**UNIT OVERVIEW:** Nucleotides and Nucleic acid

**ENQUIRY:** To what extent does DNA determine our characteristics?

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| **Unit intention:** | | | |
| **Unit Intention:** The cells of all living organisms are composed of biological molecules. Proteins, carbohydrates and lipids are three of the key groups of biological macromolecules that are essential for life. A study of the structure of these macromolecules allows a better understanding of their functions in living organisms. | |  |  |
| **Success criteria:** | | 🗸 | X |
| **2.1.3 Nucleotides and nucleic acids**  **Learning Checklist, I can:**   |  | | --- | | Describe the structure of a nucleotide as the monomer from which nucleic acids are made. | | Explain the synthesis and breakdown of polynucleotides by the formation and breakage of phosphodiester bonds | | Describe the structure of ADP and ATP as phosphorylated nucleotides. Comprising a pentose sugar (ribose), a nitrogenous base (adenine) and inorganic phosphates. | | I can the structure of DNA deoxyribonucleic acid | | I can analyse semi-conservative DNA replication. To include the roles of the enzymes helicase and DNA polymerase, | | I can describe the nature of the genetic code. To include the triplet, non-overlapping, degenerate and universal nature of the code and how a gene determines the sequence of amino acids in a polypeptide (the primary structure of a protein). | | I can explain transcription and translation of genes resulting in the synthesis of polypeptides. To include, the roles of RNA polymerase, messenger (m)RNA, transfer (t)RNA, ribosomal (r)RNA. | | |  |  |
| **Unit summative and formative assessment details:**  Weekly Seneca, factual re-call  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**   1. The structure of Nucleotides 2. Synthesis of polynucleotides 3. Semi conservative replication 4. Genetic code 5. ATP 6. Protein synthesis 7. DNA purification PAG 9 | **Recommended reading:**  Junk DNA-Nessa Carey  ‘Life Story’, also re-named ‘The Race for the Double Helix’ (BBC Horizon, 1987  **Great Discoveries in Science: The Double Helix** (Howard Hughes Medical Institute).<https://dnalc.cshl.edu/resources/3d/09-5-dna-has-4-units.html>  <http://brilliantbiologystudent.weebly.com/biuret-test-for-protein.html>  <https://jcp.bmj.com/content/jclinpath/25/10/892.full.pdf>  **Places to visit:**  Centre of the cell | | |

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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**