# LESSON PLAN – Computer Programming

**Title:** Hobbits vs. Nazgul – Polish

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

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| **Learning Objectives:** | Students will be able to:<br>● Implement fully functional 2-organism cellular automata<br>● Present a clear and organized display of the game grid over multiple generations |

| **Standards (CSDF)** | |
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| 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 finish any remaining predator logic
   B. Students will rigorously test their program to ensure that it works properly
   C. Students will refine their display so that it is clear to the viewer
III. Student work time

# Day 9 Checklist:
# Test and retest your code
# Refine user's view of the world

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 8) checklist<br><br>Do you need to schedule time outside of class in case progress is an issue? Discuss with your team. |
| ● | Finish remaining predator logic |
| ● | ***Rigorously*** test your logic continuously throughout your coding processes |
| ● | ***Refine*** and ***polish*** the view of the world so that it is clear to the user<br>• How do we do this?<br>• How do we clear the screen when we need to display a new state of the world? |