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| **Activity 2.1.2 What Do We Use Robots For?**  |

Introduction

Robots are powerful machines that give us access to places that are otherwise inaccessible to the human population. They protect us from danger by performing tasks that are harmful to our health. They enhance the quality of our lives by performing tedious jobs and providing assistance to people with disabilities.

Some of the first robots were used in the 1940s to handle radioactive materials. In the early 1960s, the first industrial robot was used to pick up an object and set it down in a new location. The explosion in robotic innovation started in Japan during the 1970s. Since then robots have become permanent members of the industrial workforce, including parts handling, welding, and painting. Initially robots were used almost exclusively for mass production, performing the three Ds: dirty, dangerous, and dull jobs.

Robots simulate many human functions. They can move, sense their surroundings, and respond to changes in the environment. Many robots are mechanical arms attached to a base. Robotic arms use flexible joints to perform tasks that require very precise movements. A robot’s degree of freedom is its ability to move in a particular direction. Most robots have at least six degrees of freedom and can have many more. The space within which a robotic arm can move is called its work envelope. The size and shape of the work envelope is determined by the size of the robot and its degrees of freedom. Some robots are independent and can be controlled by a computer and wireless radio.

Computers are the brains of a modern robotic system. A robotic system has five main parts: a controller serves as the robot’s brain; a computer program provides instructions for the robot to follow; a manipulator that resembles a human arm or torso provides movement; an end effector serves as a robot’s hand; and a power supply provides electric, hydraulic, or pneumatic power to the robot.

Equipment

* GTT notebook
* Pencil
* Computer with Internet access and presentation software
* Resource books

Procedure

Your teacher will divide your class into several groups. Each group will research and present to the class information about the use of their assigned robot in today’s society. Your group will have two days to research and prepare a presentation that includes the following information.

1. What task does the robot perform?
2. Where is the robot used?
3. Is there more than one task this robot can perform? If so what are the other task?
4. How does the robot know when to perform tasks?
5. What sensors does the robot have and how does it use these sensors?
6. Name at least three advantages and disadvantages of using a robot to complete this task.
7. Describe the impact that this robot has had or could have on its intended audience
8. What type of jobs/careers did the making of this robot involve?
9. Predict and explain the future of this robot. What could be some improvements made to it?
10. Include sketches, pictures, and/or video of the robot performing its task in your presentation.
11. While listening to your classmates present, be sure to fill out the worksheet Ms. Harris gives you. That will be turned in.