

Robotic Agricultural Assistant:

Name: _____

Lesson 2

Date: _____

Agriculture - the science of cultivating the soil, producing crops, and raising livestock

Agrorobotics- the use of robots in agriculture

Labor intensive - needing a large workforce or a large amount of work in relation to output

Job Outlook - the likelihood that the selected occupation will be available and hiring in the future

Engage

How are robotic arms used in the agriculture industry?

Answers may vary and can draw on a wide range of prior knowledge. Answers may include drones monitoring crops or spraying pesticides.

What are some advantages of robotic arms in agriculture? What about the disadvantages?

Answers may vary and can draw on a wide range of prior knowledge. Answers may include that agriculture is very labor intensive and robots do not tire like human workers. A disadvantage is that robotic arms and water do not mix well.

Explore

While robotic arms have a key role in today's lesson, we will explore the related career of an Agricultural Engineer. After watching the video, find the following information about Agricultural Engineers:

Education needed to be an Agricultural Engineer	They typically need a bachelor's degree in an engineering field, such as agricultural or biological engineering
Skills Needed to be an Agricultural Engineer	Agricultural engineers must analyze the needs of complex systems that involve workers, crops, animals, machinery and equipment, and the environment.
Duties of an Agricultural Engineer	The duties include solving problems concerning power supplies, machine efficiency, the use of structures and facilities, pollution, and environmental issues
What kind of work environment does an Agricultural Engineer work in?	Agricultural engineers work mostly in offices, but may spend time traveling to agricultural settings
Average Salary in your state	The answer will vary by location. Median pay is \$88,750 per year
What is the job outlook for this career?	Employment of agricultural engineers is projected to grow 8 percent from 2023 to 2033.

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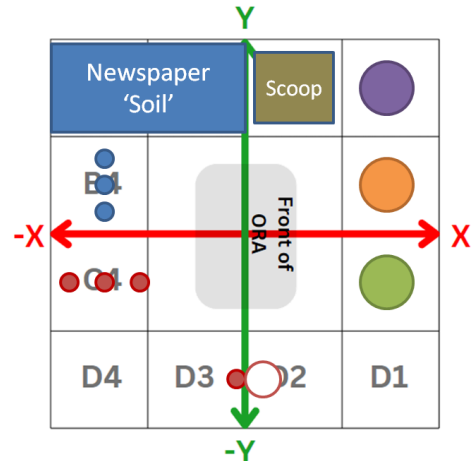
Date: _____

Elaborate

In this challenge, you will program ORA to perform several duties in a high-tech greenhouse.

Task Requirements:

1. ORA must start in the initial position.
2. ORA must use the finger grippers to interface with various objects including a student-created scoop, red cylinders (cuttings), fertilizer (foil balls), and a watering can (empty!).
3. Students will create functions to perform the following:
 - a. Fill cups in A1, B1, and C1 with substitute soil, and place cuttings
 - b. 'Water' the cups
 - c. Place a fertilizer pellet in each cup
 - d. Harvest the cuttings and stack them neatly in D1 for processing
4. ORA must finish in the Initial Position.



Pseudocode	Code Blocks
Answers will vary	Example Solution Code or Share Code: v5sqdvb

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Evaluate

Please answer the following prompts.

Remember to include your **name** and **date** on this paper!

1. Does the career of Agricultural Robotic Engineer interest you? Why or why not?

Answers will vary.

2. After testing your code in the Elaborate section, were you successful? What can be done to improve the process?

Answers will vary, but there are many points for improvement such as the best method to scoop and dump newspaper balls, the length of time to water, or the best methods for placing cups or fertilizer pellets.

3. What is something new you learned about agriculture, robotics, or robots in agriculture through today's lesson?

Answers will vary but could include the use of GPS technology to plant fields, the use of robotic arms to maintain and harvest plants, or any topic covered in this lesson.