Goals and Standards

Implementing VEX GO STEM Labs

STEM Labs are designed to be the online teacher's manual for VEX GO. Like a printed teacher's manual, the teacher-facing content of the STEM Labs provides all of the resources, materials, and information needed to be able to plan, teach, and assess with VEX GO. The Lab Image Slideshows are the student-facing companion to this material. For more detailed information about how to implement a STEM Lab in your classroom, see the Implementing VEX GO STEM Labs article.

Goals

Students will apply

- How to create and start a VEXcode GO project that makes the Code Base move forward, backward, and turn.
- How to create and test a project that has the Code Base drive to and from multiple sites.
- Drivetrain blocks in the correct sequence to create a project to solve a challenge.

Students will make meaning of

- How to solve a challenge with the Code Base and VEXcode GO.

Students will be skilled at

- Using build instructions to build the Code Base 2.0 - LED Bumper Top.
- Connecting a Brain to a tablet or computer in VEXcode GO.
- Saving and naming projects in VEXcode GO.
- Adding VEXcode GO blocks to a project.

Copyright ©2024 VEX Robotics, Inc.

- Sequencing blocks in a project.
- Using Drivetrain blocks in a project to have the Code Base drive to a specific location.
- Changing parameters in VEXcode blocks.
- Starting and stopping a project in VEXcode GO.

Students will know

- How scientists use rovers to collect and bury samples of soil and rock for future collection, in order to study changes on Mars over time.
- How to use VEXcode GO with the Code Base to solve a challenge.

Objective(s)

Objective

1. Students will develop a VEXcode GO project that orders behaviors in a sequence to complete a challenge.
2. Students will communicate behaviors, through words and gestures, that the Code Base will need to complete in order to accomplish a task.

Activity

1. In the Engage section, students will follow along with the teacher as they build a project to collect and “bury” the first sample together. In Play Part 1, students will create and test a VEXcode GO project that has the Code Base drive to collect two samples. In Play Part 2, they will add to their project to have the Code Base collect a third sample. Students can choose the order in which the Code Base drives to collect the samples.
2. Students will describe how the Code Base moves forward, backward, and turns in order to drive to collect a sample as they build a project during Engage. In the Play sections, students will describe how to move the Code Base to collect multiple samples and return them to the base as they add to their projects.

Assessment

1. Students will create a project that successfully sequences Drivetrain blocks to move the Code Base to collect two Mars soil samples in Play Part 1. In Play Part 2, students will successfully add to their projects to have the Code Base collect a third sample. In Share, students can demonstrate their projects and discuss how they ordered the blocks in the project to complete the challenge.
2. In the Mid-Play Break, students will discuss how they ordered the blocks in their project. In the Share section, students discuss their projects using words and gestures to show how the Code Base moved.

Copyright ©2024 VEX Robotics, Inc.

Connections to Standards

Showcase Standards

Computer Science Teaching Association (CSTA)

CSTA 1A-AP-10: Develop programs with sequences and simple loops, to express ideas or address a problem.

How Standard is Achieved: In the Play section activities, students will build a VEXcode GO project to drive the Code Base to collect samples from three distinct locations on a GO Field, then return them to the base to be “buried.” Students will need to sequence the commands in their project so that the Code Base drives to the location, collects the sample, returns to the base, and buries the sample. In the Share section, students will discuss how they built their VEXcode GO projects, and compare projects with other groups to identify that there are multiple ways that commands can be sequenced to achieve the goal of the challenge.

Showcase Standards

Common Core State Standards (CCSS)

CCSS.ELA-LITERACY.L.3.6: Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases, including those that signal spatial and temporal relationships.

How Standard is Achieved: Students will describe the intended movement of the Code Base using spatial language as they build VEXcode GO projects in the Engage and Play sections of the Lab. In the Mid-Play Break, students will discuss how they sequenced movements for the Code Base to collect and bury samples. In the Share section, they will describe how they coded the Code Base to move in their project, as compared to how other groups made the Code Base move to complete the challenge.

Summary

Materials Needed

The following is a list of all the materials that are needed to complete the VEX GO Lab. These materials include student facing materials as well as teacher facilitation materials. It is recommended that you assign two students to each VEX GO Kit.

In some Labs, links to teaching resources in a slideshow format have been included. These slides can help provide context and inspiration for your students. Teachers will be guided in how to implement the slides with suggestions throughout the lab. All slides are editable, and can be projected for students or used as a teacher resource. To edit the Google Slides, make a copy into your personal Drive and edit as needed.

Other editable documents have been included to assist in implementing the Labs in a small group format. Print the worksheets as is or copy and edit those documents to suit the needs of your classroom. Example Data Collection sheet setups have been included for certain experiments as well as the original blank copy. While they offer suggestions for setup, these documents are all editable to best suit your classroom and the needs of your students.

Copyright ©2024 VEX Robotics, Inc.

Materials	Purpose	Recommendation
Pre-Built Code Base 2.0 - LED Bumper Top	For demonstration purposes.	1 for demonstration
VEX GO Kit	For students to build the Code Base robot.	1 per group
Code Base 2.0 Build Instructions (3D) or Code Base 2.0 Build Instructions (PDF)	For students to follow to build the Code Base 2.0.	1 per group
Code Base 2.0 - LED Bumper Top Build Instructions (3D) or Code Base 2.0 - LED Bumper Top Build Instructions (PDF)	To add the LED Bumper to the Code Base 2.0 Build.	1 per group
Tablet or Computer	For students to use VEXcode GO.	1 per group
Lab 2 Image Slideshow Google / .pptx / .pdf	For visual aids while teaching.	1 for class to view
Robotics Roles & Routines Google / .docx / .pdf	Editable Google Doc for organizing group work and best practices for using the VEX GO Kit.	1 per group
Pencils	For students to fill out the Robotics Roles & Routines Checklist.	1 per group
Small classroom items (i.e. erasers, pom poms)	To use as samples in the challenge.	1-3 per group
Dry erase markers	To mark the sample locations and the starting point in the Field.	2 markers of different colors per group
Whiteboard eraser	To erase sample locations drawn on the Tiles at the end of the Lab.	1 per group
Pin Tool	To help remove pins or pry beams apart.	1 per group
VEX GO Field Tiles and Walls	To use as a testing area for the Code Base.	4 Tiles and 4 Walls per Field for testing
Small colored flags or colored paper (optional)	For students to indicate when they are ready to test their code on the Field.	3 flags or papers per group

Copyright ©2024 VEX Robotics, Inc.

