Lesson 10: Tic Tac Toe Game

In this lesson, students will learn about the concept of iterative and final testing in programming as they create a Tic Tac Toe game using Python. They will understand the importance of using a 2D list to represent the game board and learn how to access and modify its elements. Through scaffolded code templates and guided practice, students will work in groups or pairs to complete the game, applying their testing skills to identify and fix errors. Independent practice and thorough testing will be encouraged, and students will have the opportunity to reflect on their learning through an exit ticket.

## **Objectives:**

- Students will be able to use a 2D list as part of a programming challenge.

- Students will demonstrate their understanding of iterative and final testing.

- Students will apply their testing skills to perform tests on their program.

- Students will create a Tic Tac Toe game using Python.

## **Materials:**

- Computers with Python IDE installed

- Project rubric

- Whiteboard or projector for demonstrations

## **Bell-Ringer Activity (5 minutes):**

- Display the following question on the board: "What is a 2D list in programming?"

- Allow students a few minutes to think and write down their answers.

- Afterward, ask a few students to share their responses with the class.

## **Introduction (10 minutes):**

- Remind students about the concepts of iterative and final testing in programming.

- Explain that in today's lesson, they will be applying their testing skills to create a Tic Tac Toe game using Python.

- Show a brief demonstration of the Tic Tac Toe game to give students an idea of what they will be creating.

- Emphasize that the program may be complex, but scaffolding will be provided to support their learning.

- Inform students that they may reach different levels of completion for this project, and a rubric will be used to assess their work.

## **Direct Instruction (20 minutes):**

- Explain the rules and mechanics of the Tic Tac Toe game.

- Discuss the importance of using a 2D list to represent the game board.

- Demonstrate how to create a 2D list in Python and how to access and modify its elements.

- Provide examples of how to check for winning conditions in the game using the 2D list.

- Explain the concept of iterative testing and how it can be used to identify and fix errors during the development process.

- Discuss the importance of final testing to ensure the program works correctly before completion.

## **Guided Practice (30 minutes):**

- Divide the class into small groups or pairs.

- Provide each group with a scaffolded code template for the Tic Tac Toe game.

- Instruct students to work together to complete the code, following the provided instructions and using the 2D list to represent the game board.

- Encourage students to use iterative testing to identify and fix errors as they progress.

- Circulate the classroom to provide guidance and support as needed.

## **Independent Practice (20 minutes):**

- Instruct students to continue working on their noughts and cross game independently.

- Encourage them to apply their testing skills to perform thorough tests on their program.

- Remind students to refer to the rubric to ensure they meet the required criteria for assessment.

- Monitor their progress and provide assistance as necessary.

## **Exit Ticket (5 minutes):**

- Distribute exit tickets to each student.

- Ask students to briefly explain the purpose and importance of using a 2D list in the Tic Tac Toe game.

- Collect the exit tickets before the end of the class.

## **Closure (5 minutes):**

- Recap the main points of the lesson, emphasizing the use of a 2D list in the Tic Tac Toe game.

- Discuss any challenges or successes students encountered during the lesson.

- Remind students to continue working on their Tic Tac Toe game outside of class if necessary.

- Encourage them to apply their testing skills to ensure their program functions correctly.

- Thank the students for their participation and effort in the lesson.

**Common Core Standards:**

- CCSS.ELA-LITERACY.RST.9-10.3 - Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

- CCSS.ELA-LITERACY.RST.9-10.4 - Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.