A-Maze-ing Code	Grade 1

Lesson Plan

Description

An introductory, unplugged coding activity that allows Grade 1 students to explore directionality, sequencing, critical thinking and problem solving. This will allow students to explore beginning coding concepts and use cooperative games to experiment with coding.

Learning Outcomes

- Learners will describe the maze they built to get from the beginning of the maze to the end.
- Learners will plan and design a maze using the materials provided.
- Learners will explain directionality using proper coding terminology (e.g. "This arrow goes right," "We need to go up," and "Stop. There's something in the way.").
- Learners will use arrows to help them go from the beginning of the maze to the end of the maze.

Specific Expectations

C3.1 solve problems and create computational representations of mathematical situations by writing and executing code, including code that involves sequential events.

C3.2 read and alter existing code, including code that involves sequential events, and describe how changes to the code affect the outcomes

E1.4 describe the relative locations of objects or people, using positional language

E1.5 give and follow directions for moving from one location to another

Introduction

Whole Group Lesson:

1. Make a large 4x4 grid on the floor (chalk, tape, etc.). Explain to students that together, we will be trying to get from Point A to Point B using directions.
2. Ask a student to place the A in a square and the B in another square. Then, we ask students to hypothesize about how they could travel the grid from Point A to Point B.
3. Introduce coding language that everyone will be using to group: UP, DOWN, TURN, LEFT, RIGHT.
4. Choose a student to travel the grid from Point A to Point B, based on the recommendations of their peers.

This activity can be done several times to practice, by moving Point A and Point B, or by adding students as obstacles in the grid that they then have to work around.

Action

Set Up & Material: *Each student is given a copy of the Grid (Appendix A), as well as several arrows of different varieties (straight arrow, straight-left arrow and straight-right arrow) (Appendix C). Students are also given a Start square (start position) and End square (end goal) (Appendix B). Students are also given several Red Stop Sign squares as obstacles (Appendix B).*

- Encourage student to experiment and plan their maze. Student place Start and End on the grid, then places the arrows on the grid to get from Start to End. Each arrow takes up a whole square; arrows are put down in the direction that the Student wants them to travel to help them get from Start to End. If students show readiness signals, encourage Student to put in obstacles (stop signs) on the grid to make it more challenging, so that they must use arrows to go around obstacles to get from Start to End. While playing, Student shares problem solving strategies using language learned during the Large-Group activity. Examples of possible language: "I need to move two squares up," "Turn left," "Move three spaces down."
- Once Student thinks that they have completed their code, they are encouraged to review their code to ensure that their arrows line up.
- Once the Student reaches Point B, the Student and Educator discuss the process that the student undertook to accomplish the task. Student can retell and explain their reasoning. The game can be reset and readjusted as needed.
- This game can also be played by two players, where students take turn being the 'programmer' (who gives instructions) and the 'robot' (who follows the instructions given by the programmer).

Extension

- Students are provided with example grids that they must replicate, then use coding skills to solve.

Accommodations/Modifications	**Assessment**
Grids can be adapted to be as big or small as needed for student learning. Obstacles within the grid can be as few or as many as the student can handle.	A pre-made grid is shown to the students. Students are asked to record the code that they would need to use to get from Point A to Point B on their Exit Ticket (Appendix D) Exit ticket: "Record the code you used to solve the puzzle."

Additional Resources

Materials Needed:

- Appendix A, B, C, D.