Materials	Purpose	Recommendation
VEXcode GO	For students to build projects for the Code Base.	1 per group
Get Ready...Get VEX...GO! PDF Book (optional)	To read with students to introduce them to VEX GO through a story and introductory build.	1 for demonstration purposes
Get Ready...Get VEX...GO! Teacher's Guide (optional) Google / .pptx / .pdf	For additional prompts when introducing students to VEX GO with the PDF Book.	1 for teacher use

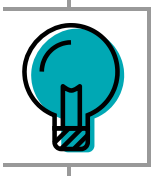
Engage

Begin the lab by engaging with the students.

Hook

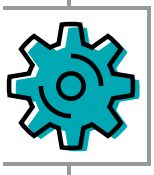
Students discuss how we can learn more about things by studying how they change over time (plants, animals, etc). The scientists studying Mars are looking for changes over time in the samples they are collecting, too. However, they can't bring those samples back to Earth immediately, so they have to bury them for a future mission.

Note: If students are new to VEX GO, use the Get Ready...Get VEX...GO! PDF book and Teacher's Guide (Google / .docx / .pdf) to introduce them to learning and building with VEX GO. Add an additional 10-15 minutes to your lesson time to accommodate this additional activity.



Leading Question

How do you think we can code our Code Base to "bury" our samples after collecting them?



Build

Copyright ©2024 VEX Robotics, Inc.

Play

Allow students to explore the concepts introduced.

Part 1

Students will build and test a VEXcode GO project where the Code Base collects two samples and takes them to the base so they can be “buried.” The Code Base can only carry one sample at a time, so it will need to drive out and back two times during this project. Students can choose the order in which the Code Base collects the samples.

Mid-Play Break

Students will discuss how they sequenced their projects to have the Code Base collect and bury two samples. How did they turn the Code Base around? What VEXcode GO blocks did they use? Why did they choose to pick up the samples in that order?

Part 2

Students will continue to work on their projects so the Code Base collects a third sample and takes it to the base to be buried.

Share

Allow students to discuss and display their learning.

Discussion Prompts

- How did your group choose the order in which to collect the samples? What VEXcode GO blocks did you use in your project, to make the Code Base move as you intended it to?
- What is similar or different about your group's sequence, compared to others in the class? What is one thing you learned from seeing how other students solved the same challenge?
- What is one thing your group had to work together to figure out as you were building your projects? What did you learn that will help you in future Labs?

Engage

Launch the Engage Section

ACTS is what the teacher will do and ASKS is how the teacher will facilitate.

Copyright ©2024 VEX Robotics, Inc.

ACTS	ASKS
1. Note students' answers on the board by writing down what they identified, and how it changes. Some examples could include: animals changing from babies to adults, leaves changing, plants blooming, landforms changing over long periods of time, etc. 2. Note students' responses and connect them to the changes you've already written down on the board. 3. Have students share their ideas, guiding them toward the idea that scientists are, in fact, looking for changes over time. Refer to the learning goals of the Mars 2020 mission, as shown in the Background Information, to help students connect to the actual Mars research that is occurring. 4. Have students share their ideas, and guide them toward the idea of using microscopes and testing samples in a lab here on Earth. 5. As students share their ideas, guide them to the fact that they need to keep the samples safe until another rover collects them to bring them back to scientists on Earth. Burying them means they can't get lost due to wind or changes on the surface of Mars. 6. Show students the GO Field set up for the Lab. Remind them that they can't actually bury a sample, but help them think of other ways they could represent "burying" with code. Suggest waiting or glowing a color on the LED Bumper, if students need help envisioning this.	1. What are some things that you know, have seen, or felt, that change over time? For example, the leaves on the trees change from season to season. What are some other things and changes that you know of? 2. Let's think about these things that we've listed. If we studied these changes over time, what kinds of things could we learn about? For example, we can learn about how old a puppy will be when it becomes a full-grown dog, or how rivers or oceans have changed landforms over thousands of years. 3. The scientists studying Mars are also looking for changes over time. What do you think they might be looking for, or looking to learn about? For example, one thing scientists are looking for are signs of water - to know if anything could have ever lived on Mars. Over time water can smooth rocks down, or leave other traces invisible to our own eyes. Scientists can code the rovers to look for rocks that might have been changed by water many many years ago. 4. We know that they are collecting rock and soil samples on Mars, how do you think the scientists will study those samples? 5. Scientists have to save those samples until they can be brought back to Earth, so they can study them. Guess what, to save them, they have to bury them on Mars! Why do you think they do that? 6. How do you think we can code our Code Base rovers to add this step to collecting our samples?

Getting the Students Ready to Build

Let's see how we can collect and bury the first sample with our Code Base! (If students do not have a pre-built Code Base 2.0 - LED Bumper Top from the previous Lab, allow an extra 10 minutes for students to build it prior to the Lab activities.)

Copyright ©2024 VEX Robotics, Inc.

Facilitate the Build

1

Instruct

Instruct students that they are going to work together to help the teacher collect and "bury" the first sample, using a Code Base and VEXcode GO.

Place the Field in a central location where all students are able to see it. View the animation below to see an example solution of how the Code Base could move to collect and bury the first sample.

2

Distribute

Distribute one pre-built Code Base 2.0 - LED Bumper Top, along with a tablet or computer with VEXcode GO open, for demonstration purposes. Students will collect their materials after the demonstration is complete.

Code Base 2.0 - LED Bumper Top build

- Turn on the Brain on, then connect the Brain on the Code Base to your device in VEXcode GO. Because connection steps vary between devices, see the Connecting articles of the VEXcode GO VEX Library for specific steps to connect the VEX GO Brain to your computer or tablet.

Copyright ©2024 VEX Robotics, Inc.

