NYS Standards:

4-6.CT.4 Decompose a problem into smaller named tasks, some of which can themselves be decomposed into smaller steps.

4-6.CT.5 Identify and name a task within a problem that gets performed multiple times while solving that problem, but with slightly different concrete details each time.

4-6.CT.6 Compare two or more algorithms and discuss the advantages and disadvantages of each for a specific task.

4-6.CT.7 Identify pieces of information that might change as a program or process runs.

4-6.CT.8 Develop algorithms or programs that use repetition and conditionals for creative expression or to solve a problem.

7-8.CT.4 Write a program using functions or procedures whose names or other documentation convey their purpose within the larger task.

7-8.CT.5 Identify multiple similar concrete computations in a program, then create a function to generalize over them using parameters to accommodate their differences.

7-8.CT.6 Design, compare and refine algorithms for a specific task or within a program.

7-8.CT.8 Develop or remix a program that effectively combines one or more control structures for creative expression or to solve a problem.

7-8.CT.10 Document the iterative design process of developing a computational artifact that incorporates user feedback and preferences.

High level description of unit content:

This will be a project-based unit that will occur right after an introduction to Python. The students have previously learned how to create print/assignment statements, debugging techniques, expressions, pseudo code, and different variable types. Throughout this unit, students will learn about if statements, loops, arrays, and lists. Using this knowledge combined with their previous knowledge, students will be able to create their own games. The goal of this unit is to create a collection of mini-games inside a bigger

game board, similar to Mario Party. After completion, students will be able to share their projects with their classmates, who will play and provide feedback to improve the game.

Rationale for creating the unit:

According to the NYS Computer Science & Digital Fluency Standards for sixth grade, students are required to learn algorithms and programming. While programming can be fun, it can be challenging to understand at times as well. What better way to learn a complex topic than through interactive fun and games. Within this effective game-based learning environment and experimentation, students can actively learn and practice the right way to program using Python.

A Chinese proverb says: *"Tell me, and I'll forget. Show me, and I may remember. Involve me, and I'll understand."*

Placement of unit in existing class/sequence:

Students will begin the text-based programming language, Python, at the end of the block code programming language and after the beginning of the text-based program language, Python.