That's A"MAZE"ing

Submitted by: Linda Bugg, 2nd Grade
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Target Grade: 2nd Grade Technology

Time Required: 90 minutes

Standards:

Tennessee Technology Standards:

- 2.2.3: Students will develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.
- 6.0: Students will utilize technology problem-solving and decision-making tools.
- 6.1: Students will use technology resources for solving problems and making informed decisions.

Tennessee Math Standards:

- 2.MD.A.1: Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
- 2.MD.A.3: Estimate lengths using units of inches, feet, yards, centimeters, and meters.

Lesson Objectives:

- Students will use proper estimating and measurement skills to make a maze.
- Students will use beginning level programing skills to program a bee-bot to complete the maze.

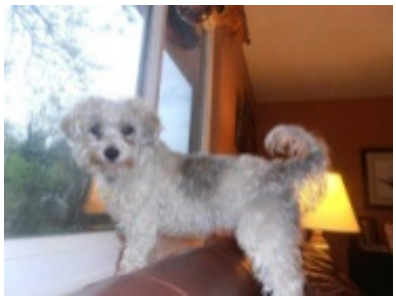
Materials:

- bee-bot
- meter sticks
- painter's tape (or masking tape)
- calculators
- handout of maze dimensions

Introduction:

Generate interest in the activity by showing pictures and talking about your own dog before the lesson starts. Personalize the maze to be about getting your dog off of the deserted island. You can also connect this lesson to a story that students are reading in class and make one of the characters stranded on the island.

The Task:



Marvin, the dog, is stranded on a deserted island. Your job is to program your bee bot to rescue him. Constraints: The bee bot moves 15 cm for each forward button, and only turns 45 degree angles. The maze must use the dimensions shown. (Maze will be displayed on a screen for students to see).

Show the students the following intro to coding video. https://www.youtube.com/watch?v=THOEQ5soVpY (2 minutes)

Instruction:

Show students the following video to understand how to program a bee-bot. https://www.youtube.com/watch?v=uMorb_m_qK0 (2 minutes).

Whole group: (15-20 minutes) Teacher will model how to measure and estimate distances, while constructing the first two legs of the maze. Teacher will model how to test each leg of the maze, before moving to the next segment.

Maze Construction and testing: (50-60 minutes) Students will work in groups of three to four to measure and tape out the maze according to the dimensions given by the teacher. Then, students will work together to write the appropriate code to rescue Marvin!

Extension: If time allows, or in the next class period, invite students to create their own floor mazes. Students would be required to measure it out and create a map (like the teacher did originally). Students should also create a key for the code that completes the maze. Students can then trade with another group to work on writing the code to complete each other's mazes.

Differentiation:

Student groups will be pre-determined so that students with language barriers and special needs are in groups that can either translate or assist when necessary. I teach all students in the school and am aware of who will be helpful in this process. Anticipated problems: Not knowing new students to our school and not knowing how well they can collaborate with others.

Assessments:

Formative: class discussion on measuring, practice in measuring in cm (5 minutes).

Summative: The bee bot either saves Marvin or doesn't. Self reflection, on what went right or wrong (Exit Ticket 5 Minutes)

Exit Ticket:
What's one important thing you learned in class today?
Did you feel prepared for today's lesson? Why or why not?
What did you find difficult about this lesson?
What would have made it more effective?

Closure:

Teacher will lead a class discussion of the trials and successes in completing the maze after the exit tickets are complete. Introduction to the next lesson: Kodable; programming on the computer, instead of programming a robot. https://www.youtube.com/watch?v=Zg3GTzgFUPA

Maze Dimensions