# VEX GO - Digital Citizens

Unit Overview

Teacher Portal

## Overview

**Grades**

**3+ (Ages 8+)**

**Time**

**40 minutes per lab**

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### Unit Essential Question(s)

- How can we improve our coding projects by incorporating the needs, perspectives, and ideas of others?
- How does new technology change the way people live and work?

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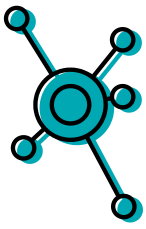
### Unit Understandings



The following concepts will be covered throughout this Unit:

- Collaborating and communicating respectfully helps to create better technological solutions that meet everyone's needs
- Responsible digital behavior, including the creation and management of secure passwords, is essential for maintaining safety and privacy
- New technologies can change how people live and work

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## Lab Summary

### Lab 1 - Cooling Courier

**Main Focus Question**: How can we collaborate respectfully and responsibly to code a robot?

- Students will be introduced to a scenario where people are living in a desert climate and need cooling cells in order to live comfortably because the desert is getting increasingly hot. Robots need to be used in order to transport these dangerous cooling cells to the neighborhood.
- Students will build the Super Code Base 2.0.
- Students will create a VEXcode GO project for their Super Code Base to drive from the factory, pick up a cooling cell at the lab, then take the cooling cell to the neighborhood.
- After building and testing their projects, students will improve on their projects to deliver the cooling cells faster. They create these improvements by gathering ideas from other groups, getting permission to use those ideas, and then giving attribution to the groups whose ideas they have used in the project plan.

### Lab 2 - Access Granted

**Main Focus Question**: How can we create and manage passwords safely and securely?

- Students will continue to interact with the scenario presented in Lab 1.
- Students will learn that the lab where cooling cells are held uses a password to help keep the cooling cells safe. Students must first decode the default password that was given to their robot. This password is communicated using the lights on the LED Bumper.
- Students must then alter the code so they can change the password that their robot will use to enter the lab. They must ensure that their password remains safe.

## Unit Standards

Unit Standards will be addressed in every Lab within the Unit.

### Computer Science Teachers Association (CSTA)

**1B-IC-20**: Seek diverse perspectives for the purpose of improving computational artifacts.

**How Standard is Achieved**: In Lab 1, students brainstorm and plan the path the Super Code Base needs to take in order to deliver these cooling cells. They discuss their plan with other groups and share ideas on how to make the delivery of the cooling cells quicker. The teacher facilitates these discussions so students have

guidance on how to seek those differing perspectives from other groups in order to improve their VEXcode GO projects.

In Lab 2, students are decoding and then creating their own passwords. They will share with one another the techniques they use in order to remember their new passwords and also techniques for keeping their password safe. Students use those varying perspectives in order to create and remember those new passwords.

## Background

The Digital Citizens Unit is designed to provide students with experiences examining, modeling, and discussing the impacts of computing on our society. They will be immersed in a scenario where they act as proactive digital citizens who must collaborate to code their robots to solve a pressing problem in their community. They will be tasked with making sure to consider the varied needs and perspectives of others as they create their solutions.
Additionally, students will practice essential digital citizenship skills, such as keeping passwords private and how to use the ideas of others appropriately as they complete the activities in this Unit.

### The Impacts of Computing and Digital Citizenship

The development of new technology impacts every aspect of students' lives, in ways both positive and negative. Advancements such as the internet, social media, and robotics open up an incredible wealth of opportunities for students to interact with the world in new ways, but also provide new ethical dilemmas. It is important to engage young students in experiences and conversation that allow them to understand how they can use technology in ways that both improve their own lives and make the world a better place for others with varying backgrounds, abilities, and needs.

#### Inclusive Computing for Better Problem Solving

One important concept for students to explore is how incorporating diverse ideas and perspectives when collaborating to solve problems leads to better innovation, and makes outcomes stronger. For example, consider the International Space Station, where scientists and astronauts from 23 different countries have collaborated on a wide array of research projects. These projects have benefitted humanity by improving cancer treatments, helping to lower heat in cities, boosting the capabilities of robotic arms and more.

Another closely linked concept is the idea that the development and improvement of computing technology is driven by the needs of diverse groups of people. This means that when students are learning to use technology to solve problems, considering the possible perspectives of users with different backgrounds, ability levels and outlooks is essential. Voice-to-Text technology is a widely used example of this kind of innovation. It was first created to help people who have difficulty using their hands to write or type. Now, it is used by just about everyone with smartphones and other devices, allowing us to drive more safely, and get instant answers to our questions even when our hands are full.

#### Safe and Ethical Computing

As our students learn to be inclusive innovators, we must also ensure they are using technology in safe and appropriate ways. Good digital citizens must follow societal rules in the digital realm just as they must in the analog world. We teach our students to say please and thank you, to not interrupt others, and to take turns from a very early age. Teaching students the rules of digital citizenship, such as always keeping passwords private, and making

sure that proper permission is give and attribution is made when using the ideas and materials of others is of equal importance.

