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DepED
DEPARTMENT OF EDUCATION

ICT 9 Activity Sheet Quarter 4 | Weeks 5-6

Basics of Robotics

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WRITERS

Introductory Message

Welcome to ICT 9!

The **Learning Activity Sheet** is self-directed instructional materials aimed to guide the learners in accomplishing activities at their own pace and time using the contextualized resources in the community. This will also assist the learners in acquiring the lifelong learning skills, knowledge and attitudes for productivity and employment.

For learning facilitator:

The **ICT 9 Activity Sheet** will help you facilitate the leaching-learning activities specified in each Most Essential Learning Competency (MELC) with minimal or no face-to-face encounter between you and learner. This will be made available to the learners with the references/links to ease the independent learning.

For the learner:

The **ICT 9 Activity Sheet** is developed to help you continue learning even if you are not in school. This learning material provides you with meaningful and engaging activities for independent learning. Being an active learner, carefully read and understand the instructions then perform the activities and answer the assessments. This will be returned to your facilitator on the agreed schedule.

Name of Learner:_____ Grade and Section:_____
School:_____ Date: _____

ICT 9 ACTIVITY SHEET
Basics of Robotics

Learning Competency:

Described robotics and their applications.

Support Competencies:

1. Identify the essential characteristics of robots.
2. Describe the types of robots.
3. Identify the components of robots.

Background information for the learners

Robotics technology influences every aspect of work and home. Robotics has the potential to positively transform lives and work practices, raise efficiency and safety levels and provide enhanced levels of service.

In this lesson, you will learn what is robotics, its characteristics, components and applications.

Activity Proper
Activity 1.

What is Robotics?

Robotics is the branch of technology that deals with the design, construction, operation and application of robots and computer systems for their control, sensory, feedback and information processing. These technologies deal with automated machines that can take the place of humans in hazardous or manufacturing processes, or simply resembles humans.

What is a Robot?

- A robot can be defined as a programmable, self control device consisting of electronic, electrical or mechanical units.
- A robot is a mechanical apparatus designed to do the work of a man. Its components are usually electromechanical and are guided by a computer program or electronic circuitry.

Essential Characteristics of Robots

- ❖ Sensing. The robot should be able to sense its surroundings and that is only possible with the help of sensors.

Types of sensors:
light sensors(eye),
hearing sensors(ear)
chemical sensors(nose).

- ❖ Movement. A robot needs to be able to move around its environment whether by rolling on wheels, walking, snaking or skating.
- ❖ Energy. A robot needs to be able to power itself which depends upon its power resources (example: batteries, power generators or fuel)
- ❖ Intelligence. A robot needs to be intelligent and smart which is only possible by the programmer person.

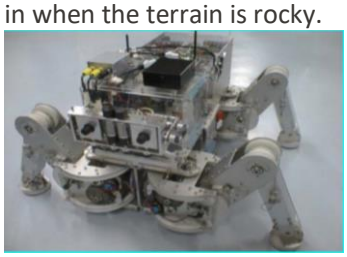
Types of Robots

Mobile Robots. Robots that are able to move, usually they perform tasks such as searching.

2 types:

1) Rolling robots- Rolling robots have wheels to move around. They can quickly and easily search. However, they are only useful in flat areas.

2. Walking robots- Robots on legs are usually brought in when the terrain is rocky.



Industrial Robots or stationary robots

- Most of these robots perform repeating tasks without ever moving.
- Most robots are working in industries. Especially dull and repeating tasks are suitable for robots.

Autonomous Robots

- Autonomous robots are self- supporting.
- They run a program that gives them the opportunity to decide on the action to perform depending on their surroundings.

Remote-controlled Robots

A person can guide a robot by remote control. A person can perform difficult and usually dangerous tasks without being at the spot where the tasks are performed.

Virtual Robots

Virtual robots don't exits in real life.
Virtual robots are just programs, building blocks of software inside a computer.

Robot Components

1. **Manipulator or Rover**. Main body of robot (Links, Joints, other structural element of the robot)
2. **End Effecter**. The part that is connected to the last joint hand) of a manipulator.
3. **Actuators**. Muscles of the manipulators (servomotor, stepper motor, pneumatic and hydraulic cylinder).
4. **Sensors**. To collect information about the internal state of the robot or to communicate with the outside environment.
5. **Controller**. Similar to cerebellum. It controls and coordinates the motion of the actuators.
6. **Processor**: The brain of the robot. It calculates the motions and the velocity of the robot's joints, etc.
7. **Software**: Operating system, robotic software and the collection of routines.

The Purpose of Robots

Robots are also used for the following tasks:

- Dirty Tasks
- Repetitive tasks
- Dangerous tasks
- Impossible tasks
- Robots assisting the handicapped
- Can operate equipments at much higher precision than humans.
- Cheaper on a long term basis.

Robotic Applications

EXPLORATION

- Space Missions
- Robots in the Antarctic
- Exploring Volcanoes
- Underwater Exploration

MEDICAL SCIENCE

- Surgical assistant

ASSEMBLY

- factories Parts
- handling
- Assembly
- Painting
- Surveillance
- Security (bomb disposal,etc)
- Home help (grass cutting, nursing)

Answer the questions below.

1. What is the difference between Mobile robots and industrial robots?
2. What is the importance in knowing the different types of robots and its applications?

Activity 2.

In this activity, you will watch a video that will showcase the application of robotics.

Link:
https://www.youtube.com/watch?v=V3gIWyjEtEg

After watching the video, answer the questions below.

1. What application of robotics was shown in the video?
2. How robots help humans in their daily lives?

Activity 3.

Multiple choice. Select the letter of the correct answer.

1. Which of the following is NOT a characteristic of robots?
   a. Intelligence c. Lucrative
   b. Sensing d. Movement
2. A robot is
   a. Mechanical device c. Hazardous
   b. Programmable d. Self control device
3. The purpose of the robots is___
   a. do dangerous tasks
   b. eliminate human beings
   c. operate equipments
   d. perform repetitive tasks
4. A robot component that serves as the brain is called__
   a. controller c. sensor
   b. software d. processor
5. The following are the sensors of robots, except
   a. physical c. light
   b. chemical d. hearing
   b. autonomous robots d. stationary robots
6. What type of robot that has wheels and can quickly and easily search?
   a. walking robots c. rolling robots
   b. remote-controlled robots d. industrial robots
7. Robots can perform a task without human intervention.
   a. True b. False
8. Robots are intelligent because they are designed by human.
   a. True b. False
9. Robots that are self- supporting is called__
   a. mobile robots c. remote-control robots
   b. autonomous robots d. stationary robots
10. The main body of the robot is called___
    a. Actuators c. Controller
    b. End Effector d. Manipulator

Reflection.

Complete the statements below.

I understand_____
_____
I don't understand _____
_____
I need more information about _____
_____

Links and/or Other References

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