Underwater Quest

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

🗍 Beginner

Grades

1-2



Teacher Support

Key objectives

30-45

min.

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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 SPIKETM Essential Set
- Device with the LEGO $^{\rm \tiny O}$ Education ${\rm SPIKE}^{\rm \tiny TM}$ App installed

Additional resources

<u>Building instructions</u> <u>Meet the Team: Minifigure Bios</u> 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 SPIKETM 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.

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.

Explore

(Small Groups, 30 Minutes)

- Have your students use the LEGO[®] Education SPIKE[™] App to guide them through their first challenge:
 - $\,\circ\,$ 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.

Explain

(Whole Class, 5 Minutes)

- $\circ\,$ 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?*

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.

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.
 - $\,\circ\,$ 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.

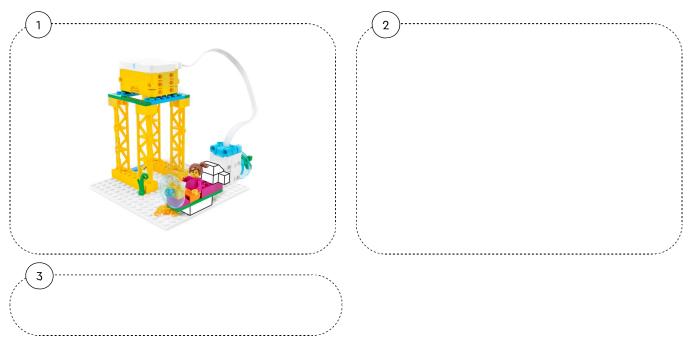
Peer-Feedback

- 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...

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.



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
- $\circ\,$ 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

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