SPRK Maze Challenge

Freebie!

Vivify

STEM for the Classroom

Thank You!

Thank you for downloading a Vivify product! If you have any questions, please email us at info@vivifystem.com.

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About Vivify

Vivify is a team comprised of two Aerospace Engineer friends, Natasha and Claire, who live in Texas. We met as college classmates and roommates at Texas A&M University and later left engineering careers in the Department of Defense and Air Tractor to pursue our passion for STEM education. Learn more of our story here.

Our goal is to bring engineering to life—to vivify learning—for kids of all ages. Please connect with us so we can learn how to better serve your students!

- Natasha & Claire, The Vivify Team

Connect with us for free STEM resources!

Subscribe to our newsletter and receive access to a library of free STEM resources through www.vivifystem.com. Follow us on social media or listen to "The STEM Space" podcast for more resources and ideas. We also welcome you to join "The STEM Space" Facebook group to connect with other educators across the world.

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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.

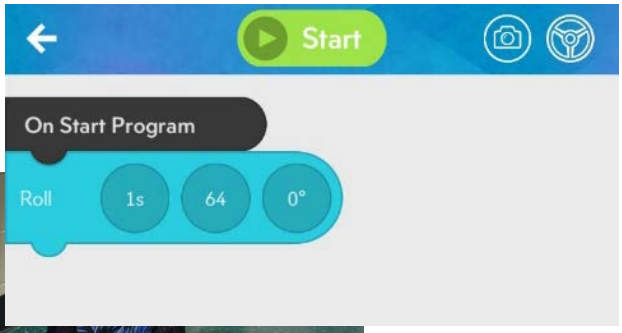
Read more tips at our blog post at vivifystem.com/blog.

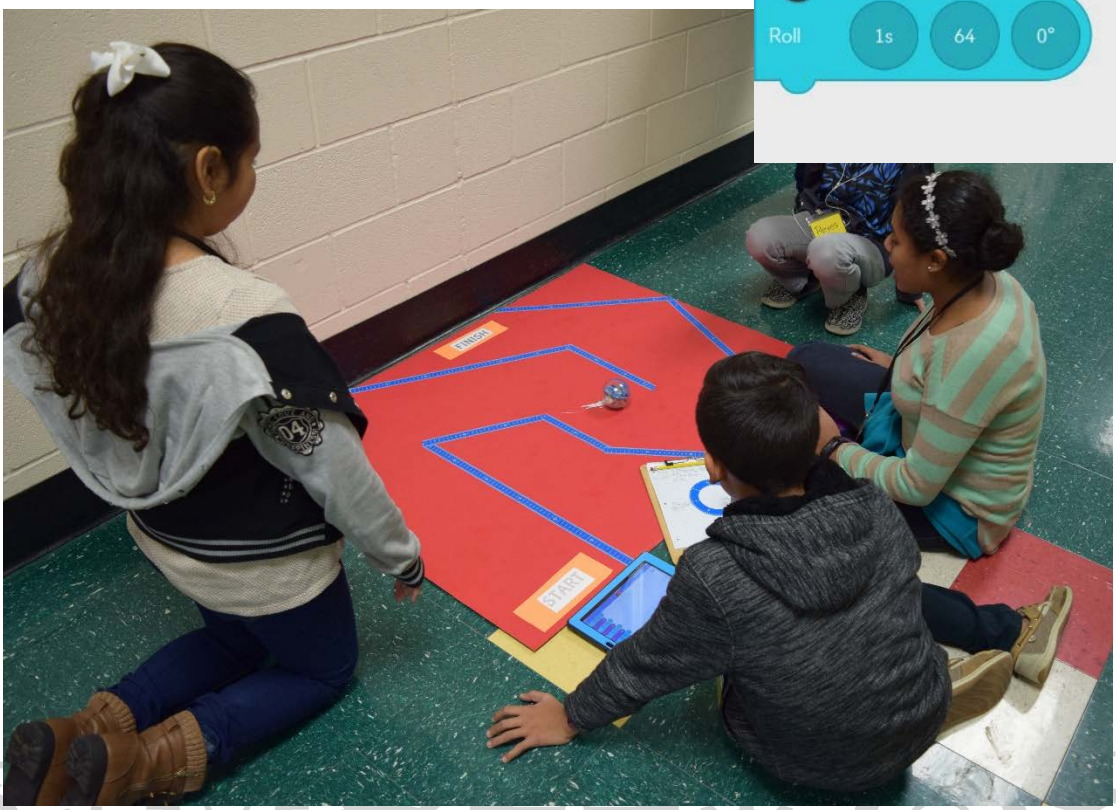
Program Planners

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!





WANT MORE STEM?

For a complete list of all of Vivify STEM resources broken down by standards, topics, and grade levels, go here: http://bit.ly/VivifyResourceGuide

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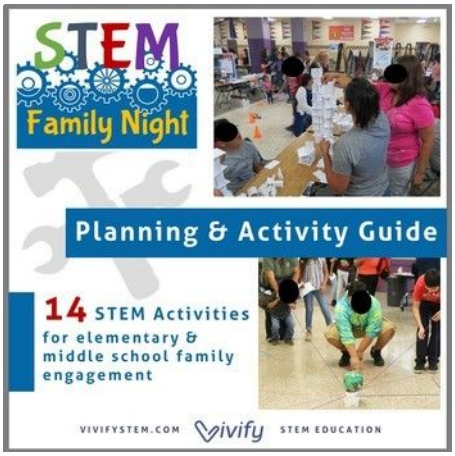

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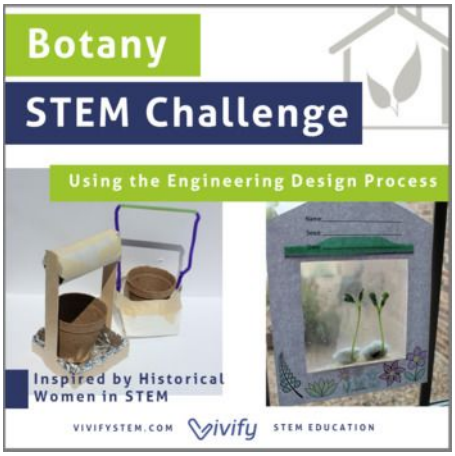

bit.ly/Vivifybotany

Vivify's Overview of STEM Education

Successful STEM education is an empowering interdisciplinary approach that brings math and science concepts to life through problems that mimic the complexities and excitement of the real world. STEM revolves around the Engineering Design Process that embraces failure, relies on teamwork, and requires critical thinking and creativity. While exciting, educators often become intimidated as a search for curriculum leads to an overwhelming range of activities from index towers to robotics competitions. At Vivify, we believe that not all STEM is created equal. Educators should adopt a 3 Stages of STEM approach by progressively building towards more complex projects.

To learn more about the 3 Stages of STEM, go here: http://bit.ly/stemstages