

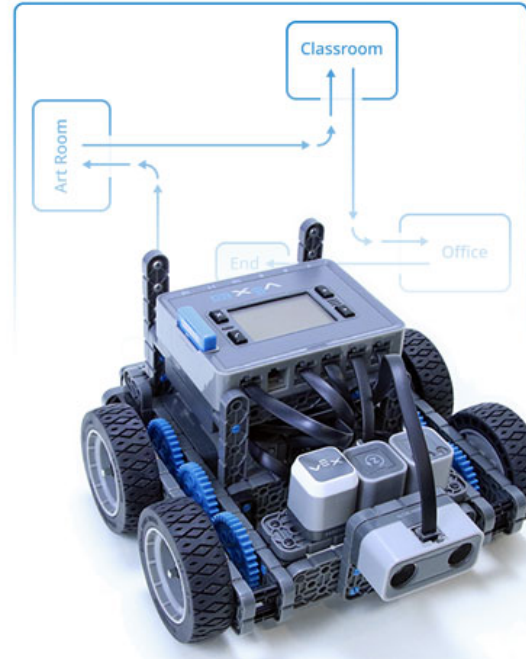
Movement Challenge Letter Home

Introduction

Science, Technology, Engineering and Mathematics (STEM) education provides opportunities for students to engage in important life skills like teamwork, communication, and project-based organization. Robotics is an ideal approach to acquiring these STEM skills as students work together to solve various engineering challenges.

The following VEX STEM Lab builds on fundamental robotics coding skills students learned in the Forward and Reverse STEM lab and Turning STEM lab. Students will apply these foundational skills to solve an open-ended challenge they help to design.

Please keep this letter for your reference as your student works through the Open-Ended STEM Lab. It contains information that you can use to keep up to date on what students are learning and to spark discussions about STEM and Robotics at home.



Look Inside the STEM Lab

In this lab, students will first have the opportunity to build the Autopilot as a team. Students will be introduced to a scenario where the Autopilot needs to collect recycling, and asked to design a map for the Autopilot to follow. Students will then create a project using VEXcode IQ Blocks to navigate this map.

Students will discuss how robots benefit different industries in their community, as well as be introduced to a worldwide robotics competition for VEX users.

Students will have an opportunity to re-evaluate their original project and determine what changes should be made. Students can revise their projects after reflection. As a group, students can look at other ways to program more efficiently.

Vocabulary

The following vocabulary terms are introduced in this lab, and students will become familiar with them as they work through the activities. Asking your student if they can tell you about these terms can spark discussion and help the student cement what they've been learning.

Autopilot

The robot build that is used for the STEM Lab. This robot is the result of the first hands-on lesson the students will accomplish. It is used to complete the rest of the STEM Lab activities.

VEXcode IQ Blocks

A block-based programming language used to program a VEX IQ robot.

Behavior

An instruction that is downloaded to a robot brain, which is then executed. Programs usually consist of several behaviors combined in a logical succession.

Parameter

A limit or boundary that defines the scope of a particular process or activity.

Spatial Reasoning

Thinking about how spaces and objects relate to each other.

Scale

A mathematical concept used to change the relative size relationship of objects from a smaller to larger size.

Sequencing

Arranging code blocks in a specific arrangement in order to achieve a goal.

Real World Connection

Students will discuss how robots are used in the real world to complete tasks humans do not want to do and improve the environment, like picking up trash. Students will be introduced to the VEX Robotics Competitions, in which teams of students are tasked with designing and building a robot to play against other teams in a game-based engineering challenge.

Guiding at Home Questions

1. What was it like to create a design plan for the Autopilot?
2. What steps did you follow to go from your design plan to the final project?
3. What is the most challenging part about programming your robot accomplish the recycling task?

You can explore the STEM Labs at <https://education.vex.com/>.

Movement Challenge Checklist

- ☐ Seek
 - ☐ The Completed Look of the Build
 - ☐ Parts Needed
 - ☐ Build Instructions
 - ☐ Exploration Questions
- ☐ Play
 - ☐ Recycle Robot Run
 - ☐ Program Specificity - Putting a design to work
 - ☐ Open-ended STEM Lab Exploration
- ☐ Apply
 - ☐ Italy's Trash Robot
 - ☐ Competition with a Purpose!
- ☐ Rethink
 - ☐ Improve and Remix Your Project
 - ☐ Remix Challenges
- ☐ Know
 - ☐ Know Questions