

Big Little Helper

Daniel's locker is overflowing. How can he get all his things home?

🕒 30–45 min.

📦 Beginner

🎓 Grades 3–5



Teacher Support

Key objectives

Students will:

- Create a possible solution to a problem that has constraints
- Improve on others' ideas to develop a new program
- Engage effectively in a range of collaborative discussions

Things you will need

(one for every two students)

- LEGO® Education SPIKE™ Essential Set
- Device with the LEGO® Education SPIKE™ App installed

Additional resources

[Building instructions](#)

[Meet the Team: Minifigure Bios](#)

[Assessment Rubric](#)

Educational standards

- CSTA 1B-AP-08
- NGSS 3-5 ETS1-2
- ISTE 1.4c
- CCSS.ELA-LITERACY.SL.5.1

Math Extension

- CCSS.MATH.CONTENT.5.G.A.1

Prepare

- Review the *Big Little Helper* lesson in the LEGO® Education SPIKE™ App.
- If necessary, pre-teach these related vocabulary words: *control*, *constraint*, *design*, *robot*, and *solution*.
- Consider the abilities and backgrounds of all your students. Differentiate the lesson to make it accessible to everyone. See the *Differentiation* section below for suggestions.
- If time allows, plan and facilitate the math extension. See the *Extension* section below for more information.

Engage

(Whole Class, 5 Minutes)

- Facilitate a quick discussion about solving a problem that has constraints.
 - Talk with your students about moving everything out of your classroom into another one, with one catch. They must finish the move in 10 minutes!
 - Ask questions, like: *How could you empty the classroom in the shortest amount of time? What if you only had four classmates to help?*
 - Introduce your students to the story's main characters and the first challenge: controlling the robot helper.
 - Distribute a brick set and a device to each group.
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Explore

(Small Groups, 30 Minutes)

- Have your students use the LEGO® Education SPIKE™ App to guide them through their first challenge:
 - Create and test the program that controls the robot helper.
 - Have your students iterate and test their models to complete the next two challenges in the app:
 - Program the robot helper to follow Daniel home.
 - Design your own improved robot helper.
 - You can find coding and building support in the *Tips* section below.
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Explain

(Whole Class, 5 Minutes)

- Gather your students together to reflect on their completed challenges.
 - Ask questions, like: *How did you help Daniel get all his belongings home? How is the design of your robot helper different from Daniel's?*
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Elaborate

(Whole Class, 5 Minutes)

- Prompt your students to discuss and reflect on ways of creating a possible solution to a problem that has constraints.
 - Ask questions, like: *Why is it important to consider constraints when designing a solution? How do constraints affect your design process?*
 - Have your students clean up their workstations.
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Evaluate

(Ongoing Throughout the Lesson)

- Ask guiding questions to encourage your students to "think aloud" and explain their thought processes and reasoning in the decisions they've made while building and programming.

Observation Checklist

- Measure your students' proficiency in creating a possible solution to a problem that has constraints.
- Create a scale that matches your needs. For example:
 1. Needs additional support
 2. Can work independently
 3. Can teach others

Self-Assessment

- Have each student choose the brick that they feel best represents their performance.
 - Yellow: I think I can create a solution to a problem that has constraints.
 - Blue: I can create a solution to a problem that has constraints.
 - Green: I can create a solution to a problem that has constraints, and I can help a friend do it too.

Peer-Feedback

- In their small groups, have your students discuss their experiences working together.
 - Encourage them to use statements like these:
 - I liked it when you...
 - I'd like to hear more about how you...
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Tips

Coding Tip

- After your students complete their first challenge, they'll be provided with a map.
- Your students can use the map and experiment with the available Coding Blocks to modify their programs to follow the route for the trip.

Model Tip

- After your students complete their second challenge, they'll be provided with three Inspiration Images and an open-ended prompt for improving their models.
- The Inspiration Images are to help spark their imaginations as they experiment and personalize their models.

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There aren't any building instructions for this challenge.

Differentiation

Simplify this lesson by:

- Selecting one Inspiration Image to help your students personalize their models
- Experimenting with either the coding or the building

Increase the difficulty by:

- Designing different bases to assist the robot helper in carrying Daniel's things

- Programming the robot helper to follow a predetermined route
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Extension

- Have your students use graph points to map the robot helper's path. They should use the x- and y-axis to plot where the robot helper travels. They can also plot the path of another group's helper.

If facilitated, this will extend beyond the 45-minute lesson.

Math: CCSS.MATH.CONTENT.5.G.A.1