### What is Path Planning?

Path planning is the process of decomposing a project into the smallest possible robot behaviors before beginning to actually code the robot. It is a much more effective way to code your robot to solve a challenge or accomplish a task than guessing and checking.

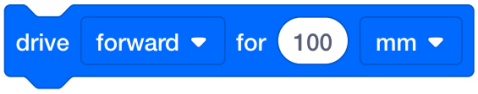
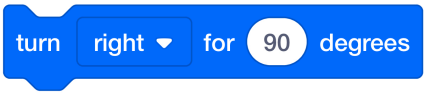
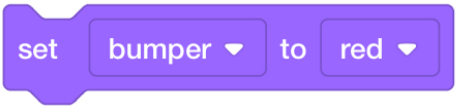
The steps to Path Planning are:

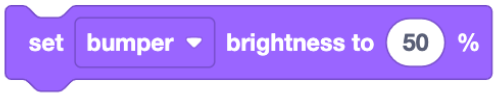
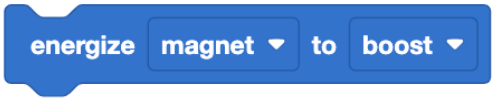
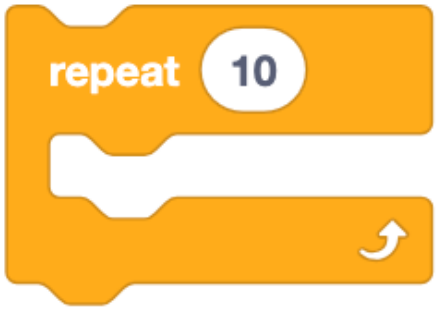
- Identify the task of the robot – What is it that you want the robot to do?
- Break that task down into the smallest behaviors you can.
    - List those behaviors in written steps.
    - Drawing a picture of the path, or acting out the movements of the robot can be helpful here.
    - The smallest behaviors means each time the robot drives or turns a specific distance, each time the LED Bumper flashes, etc.
- Attach code block(s) to each of those behaviors.

### What is VEXcode GO?

VEXcode GO is a coding environment that is used to communicate with VEX GO robots. Students use the drag and drop interface to create VEXcode GO projects that control their robots actions. Each block's purpose can be identified using visual cues such as its shape, color, and label. For more information on how to work with VEXcode GO, see the VEXcode GO Section of the VEX Library.

The following VEXcode GO blocks will be used in this Unit:

| VEXcode GO blocks | Behaviors |
| --- | --- |
|  | The **When started** block begins running the attached stack of blocks when the project is started. |
|  | The **Drive for** block moves the Drivetrain forward or in reverse a given distance. Set how far the Drivetrain will move by entering a value into the oval. |
|  | The **Turn for** block turns the Drivetrain for a given distance. Set how far the Drivetrain will turn by entering a value into the oval. |
|  | The **Wait** block waits for a specific amount of time before moving to the next block in a project. |
|  | The **Set bumper color** block sets the color of the LED Bumper. |

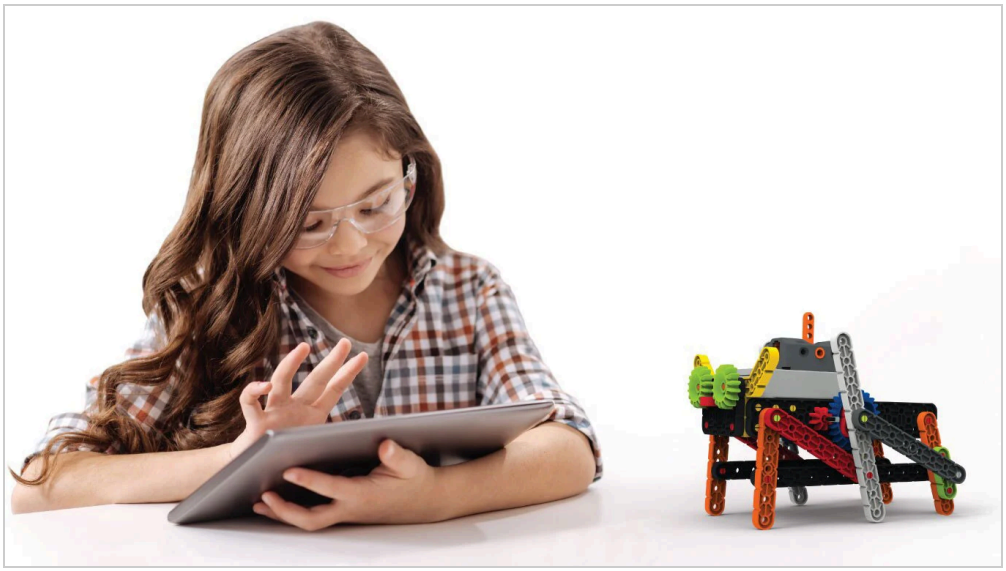
| VEXcode GO blocks | Behaviors |
| --- | --- |
|  | The **Set bumper brightness** block sets the brightness level of the LED Bumper from 0-100%. |
|  | The **Energize electromagnet** block is used to set the magnet to boost (pick up) or drop (release) an object. |
|  | The **Repeat** block is a C-shaped block that causes the blocks inside it to repeat for a specific number of times. |

