Computer Coding Lesson Plan: Blockly Maze Game

Grade Levels: 3-5, 6-8, 9-12

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In this lesson plan which is adaptable for grades 3-12, students use BrainPOP resources (including an online game) to explore computer coding, algorithms, and programming.

Lesson Plan Common Core State Standards Alignments

Materials:
- Computers with internet access for BrainPOP
- Class set of **Graphic Organizer** photocopies

Preparation:

This lesson plan uses a free online game from Google called Blockly: Maze. In this game, students are introduced to concepts behind simple computer programming with a graphical editing tool that uses blocks instead of typed characters. Students will learn to drag blocks together to build a simple web application. Running the app, students must instruct a character to move properly through a maze in order to reach a specified target. As they succeed in early levels, they will advance to more and more complicated tasks. The game covers simple directional commands, simple loops, while loops, and if-then-else statements.

Lesson Procedure:

1. As a warm-up, have students complete the **Graphic Organizer**.
2. Have students trade papers with a friend and attempt to follow the directions exactly as they are written. Instruct students not to make any inferences at all.
3. Ask student volunteers to share examples of missed or unclear steps in the algorithm and talk about how those mistakes affected the outcome.
4. Draw students' attention to the directions that read, "If they can't follow it, you'll need to iterate." What does the word "iterate" mean in this context?
5. Play the **Computer Programming** movie for the class and have students share in their own words what it means to create computer code.
6. Encourage students to relate the warm-up activity to computer programming. What happens when there is an error in an algorithm provided for a computer?
7. Tell students they will have the chance to create and test out an algorithm in an online game called Blockly. Have students explore the game independently or in pairs for approximately 5-10 minutes.
8. Have students take a brief break from game play to talk about what they noticed, and what they learned about creating an accurate algorithm.
9. Provide an additional 5-15 minutes for students to advance through additional levels of Blockly and apply the understandings they gained during the class discussion.
10. Encourage students to create their own version of the Blockly game, either online or offline. Have them work collaboratively to design an opportunity for classmates to practice coding and writing algorithms in order to complete a specific task. Allow students to explore one another's games and relate them to what they know about computer programming.
11. For additional assessment of student learning, you can use the **Activity**, **Movie Quiz**, or the game quiz.