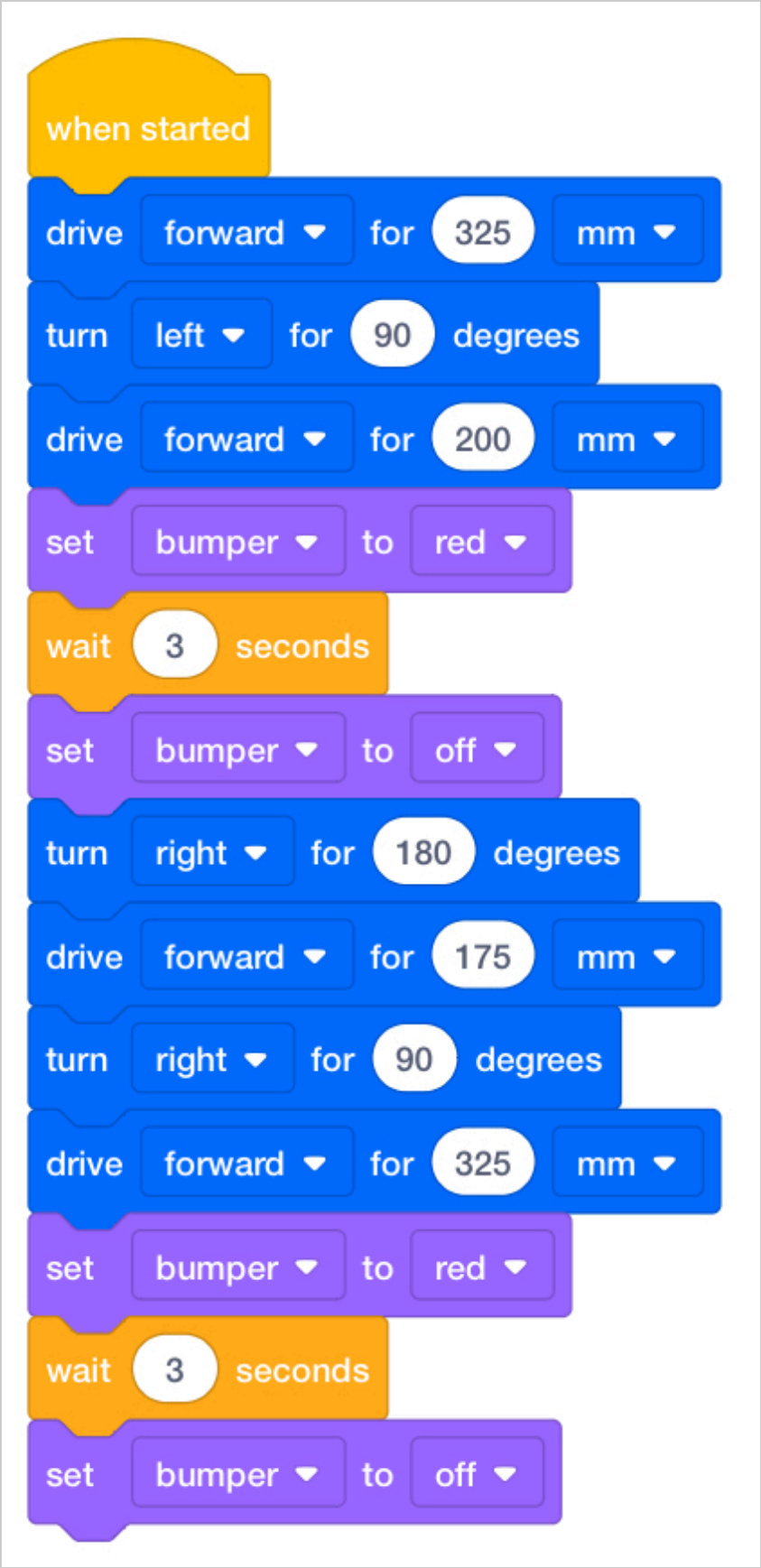
- Next, configure VEXcode GO for the Code Base. If necessary, model the steps from the Configure a Code Base VEX Library article and ensure students can see the Drivetrain blocks in the Toolbox.
- Identify with your students, which sample you are going to be collecting and burying first. The example code provided will navigate the Code Base to the pink collection point, as shown in the animation in the Instruct step.

3

Facilitate

Facilitate building a project together to collect and bury the sample, so that it can be returned to Earth in a future mission. Begin by identifying the four main actions needed - drive to the sample, collect it, drive back to base, and bury the sample. You can also have the Code Base rover signal that it is collecting and returning a sample by having the LED Bumper Sensor glow. Refer to the image below for an example of a possible solution.

Copyright ©2024 VEX Robotics, Inc.



Engage Possible Solution

 Copyright ©2024 VEX Robotics, Inc.

- As you build the project, ask students questions about how the Code Base needs to move, and how that connects to the blocks you use. You can this series of questions, as a guide to help you facilitate building the first half of the project (driving to the sample, and collecting it) together. Repeat them to build the second half (returning to the base, and burying the sample).
    - First, we need to drive to the sample. Who can show me, with their hands and words, how the Code Base needs to move to get to the sample?
    - Which block do you think will be first in our project to make our Code Base move that way?
    - How far does our Code Base rover need to travel? Who remembers how to change that parameter?
    - What blocks should we use to have the LED Bumper glow, to signal that it is collecting the sample?
    - We will have to also have the glow turn off, how can we have our LED Bumper glow for a set amount of time, then turn the LED off?
    - Now our Code Base needs to turn. How do I add that into my project? Who remembers how to set the [Turn for] block to left or right?
    - We're close to the sample! What is the last movement our Code Base needs to make to get there?
    - Ok, so we drove to the sample, now we need to collect it. Who remembers how we did that in Lab 1? What blocks do I need to add to my project? Let's test it to make sure we're on the right track.
- Test your project as you are building it to model that practice for students. Then, continue to ask questions and build the second half of the project (returning to the base, and burying the sample), as you built the first, and test it to make sure it solves the challenge.

4

Offer

Offer positive reinforcement for students who are actively engaging in the demonstration conversations, by taking turns to talk and listening to others. Remind students that they are going to work on building their own projects very soon - and that paying attention now will help them to be successful when they work with their groups during Play.

Copyright ©2024 VEX Robotics, Inc.

