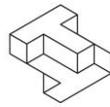


# Help the Helper

Lab Related Activity: *Social Robots*



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Students will brainstorm different jobs people perform to help others. They will then pick one job and create a robot design to help humans performing this job. Designs will show how the robot will perform functions by labeling inputs and outputs.

**Grades:** 3-8 | **Estimated Time:** 45 minutes

## Student Outcomes

Students will be able to identify inputs and outputs

Students will be able to design an original robot to perform a helping role

## Next Generation Science Standards

*Physical Science*

Grade 4: 4-PS4-3

*Engineering Design*

Grade 3-5: 3-5-ETS1-1

Grade 6-8: MS-ETS1-1

## California State Science Standards

*Investigation and Experimentation*

Grade 5: 6c, g

Grade 6: 7d

Grade 7: 7d

## Common Core ELA Standards

*Presentation of Knowledge and Ideas:*

Grade 4: SL.4.4; Grade 5: SL5.4; Grade 6: SL6.4

## Vocabulary

*Familiarity with these terms and concepts will enhance students' experience in the activity.*

- **Engineer:** a person who designs, builds, creates, invents, or repairs devices or machines.
- **Circuit:** a closed path that allows electricity to flow (one device connected to a power source by a conductor).
- **Prototype:** an early model of new machines and devices developed by engineers
- **Sensor:** a device that detects heat, light, sound, motion, etc.
- **Social Robot:** a robot that interacts and communicates with humans through social interaction. E.g. performing tasks such as doing the dishes, taking restaurant orders, etc.
- **Input (in relation to exhibit):** A device that gives a command
- **Output (in relation to exhibit):** A device that receives a command and carries out its predetermined action

## Materials (one set per group of 4 students)

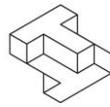
- Material to create a robot (paper and markers, clay, recycled materials, etc.)
- Paper and pencils or computer to record notes on how the robot works
- (Optional) Whiteboard or smartboard to brainstorm as a class
- (Optional) Technology to show a short video clip to the class

## Teaching points:

1. Looking for the Helpers
  - a. Grades 1-3: Looking for helper people
    - i. Mr. Rogers tells a story about looking for the helpers [https://youtu.be/-LGHtc\\_D328](https://youtu.be/-LGHtc_D328)
    - ii. Who can think of a job where people help other people? How do they help others?  
Lead students to topics like medical staff, firefighters, teachers, police, garbage collectors, etc. As you go further your students might point out all jobs are about helping others.
  - b. Grades 4-8: Some helper robots
    - i. Zume delivers made-to-order pizza with robots <https://youtu.be/uFSdxwRVh8A>
    - ii. Robot-staffed hotel in Japan <https://youtu.be/HVVk0b9DX8Q>
    - iii. Medical robot to help children <https://youtu.be/5tvGtxJt-To>
2. *What jobs do you think a robot could do to help people? Are there tasks in your life that you think a robot could be*

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*designed and built to assist with? How about at your school?*

## Procedure:

3. (Assessment) Have students work individually or in groups to come up with a robot that will help the helpers. Students will be required to design a robot that helps a person helper. The individual or team will need to:
  - a. Create a model or drawing of their social robot
  - b. Identify 3 inputs and outputs for the robot.
  - c. Write and present a sales pitch as to why this social robot will be able to help a helper.
4. What is an input?  
This is a device that gives a command, in this case something that gives a command to our robot.  
For example, if I want to turn off the light, do I unscrew the lightbulb? No, I would flip the switch which disconnects the circuit.
5. Inputs don't need to be switches. There are other ways to give robots information. Imagine, how are the ways you get information? Lead students to talk about their senses (this activity will work well after the Robot Sensors activity). Lead into a connection between robot sensors and human senses. For example: Robots can sense heat, which is like human skin.
6. When we create robots we want them to perform different tasks based on the inputs. We might do this by writing a program and by giving the robot different sensors, so it can act off of information around it. Finally we want the robot to make outputs, or actions. Let's think about this with our own bodies again. What if you heard a loud sound with your ears, what might you do? Cover your ears, look for the source, etc. Those are all outputs or responses based on the inputs. Think about the doors at a lot of grocery stores or big stores, how do the doors open? How does the door 'know' that it should open?
7. Now I want to give you (your team) an opportunity to create a helper robot. Remember the jobs we discussed at the beginning of the class? You (your team) will be responsible for designing a helper robot to assist a helper person. Let's practice as a group with the job of librarian (see example at the end of this document).
  - a. What are some of the things a librarian does to help us?
  - b. Can any of those be programmed into a robot?
  - c. What would the inputs, sensors, and outputs be?
8. Great work! Now it is your (your teams) turn. Pick a helper job that is not a librarian.
  - a. Create a model or drawing of the helpful social robot
  - b. Identify 3 inputs and outputs for the robot
  - c. Write and present why this social robot will be able to help the helpful person.
  - d. (Optional) Have students sign up for helper jobs, if you want a limit on how many robots address one job.

## Teaching Points:

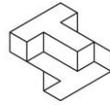
9. DISCUSSION QUESTIONS:
  - a. What do you think is the best part of your design?
  - b. What do you think would be the biggest benefit of making robot helpers?
  - c. After seeing the presentations by the different groups, what would you change about your design?
10. Looking at your creations I am reminded how much people give to each other. I am thankful for their hard work and your hard work as students.

## Taking it Further

- Have students write thank you notes to people who perform helpful services in their community
- Invite members of the community to see student innovation presentations
- Have students code using Khan Academy or Hour of Code

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## EXAMPLE: SOCIAL LIBRARIAN ROBOT

