Week 4 - Overview

Week 4 will start by learning to use variables. We will count by incrementally increasing the value of variables. We will then use variables to record encoder values to make calculations about the environment. Then, we will use encoders, math, and variables to drive our robot in different polygons. In the third lesson, we will code our robots to navigate a maze. In a maze, the robot will have to make decisions using a switch. The week finishes with a few fun missions to synthesize everything the student has learned in the past 4 weeks. We will use the manual controls to drive some missions to collect game pieces. We will write a code for a new maze shaped like a hexagon.

Computer Science Skills
- Declaring, calling, and setting variables
- Types of variables
- Calculations and iterations with variables in loops
- Control Flow Switches
- Using indices

STEM Skills
- Developing equations
- Learn about geometric shapes
- The geometry and angles of a polygon
- Interior and exterior angles of polygons
- Absolute value

CoderZ Techniques
- Using variables
- Doing math with variables
- IF-DO switches
- Absolute value blocks
- Using the gyro sensor

Implementation Thoughts

You should develop the connection between equations and variables based on the math background of the students. If they are familiar with pre-algebra and functions, you should be able to go in deeper to the mathematical concepts. The control flow switch, or IF-DO loop is another advanced concept. Treat this as a decision the robot needs to make. This is an example of the robot starting to make autonomous decisions.

Lesson 1: Using Variables

- Learn to use variables
- Declare, call, set setting variables
- Counting with variables
- Storing encoder values to variables
- Doing math with variables

Lesson 2: Don't be a polygon

- Learn about polygon angles
- Driving in polygons using encoder values

Lesson 3: A-Mazing

- Navigating a maze using the touch sensor and encoders
- Using a Control Flow Switch

Lesson 4: Polygon Part 2

- Learning to use the gyro sensor
- Using the gyro sensor to navigate
- Using indices in calculations

Lesson 5: Amazing Hexagon

- Use geometry and sensors to navigate in new missions
- Synthesize everything you have learned so far