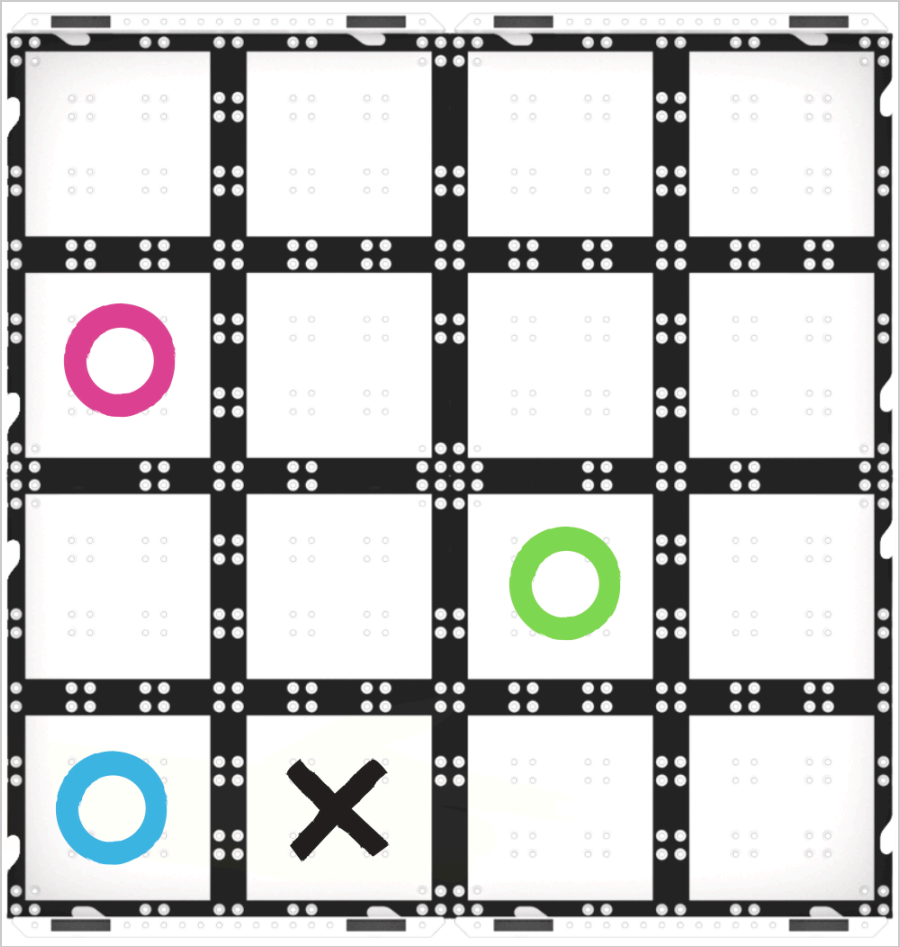
Teacher Troubleshooting

- If the wires seem to be getting in the way for students, use a rubber band to pull them together, and you can tuck the bundle into the build if needed, to keep the wires from impeding the movement of the Code Base during the Lab.
- If students are having trouble taking turns with the Field, try setting a short 2-3 minute timer for each trial, so that groups have equal access to the test space. When one group's time is up, the next group can move into the Field and restart the timer for their turn.

Facilitation Strategies

- **Allow time for building** - If students do not have their Code Base - LED Bumper Top build from the previous Lab, allow time for building prior to beginning the Lab activities.
- **Think about how your students will access VEXcode GO.** Ensure that the computers or tablets that students will use have access to VEXcode GO. For more information about setting up VEXcode GO, see this VEX Library article.
- **Set up your Fields ahead of time**, as shown in the image below, to serve as a testing area for the Code Base rovers. Mark the start and sample locations, as shown, using a dry erase marker, or classroom items. Have these spread out around the classroom to allow students ample space to test their projects. This is the same Field setup from Lab 1, with 4 of the Walls removed.

Copyright ©2024 VEX Robotics, Inc.



Lab 2 Field Setup

- **Peer to Peer support** - If one group has successfully completed the Play Part 1 challenge in less time, assign students to help other groups that may be struggling. Encourage them to share how they solved the challenge, to help the other group to be successful as well.
- **Collect another sample** - For students who finish Play Part 2 early and need an additional challenge, give them a dry erase marker, and have them mark an additional "sample" to collect. Then add the blocks to their project to collect and "bury" that sample as well.
- **Use the Get Ready...Get VEX...GO! PDF Book and Teacher's Guide -** If students are new to VEX GO, read the PDF book and use the prompts in the Teacher's Guide (Google / .docx / .pdf) to facilitate an introduction to building and using VEX GO before beginning the Lab activities. Students can join their groups and gather their VEX GO Kits, and follow along with the building activity within the book as you read.
    - Use the Teacher's Guide to facilitate student engagement. To focus on VEX GO connections in a more concrete or tangible way, use the Share, Show, or Find prompts on each page to give students an opportunity to get to know their kits in more depth.
    - To focus on the habits of mind that support building and learning with VEX GO, like persistence, patience, and teamwork, use the Think prompts on each page to engage students in conversations

 Copyright ©2024 VEX Robotics, Inc.

about mindset and strategies to support successful group work and creative thinking.

- To learn more about using the PDF book and accompanying Teacher's Guide as a teaching tool any time you are using VEX GO in your classroom, see this VEX Library article.

