

LEGO® Education Computer Science Learning Progression



SPIKE™ Essential Grade 1

Introduction

LEGO® Education believes that students learn best through play—by actively doing, exploring, and experimenting. This approach empowers them to become creative and engaged lifelong learners, which is essential for success in their future careers and lives.

Read this Introduction to explore ways to use this learning progression and find activities that support your learners.

This learning progression organizes activities in a recommended sequence that supports students' successful learning with LEGO® Education SPIKE™ Essential. For classroom convenience, it also clusters activities that use the same model.

Following the recommended sequence ensures that students build the necessary knowledge and experience for each successive activity. However, you may also choose activities according to your students' needs and prior knowledge/experience.

Some activities are reprinted or modified from published LEGO Education sources. Others are developed especially for these learning progressions.

Each activity


- ☑ contains anticipated timing, topics, relevant standards, learning objectives, and a ready-to-use prompt.
- ☑ is labeled with one or more topics, such as Modifying Programs (computer science), or Narrative Writing (ELA).
- ☑ lists the relevant standards, beginning with the most important standard in the learning.

To find what you need,

- ☑ scan the Topic(s) & Standards column or search with terms like *CSTA*, *ELA*, or *Math*.
- ☑ use the **Key** below to locate activities of different lengths and levels of instructional support.
- ☑ use the **Additional Resources** below to locate more support.


Key


1 Numbers show the recommended order in which to use activities.

 Activities that will take approximately 20–30 mins

LESSON Longer activities with full lesson support

PROMPT Short activities to quickly expand or extend the learning





 Activities that use only bricks and require no hardware/software



 or  Activities that will take approximately 45 or 90 mins

MORE DETAILS Links that lead to lesson details and teaching support


Additional Resources on the [LEGO® Education Community](#)


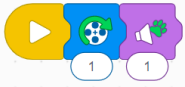
- ☑ [SPIKE™ App Help](#) Definitions and directions for using the coding blocks located in the [HELP](#) section of the LEGO® Education SPIKE™ App
- ☑ [Curriculum Integration Guide](#) SPIKE Essential activities organized by domain Also contains a protocol for integrating activities into your curriculum
- ☑ [Coding Blocks in LEGO® Education SPIKE™ Essential Lessons](#)
- ☑ [Basic Coding Concepts in LEGO® Education SPIKE™ Essential Lessons](#)
- ☑ [Troubleshooting with LEGO® Education SPIKE™ Essential](#)
- ☑ [Computational Thinking in LEGO® Education SPIKE™ Essential Lessons](#)




#	Activity Name	TOPIC(s) and Standards	Objectives Students will	Prompt
1 	<p>PROMPT Brick-tionary with Bricks</p> 	<p>CSTA CORE PRACTICE COLLABORATING AROUND COMPUTING</p> <p>DESIGN ENGINEERING NGSS K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.</p>	<ul style="list-style-type: none"> • Identify a model as a representation of an object or phenomenon. • Understand ways to use models to communicate ideas for solving problems. 	<p>Use a simple hands-on game activity to introduce students to the LEGO® Education SPIKE™ Essential set and the engineering concept of modeling.</p> <ol style="list-style-type: none"> 1. Organize groups of 4 2. Provide each student with LEGO® bricks and a stack of cards labeled with recent vocabulary study or familiar objects. Use pictures if your students aren't ready to read the cards. 3. Have students take turns privately reading a card and then building a model of it for partners to guess. Emphasize that the model represents, or stands for, the idea on the card. <p>SAY/ASK <i>Take turns drawing a card. Don't show it to anyone! Then use LEGO bricks to build what you see on it. What is your model? Have your classmates try to guess.</i></p>
2 	<p>PROMPT Memory Game: Sequences and Patterns</p> 	<p>SEQUENCES CSTA 1A-AP-10 Develop programs with sequences and simple loops, to express ideas or address a problem.</p> <p>DATA: IDENTIFYING PATTERNS CSTA 1A-DA-07 Identify and describe patterns in data visualizations, such as charts or graphs, to make predictions.</p>	<ul style="list-style-type: none"> • Repeat a sequence. • Recognize patterns. 	<p>Create a model by stacking a few LEGO bricks from your SPIKE Essential set. Then provide each student with the same bricks that you used.</p> <ol style="list-style-type: none"> 1. Display the model for 10 seconds and then hide it. 2. Prompt students to use their bricks to create an exact copy of the model. 3. Have students compare their build to the model. 4. Reinforce the concept of a sequence by referring to the bricks in order. 5. Repeat the process by including a pattern in the model. Challenge students to identify the pattern. <p>SAY/ASK <i>Look carefully at my model. Now I'm going to hide it. Use your bricks to build the same thing that I built. Next, let's look at the two models. Which brick is first in the stack? Did you use the same brick? Do you notice a pattern? What is the pattern? How did the pattern help you remember the order of the bricks?</i></p>


