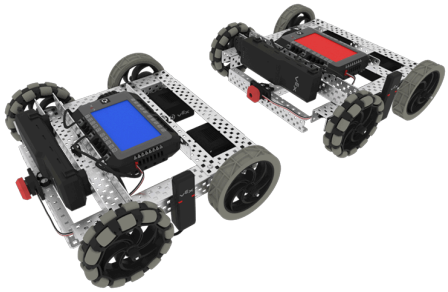
VEX V5 Letter Home - Team Freeze Tag STEM Lab Unit

Support STEM learning at home

Your student is currently engaged in the V5 STEM Lab Unit, Team Freeze Tag. V5 STEM Lab Units like this one, are designed to provoke students' curiosity and creativity, while engaging them in active learning and self-reflection to learn about science, technology, engineering, and math (STEM) concepts. **Read this Letter Home to see how what your student is doing in this STEM Lab Unit relates to life outside the classroom, so that you can connect with your student about their learning and support it at home.**



Using a competition as motivation for learning

The Team Freeze Tag STEM Lab Unit is centered around a competition, providing students with a highly motivating end-goal to work towards. Playing a game with their robot capitalizes on the motivational effects of competitions and robotics to help students create an identity as a STEM learner. Each Lesson builds towards the competition, embedding STEM skills and concepts, collaboration, and the engineering design process along the way.

In the Team Freeze Tag STEM Lab Unit, students will design and build a robot to compete in a Team Freeze Tag competition. Two groups join to form a team, and drive their robots to tag their opponents in order to score points. Students will learn about various STEM concepts, including:

- **Controller configurations for remote control driving**
- **How to use sensors, like a Bumper Sensor, in a VEXcode V5 project with their robot**
- **Developing a game strategy collaboratively within their team**

Embracing failure as an opportunity to learn

Each Lesson within the Team Freeze Tag Unit presents students with an open-ended challenge to be solved. Students will use the engineering design process (pictured below) to define a problem, develop a possible solution, and optimize their solution in the context of the challenge. As students move through this process, they will be encouraged to learn equally from their failures, as well as their successes.

The goal of the STEM Lab Unit is for students to participate actively in problem solving – designing a solution, testing it, and making an informed decision from that data, and continuing to iterate until the problem is solved. With this focus on continuous improvement, making a mistake is not punished, it is celebrated as a moment to build upon and learn from.

Students document this process carefully, using their engineering notebook as a tool for learning, reflection, and growth. The engineering notebook is a personalized artifact of the learning process, and each student's notebook is uniquely their own. They can look back in their engineering notebook to see

not only the development of their robots, but the development of persistence, resilience, and flexibility as well.

What you can do at home:

Have your student share their engineering notebook with you, and talk about how they documented the development of their game strategy over the course of the Unit. Encourage your student to explain their thinking, and verbalize their team's reasoning behind decisions, to help them build their identity as a collaborative problem solver.

Students are a part of a team

Throughout the Team Freeze Tag Unit, students will be working collaboratively in teams to design and build their robot for competition, giving them multiple opportunities to practice valuable skills like communication, collaboration, and time-management in a fun and authentic way. Like other team activities, from sports to music, robotics teams offer students a way to connect to one another, work together, and build resilience, while gaining an identity as part of a team. Listening to others' perspectives, taking on varied roles within a group, and engaging in collaborative decision-making helps lay the foundation for students to build their 21st century skills.

What you can do at home:

Talk with your student about how you have assigned roles or responsibilities within a team of your own, personally or professionally, to help the team be successful. Ask your student to explain the roles on their team, and how they contributed to a successful Team Freeze Tag competition.

Student-centered assessment

One of the ways the engineering notebook is used throughout the Team Freeze Tag Unit, is as a vehicle for students to reflect not only on what they are learning, but also on how they are learning. Students will answer reflection prompts about how they are collaborating, how well they understand the concepts or skills in a Lesson, and how they are engaging in the engineering design process. This process of self-reflection helps students to continue to take ownership of their learning, and builds their identity and self-efficacy as a learner.

What you can do at home:

Continue this self-reflection process at home, by talking with your student about their experience. In the Team Freeze Tag Unit, students will be reflecting on things like:

- What made your team successful in the Team Freeze Tag competition? How did your groups work together?
- How did your robot design change throughout the Unit? Why?
- How did your driving strategy change throughout the Unit? How did your team choose a driver for the competition?
- What was the biggest challenge you faced in Team Freeze Tag? How did you work through that challenge?

Career connections

The authentic problem solving and learning processes that students engage in throughout the Team Freeze Tag Unit, have direct connections to real-world STEM career opportunities. Students will be introduced to careers that connect to the concepts and content in the Team Freeze Tag Unit, like:

- **Race Engineer** – A Race Engineer is the member of a car racing team responsible for things like collecting and analyzing data to help the vehicle and driver optimize their performance in the race. Race Engineers have to consider things like the best tires for race track conditions, so that the racing team can be set up for success before and during the race.

- **Electro-Mechanical Technician** – Electro-mechanical technicians work with electronic and computer-controlled mechanical systems to install, test, repair, or upgrade system components. From aerospace to energy, computer and communications equipment to plastics manufacturing, electro-mechanical technicians play an important role in keeping systems functioning effectively and efficiently.

What you can do at home:

Help your student research and discover how they could become involved in a STEM career, like those in this Unit. What kind of education would be needed? Is there specialized training involved? What other questions does your student have about career paths in STEM fields?

Want to learn more?

- To learn more about the Team Freeze Tag STEM Lab Unit, and other V5 STEM Lab Units, visit education.vex.com.
- To learn more about competition robotics, and this year's VEX Robotics Competition, visit competitions.vex.com.