

Material Movers

Name: _____

Lesson 12

Date: _____

Shipping Pallet - a flat platform used to transport, store, and handle products

Shipping Container - A large, long box used to transport and protect goods between two locations

Density - a physical property describing the volume divided by the mass

Optimize - make the best or most effective use of something, often space

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

Engage

When you buy a product that was made overseas (for example, a cell phone), describe, to the best of your knowledge, how that item gets from the manufacturer into your hands.

Answers may vary based on the student's background knowledge. But it is important to know that there is a large network of shipping and freight that helps drive our global economy!

How can robotic arms be used to increase the efficiency of this process?

Answers may vary based on student background knowledge, but students could draw on lessons learned in the ORA Essentials about how robotic arms are good for high-speed and precise motions!

Explore

Robotic arms have a key role in today's lesson. We will explore the related career of Distribution Manager. After watching the video, find the following information about Distribution Managers:

Education needed to be a Distribution Manager	Distribution managers typically need a high school diploma, although some employers prefer or require a bachelor's degree. They also need related work experience to enter the occupation.
Skills Needed to be a Distribution Manager	A distribution manager needs to have a solid grasp of hard skills such as logistics, operational procedures, and inventory control
Duties of a Distribution Manager	Distribution managers plan, direct, or coordinate the movement of people and goods.
What kind of work environment does a Distribution Manager work in?	Distribution managers work full time, and some work more than 40 hours per week.
Average Salary in your state	Varies by location. Median salary is \$99,200
What is the job outlook for this career?	Employment is projected to grow 9 percent from 2023 to 2033, much faster than the average for all occupations.

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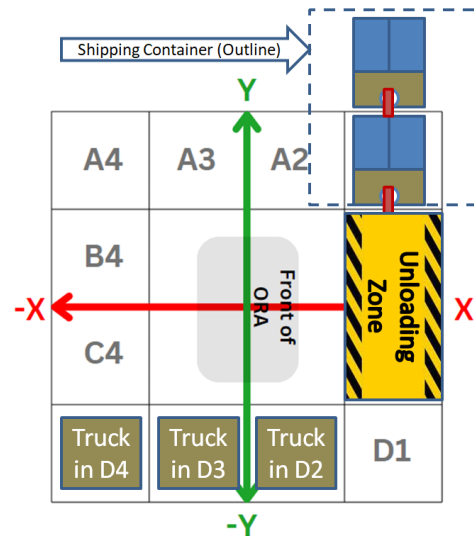
Date: _____

Elaborate

In this challenge, students will program ORA to unload a model shipping container with two pallets inside. Students will remove the pallets from the container and then move the products on the pallets to three waiting trucks to transport those goods to a store.

Task Requirements:

1. ORA must start in the initial position.
2. ORA must use the vacuum grippers to grip the first pallet by the handle and pull it to the Unloading Zone.
3. ORA will move two boxes from the pallet and place them in a single pile in D2. Then repeat this by placing two boxes from the pallet into D3 and D4.
4. ORA will remove the empty pallet from the Unloading Zone.
5. ORA will reach into the shipping container to grip and remove the second pallet into the Unloading Zone.
6. ORA will again unload two boxes from the pallet, each into D2, D3, and D4, so that there are 4 boxes in each 'truck.'
7. ORA must finish in the Initial Position.



Pseudocode	Code Blocks
Answers may vary	Example solution code.

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Evaluate

Please answer the following prompts.

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

1. Did this lesson change your understanding of how goods are shipped? If so, how?

Answers may vary based on student's background knowledge.

2. After testing your code in the Elaborate section, what was the most difficult part? What about that process made it most difficult?

Answers may vary based on student difficulties. One difficult thing was ensuring the Z height was correct, as the stacks on the pallets or the stacks on the trucks increased or decreased as the program progressed.

3. Does the career of Distribution Manager interest you as a possible career option? Why or why not?

Answers may vary, but the pay for a Distribution Manager is pretty good, and it is a growing industry, so it is likely that the students could find job opportunities.