### Spatial Reasoning

**Predicts STEM Proficiency**

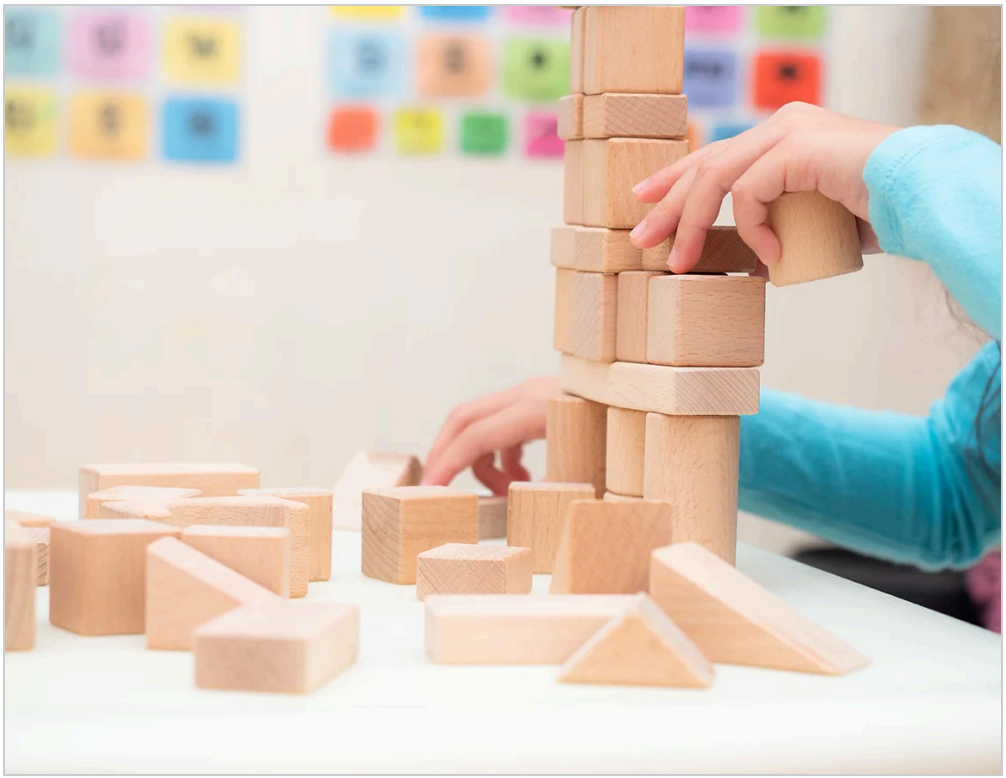
Recent studies have shown that spatial reasoning predicts STEM achievement and proficiency. In many areas of mathematics, a skill required to solve problems effectively is the ability to create an accurate and organized mental representation of the problem that is to be solved. Being able to create that representation requires the ability to visualize mentally. In fact, research shows that spatial reasoning is linked to performance within many strands of mathematics including: basic magnitude and counting skills.

Spatial reasoning is an umbrella term that encompasses many cognitive processes, including understanding the characteristics of a particular object, the similarities and differences between objects, the transformation of an object (e.g. a rotation), and being able to mentally compose/decompose an object based on seeing its pieces or parts (e.g. composing a number with smaller numbers as in an equation, 4+2=6).



Some examples of spatial reasoning skills include the ability to comprehend and recognize imaginary movements in space, describe experiences and observations using spatial language, and explain mental processes using gestures.

