Unit 1: Advanced Robotics

Content Area: **Technology**
Course(s): **Technology**
Time Period: **Marking Period 1**
Length: **Weeks**
Status: **Published**

Unit Overview

Building on their knowledge of robotics and programming from previous year's, students will build robots that will interact with each other.

Standards

TECH.8.2.5.B. 6	Compare and discuss how technologies have influenced history in the past century.
TECH.8.2.5.B.CS4	The influence of technology on history.
TECH.8.2.5.C.5	Explain the functions of a system and subsystems.
TECH.8.2.5.C.6	Examine a malfunctioning tool and identify the process to troubleshoot and present options to repair the tool.
TECH.8.2.5.C.7	Work with peers to redesign an existing product for a different purpose.
TECH.8.2.5.D.2	Evaluate and test alternative solutions to a problem using the constraints and trade-offs identified in the design process to evaluate potential solutions.
TECH.8.2.5.D.3	Follow step by step directions to assemble a product or solve a problem.
TECH.8.2.5.D.4	Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved.
TECH.8.2.5.D.5	Describe how resources such as material, energy, information, time, tools, people and capital are used in products or systems.
TECH.8.2.5.D.CS2	Use and maintain technological products and systems.
TECH.8.2.5.D.CS3	Assess the impact of products and systems.
TECH.8.2.5.E	Computational Thinking: Programming: Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.
TECH.8.2.5.E.1	Identify how computer programming impacts our everyday lives.
TECH.8.2.5.E.2	Demonstrate an understanding of how a computer takes input of data, processes and stores the data through a series of commands, and outputs information.
TECH.8.2.5.E.3	Using a simple, visual programming language, create a program using loops, events and procedures to generate specific output.
TECH.8.2.5.E.4	Use appropriate terms in conversation (e.g., algorithm, program, debug, loop, events, procedures, memory, storage, processing, software, coding, procedure, and data).
TECH.8.2.5.E.CS1	Computational thinking and computer programming as tools used in design and engineering.

Essential Questions

- What steps do manufacturers take to design and build a product?
- How is energy transferred between objects or systems?

Application of Knowledge and Skills...

Students will know that...

- Different materials are used in making things.
- Engineers have an impact on the world they live in and their daily lives.
- Systems have parts that work together to accomplish a goal
- The engineering design process is useful for planning and guiding the creation of artifacts.

Students will be skilled at...

- Applying an understanding of modern manufacturing to design and build a product.
- Communicating using digital media
- Explaining how robots have changed how products are manufactured
- Explaining the type of energy transfer in their robot.
- Identifying roles robots and robotics have in manufacturing.

Assessments

The teacher will formally assess students throughout the unit by using rubrics for the following project or other projects determined by the teacher:

- Groups building a soccer player and goalie.

Activities

- Students will start each class by navigating to Google Classroom and responding to a writing prompt. In responding to the writing prompt, students will be collaboratively conversing with each other and their teacher digitally, using their schema of keyboarding and mouse skills.
- Engineer of the Week: Each week, a new engineer will be briefly introduced to the class, highlighting their impact on their current world.
- Students will be building in groups where they will build a soccer player and a goalie. They will then play a "soccer game"

- Students will be taking pre-existing projects and reuse them into another robot using materials they have already been exposed to

Activities to Differentiate Instruction

Enrichment Opportunity:

- Students can use NAO robot to learn Python and program a humanoid robot
- Studens can use advanced robotics kits to build alternate robot
- Mindstorms to build Alpha Rex

Integrated/Cross-Disciplinary Instruction

- Math- Students will have to have the proper number of blocks as well as the correct amount of bricks.

Resources

- Lego WeDO Robotics
- Mindstorms- If needed
- NAO Robot-if needed