*Unit 6 Advanced Programming

Content Area: **Technology**
Course(s): **Robotics**
Time Period: **January**
Length: **12 blocks**
Status: **Published**

Transfer Skills

Though it requires the use of formal syntax and can be difficult to troubleshoot, text-based code allows for more complex programs to be created and organized in a smaller visual space.

Enduring Understandings

1. Variables are places to store values (such as sensor readings) for later use, or for use in Calculations.

2. All variables must be introduced at the beginning of a program.

3. All variables need to be assigned a value.

4. Multiple variables can be used for a single mechanical system so that different outputs can be attained.

5. Text-based code requires the use of formal syntax in order to function properly.

Essential Questions

1. What is the purpose of variables?

2. What type of values can be assigned to variables?

3. How can multiple variables be used for the same output?

4. How can variables be used by a robot to interpret and react to the environment around them?

5. What advantages does the use of text-based code have over block-based code?

Content

Vocabulary: text-based code, block-based code, variable, integer, Boolean logic, AND, NOR, XOR, NAND, OR, floating decimal point, string, declaration, counter, if-then, if-else, while loop, function

Skills

1. Add variables to a computer program.

2. Create codes that reference variables to determine output.

3. Develop computer programs that involve the use of multiple variable types.

4. Design a computer program with multiple variables that performs specific tasks.

5. Design a computer program that uses multiple input sensors and Boolean logic.

6. Design a program that utilizes sensors to interpret an environment and make decisions based on the data.

Resources

Desktop computers

Line-based programming software

Programmable integrated circuit (PIC) compatible with programming software

PIC peripherals

PIC sensors

PIC outputs

Standards

TECH.8.2.12.C.4	Explain and identify interdependent systems and their functions.
TECH.8.2.12.C.CS2	The application of engineering design.
TECH.8.2.12.D.CS1	Apply the design process.
TECH.8.2.12.E.1	Demonstrate an understanding of the problem-solving capacity of computers in our world.
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.4	Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).
TECH.8.2.12.E.CS1	Computational thinking and computer programming as tools used in design and engineering.