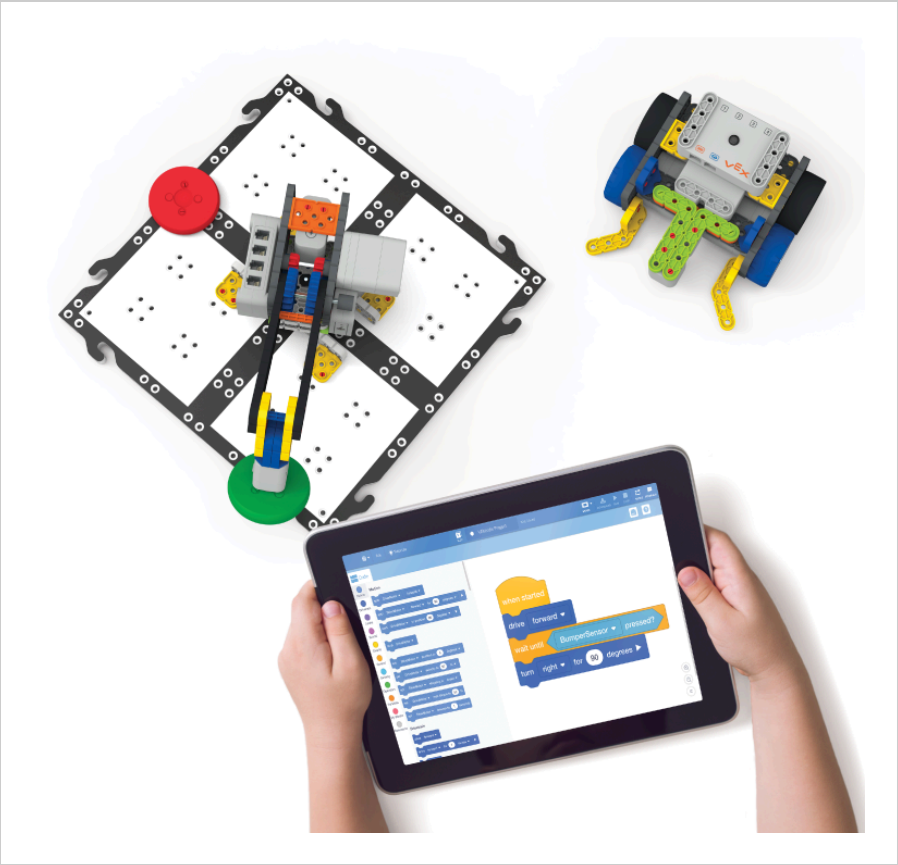
Most children have a sense of self-efficacy by the time they reach kindergarten about mathematics. Some students may feel they have a strong understanding, while others may have a sense of despair. Spatial reasoning skills have a strong correlation with mathematical proficiency and can be improved regardless of a child's age. A great way to improve spatial reasoning is to have students participate in constructional tasks that require these skills. This should not come as a surprise, since teachers have known for some time that students often retain concepts better when they have the opportunity to engage those concepts in a hands-on activity.



Beyond the activities contained within this unit, students are also prompted to engage in "spatial talk" throughout their activities. With spatial talk, students are asked, for example, to describe where certain pieces are being placed as an object is built.

### Applying VEX GO

| **Connection to VEX GO** |
| --- |




The Digital Citizens Unit immerses students in a scenario that provides the background for learning and practicing essential concepts in digital citizenship and literacy. They assume the role of citizens who are faced with an environment that is so hot their homes are nearly uninhabitable. This crisis requires them to collaborate to solve community problems using technology. They will do so by creating VEXcode GO projects for their robots. As they develop these solutions, they will be required to include the ideas and suggestions of other groups, gaining first-hand experience on how a diversity of ideas can make solutions to problems stronger and more robust.

They will also be tasked with considering the needs of community members with different backgrounds, ability levels, points of view, and disabilities as they work to develop solutions. They will experience how taking the needs of others into account can often lead to improvements for all. As they collaborate to solve their community's problem, they will also practice working appropriately and safely with technology, making sure they know how to keep passwords safe and attribute credit when using others' work and ideas. At the same time, students will be required to use their spatial reasoning skills as they build and code with VEX GO.

In Lab 1, students will be introduced to a scenario where people are living in a desert climate and need cooling cells in order to live. For safety, robots must be used to transport cooling cells to the people who need them. They will collaborate to create a VEXcode GO project for their robot to drive from the factory, pick up a cooling cell at the lab, then take the cooling cell to the neighborhood. After building and testing their projects, student groups will share their work with each other and incorporate their ideas to improve on their projects to deliver the cooling cells faster. As they do so, they will practice asking permission to use others' ideas and learn to properly attribute the ideas as well. This Lab gives students the opportunity to experience how an inclusive computing culture leads to stronger solutions to problems.

In Lab 2, students will turn their attention to password safety.  As robot operators, they will need to have a unique password to enter the lab where the cooling cells are produced. They will be provided with a VEXcode GO project that causes the LED Bumper to blink in a red and green pattern, the "default password" for all robots. They will first decode the pattern, and then modify the VEXcode project so that their robot has its own secure password. This provides the opportunity to talk about the importance of keeping passwords private.

## Teaching Coding

Throughout this Unit, students will be engaged with different coding concepts such as decomposition and sequencing. The Labs within this unit will follow a similar format:

- **Engage:**
    - Teachers will help students make a personal connection to the concepts that will be taught in the Lab.
    - Students will complete the build.
- **Play:**
    - **Instruct:** Teachers will introduce the coding challenge. Ensure that the students understand the goal of the challenge.
    - **Model:** Teachers will introduce commands that will be used in the creation of their project to complete the challenge. Model the commands by projecting VEXcode (GO/123) or by showing physical (representations of the blocks/Coder cards). For Labs that include pseudocode, model for students how to plan and outline the intention for their projects.
    - **Facilitate:** Teachers will be given prompts to engage students in a discussion about what the goals of their project are, the spatial reasoning involved in the challenge, and how to troubleshoot unexpected outcomes of their projects. This discussion will also verify that the students understand the purpose of the challenge and how to properly use the commands.
    - **Remind:** Teachers will remind students that the first attempt of their solution will not be correct or run properly the first time. Encourage multiple iterations and remind students that trial and error is a part of learning.
    - **Ask:** Teachers will engage students in a discussion that will connect the Lab concepts to real-world applications. Some examples could include, “have you ever wanted to be an engineer?” or “where have you seen robots in your life?”
- **Share:** Students have an opportunity to communicate their learning in multiple ways. Using the Choice Board, students will be given a “voice and choice” for how they best display their learning.

