

High-Tech Playground

What do you think a high-tech playground would look like? Help Maria design something new for her friends!



🕒 30–45 min. 📦 Beginner 🎓 Grades 3–5

Teacher Support

Key objectives

Students will:

- Use the design process to improve an existing object
- Develop, test, and refine prototypes as part of a design process
- 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-12
- NGSS 3-5 ETS1-2
- ISTE 1.4c
- CCSS.ELA-LITERACY.SL.5.1

Language Arts Extension

- CCSS.ELA-LITERACY.W.5.1

Prepare

- Review the *High-Tech Playground* 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 changes and improvements to an everyday object.
 - Talk with your students about some objects around your school that they'd like to improve.
 - Ask questions, like: *What object from around our school would you like to improve? What would you change about it?*
 - Introduce your students to the story's main characters and the first challenge: rocking the seesaw.
 - 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 rocks the seesaw.
 - Have your students iterate and test their models to complete the next two challenges in the app:
 - Modify the program to make the seesaw more exciting.
 - Design your own upgraded seesaw.
 - 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 program the seesaw to make it high tech? How did your changes make the seesaw more fun for Maria?*
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Elaborate

(Whole Class, 5 Minutes)

- Prompt your students to discuss and reflect on ways of using the design process to improve an existing object.
 - Ask questions, like: *What happens when you try to improve something but your first idea doesn't work? How can you adjust your idea to make it successful?*
 - 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 the design process to improve an existing object.
- 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 the design process to improve an existing object.
 - Blue: I can use the design process to improve an existing object.
 - Green: I can use the design process to improve an existing object, 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.

1

when tilted

A

start motor

sound

when tilted

A

start motor

2

3

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.

1



2



3

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:

- Having your students interview each other about the features they'd like a seesaw to have, then designing one that meets those specifications
- Exploring new and different coding blocks in the program

Extension

- Have your students write an opinion piece on whether there should be a playground at their school. Make sure that they give a clear argument supported by facts and details.

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

Language Arts: CCSS.ELA-LITERACY.W.5.1