LESSON PLAN – Computer Programming

Title: Hobbits vs. Nazgul – Test Prey, Start Loops

Essential Questions	Can we model life-like behavior with Python? How can we apply our expanded understanding of data types and storage?

Learning Objectives:	Students will be able to: ● Rigorously test code, especially for edge cases ● Create a function that will loop over the whole grid to execute a game "day"

Standards (CSDF)	
9-12.CT.4	Implement a program using a combination of student-defined and third-party functions to organize the computation.
9-12.CT.5	Modify a function or procedure in a program to perform its computation in a different way over the same inputs, while preserving the result of the overall program.
9-12.CT.7	Design or remix a program that utilizes a data structure to maintain changes to related pieces of data.
9-12.CT.8	Develop a program that effectively uses control structures in order to create a computer program for practical intent, personal expression, or to address a societal issue.
9-12.CT.9	Systematically test and refine programs using a range of test cases, based on anticipating common errors and user behavior.
9-12.CT.10	Collaboratively design and develop a program or computation artifact for a specific audience and create documentation outlining implementation features to inform collaborators and users.

Teaching Materials:

Student handouts (attached)
Student computers

Procedure:

I. Checklist from previous day
   A. Confirm that previous day's tasks are complete
   B. Adjust plan to allow for time outside of class if progress is an issue
II. Division of labor
   A. Students will need to rigorously test their movement and breeding code
      1. Check behavior of hobbits on the edges of the grid
      2. Check behavior of hobbits with no room to breed
   B. Students will develop function(s) to iterate over the game board and enact a "turn" for every creature
III. Student work time

Day 6 Checklist:

Testing cells and game loop of cells

You must have the following tasks accomplished before the end of class today.

Accomplished	Task
●	Make sure you have completed all of the tasks from yesterday's (Day 5) checklist Do you need to schedule time outside of class in case progress is an issue? Discuss with your team.
●	Division of labor and assignment of tasks. ● **Who works on what?** ● **Again, who should take on what responsibilities unless that/those person(s) are out for the day?** ● **What needs to happen if a team member is stuck or becomes frustrated?** *Collaboration is encouraged if the team feels it necessary to be successful.*
●	● You will need to **rigorously** test both your movement and breeding logic. This is because we are going to start creating our gaming loop
●	● Check behavior of hobbits on the edges of the grid. ○ Again, do the characters behave the way you expect them to? How should the

	logic be modified if it does not? ○ What should happen if hobbits have no room to breed? How should the Nazgul respond or adapt?
●	● Develop functions that will help you create your gaming loop ○ It should cycle (***iterate***) over the entire gameboard ○ Every creature on the board should have a **“turn”** (turn-based)