

Unit 2 - Using Code to Program a Robot

Content Area: **Technology**
Course(s): **Technology 5**
Time Period: **December**
Length: **10 Classes**
Status: **Published**

Unit Overview

This unit will take approximately 10 classes.

Vocabulary for this unit includes: Reinforcement of terms from Unit 1

Priority Standards

CS.3-5.8.1.5.AP.6	Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended.
CS.3-5.8.1.5.CS.1	Model how computing devices connect to other components to form a system.

Essential Questions

- How can a prototype help me establish a design?
- How can does collaboration with my peers assist me in acheiving a goal?
- How can multiple components depend on each other to achieve a task?
- How can trial and error assist me with solving problems?

Unit Learning Goals

- SWBAT construct a maze for their EV3 and program their robot to traverse it
- SWBAT create a maze for their EV3 based off of a prototype
- SWBAT describe the function of the components of a EV3
- SWBAT Join a robot to their Chromebook using Blu-tooth
- SWBAT send basic code to a robot utilizing Bu-tooth

Unit Learning Targets

- I can connect my robot to a Chromebook and send basic code to it.
- I can create and use a prototype to design and construct a maze for my EV3.
- I can describe and explain the function of the major components of an EV3 robot.

- I can program my robot to traverse my designed maze.

Marzano Elements

- Helping students elaborate on new content (DQ2)
- Helping students examining similarities and differences (DQ3)
- Helping students examining their reasoning (DQ3)
- Identifying critical content (DQ2)
- Reviewing content (DQ3)

Strategies for Differentiating Instruction

- Modeling and practice
- Advanced students to assist others (groupings as needed)
- One on one monitoring and conferences as needed
- Allow and encourage more or less complex mazes and programs based on students' abilities

Unit Assessments (Required)

- Assessment of maze including prototype, design and programming. (Complexity of design, originality and neatness of finished product)

Unit Assessments (Optional)

None

Learning Goals / Targets / Plans

<u>Class</u>	<u>Topic</u>	<u>Lesson / Activity</u>	<u>Standard / Learning Goal</u>
1	Introduction to EV3 Parts	Exploration of the components of an EV3 Robot	<p>Standard: CS.3-5.8.1.5.CS. components to form a system</p> <p>Learning Goal: SWBAT de</p>

			Learning Target: I can describe components of an EV3 robot.
2	Introduction to EV3 Programming	Connection of EV3 by using Bluetooth, practice programming robot with simple commands	Standard: CS.3-5.8.1.5.AP. implement the program design as intended. Learning Goal: SWBAT 1) connect their robot to a PC (robot) Learning Target: I can connect my robot to a PC.
3-5	Construction of Maze Mat	Plan and construct and design a mat/maze for an EV3 Robot	Standard: CS.3-5.8.1.5.AP. implement the program design as intended. Learning Goal: SWBAT 1) design a maze for their EV3 robot 2) construct a maze for their EV3 robot Learning Target: I can create a maze for my EV3.
6-10	Programming of EV3 Through Maze / Evaluation	Program the robot to traverse maze.	Standard: CS.3-5.8.1.5.AP. implement the program design as intended. Learning Goal: SWBAT program the robot to traverse the maze. Learning Target: I can program the robot to traverse the maze.

Cross Curricular Connections

- 3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is

likely to meet the criteria and constraints of the problem.

- 3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.
- 5.NBT.C Perform operations with multi-digit whole numbers and with decimals to hundredths.
- 5.NF.A Use equivalent fractions as a strategy to add and subtract fractions.

21st Century Themes

For this unit, students will work on the following 21st century themes:

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP2. Apply appropriate academic and technical skills.
- CRP6. Demonstrate creativity and innovation.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP11. Use technology to enhance productivity.

Materials and Resources

[Google Classroom](#)

[EV3 Component Video](#)

[EV3 Mindstorms Software for Chromebooks](#)

[EV3 Lessons](#)