

Big Bus

Today is going to be an awesome day! Help Daniel get to the sports stadium to see the big game.

🕒 30–45 min.

📖 Beginner

🎓 Grades 3–5



Teacher Support

Key objectives

Students will:

- Improve a program to meet a specific need
- Test and evaluate solutions to determine whether they meet a specific need
- 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-13
- NGSS 3-5-ETS 1-2
- ISTE 1.5a
- CCSS.ELA-LITERACY.SL.3.4

Language Arts Extension

- CCSS.ELA-LITERACY.W.3.1

Prepare

- Review the *Big Bus* 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.

Engage

(Whole Class, 5 Minutes)

- Facilitate a quick discussion about making improvements to make something work better.
 - Talk with your students about how buses stop at different bus stops.
 - Ask questions, like: *How does the bus know where to stop? What happens if people are waiting at the bus stop? What happens if no one is waiting?*
 - Introduce your students to the story's main characters and the first challenge: making the bus stop at the green stop.
 - 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 makes the bus stop for Daniel at the green stop.
 - Have your students iterate and test their models to complete the next two challenges in the app:
 - Modify the program to change the bus ride.
 - Upgrade the bus route to stop at different stops.
 - 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 did you want to include in your program to ensure that it met Daniel's needs? What was the most challenging part of trying to make the bus stop at the appropriate stop?*
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Elaborate

(Whole Class, 5 Minutes)

- Prompt your students to discuss and reflect on improving a program to meet a specific need.
 - Ask questions, like: *Why do you think it's important to accommodate specific needs in your programming? How do you feel when something you need is included?*
 - 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 improving a program to meet a specific need.
- 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 improve a program to meet a specific need.
 - Blue: I can improve a program to meet a specific need.
 - Green: I can improve a program to meet a specific need, and I can help a friend do it too.

Peer-Feedback

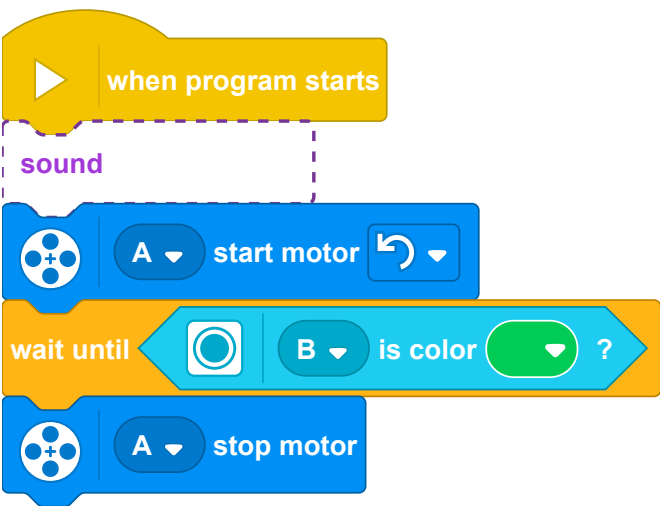
- In their small groups, have your students discuss their experiences working together.
 - Encourage them to use statements like these:
 - I liked it when you...
 - I'd like to hear more about how you...
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Tips

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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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.

There aren't any building instructions for this challenge.

Differentiation

Simplify this lesson by:

- Reading the *Big Bus* 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
 - Adding three different-colored bus stops to the bus route
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Extension

- Have your students write a pamphlet explaining why it's important for public spaces (e.g., buildings, buses, schools) to be accessible for all people, including those with a handicap.

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

Language Arts: CCSS.ELA-LITERACY.W.3.1