

Robotics 3 - Unit 6

Content Area: **21st Century Life & Careers**
Course(s): **Engineering Robotics 3**
Time Period: **Generic Time Period**
Length: **4 weeks**
Status: **Published**

Unit Introduction

This advanced unit will have students prepare for, design, fabricate, test, and compete in the TSA VEX Robotics Competition. Students will evaluate last year's competition teams' robots for strengths and weaknesses within the design and utilization of the previous competition. Once the competition is released, students will analyze the rules and regulations and then begin designing a competition robot. Students will also begin fabrication on the field implements to test their design against. Everything will be designed in 3D and tested within a virtual arena.

Standards

TECH.8.1.12.B.CS1	Apply existing knowledge to generate new ideas, products, or processes.
TECH.8.1.12.C.1	Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.
TECH.8.1.12.C.CS1	Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media.
TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.
TECH.8.1.12.E.CS3	Evaluate and select information sources and digital tools based on the appropriateness for specific tasks.
TECH.8.1.12.F.CS3	Collect and analyze data to identify solutions and/or make informed decisions.
TECH.8.2.12.C.5	Create scaled engineering drawings of products both manually and digitally with materials and measurements labeled.
TECH.8.2.12.C.CS2	The application of engineering design.
TECH.8.2.12.D.1	Design and create a prototype to solve a real world problem using a design process, identify constraints addressed during the creation of the prototype, identify trade-offs made, and present the solution for peer review.
TECH.8.2.12.D.CS1	Apply the design process.
TECH.8.2.12.E.2	Analyze the relationships between internal and external computer components.
TECH.8.2.12.E.3	Use a programming language to solve problems or accomplish a task (e.g., robotic functions, website designs, applications, and games).
TECH.8.2.12.E.CS1	Computational thinking and computer programming as tools used in design and engineering.

Essential Questions

How to analyze and evaluate a design?

What is the relationship between design and use?

What are the differences between FRC and VEX?

What are the similarities between FRC and VEX?

Why would somebody use specific coding languages?

How to identify necessary details?

How to properly compromise on design?

Content / Skills

Research and Identification

VEX Robotics

Coding

Automation

Signal Based Communication

Driving

3D Design

3D Testing and Evaluation

Fabrication