Play

Part 1 - Step by Step

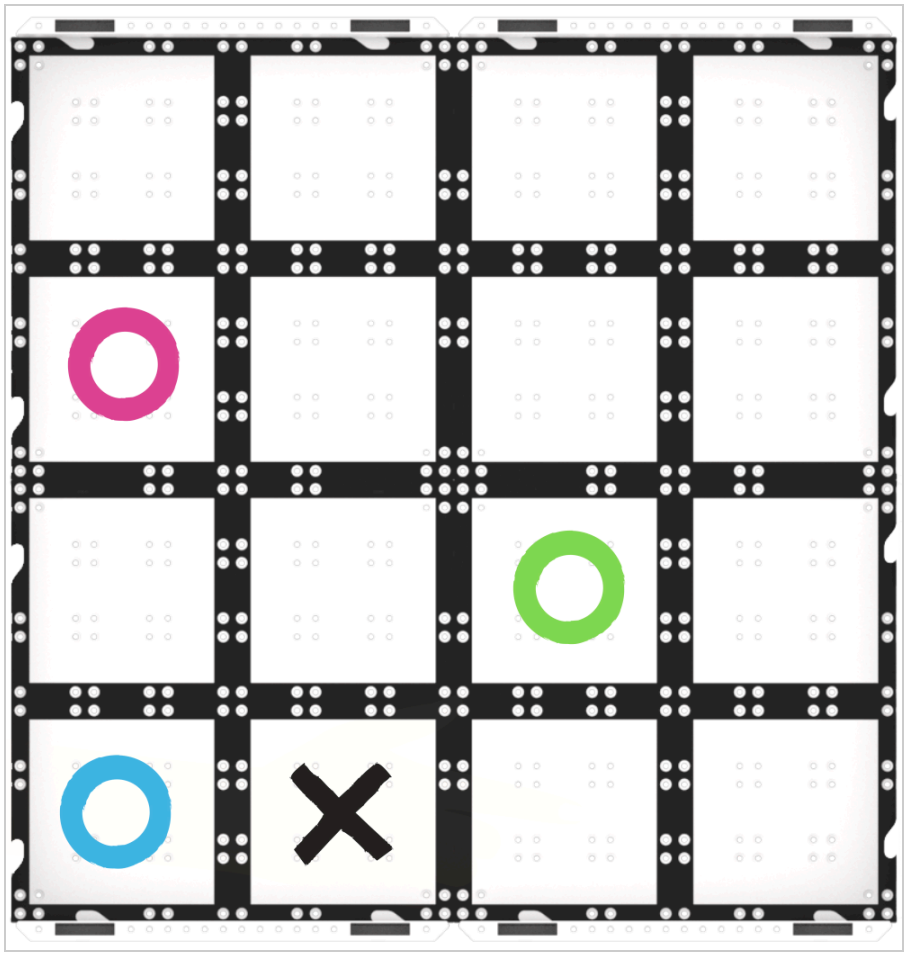
1

Instruct

Instruct students that they will be challenged to create a project for the Code Base to collect and bury two samples. Remind students that the Code Base can only carry one sample at a time, so they will need to code the robot to drive out to collect a sample and return to the base two times. Because students can choose any two samples and any path that accomplishes the task, their projects will all be different. Below is a video of an example solution.

- Instruct students to use the blocks they learned about previously in Lab 1 to build their projects. Identify with students the steps that the Code Base needs to complete to collect and bury each sample. These steps are also listed in the Lab 2 Image Slideshow (Google / .pptx / .pdf) for students to reference while they build their projects.
    - Drive to a sample location.
    - LED Bumper Sensor glows red for 3 seconds to show that a sample is being collected.
    - LED Bumper Sensor glow turns off after 3 seconds to show that the sample has been collected.
    - Return to the base.
    - LED Bumper Sensor glows red for 3 seconds to show that a sample is being buried.
    - LED Bumper Sensor glow turns off after 3 seconds to show that the sample has been buried.
- Show students where to place their robots on the Field. Students should always begin on the 'X,' but they can orient the Code Base however best fits with their project. Some students may choose to navigate to the blue circle first and orient the Code Base to face that location when placing the robot on the Field.

Copyright ©2024 VEX Robotics, Inc.



Field Setup

2

Model

Model for students how to configure and connect their Code Base to their device in VEXcode GO.

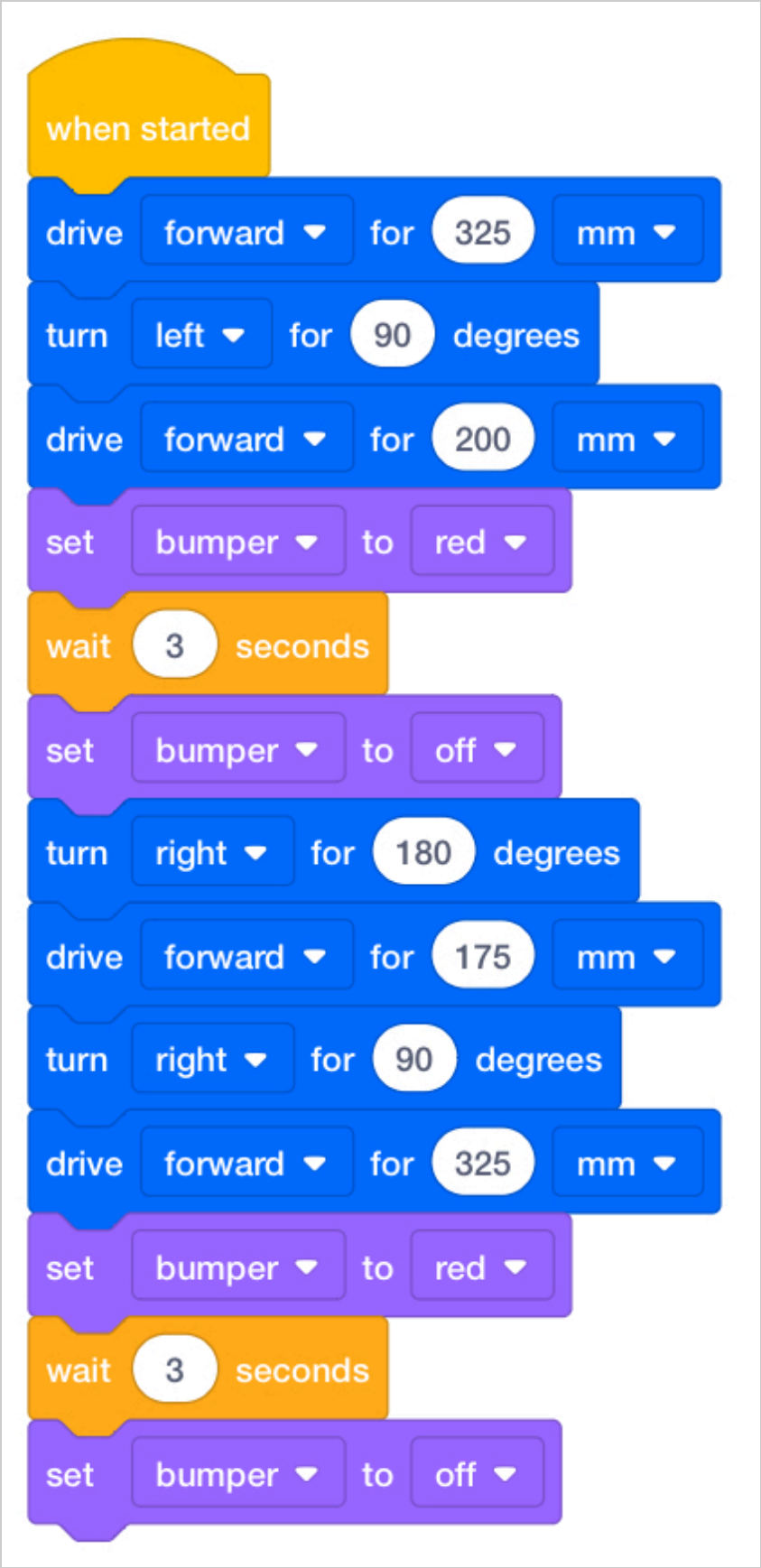
- Begin by showing students how to connect the Brain on their Code Base to their device in VEXcode GO. Because connection steps vary between devices, see the Connecting articles of the VEXcode GO VEX Library for specific steps to connect the VEX GO Brain to your computer or tablet.
- They will also need to configure VEXcode GO for the Code Base. If necessary, model the steps from the Configure a Code Base VEX Library article and ensure students can see the Drivetrain blocks in the Toolbox.

