Robot House Builder:

Name:_____

Lesson 3

Date:_____

Construction - the industry related to designing and building various structures
Additive Manufacturing - the process of creating an object by building it one layer at a time
Blueprint - a design plan or other technical drawing for creating an object
Job Outlook - the likelihood that the selected occupation will be available and hiring in the future

Engage

How difficult would it be for you to recreate the structure presented?
Answers will vary, but with the same materials available, it would be fairly simple to recreate the structure.

If you were to tell a friend in another class to recreate the structure, how can you best convey how to build it?
Answers will vary, but students may suggest taking pictures from multiple angles or drawing the structure to send to the friend.

Explore

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

Education needed to be a Construction Engineer	The minimum is a bachelor's degree in civil engineering or a related field
Skills Needed to be a Construction Engineer	A strong foundation in engineering principles, construction methods, materials science, and design software
Duties of a Construction Engineer	They manage construction projects from start to finish to ensure that they are built safely, on time, and within budget
What kind of work environment does a Construction Engineer work in?	Construction engineers work in a variety of locations and conditions, including indoors in office settings and outdoors at construction sites
Average Salary in your state	The answer will vary by location. Average salaries range from $88,000 to $137,000
What is the job outlook for this career?	The projected construction engineer job growth rate is 7% from 2018-2028

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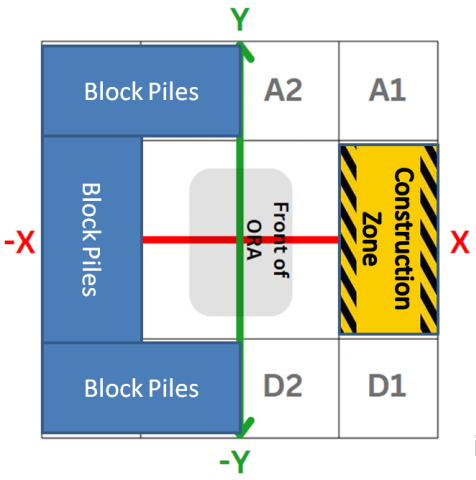
Elaborate

In this challenge, you will program ORA to create a small house based on your cross-section blueprints.

Task Requirements:

1. Students must build a simple house that:
    a. Fits in the construction zone
    b. Has at least one door
    c. Has at least one window
    d. Has a roof
    e. Is at least three 'layers' tall
    f. It is planned on engineering paper
2. ORA must start in the initial position.
3. ORA must use the vacuum grippers to pick up building blocks to recreate the house as laid out the blueprints.
4. ORA must finish in the Initial Position.



in

Pseudocode	Code Blocks
Answers will vary	Example Solution Code or Share Code: tsvc98g

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Evaluate

Please answer the following prompts.
Remember to include your **name** and **date** on this paper!

1. What application of Robotic Construction Engineer discussed in this lesson interests you the most and why?

Answers will vary but should include an aspect discussed in the lesson, such as 3D printing a house or robotic paint application.

2. After testing your code in the Elaborate section, were you successful? What was one roadblock that made the task difficult?

Answers will vary but one roadblock could be individual differences in blocks (especially if they were hand-crafted) which may lead to gaps in the structure.

3. Why do construction firms use blueprints when constructing buildings?

Blueprints give the builders precise measurements to follow. These usually have been approved by a client so they need to know exactly how to make the building to meet the client's needs.