**5E Lesson Plan Template**

\*All companion materials such as power points, handouts and video clips must be included with the submitted lesson plan.

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| **Authors:** | April Craft, Shelby Fisher, Angel Bonds, Vanous Brown |
| **Title:** | “Ozopox” Virus Outbreak |
| **Grade level(s):** | MS/HS |
| **Time Required:** | 1 week |
| **Subject(s):** | Science/Math |
| **Standards:** | Science:  Develop and use a model to describe why structural changes to genes (mutations) located on Chromosomes may affect proteins and may results in harmful beneficial or neutral effects to the structure and function of an organism. |
| **Science and Engineering Practices, Cross-cutting Concepts and Standards for Mathematical Practice** | Develop and Use Models  Cause and Effect  Structure and Function  Obtain and Evaluate Information |
| **Objectives:** | I CAN make a connection between cause (DNA sequence) effect (the behavior).  I CAN explain the role mutations and change in outcome. |
| **Materials List:** | Ozobots, Markers, Paper, Intro Movie, List of Symptoms |
| **Safety Concerns:** | None |
| **Accommodations for Learners with Special Needs (ELL, Special Ed, 504, GT, etc.):** | Students worked in pairs |
| **References:** |  |

Cause and effect relationship of how a change in a codon can results in a change in outcome.

1. What does the code of the ozobot do? (2 days)
2. Given symptoms of the monkey pox, students decided which moves best represents the symptoms (headache, fever, muscle aches…)
3. Gave a key for which ozobot colors represented which nucleotide, students were asked to map the Genome of the virus.
4. Create mutations (incretions and deletion) to decide change in sequence.

Extension:

1. Argue if the mutations were beneficial to virus, host,…
2. Given various moves (symptoms) which version of the virus do you have?

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| **ENGAGEMENT Time: 5 Minutes** | | |
| **What the Teacher Will Do** | **Probing/Eliciting Questions** | **Student Responses and Misconceptions** |
| **Show video** | **Can you prevent the next great outbreak?** | **Viruses have DNA sequences cause symptoms** |
| **Evaluation/Decision Point Assessment** | **Assessment** | **Student Outcomes** |
| **None** | **none** | **Hook causes engagement** |

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| **EXPLORATION Time: 4 class periods** | | |
| **What the Teacher Will Do** | **Probing/Eliciting Questions** | **Student Responses and Misconceptions** |
| **Provide Ozobot to explore.**  **Facilitate discussion to establish behavior constants.** | **How do codes cause behavior?** | **Codes must be created perfectly in order to get Bot to read code correctly.** |
| **Evaluation/Decision Point Assessment** | **Assessment** | **Student Outcomes** |
| **Student peer assessment of T-chart.** | **T-chart created correctly. Codes correct to behavior** | **Ability to predict behavior based on code.** |
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| **EXPLANATION Time: 2 days** | | |
| **What the Teacher Will Do** | **Probing/Eliciting Questions** | **Student Responses and Misconceptions** |
| **Facilitate discussion of norms to match behavior relating to symptoms given of OzoPox** | **What happens when there is an unexpected change (mutation) in the sequence?** | **Students began to manipulate sequences and notice how mutations may or may not effect behavior.** |
| **Evaluation/Decision Point Assessment** | **Assessment** | **Student Outcomes** |
| **Formative: What type of mutation caused the most DRASTIC change in behavior and why? Site evidence from your data** | **Check on student learning to start discussion for following day.** | **Misconceptions addressed.** |

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| **ELABORATION Time: 2 days** | | |
| **What the Teacher Will Do** | **Probing/Eliciting Questions** | **Student Responses and Misconceptions** |
| **Propose different versions of the virus.** | **How do mutations cause a variation in symptoms of a virus?** | **Students will connect how this would connect to real life like the flu.** |
| **Evaluation/Decision Point Assessment** | **Assessment** | **Student Outcomes** |
| **Literacy piece: propose and argument about how 2 people that have the flu might have a variation of symptoms.** | **Students will used evidence to prove thinking.** | **Essay submitted.** |

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| **EVALUATION Time: 2 days** | | |
| **What the Teacher Will Do** | **Probing/Eliciting Questions** | **Student Responses and Misconceptions** |
| **Scored DNA sequences submitted by students on a track** | **none** | **Product submitted** |