Model for students how to name, save and test their projects in VEXcode GO.

Copyright ©2024 VEX Robotics, Inc.

- Once students have built their project, have them name their project as *Collect and Bury 2* and save it to their device. See the Open and Save section of the VEXcode GO VEX Library for device-specific steps to save a VEXcode GO project.
- You can model using the Engage solution as a strategy to begin coding the project. If using the Engage project as a base, have them recreate this code below in VEXcode GO and test the project to see what blocks need to be added to collect and bury the second sample.

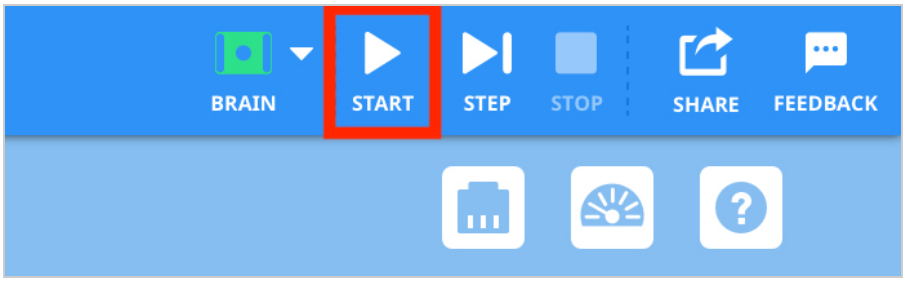
Copyright ©2024 VEX Robotics, Inc.



Engage Project

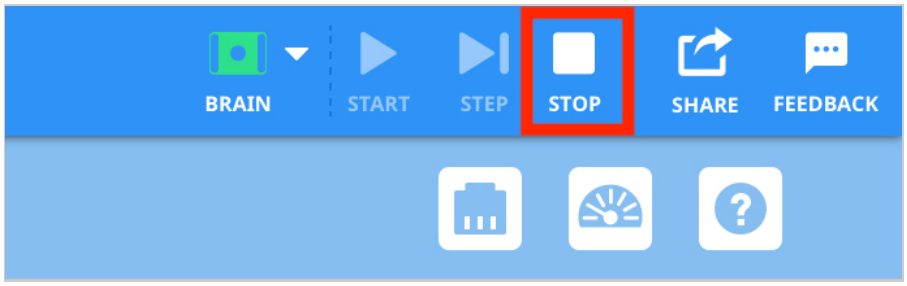
 Copyright ©2024 VEX Robotics, Inc.

- Once the Code Bases are placed on the Field, have students select ‘Start’ in VEXcode GO to test their projects.



Select Start to test the project

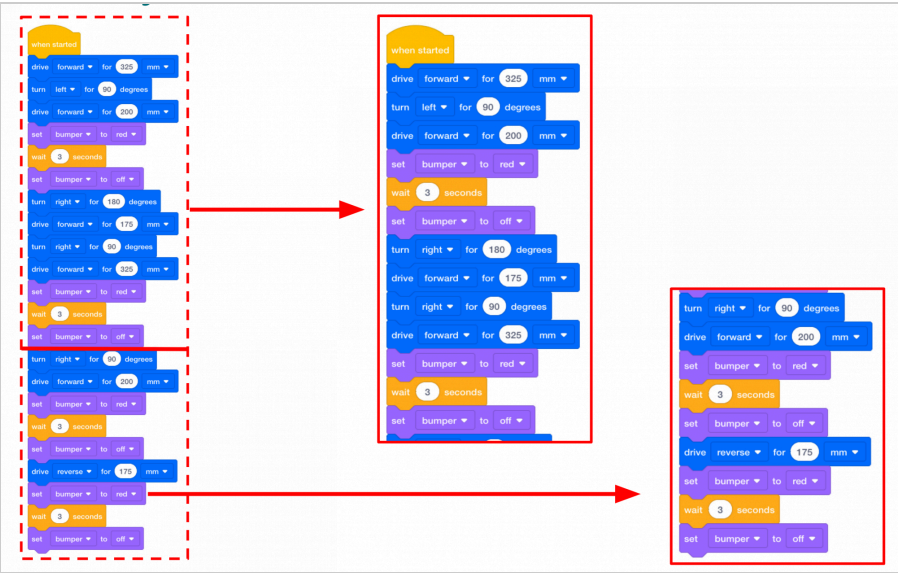
- When the Code Base reaches each sample location, students should place their ‘sample’ on top of the robot when the LED Bumper sensor glows red. After the robot returns to the base, students should remove the sample from the top of the Code Base (when the LED Bumper Sensor glows red again) to indicate that the sample has been buried.
- After the project is finished running, students should select the ‘Stop’ button in the Toolbar.



Select Stop

- Here is just one possible solution for collecting and burying two samples. You can use this as a reference when modeling or facilitating the building of a project to collect two samples with your students.

Copyright ©2024 VEX Robotics, Inc.



Possible Play Part 1 Solution

For groups who complete their project early, challenge them to change the path of the Code Base to collect the same two samples. How many different paths can they code to collect and bury the two samples?

3

Facilitate

Facilitate a conversation with students while they create and test their projects. Groups will most likely not have their project correct on the first try. Have them edit and retest their VEXcode GO projects until the Code Base is able to collect and bury two samples.

- Which two samples are you planning on collecting? In what order?
- How does the Code Base need to move to drive to the first sample? The second?
- If you changed a [Turn for] block from 90 degrees to 180 degrees, how would the Code Base move? Can you show me with your hands?

4

Remind

Remind students to check the order (or sequence) of the blocks and the parameters each block is set to. Did the Code Base turn right instead of left? Was the sample further away? How can you change the parameter in the [Drive for] block to find the right distance for the Code Base to travel?

Copyright ©2024 VEX Robotics, Inc.

Talk students through problem-solving each issue as you circle the classroom. This will be an iterative process, so remind students that scientists who code the Mars rovers also have to try multiple times to get the rover to move how they intended.

5

Ask

Ask students about other places rovers where rovers might be sent to help scientists study an area. Would a rover be useful on the Moon? Inside a volcano? Underwater? Why or why not?

Mid-Play Break & Group Discussion

As soon as every group has created a project to collect and bury two samples, come together for a brief conversation.

