

Taxi! Taxi!

Leo needs help getting to the art museum. Hail a taxi, and let's go!

🕒 30–45 min. 📦 Beginner 🎓 Grades 3–5



Teacher Support

Key objectives

Students will:

- Identify and fix errors in a program (test and debug)
- Explore two-dimensional shapes and angles
- Recount an experience using relevant facts and descriptive details

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-15
- NGSS 3-5-ETS 1-2
- ISTE 1.5c
- CCSS.ELA-LITERACY.SL.3.4

Math Extension

- CCSS.MATH.CONTENT.3.MD.D.8

Prepare

- Review the *Taxi! Taxi!* lesson in the LEGO® Education SPIKE™ App.
- If necessary, pre-teach these related vocabulary words: *backward*, *debug*, *direction*, *forward*, *frustrated*, and *route*.
- 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 having to make a change in order to complete a task.
 - Talk with your students about taking different routes to get from one place to another, like between classrooms.
 - Ask questions, like: *Would you be able to get to that classroom if you could only make right turns? What would you have to change in order to reach the other classroom?*
 - Introduce your students to the story's main characters and the first challenge: driving the taxi.
 - 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 drives the taxi.
 - Have your students iterate and test their models to complete the next two challenges in the app:
 - Modify the program to make the taxi follow the route on Leo's map.
 - Design a new route for Leo's next trip.
 - 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: *What were you thinking about when you were modifying the program to follow the route on Leo's map? How was your program for Leo's next trip different from the one that you made for Leo's trip to the art museum?*

Elaborate

(Whole Class, 5 Minutes)

- Prompt your students to discuss and reflect on the process of testing a program to identify and fix errors.
 - Ask questions, like: *Why is it important to test a program to make sure it works as intended? How can you use the results of your tests to improve the program?*
 - 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 identifying and fixing errors in a program (testing and debugging).
- 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 identify and fix errors in a program (test and debug).
 - Blue: I can identify and fix errors in a program (test and debug).
 - Green: I can identify and fix errors in a program (test and debug), 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.
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Differentiation

Simplify this lesson by:

- Reading the *Taxi! Taxi!* story and instructions from the LEGO® Education SPIKE™ App aloud to your students
- Selecting one Inspiration Image to help your students change their models

Increase the difficulty by:

- Exploring new and different coding blocks in the program
 - Creating routes for another group's taxi to follow
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Extension

- Have your students record their taxi's path. Ask them to identify the shape made by the taxi and investigate the shape's perimeter.

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

Math: CCSS.MATH.CONTENT.3.MD.D.8