

MAZE MAYHEM

OVERALL TIME 1- to 2-hour lesson

GROUPS Three to four kids

PROGRAMMING LEVEL Intermediate
Block: Simple Controls (Loops), Sensors, and Comments

CONTENT THEME Technology & Engineering

OBJECTIVE

- I will evaluate a maze for the **quickest and most efficient solution.**
- I will create a program to navigate the Sphero BOLT through a maze using **Blocks and the Blocks Canvas.**

OVERVIEW

Program the Sphero BOLT to navigate your own original maze. To complete this challenge, you must gather data about the best route through the maze and figure out how to build a program so the Sphero BOLT can successfully navigate through the mayhem.

MATERIALS

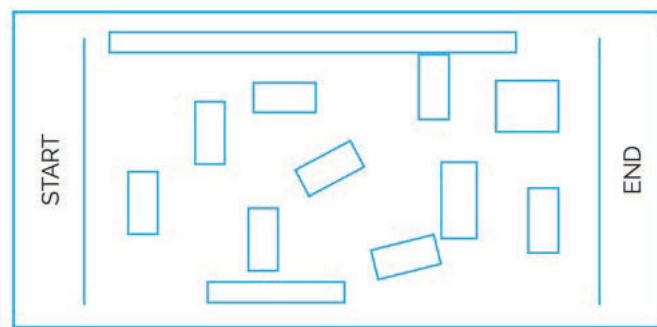
- **Sphero BOLT**
- **Sphero BOLT Maze Tape (or masking tape)**
- **Stopwatch or timer**
- **Measuring tape or rulers**
- **Protractors**
- **Large space on the floor**
- **Books and other everyday objects to build the maze**

EXPLORATION: MAZE INSPIRATION

What does it take for the Sphero BOLT to navigate a maze? It's definitely more than just driving it around. In this activity you will gather data and program the most efficient path through a maze.

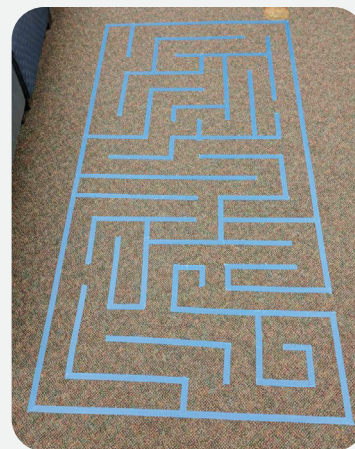
Below is a video and an image with examples of possible mazes.

► <https://youtu.be/X9rEIBhT9nE>



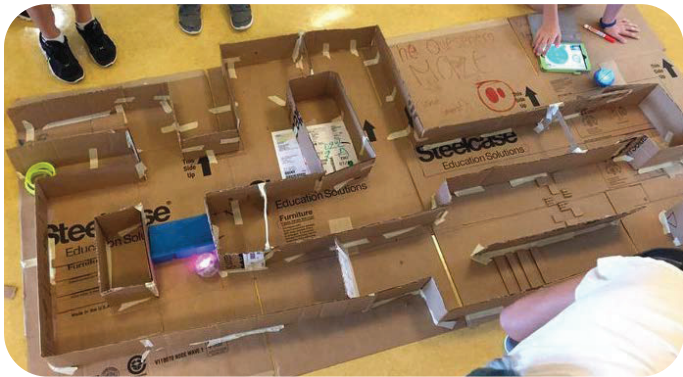
EXPLORATION: MAZE BUILDING

Your maze can be as simple as blue tape on the floor. It doesn't take much to create a path for the Sphero BOLT to navigate. If you have the space, grab some object from around the room to create walls and a path for the Sphero BOLT. Things like books, LEGO® bricks, boxes, shoes, or even waste baskets will work.



As you create this maze, add some obstacles to make the path more difficult. Narrow passages can be tricky too.

SKILLS BUILDING: HOW FAR DOES THE SPHERO BOLT TRAVEL?



To navigate the maze quickly and efficiently you'll want to determine how far the Sphero BOLT travels. You will need to know how far the Sphero BOLT travels in a set period of time (for example, in 1 second). Watch the video below to get started.

► https://youtu.be/_RDZQvh3QIc

Create a program that will help you take this measurement. (**HINT:** Start with a simple roll block, set the speed and set the duration to one second.)

SKILLS BUILDING - NAVIGATING THE MAZE

Using the data you gathered in Step 3, write down instructions for what you want the Sphero BOLT to do. Draw the maze on a piece of paper, determine the Sphero BOLT's path and take measurements of distances and angles. Something like this:

- Go straight for 40 cm
- Stop
- Turn left 90 degrees
- Go straight for 20 cm

Next to each instruction, write which block you would need to complete that instruction. When you are done, you will have step-by-step instructions for the Sphero BOLT to move through the maze.

CHALLENGE: MAZE MAYHEM!

Time to put all of the planning to work and start programming!

Test your program as you go. Modify the program as needed. Remember you are programming for quickness and efficiency.

HINT: If you find that the Sphero BOLT isn't turning consistently or as sharp as you'd like, explore the Delay block under "Controls."

REFLECTION

Write your reflections on this activity.

- *What worked and what didn't?*
- *How would you do things differently in the future?*
- *What route worked best?*
- *What was the trickiest part of the maze?*
- *What was the most challenging part of the activity?*