## Pacing Guide

This unit should be implemented to supplement student learning on the concepts of digital citizenship and literacy, such as improving the accessibility of technology and seeking diverse perspectives when creating computational artifacts..

STEM Labs can be adapted in various ways to fit into any classroom or learning environment. Each STEM Lab includes the following 3 sections: Engage, Play, and Share (optional).

**Each STEM Lab in this unit can be completed in as little as 40 minutes**

**Section Summary**

The Engage and Play sections, which contain the primary learning activities, can be completed within 40 minutes. The Share section, which enables students to express their learning is optional, but estimated at around 3-5 minutes per group.

### Engage (20 minutes)

The Engage section is the introductory section designed to capture the student's attention. This section is intended to be a whole-class activity. It includes a hook, a leading question that personalizes the learning for students, and the build that will be utilized to create a hands-on, exploratory learning experience that places STEM into the hands of young learners.

### Play (20 minutes)

The Play section is split into 3 parts in order to structure learning while maintaining student interest: Part 1, Mid-Play Break, and Part 2. In Play Part 1, students will run an investigation, test, and/or make predictions about scientific phenomena using their build as it relates to the key concepts of the unit. The Mid-Play Break includes a discussion of Part 1 and transition to Part 2. In Play Part 2, students will continue to explore their builds and deepen their understanding of key concepts by applying their knowledge in new ways.

### Share (Optional: 3-5 minutes per group)

The Share section is the closing section of the lab whereby students can think about their learning through discussion of observations made during the activity and make connections about how the concepts could apply to other areas in their lives. Students are also given the opportunity to consider the cooperative learning components of the lesson.

**The Pacing Guide**

The pacing guide for each Lab provides step-by-step instructions on What, How, and When to teach. The STEM Lab Pacing Guide previews the concepts that are taught in each section (Engage, Play, and Share (optional)), explains how the section is delivered, and identifies all the materials that are needed.

**Lab 1 - Cooling Courier**

**Total Time**: 40 minutes

| Engage | Play | Share |
|---|---|---|
| 20 mins | 20 mins | Optional 3-5 mins per group |

**Build**
Super Code Base 2.0

**Engage**
Students are introduced to a scenario where people are living in a desert climate and need cooling cells in order to live comfortably because the desert is getting increasingly hot. Robots need to be used in order to transport these dangerous cooling cells to the neighborhood. Then they build the Super Code Base 2.0.

**Play**
Students will create a VEXcode GO project for their Super Code Base to drive from the factory, pick up a cooling cell at the lab using the Electromagnet, then take the cooling cell to the neighborhood. After building and testing their projects, students will improve on their projects to deliver the cooling cells faster using feedback and ideas from other groups.

**Share**
Students share their final VEXcode GO projects and what improvements were made when collaborating with other groups. As they share their projects, students will also give credit to other groups whose ideas were used.

**Main Focus**
How can we collaborate respectfully and responsibly to code a robot?

**Materials Needed**

- VEX GO Kit
- Lab 1 Image Slideshow
- Tablet or Computer
- Robotics Roles and Routines Sheet
- Super Code Base 2.0 Build Instructions
- Lab 1 Worksheet
- VEX GO Field Tiles and Walls
- Pencils
- Pin Tool

**Lab 2 - Access Granted**

**Total Time**: 40 minutes

| Engage | Play | Share |
|---|---|---|
| 20 mins | 20 mins | Optional 3-5 mins per group |

**Build**
Super Code Base 2.0

**Engage**
Students will continue to interact with the scenario presented in Lab 1. They learn that the lab where cooling cells are held uses a password to help keep the cooling cells safe and secure. Students will learn about practices to keep passwords safe.

**Play**
Students must first decode the default password that was given to their robot. They must then alter the project in VEXcode GO so they can change the password that their robot will use to enter the lab.

**Share**
Students discuss the strategies and techniques they used to remember their new password. They will also share what makes their password safe and secure.

**Main Focus**
How can we create and manage passwords safely and securely?

**Materials Needed**

- VEX GO Kit
- Lab 2 Image Slideshow
- Tablet or Computer
- Super Code 2.0 Base Build Instructions
- Starter Password VEXcode GO project
- Robotics Roles and Routines Sheet
- Blueprint Worksheet
- VEX GO Field Tiles and Walls
- Pencils
- Pin Tool

## Making This Unit Fit Your Unique Classroom Needs

Not every classroom is the same, and teachers face a variety of implementation challenges throughout the year. While each VEX GO STEM Lab follows a predictable format, there are things that you can do in this Unit to help make it easier to meet those challenges when they arise.

