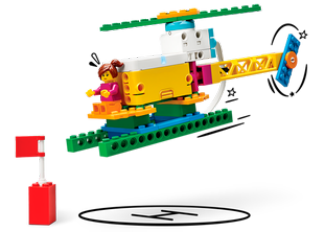


Hovering Helicopter

Help Maria get to Spike Mountain for a hike!

🕒 30–45 min. 📦 Beginner 🎓 Grades 3–5



Teacher Support

Key objectives

Students will:

- Describe the choices they've made when creating a program
- Create and test automated solutions
- 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-17
- NGSS 3-5-ETS 1-3
- ISTE 1.5b
- CCSS.ELA-LITERACY.SL.3.4

Language Arts Extension

- CCSS.ELA-LITERACY.W.3.3.B

Prepare

- Review the *Hovering Helicopter* 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 describing a decision, a choice, or experience to a friend.
 - Talk with your students about telling a friend about a new experience (e.g., an activity or movie).
 - Ask questions, like: *How do you feel when you tell someone about a new experience? Why do you think it's valuable to share?*
 - Introduce your students to the story's main characters and the first challenge: starting the helicopter.
 - Distribute a brick set and a device to each group.
-

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 starts the helicopter.
 - Have your students iterate and test their models to complete the next two challenges in the app:
 - Create the program that makes the helicopter act differently when it's tilted.
 - Upgrade the helicopter for Maria's next adventure.
 - You can find coding and building support in the *Tips* section below.
-

Explain

(Whole Class, 5 Minutes)

- Gather your students together to reflect on their completed challenges.
 - Ask questions, like: *How did Maria's helicopter get to Spike Mountain? How did you modify Maria's helicopter to improve it for her next adventure?*
-

Elaborate

(Whole Class, 5 Minutes)

- Prompt your students to discuss and reflect on the choices they've made while developing their programs.
 - Ask questions, like: *Why is it important to describe the choices you've made when creating your program? How can describing your program to others help you improve it?*
 - Have your students clean up their workstations.
-

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 describing the choices they've made while developing their programs.
- 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 explain the decisions I've made while developing my program.
 - Blue: I can explain the decisions I've made while developing my program.
 - Green: I can explain the decisions I've made while developing my program, 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...

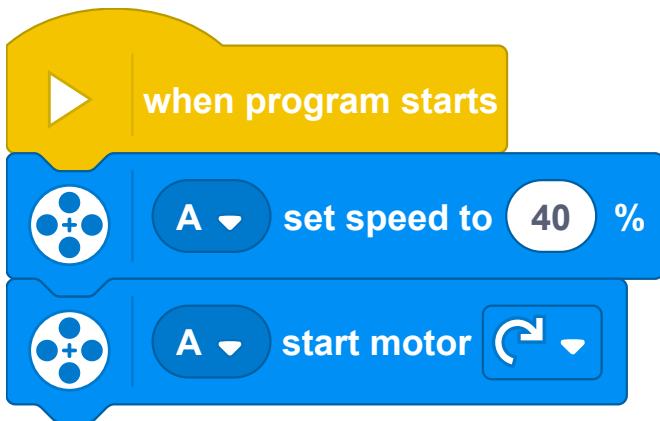
- I'd like to hear more about how you...

Tips

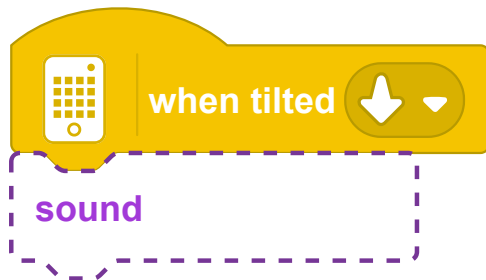
Coding Tip

- 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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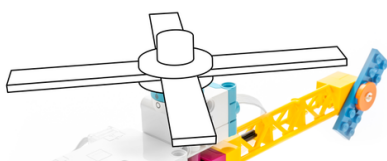


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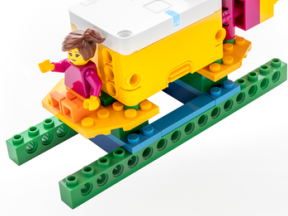
Model Tip

- 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 *Hovering Helicopter* 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:

- Adding the Color Sensor or another motor to Maria's helicopter
- Pairing up student groups to explain their programs and suggest improvements to one another

Extension

- Have your students write a narrative about what Maria sees, hears, smells, and feels on her hike.

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

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