**Grade Level: \_\_\_\_9\_\_\_ Subject: \_\_Biology\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Unit Number and Title:\_\_5 Cell Growth and Differentiation\_\_\_\_\_ #Days\_10\_\_\_ #SEs\_4\_\_\_ #PAs\_\_2\_\_**

**\_\_IFD Planning Guide**

**Science**

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| **IFD Summary**  DNA structure and replication during the cell cycle  Cell Cycle stages, including its significance in growth and development, G’s, S (DNA), mitosis, interphase  Disruptions to these important processes may lead to cancer and other diseases |

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| **PA # \_\_\_\_\_\_:**  **Description of PA:** | **Standard:**  **(verb/content)** | **TCD or VAD notes**  **(TCD for High School)** | **STAAR Analysis**  **(released items)** | **Vocab** | **Notes-Resources:**  **Instruction:** |
| Label a model of DNA replication. Use the model to give a brief oral presentation that explains the following:   * The process of DNA replication including the structures involved * The purpose of DNA replication * The significance of DNA replication to the organism, their ancestors, and their offspring * The limitations of the model | **Process:**  **2H** Communicate valid conclusions supported by data  **3E** Evaluate limitations of model | Lab report  Graphic organizer  Journal  Use tech  Advantages and limitations of biological models |  |  | 40% of all questions in STAAR will be dual coded |
| **4B** Investigate cellular processes and new molecule synth | Synthesis of new molecules (organic polymers from monomers)   * + Nucleic acids   + Location of synthesis |  | Polymers monomers  Nucleic acids  Interphase  G, S, M  Mitosis  Prophase  Metaphase  Anaphase  Telophase  Cytokinesis | **-Production** and synthesis often used interchangeably  Students may have foundational understanding of maintaining balance  **-Mitosis** questions use a lot of drawings, micrographs, diagrams  **-First** time students learn about cell cycle |
| **5A** Describe cell cycle:   * DNA Replication * Mitosis * Growth of organisms | Cell cycle  Interphase, etc. |  |
| 6A Identify components of DNA | Components (3)  Double helix  H-bonds  Antiparallel |  | Nucleotide  Deoxyribose sugar  Phosphate group  Nitrogen base  Double helix  Antiparallel  5’, 3’ | -**Students** should know about purines and pyrimidines to understand Chargaff’s rule. Not tested though  **-First** time students learn of structure of DNA |
| **Misconceptions:**  Different cell types do not have unique genetic codes  DNA replication is not part of mitosis. This process happens during S phase (synthesis)  Cell division is not continuous | | | | | |
| **PA # \_\_\_\_\_\_:**  **Description of PA:** | **Standard:**  **(verb/content)** | **TCD or VAD notes**  **(TCD for High School)** | **STAAR Analysis**  **(released items)** | **Vocab** | **Notes-Resources:**  **Instruction:** |
| Create a model to illustrate each stage of the cell cycle. Describe in writing how the model illustrates each stage.  Write a summary that **includes** the role of DNA replication in the cell cycle (especially mitosis), the importance of the cell cycle to the growth of an organism, and how disruptions in the cell cycle might lead to disease. | **Process:**  **2H** Communicate valid conclusions supported by data | Lab report  Graphic organizer  Journal  Use tech |  |  | 40% of all questions in STAAR will be dual coded |
| **5A** Describe cell cycle:   * DNA Replication * Mitosis * Growth of organisms | Cell cycle  Interphase, etc. |  | Interphase  G, S, M  Mitosis  Prophase  Metaphase  Anaphase  Telophase  Cytokinesis | **-Mitosis** questions use a lot of drawings, micrographs, diagrams  **-First** time students learn about cell cycle |
| **5D** Recognize that disruption of cell cycle will lead to cancer and other diseases | -Normal cells control cell division  -Failure to control leads to neoplasms (2);  Benign and malignant  -Genetic mutations appear to contribute to these maladies |  | – oncogenes, mutated, genes, transform, cell, tumor cell, benign, malignant, formation, tumor, ATP, production, inhibited, unregulated, somatic cell, antibody | **Students** should know that cellular respiration and breathing respiration are two separate processes.  **-Students** need to understand that cell reproduction, cell division, and cell cycle are all synonymous. |
| **Misconceptions:**  Cellular respiration and breathing respiration are not the same thing. | | | | | |

Assessment Creator

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| **Unit Blueprint** | | | | |
|  | **Total problems** | **Rate**  **(min/problem)** | **Readiness**  **(Count/ %)** | **Supporting**  **(Count/ %)** |
| **STAAR Assessment** |  |  |  |  |
| **Unit Assessment** |  |  |  |  |

Day-by-Day Outline

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| 1Video of the basic structure of DNA | 2 Review of H-bonding. Intro nucleotide monomers as parts of the nucleic acid macromolecule | 3 Begin constructing the basic model of DNA using student understanding of nucleic acids and the components of the DNA molecule | 4 Continue with DNA construction using materials provided. Why are these molecules twisted?  What are any limitations of the model they created? | 5 Ask students about why H-bonds are used for maintaining the two strands together  Do all cells in an organism have the same DNA molecules? Why or why not? |
| 8 **PA 1 Bio DNA Replication** | 9 Introduce the concept of the cell cycle and the major components. View a short video depicting some of the key features | 10 Create and label a model of the cell cycle to clearly include interphase, G0, G1, S, G2, M phase (mitosis), cytokinesis, and the resulting daughter cells  How does this model mimic other real-world processes? | 11Students will investigate how disruptions in the cell cycle may lead to disease. | 12 **PA 2 Bio Cell cycle** |
| 15 | 16 | 17 | 18 | 19 |
| 22 | 23 | 24 | 25 | 26 |