- **Implementing in less time:**
  - In Lab 1, provide students with a discrete path for the robot to take. They can create and test the code based on this path. Then discuss as a whole class how they would make the path faster and how they would give attribution to the ideas of other students if they were to improve their projects. This allows you to skip Play Part 2.
  - For Lab 2, explain to students the logic behind the password in Play Part 1 rather then having them discover the patterns. Then have students create their own password VEXcode GO projects and run them on the robot to test.
- **Activities to support reteaching:**
  - If students are struggling to communicate with one another to share ideas and/or attribute ideas from other groups, have them complete the Follow Directions and the Copycat VEX GO Activities.
  - To emphasize the idea of keeping information like passwords safe, have students complete the Security Robot VEX GO Activity.
  - To further engage with the idea of adaptive technologies helping to meet the needs of others and also benefitting society as a whole, have students complete the Handy Helpers VEX GO Activity.
  - For additional practice coding the Electromagnet, have students complete the Mars Rover Search and Collect Activity.
- **Extending this Unit:**
  - Once groups have successfully collected their cooling cells, have them try to use the Drive Tab in VEXcode GO, to deliver the cooling cells using remote control driving. Then, compare and contrast the movement and accuracy of the Super Code Base between remote control driving and driving with their coding projects. Which is faster? Which is more precise? Which drives further? What are some advantages and disadvantages to each form of driving the Super Code Base? What option do they think is more appropriate for transporting the cooling cells to the neighborhood?
  - Use the Choice Board activities to extend the Unit, while allowing students to express their voice and choice in what activities they want to complete.
  - To extend Lab 2, have students create a longer password (4 or 5 digits). They can then incorporate their password into the following Lab when they code their robot to drive and pick up two cooling cells at a time. Students will need to have their Super Code Base display the password to enter the lab before picking up the cooling cells.
    - You can also invite students to build a 'gate' at the edge of the cooling cell lab pick up area. The gate should be down until the robot approaches and flashes the password. Then the gate can be raised or moved to allow the robot to enter and pick up the cooling cells.

**VEXcode GO Resources**

| Concept | Resource | Description |
|---|---|---|
| Drivetrain Commands | **Driving Your Robot** Tutorial Video | Describes basic movements using the **Drive for** and **Turn for** blocks in a project. Use this if students need reminders in Lab 1. |
| Drivetrain Commands | **Turning Your Robot** Tutorial Video | Describes the difference between the kinds of Drivetrain turn blocks. Use this if students need reminders in Lab 1. |
| Drivetrain Commands | **Turning Accurately** Example Project | Shows the different kinds of Drivetrain turn blocks used in a project. Use this with the Turning Your Robot tutorial video if students are looking for ideas on how they could improve their projects in Lab 1. |
| Sequencing | **Sequencing** Tutorial Video | Defines sequence and explains the importance of ordering blocks in a project so the robot performs as you intent it to. Use this if students need reminders in Labs 1 and 2. |
| Velocity | **Changing Velocities** Example Project | Shows the **Set drive velocity** and **Set turn velocity** blocks and how they are used in a project. Use this if students are looking for ideas on how they could improve their projects in Lab 1. |
| LED Bumper | **Using the LED Bumper** Example Project | This example project uses a **Repeat** loop to change the color of the LED Bumper from green, to red, to off. Use this to help students with their LED Bumper in Lab 2. |
| Electromagnet | **Using the Electromagnet** Example Project | This example project shows how the **Energize electromagnet** block can be used to pick up and drop off a Disk. |

**Using VEXcode GO Help**

In Lab 2 of this Unit, a VEXcode GO project is provided for the student either in the form of an downloadable project or as images of projects to recreate. You can use the Help feature together with your students as an extension tool to explain how specific blocks are functioning in this project.

After reading the description for, or with your student, you can ask students to describe how the block functions in the project they are working on. If students want more practice with a specific block, have them look at the example provided and ask them what the robot will do in the project shown, then you can help them make connections to how that is similar or different to the project they are working on in the Unit.

Blocks in this Unit include:

- **Set bumper color**
- **Set bumper brightness**
- **Energize electromagnet**
- **Wait**
- **Repeat**

### Choice Board

**Choice Board Examples & Strategies**

Use the Choice Board to allow students to display their voice and choice within their learning. The Choice Board can be used in multiple ways by the teacher to:

- Engage students who finish early
- Assess what students have learned at different points throughout the Unit
- Extend the Unit or lesson
- Allow students to display their learning in the Share section

The Choice Board is intended to provide content that can be added to the classroom's existing Choice Board or to any bulletin board in the classroom.

