Inspiring Greatness

ISD

INDEPENDENCE SCHOOL DISTRICT

PLTW Virtual Learning

6th Grade Intro to Gateway

April 22, 2020

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Lesson: April 22 (Part 3 of 5)

Objective/Learning Target:
Student will research and develop a deeper understanding of different types of robots used in society today and in the near future.

Warm-Ups:

You selected your robot category as part of yesterday's lesson. Make a list of all of the different things you would think that a robot in your category could do.

Pick one of the things you brainstormed, and sketch out what you think a robot would look like that could do that task.

Lesson Introduction/Background Information:

Yesterday you were to pick one of the following categories of robots to research:

- Industrial
- Medical
- Assistive
- Exploratory
- Rescue
- Toys
- Household

Practice:

Today you are going to start your research on your category. You are going to pick ONE robot from your category that you want to answer the questions about, so that will require some Googling before you start answering your research questions.

Then, I'm giving you three questions a day to find the answers to and record on a piece of paper.

Practice:

1. What task does the robot perform? What human function or task does this robot simulate?
2. Where is the robot used? What is its work envelope (how many degrees of freedom or flexible joints does it have)?
    a. “A robot's work envelope is its range of movement. It is the shape created when a manipulator reaches forward, backward, up and down. These distances are determined by the length of a robot's arm and the design of its axes. Each axis contributes its own range of motion. A robot can only perform within the confines of this work envelope. Still, many of the robots are designed with considerable flexibility. Some have the ability to reach behind themselves.”
3. Is the robotic end effector multi-functional? If so, what other tasks can it perform?
    a. “In robotics, an end effector is a device or tool that's connected to the end of a robot arm where the **hand** would be. The end effector is the part of the robot that interacts with the environment. The structure of an end effector and the nature of the programming and hardware that drives it depend on the task the robot will be performing.
    In manufacturing, a robot arm can accommodate only certain tasks without changes to its end effector's ancillary hardware and/or programming. If a robot needs to pick something up, a type of robot hand called a gripper is the most functional end effector. If a robot needs to be able to tighten screws, however, then the robot must be fitted with an end effector that can spin. “

Self-Assessment:

Go over the answers to your research questions today with someone else at home, explaining your research to them.

(You would have been presenting this information to the class if we were in school, so present it to someone at home!)

Extend Your Learning/Continued Practice:

Do you think that your robot will have a significant impact on humans? Why or why not?