

High Stick Hockey

See how many goals you can score in Maria's hockey game simulator!



🕒 30–45 min. 📦 Beginner 🎓 Grades 3–5

Teacher Support

Key objectives

Students will:

- Observe and describe how energy can be transferred
- Predict how energy moves from place to place
- 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-10
- NGSS 4-PS3-2
- ISTE 1.3d
- CCSS.ELA-LITERACY.SL.4.1
- CCSS.MATH.CONTENT.4.MD.C.5

Math Extension

- CCSS.MATH.CONTENT.4.NF.C.6

Prepare

- Review the *High Stick Hockey* 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 math extension. See the *Extension* section below for more information.

Engage

(Whole Class, 5 Minutes)

- Facilitate a quick discussion about ways of finding evidence that energy can be transferred from place to place.
 - Talk with your students about what happens when a ball is thrown against a wall and ricochets off.
 - Ask questions, like: *What happens to the ball when it ricochets off the side of the wall? What happens to the wall? What happens to the ball?*
 - Introduce your students to the story's main characters and the first challenge: seeing how many goals they can score while playing the hockey game.
 - 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 to see how many goals they can score in three tries.
 - Have your students iterate and test their models to complete the next two challenges in the app:
 - Modify the program to make the hockey game more fun.
 - Upgrade the hockey game to make it harder to score.
 - 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 hockey game to score a goal? How did the energy being transferred from the hockey stick to the ball impact the*

ball's motion? How was the energy of the ball impacted when it collided with the wall?

Elaborate

(Whole Class, 5 Minutes)

- Prompt your students to discuss and reflect on the importance of observing and understanding how energy transfers.
 - Ask questions, like: *How can you use your knowledge about energy transfer to help score more points? In what other games do you see energy being transferred from place to place?*
 - 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 understanding and describing how energy can be transferred.
- 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 describe how energy can be transferred.
 - Blue: I can describe how energy can be transferred.
 - Green: I can describe how energy can be transferred, and I can help a friend do it too.

Peer-Feedback

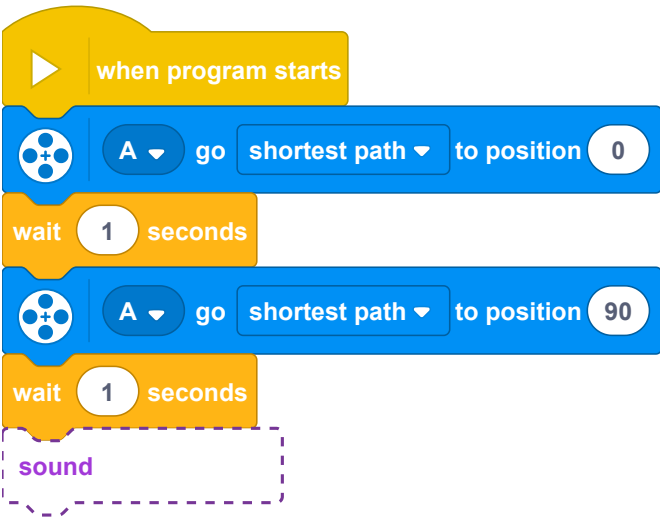
- In their small groups, have your students discuss their experiences working together.
- Encourage them to use statements like these:
 - I liked it when you...
 - I'd like to hear more about how you...

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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when program starts
  A go shortest path to position 0
  wait 1 seconds
  A go shortest path to position 90
  wait 1 seconds
  sound
  
```

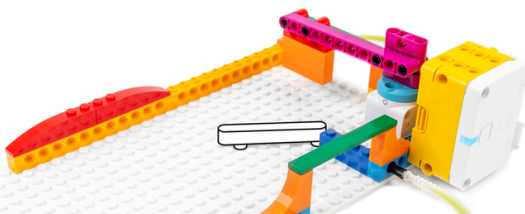
2

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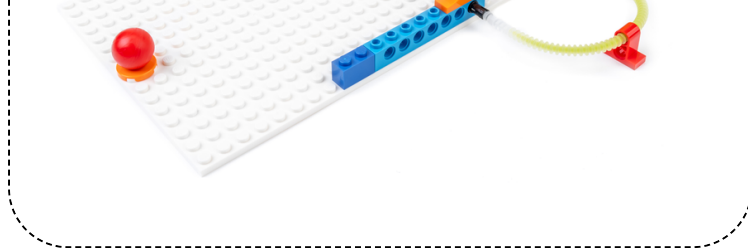
Model Tip

- 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.

1



2



3

There aren't any building instructions for this challenge.

Differentiation

Simplify this lesson by:

- Shortening the lesson to only include the first challenge
- Selecting one Inspiration Image to help your students change their models

Increase the difficulty by:

- Adding "players" or obstacles to the field
- Combining two groups to create a bigger hockey game

Extension

- Have your students record ten scoring attempts and compare their results. Tell them to write the number of goals as one fraction, and the number of saves as another fraction.

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

Math: CCSS.MATH.CONTENT.4.NF.C.6