

Cable Car

Leo is nervous about crossing Spike Lake in the cable car today. Can Maria help him conquer his fears?

🕒 30–45 min. 📦 Beginner 🎓 Grades 3–5



Teacher Support

Key objectives

Students will:

- Use sequences and loops to program their models
- Identify and fix errors a program to ensure it works as intended (test and debug)
- 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-10
- NGSS 3-5-ETS 1-2
- ISTE 1.5d
- CCSS.ELA-LITERACY.SL.3.4

Language Arts Extension

- CCSS.ELA-LITERACY.W.3.3

Prepare

- Review the *Cable Car* lesson in the LEGO® Education SPIKE™ App.
 - 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 language arts extension. See the *Extension* section below for more information.
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Engage

(Whole Class, 5 Minutes)

- Facilitate a quick discussion about repeating a motion to repeat a task.
 - Talk with your students about moving people from one place to another.
 - Ask questions, like: *What are some ways of moving people from one place to another? How could that mode of transportation be repeated to make sure that everyone gets to where they want to go?*
 - Introduce your students to the story's main characters and the first challenge: moving the cable car across the lake.
 - 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 moves the cable car across the lake.
 - Have your students iterate and test their models to complete the next two challenges in the app:
 - Modify the program to improve the cable car ride.
 - Upgrade the cable car for Leo and Maria'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: *How did you improve the program for the cable car ride? Why did you make those improvements?*
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Elaborate

(Whole Class, 5 Minutes)

- Prompt your students to discuss and reflect on using sequences and loops.
 - Ask questions, like: *How did introducing a loop to your program improve the cable car ride? Why do you think it's valuable to have something on a loop?*
 - 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 using sequences and loops.
- 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 use sequences and loops.
 - Blue: I can use sequences and loops.
 - Green: I can use sequences and loops, and I can help a friend do it too.

Peer-Feedback

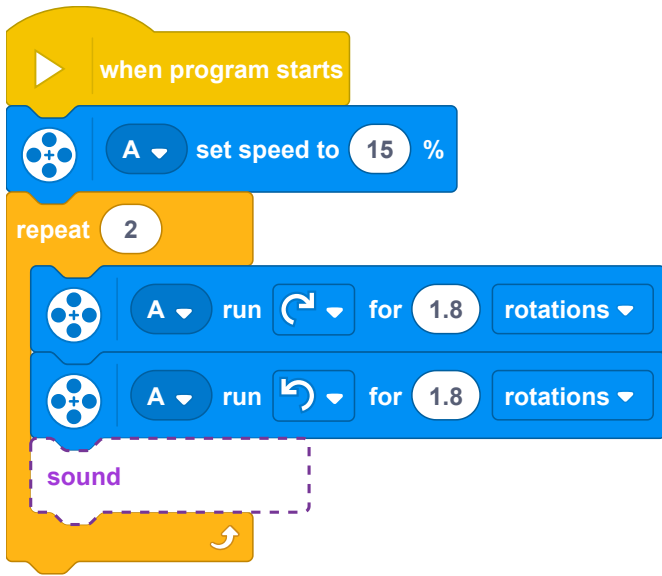
- In their small groups, have your students discuss their experiences working together.
 - Encourage them to use statements like these:
 - I liked it when you...
 - I'd like to hear more about how you...
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Tips

Coding Tip

- After your students complete their first challenge, they'll be provided with three Inspiration Coding Blocks to help them modify their programs.
- The Inspiration Coding Blocks are intended to spark their imaginations as they experiment to find their own solutions.

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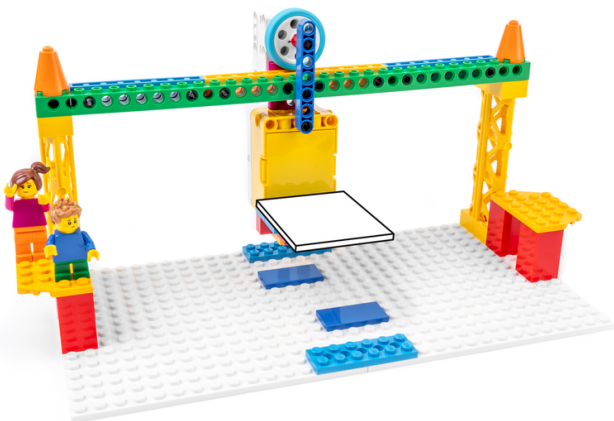
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Model Tip

- 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 change their models.

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There aren't any building instructions for this challenge.

Differentiation

Simplify this lesson by:

- Reading the *Cable Car* 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
 - Making the cable car track as long as possible
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Extension

- Have your students write a story about Leo and Maria's trip across Spike Lake in the cable car. Tell them to use a clear sequence of events that explains what Leo and Maria did before, during, and after their trip.

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

Language Arts: CCSS.ELA-LITERACY.W.3.3