**UNIT OVERVIEW:** Genetics and Evolution

1. **ENQUIRY:** How do people use biological knowledge?

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| **Unit intention:** In Ks4 and Year 12 students study the structure of DNA and proteins, the genetic code and protein synthesis, Measuring genetic diversity and Classification and evolution. In this topic they explore Genome sequencing gives information about the location of genes and provides evidence for the evolutionary links between organisms. Genetic engineering involves the manipulation of naturally occurring processes and enzymes. The capacity to manipulate genes has many potential benefits, but the implications of genetic techniques are subject to much public debate. | | | |
| **Success criteria: I can** | | 🗸 | X |
| Describe the types of gene mutations and their possible effects on protein production and function  Explain the regulatory mechanisms that control gene expression at the  Explain the genetic control of the development of body plans in different organisms  Explain the contribution of both environmental and genetic factors to phenotypic variation  Use of phenotypic ratios to identify linkage and epistasis  Describe the factors that can affect the evolution of a species  Explain the principles of DNA profiling, sequencing and its uses  Evaluate ethical issues (both positive and negative) relating to the genetic manipulation of animals, plants and microorganisms  Explain natural clones in plants and the production of natural clones for use in horticulture  Explain the production of artificial clones of plants by micropropagation and tissue culture  Describe the use of microorganisms in biotechnological processes  Explain how to culture microorganisms effectively, using aseptic techniques  Explain the uses of immobilised enzymes in biotechnology and the different methods of immobilisation | |  |  |
| **Unit summative and formative assessment details:**  Weekly Seneca, factual re-call  MCQ  Extended writing  Practical Research  End of unit test | | | |
| **Home Learning (What and how often):**  **Home Learning (What and how often):**  Homework once a week (flip learning and Seneca)  Revisit class content (make notes)  Research activities for practical | | | |
| **Topic Sequence**  Mutations and variations  Control of gene expression  Body Plans  Variation and Inheritance  Phenotypic ratios  Evolution  Speciation and artificial selection  DNA profiling and DNA sequence and analysis  Using DNA sequencing  Genetic engineering  Gene technology and ethics  Natural cloning and Artificial cloning  Microorganisms and biotechnology  Microorganisms, medicines and bioremediation  Culturing microorganisms on an industrial scale  Using mobilised enzymes |  | | |

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| **Success criteria** – Have you met them? Show your evidence in the boxes below. |
| **1.** |
| **2.** |
| **3.** |
| **4.** |
| **5.** |
| **6.** |
| **How will you improve your work?** |

**End of Unit EVALUATION**