

SPRK Maze Challenge

Freebie!



STEM for the
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SPRK Maze Challenge

Overview: Students will apply programming and measurement skills to code a SPRK+ robot to navigate a maze autonomously.

Background: Engineers send commands to rovers on Mars to navigate autonomously.

Materials per team (2 – 3 students):

- SPRK robot
- iPad
- Worksheet
- Pencil
- Ruler
- Protractor
- Clipboards

Set-up:

1. Open Lightning Lab and login to school account on each iPad.
2. Create 3 - 4 different mazes from masking tape ranging from easy to hard. Make sure to create a minimum 1 foot wide track to allow for margin of error.
3. Assign student teams to a maze. Students can be assigned roles such as *planners* who plan the route using angles and measurements and *coders* who use the iPad to program the commands into the SPRK robot.

Read more tips at our blog post at vivifystem.com/blog.



Program Planners

1. Using the paper provided, draw out your maze.
2. Take measurements to determine the distance and angles the SPRK will need to travel.
3. Write out the commands needed to navigate your maze. For example – Go straight 7 cm, Make a 90 degree angle, Go straight 8 cm.

Coders

1. Open the Lightning Lab app. Go to Programs (bottom row). Click “+”. Name your program, and choose “Block” program type. Click “Create”.
2. To figure out how far SPRK goes in one second: click on “Actions” at the bottom and then drag “Roll” command into workspace.
3. Determine what you need to set the “Speed” and “Time” to get different distances.
4. Use commands from Program Designers and table to program your SPRK to navigate maze. See below for a sample program. “Delay” command is found in the “Controls” tab.
5. Test results in maze and modify as needed!

