**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 functionExplain the regulatory mechanisms that control gene expression at the Explain the genetic control of the development of body plans in different organismsExplain the contribution of both environmental and genetic factors to phenotypic variationUse of phenotypic ratios to identify linkage and epistasis Describe the factors that can affect the evolution of a speciesExplain the principles of DNA profiling, sequencing and its usesEvaluate ethical issues (both positive and negative) relating to the genetic manipulation of animals, plants and microorganismsExplain 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 cultureDescribe the use of microorganisms in biotechnological processesExplain how to culture microorganisms effectively, using aseptic techniquesExplain the uses of immobilised enzymes in biotechnology and the different methods of immobilisation |  |  |
| **Unit summative and formative assessment details:**Weekly Seneca, factual re-call MCQExtended writing Practical ResearchEnd 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 variationsControl of gene expressionBody PlansVariation and InheritancePhenotypic ratiosEvolutionSpeciation and artificial selectionDNA profiling and DNA sequence and analysisUsing DNA sequencingGenetic engineeringGene technology and ethicsNatural cloning and Artificial cloningMicroorganisms and biotechnologyMicroorganisms, medicines and bioremediationCulturing microorganisms on an industrial scaleUsing 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**