*Unit 3 Introduction to Robotics

Content Area: **Technology**
Course(s): **Robotics**
Time Period: **November**
Length: **6 blocks**
Status: **Published**

Transfer Skills

Robots are complex devices that require problem solving, trouble shooting and maintenance to function safely and properly.

Enduring Understandings

1. Robots gather information through inputs such as sensors.

2. Autonomous robots can gather information and interpret it to determine outputs.

3. Robots follow the SPA sequence of Sense, Plan, Action

4. Robots cannot reason, they must follow guidelines set by writing specific programs.

5. The field of robotics incorporates many different areas of engineering, science and technology.

6. Sensors allow robots to interact with the world.

7. There are many different ways in which robots can be programmed to perform the same task(s).

8. Artificial intelligence (AI) is the science and engineering of making intelligent machines.

9. Many experts believe that AI is the future of robotics.

10. Many experts believe robotics is the future of manufacturing.

Essential Questions

1. Why do robots need to gather information?

2. Can a robot ever be fully autonomous?

3. Why do robots use predetermined programs?

4. Can a robot learn?

5. What are the ethical considerations with robotics?

6. How has robotics evolved over time?

7. What is the future of robotics?

8. What is artificial intelligence (AI)?

9. How does AI relate to robotics?

10. What is the future of AI in robotics?

Content

Vocabulary:

Robot, autonomous, sensor, program, programming, input, output, biomimetic, actuator, automation, FIRST, SPA, while loop, IF-THEN statement, debugging, analog, digital, boolean logic

Skills

1. Construct a simple robot.

2. Describe the difference between autonomous and non-autonomous robots.

3. Develop an SPA sequence of events for completing a simple task.

4. Develop an SPA sequence of events for a robot to complete a simple task.

5. Research an existing robot and create a report on its design and functions.

6. Design alterations to an existing robot based on its functionality during testing.

Resources

Desktop computers

Presentation device

Block-base programming software

Robotics platform compatible with software

Robotics platform peripherals

Standards

TECH.8.2.12.C.2	Analyze a product and how it has changed or might change over time to meet human needs and wants.
TECH.8.2.12.C.4	Explain and identify interdependent systems and their functions.
TECH.8.2.12.C.6	Research an existing product, reverse engineer and redesign it to improve form and function.
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.