- How did your group work together to build the project?
- Using gestures and words, can you tell me how your Code Base moved to collect and bury the first sample?
- What sample did your group choose to navigate to next? How did the Code Base drive to collect and bury the second sample?

Part 2 - Step by Step

1

Instruct

Instruct students that they will be challenged to add to their Play Part 1 project to collect and bury a total of three samples. Remind students that the Code Base can only carry one sample at a time, so they will need to code their robot to drive out to collect a sample and return to the base three times. Because students can choose to collect the samples in any order, their projects will all be different. Below is an animation that shows one possible solution for this challenge.

2

Model

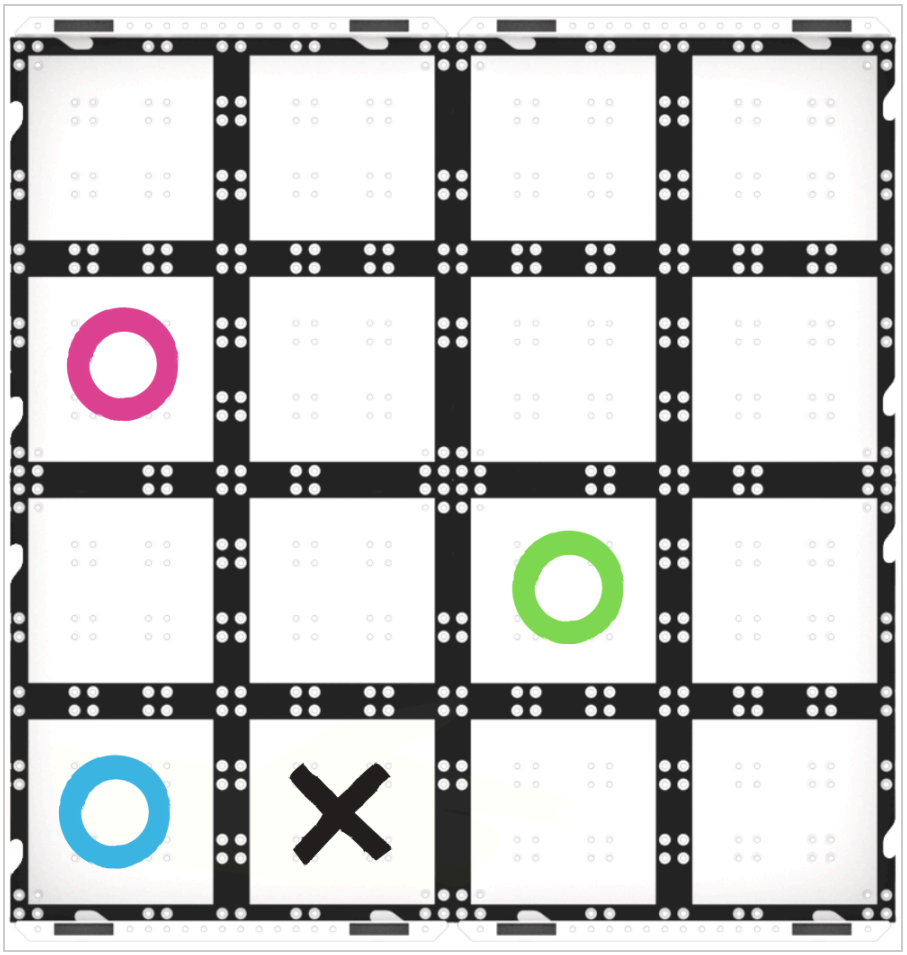
Model for students how to build on their project to collect a third sample. Your students may be able to complete the challenge on their own. However, for younger students, you may want to build the project together as a class. If you are building the project together, you can follow the steps below.

- If students need to open their *Collect and Bury 2* projects from Play Part 1, model the device-specific steps to open a project, as shown in the VEX Library articles in the Open and Save section.

Copyright ©2024 VEX Robotics, Inc.

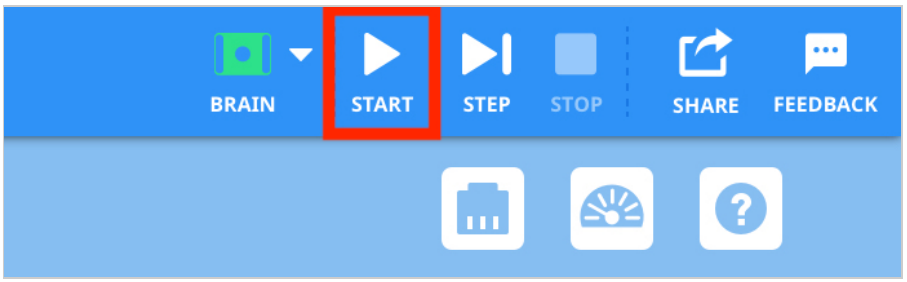
- Students can begin adding blocks to the bottom of the project to collect and bury the third sample. Remind students of the steps the Code Base needs to complete to collect and bury each sample.
- These steps are also listed in the Lab 2 Image Slideshow (Google / .pptx / .pdf) for students to reference while they build their projects.
    - Drive to a sample location.
    - LED Bumper Sensor glows red for 3 seconds to show that a sample is being collected.
    - LED Bumper Sensor glow turns off after 3 seconds to show that the sample has been collected.
    - Return to the base.
    - LED Bumper Sensor glows red for 3 seconds to show that a sample is being buried.
    - LED Bumper Sensor glow turns off after 3 seconds to show that the sample has been buried.
- Once students have built their project, have them name their project as *Collect and Bury 3* and save it to their device. See the Open and Save section of the VEXcode GO VEX Library for device-specific steps to save a VEXcode GO project.
- Model for students where to place their Code Bases on the Field. Students should always begin on the 'X,' but they can orient the Code Base however best fits with their project. Some students may choose to navigate to the blue circle first and orient the Code Base to face that location when placing the robot on the Field.

Copyright ©2024 VEX Robotics, Inc.



Field Setup

- Once the Code Base are placed on the Field, have students select Start in VEXcode GO to test their projects.

