
* -How a combination of genetics and environmental factors shape our characteristics
* Evolution by natural selection
* Selective breeding of plants and domesticated animals
* Genetic engineering: science and ethics
* Fossils and evidence for evolution How organisms become extinct
* Classification of living organisms
 | **Module 7: Ecology (links to KS3 T8 and GCSE Chem Module 9)*** Ecosystems and how the community of living organisms (biotic) interacts with the non-living (abiotic) parts of their environment.
* Organisms have adaptations which may be structural, behavioural or functional.
* Feeding relationships within a community can be represented by food chains

**Required Practical:** use sampling techniques to measure the population size of a common species in a habitat.* Explain how the carbon and water cycles are important to living organisms
* the impact of environmental changes on the distribution of species in an ecosystem
* biodiversity and the stability of ecosystems
* The impact that human have had on ecosystems: waste management, land use, deforestation and global warming.
* The importance of maintaining biodiversity

Consolidation work and revision for exams  | STEM ClubEngineering Club |
| **Assessment:** Low stakes Microsoft Forms quizzes throughout all topics. Open book end of topic tests and Interim exam on paper 1 content | **Assessment:** Low stakes Microsoft Forms quizzes throughout all topics. Open book end of topic tests and Mock exam on Paper 2 content | **Assessment:** Low stakes Microsoft Forms quizzes throughout all topics. Open book end of topic tests and GCSE exams |  |