The following is the Choice Board for this Unit:

| Choice Board | | |
|---|---|---|
| **Accessibility Brainstorm**<br>Choose one piece of technology in your classroom or school, and design a modification to improve its accessibility. Make a pamphlet to showcase your modification and explain why it improves the device, and makes it usable for more students. | **Role Play**<br>Write and act out a scenario in which someone asks you to share your password to log into a website. What should you do? Why? Be sure your scenario clearly communicates the safe and responsible choice! | **Attribution Journal**<br>Think of a time when someone helped you with a project. Write a journal entry to give attribution to your collaborators. Describe their contributions and explain how their ideas improved your project. |
| **Robots in Real Life**<br>What kind of robots are being developed to help people with special needs or disabilities? Research one of them and make a slide that shows and describes how the robot uses technology to improve accessibility for its users. | **Coding Collaboration**<br>Code your robot to deliver a cooling cell to two locations on the Field. Share your project with three other people, and make an improvement to your project based on their feedback. | **Security Questions**<br>Code the LED Bumper to flash a new password pattern. Write a question for each number in the password to help you remember it. |
| **Short Story**<br>Write a short story to explain how robots came to be used in this desert society. Describe how robotic technology changes the citizens lives. What got better? Did anything get worse? Why? | **Responsible Rules**<br>Good digital citizens are safe, respectful, and responsible when using technology. Make a poster of 3-5 rules to help your class be good digital citizens. Be sure to explain each rule. | **World Without Cell Phones!**<br>Imagine you live in a town where there are no cell phones! Write out your daily routine and describe how it is different without cell phone technology. What parts of your day would be affected the most? The least? Why? |

## Vocabulary

**Accessibility**

Properties that enable something to be used, understood, or accessed by as many people as possible, including those with disabilities

**Attribute**

Giving credit to the person or group who created something, like citing the author of a quote

**Digital Citizenship**

Responsible, safe, and respectful use of technology to learn, create, and participate

**Efficient**

Accomplishing a task with little to no wasted effort or time

**Electromagnet**

A type of magnet where a magnetic field is produced by an electric current.

**LED Bumper**
: A sensor that reports if it is being pressed or not, and can glow red or green

**Password**
: A secret sequence of numbers, letters, or symbols, used to control who has access to something

**Perspective**
: A point of view

**Encouraging Vocabulary Usage**

The following are additional ways to facilitate vocabulary usage as students are engaged in the activities throughout this Unit.

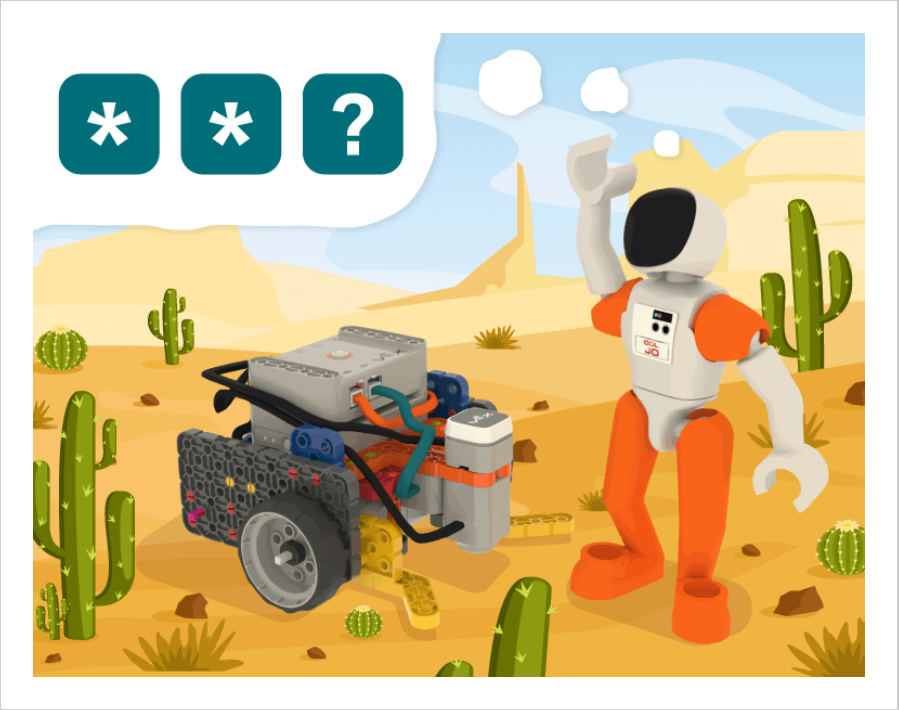
Students should be encouraged to use the vocabulary terms:

- Throughout all of the activities
- As they are working in groups
- As they are reflecting
- As they are sharing their knowledge and experience

**Tips for Encouraging Vocabulary Usage**

- **Vocabulary Journal** – Have students create a journal entry about each word as they are working throughout the Unit and using that vocabulary word in practice. The journal entry could describe an idea about *accessibility* and how they learned to *attribute* that idea to its creator.
- **Collaboration Station** - Encourage students to collaborate to create a graphic organizer that they can display to help classmates with vocabulary acquisition. Use large chart paper and include the word, the definition of the word, characteristics of the word, non-examples of the word and an example of the word used in the sentence. Have students share with the class and then display their graphic organizers throughout the Unit.