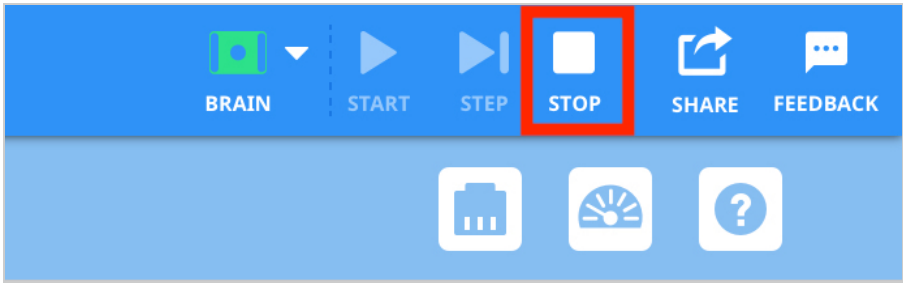


Select Start to test the project

- When the Code Base reaches each sample location, students should place their ‘sample’ on top of the robot. After the Code Base returns to the base, students should remove the sample from the top of the robot to indicate that the sample has been buried.

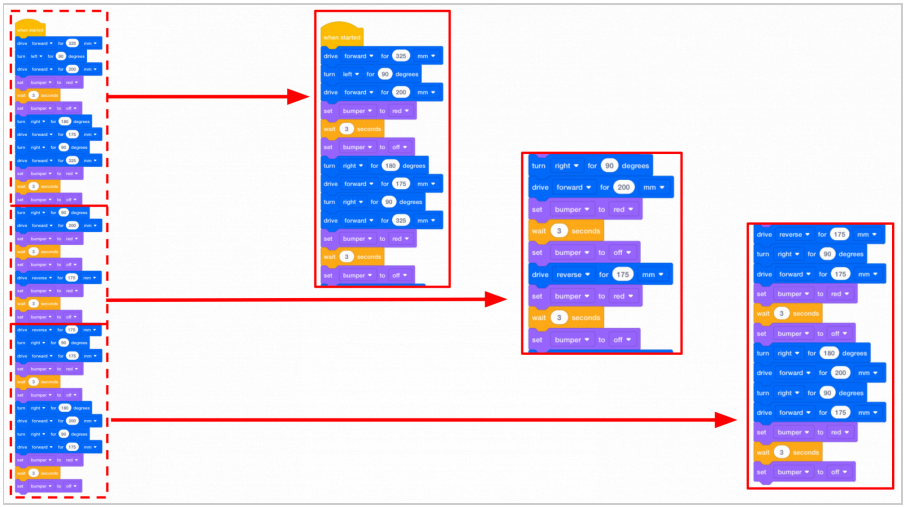
Copyright ©2024 VEX Robotics, Inc.

- After the project is finished running, remind students to select the 'Stop' button in the Toolbar.



Select Stop

- Here is one of the possible solutions for the collecting and burying three samples.


Possible Play Part 1 Solution

- For groups who complete their project early, challenge them to change the path of the Code Base to collect the samples in a different order. How does this new project compare to their original code? What is similar or different?

3

Facilitate

Facilitate a conversation with students while they work to complete the challenge.

- How does the Code Base need to move to collect and bury the third sample? Show me with your hands.
- Is creating the code to collect the third sample easier or harder than collecting the first two samples? Why?

Copyright ©2024 VEX Robotics, Inc.

Review the Using the VEX GO Sensors and the Coding with the VEX GO LED Bumper articles for additional information on the LED Bumper.

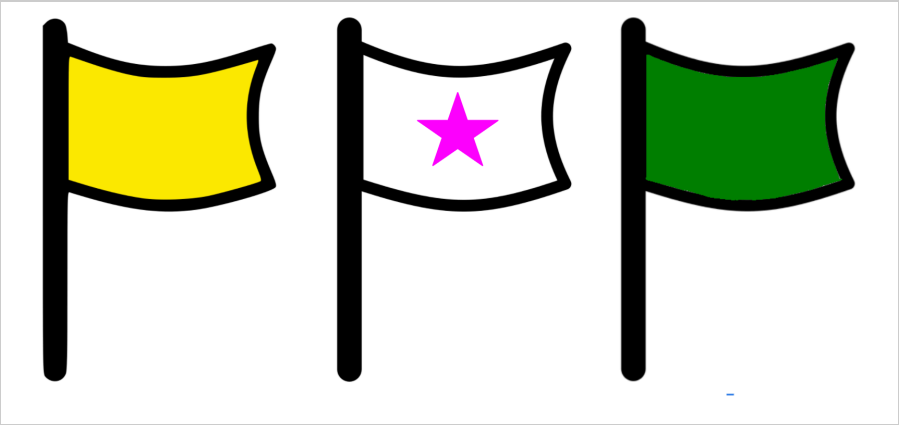
4

Remind

Remind students that they may need to share the Field with other groups. After they test their projects, they will need to remove their robot from the Field so other students can test.

- Groups will need to test their code multiple times to create a successful project. Remind them to check the order of their blocks and the parameters of each block to ensure the Code Base is driving and turning for the correct distance and the LED Bumper is glowing the correct amount of time.

- Having an issue with turn-taking? Give each group small colored flags or pieces of colored paper to keep at their desks with their computers. While they are coding, they should put up a yellow flag. When they are ready to test they can put up their green flag. As you see groups raise their green flags, assign them Fields to test on. When they think their project is completed and correct, they can put up a flag with a star on it!



Ready for testing!

5

Ask

Ask students about Mars rovers to connect their projects with real-life rovers. What tools do they think the rovers have that let them bury samples? How do they think the future rovers will be able to find and uncover the samples buried by this rover?

Copyright ©2024 VEX Robotics, Inc.

Share

Show Your Learning

Discussion Prompts

Observing

- How did your group choose the order in which to collect the samples? What VEXcode GO blocks did you use in your project, to make the Code Base move as you intended it to?
- If you changed the order —or sequence of the blocks in your project, would the Code Base still reach the samples? Why or why not?
- How did the Code Base have to move to collect the sample? What direction? How far? How did it have to move to return the sample to the base?

Predicting

- If you were going to do this challenge again, would you change your project? Why or why not?
- What is a non-coding challenge that can have more than one possible solution? (Examples could include giving directions to your house, making an ice cream sundae, etc.)
- What is similar or different about your group's sequence, compared to others in the class? What is one thing you learned from seeing how other students solved the same challenge?

Collaborating

- What is one thing you learned from another group’s project?
- What is one thing your group had to work together to figure out as you were building your projects? What did you learn that will help you in future Labs?
- How did your group do following your role responsibilities? Do you have a ‘favorite’ job or role? Why?

Notice at collection | Your Privacy Choices

Copyright ©2024 VEX Robotics, Inc.