

The Lego “Robot” Challenge

Background:

Robots are a diverse bunch. Some walk around on their two, four, six, or more legs, while others can take to the skies. Some robots help physicians to do surgery inside your body; others toil away in dirty factories. There are robots the size of a coin and robots bigger than a car. Some robots can make pancakes. Others can land on Mars. This diversity—in size, design, capabilities—means it’s not easy to come up with a definition of what a robot is.

A robot is a type of autonomous machine that can execute specific tasks with little or no human intervention and with speed and precision. They can be designed to achieve specific tasks and perform specific functions. It senses its environment, carrying out computations to make decisions, and performing actions in the real world.

Activity:

Using the provided Lego kits, you and your partner will design and build 2 or more different “robots” that could meet the accomplish each of the following 5 tasks:

- Can reach an item 15 feet above the ground
- Carry a hammer 36 inches
- Make a pot of coffee
- Travel across a gap of 20 centimeters
- Push an object 10 meters

Each group will record their ideas using the table on the next page. Be sure to record ideas in written form and visually.

Criteria:

- Design a “robot” that could accomplish the specified task using the Lego kits
- Record each design and any comments regarding the design using the table outline

Constraints:

You will have one class period to design your “robots” and you may only use the materials provided in the kits and in the Lego cabinet.

As you work through the design challenge, select one team member who will record your process in the graphic organizer below.

Robot #1

Goals <i>What are your group's goals for this challenge?</i>	To make one robot that can move a hammer 10 meters
Process <i>Record the steps your group took to complete the challenge.</i>	So we first wanted to create a base so it had a good foundation for the hammer, but we also had limited materials, so we had to use random lego to make the build. After testing it with the hammer, we found that it was slipping off, so we put these t shaped pieces to hold it in place.
Challenges <i>What challenges did your group run into?</i>	We did not have a lot of material to work with, so we had to compromise. After looking at the Activity again, we found out that we only had to carry a hammer 36 inches not 10 meters. We got the 2 challenges mixed up, but at the end, I guess we did fit the criteria.
Accomplishments <i>What are your group's goals for this challenge?</i>	We finished the robot which can move the hammer 10 meters
Photos <i>Include photos of your process</i>	

Robot #2

Goals <i>What are your group's goals for this challenge?</i>	To make one robot that can push an object 10 meters
Process <i>Record the steps your group took to complete the challenge.</i>	We first attached wheels to a base so it had a way to move. Then we built a claw that was attached to the front so it could push an object. At first the robot was too complicated and it wouldn't give good results. However in the end we extended the length of the robot and removed unnecessary parts so it gave better results.
Challenges <i>What challenges did your group run into?</i>	The robot was too small and the components were too complicated so it was hard to get good results.
Accomplishments <i>What are your group's goals for this challenge?</i>	We finished making the robot in the end by focusing on what went wrong with the first design.
Photos <i>Include photos of your process</i>	