## Letter Home




In each VEX GO STEM Lab unit, you will find a letter home. The purpose of this letter is for your classroom guardians to receive a detailed and content-specific guide of what the students are learning and creating when using VEX GO Kits in the classroom.

The letter home is easily accessible in an editable format for you to copy and personalize to best fit the needs of your students. The letter will include an introductory description about the unit, all unit titles, vocabulary and definitions, an explanation on how the content is relevant to daily life, and suggested follow-up questions for at-home discussions.

Altogether the letter home encompasses a go-to resource for guardians to glimpse into the daily life at school and be a part of the day-to-day learning their student is engaging in.

Editable Letter Home (Google / .docx / .pdf)

# Digital Citizens Letter Home

## Introduction


In the Digital Citizens STEM Lab Unit, students will explore digital citizenship and how technology affects our lives. Through engaging, hands-on activities using the VEX GO Kits, students will explore concepts like collaboration and attribution, password protection, and accessibility. They will act as citizens in a desert society and use the Super Code Base robot to pick up and deliver cooling cells to their neighbors.

Students will explore questions like: How can we improve our coding project by incorporating the needs, perspectives, and ideas of others? And how does new technology change the way people live and work? This Unit is designed to foster curiosity, analytical thinking, and a deeper understanding of how collaboration and the responsible use of technology can influence how we learn about our world.

Please keep this letter for your reference as your student works through the Digital Citizens Unit. It contains information that you can use to keep up to date on what students are learning and to spark discussions at home.

## Look Inside the VEX GO STEM Lab Unit

In **Lab 1:  Cooling Courier**, students are introduced to a scenario where people are living in a desert climate and need cooling cells in order to live in the rising temperatures. Students will build the Super Code Base 2.0, and code the robot to pick up and deliver a cooling cell to the neighborhood, using the Electromagnet. After building and testing their projects, students will improve on their projects to deliver the cooling cells faster. They gather ideas from other groups, getting permission to use those ideas, and then giving attribution to the groups whose ideas they have used in the project plan.

**Lab 2 : Access Granted** shifts the students' focus to passwords, and how they can be safely and securely created and managed. Here, they use the LED Bumper to decode the default password given to their robot to enter the lab where the cooling cells are

located. They then alter the code so that they can change their password to make it unique and secure.

## Vocabulary

**General notes on encouraging vocabulary usage with children:**
The vocabulary words offered are not meant for students to memorize terminology, but to give them language to use to talk about the activities and learning they are doing throughout the Unit. Work these terms into conversations naturally, and positively reinforce this for students as well.

The names of VEXcode GO blocks that are included in the vocabulary are meant to help students learn the names of the blocks they are using so that they are able to refer to those blocks correctly when building future projects. Ask students about how they used these blocks in their projects to help them build their VEXcode GO vocabulary.

- **Accessibility -** Properties that enable something to be used, understood, or accessed by as many people as possible, including those with disabilities
- **Attribute** - Giving credit to the person or group who created something, like citing the author of a quote
- **Digital Citizenship -** Responsible, safe, and respectful use of technology to learn, create, and participate
- **Efficient -** Accomplishing a task with little to no wasted effort or time
- **Electromagnet -** A type of magnet where a magnetic field is produced by an electric current
- **LED Bumper -** A sensor that reports if it is being pressed or not, and can glow red or green
- **Password -** A secret sequence of numbers, letters, or symbols, used to control who has access to something
- **Perspective -** A point of view

## Connection to Daily Life

In this Unit, students are not just learning about coding a robot; they're exploring concepts that are integral to everyday interactions with technology in our digital world.

# Digital Citizens Letter Home

This Unit offers a perfect opportunity for you to connect with your students about how technology impacts our daily lives. Technology and digital interaction is a constant presence in our lives, so learning to interact and collaborate with technology in a responsible and respectful manner is an important life skill for students. Discussing how you use technology and digital interactions in your work or daily routine can help your student see the practical applications of what they're learning. You can also explore together how technology, accessibility, and digital citizenship make a difference in various aspects of life, such as interacting respectfully in online communications, managing passwords for financial logins, or considering accessibility factors when planning family or community events to ensure that everyone can participate fully. This conversation can deepen their understanding of the Unit's concepts and enhance their appreciation of how technology and digital citizenship shapes the world around them.

## Follow-up questions to ask at home

Use these questions to discuss the activities that your student is participating in with their group. Included here are questions that address the digital citizenship concepts your student will be exploring and learning about throughout the Unit.

1. Why is it important to give credit to someone whose idea you used in your project? How would you feel if you gave someone an idea and they did not attribute it to you?
2. How did collaboration help you to make your project more efficient or accessible?
3. How did your group decide on your password? Do you think it is something you would be able to remember easily? Why or why not?
4. What is a way that we could make something in our house more accessible for someone with different needs than we have?
5. Why is it important to collaborate respectfully with others? How could collaboration help to solve real-world problems?
6. What was one challenge your group worked through during this Unit? How did you solve the problem together?