

Underwater Quest

Maria is curious to explore life below the sea. How can she get the submarine in and out of the water?



🕒 30-45 min.

📦 Beginner

🎓 Grades 1-2

Teacher Support

Key objectives

Students will:

- Understand that an action can be repeated
- Develop programs that use simple loops (repetitions) to address a problem
- Practice helping a story character
- Participate in collaborative conversations

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 1A-AP-10
- NGSS K-2-ETS 1-2
- ISTE 1.5a
- CCSS.ELA-LITERACY.SL.1.1

Language Arts Extension

- CCSS.ELA-LITERACY.W.1.8

Prepare

- Review the *Underwater Quest* lesson in the LEGO® Education SPIKE™ App.
 - If necessary, pre-teach these related vocabulary words: *loop*, *submarine*, *turtle*, and *underwater*.
 - 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 a time when your students had to repeat an action over and over in order to complete a task.
 - Talk with your students about how they need to move their bodies in order to swim.
 - Ask questions, like: *What do your arms and legs do when you're swimming? What else do you need to do to keep your body moving in the water?*
 - Introduce your students to the story's main characters and the first challenge: getting the submarine to move.
 - 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:
 - Make and try the program that moves the submarine.
 - Have your students iterate and test their models to complete the next challenge in the app:
 - Change the submarine for Maria's next trip.
 - You can find 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 the submarine move? How did you make the submarine repeat its movement?*
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Elaborate

(Whole Class, 5 Minutes)

- Prompt your students to discuss and reflect on ways of using loops or a program with repeated movement.
 - Ask questions, like: *How do you think programming the submarine with using a loop made it easier for Maria to visit the turtles? Why do you think it was helpful to program the submarine using 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 describing how an action can be repeated to complete a task.
- 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 an action can be repeated to complete a task.
 - Blue: I can describe how an action can be repeated to complete a task.
 - Green: I can describe how an action can be repeated to complete a task, 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

Model Tip

- After your students complete their first 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 *Underwater Quest* 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 Light to the model and including it in the program
 - Clicking *Show Full Palette* in the app to utilize more Coding Blocks
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Extension

- Have your students research and write a short paragraph about why they think it's important to look after wildlife, like turtles.

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

Language Arts: CCSS.ELA-LITERACY.W.1.8