<p>3</p> <p>⌚</p>	<p>PROMPT Guess My Brick</p> 	<p>DEVICE/INTERNET SECURITY CSTA 1A-NI-04 Explain what passwords are and why we use them and use strong passwords to protect devices and information from unauthorized access.</p>	<ul style="list-style-type: none"> • Define the purpose of passwords. • Identify the features of a strong password. 	<p>Introduce students to the concept of passwords with a bricks-only activity.</p> <ol style="list-style-type: none"> 1. Organize pairs to create a password with LEGO bricks. Provide bricks. Designate a student A and a Student B 2. Student A chooses a brick as the password and then hides all the bricks. 3. Student B guesses the brick by naming its color. Partners then take turns making more complex passwords by adding criteria, such as number of studs (bumps), special use (e.g., wheels, gears), etc. <p>SAY/ASK <i>Take turns using bricks as passwords. First, choose one brick as your password. Hide it and all the bricks. Can your partner guess the color? Next, make the passwords harder. Add more things to guess, like the number of bumps on the brick. Can your partner guess?</i></p>
<p>4</p> <p>⌚</p>	<p>PROMPT Meet the Motor</p> 	<p>HARDWARE AND SOFTWARE CSTA 1A-CS-01 Select and operate appropriate software to perform a variety of tasks and recognize that users have different needs and preferences for the technology they use.</p> <p>CSTA 1A-CS-02 Use appropriate terminology in identifying and describing the function of common physical components of computing systems (hardware).</p>	<ul style="list-style-type: none"> • Follow instructions to create a program. • Explore programming a motor. • Use appropriate terminology when using hardware. 	<ol style="list-style-type: none"> 1. Introduce students to the motor in their set. 2. Display it and have them predict what the element does. 3. Introduce the SPIKE app to students. Briefly discuss the purpose of the app. Have students practice opening the app and connecting the hub. 4. Prompt students to complete <i>The Motor</i> tutorial in their LEGO® Education SPIKE™ App. 5. Regroup students and lead discussions about where they might see motors used in the real world. <p>SAY <i>Connect a small motor to your hub. Then create the program to make the motor turn.</i></p> <p>MORE DETAILS <i>The Motor</i> tutorial in the START section of the SPIKE App, available on the web or downloaded.</p>

<p>5</p> <p>⌚</p>	<p>PROMPT Meet the Team: Minifigure Bios</p>	<p>SEQUENCES CSTA 1A-AP-10 Develop programs with sequences and simple loops, to express ideas or address a problem.</p>	<ul style="list-style-type: none"> Design and program a simple model that moves using a motor. 	<ol style="list-style-type: none"> As a class, read the bios for Maria, Daniel, Sofie, and Leo. Ask students to think about a team pet. What kind of pet would they have? What would the pet's name be? Brainstorm ideas. Have students build a model of their pet using the motor from SPIKE essential and other bricks in the set. Have students use the program from the motor tutorial to make their motors move. Have students share their build with another pair, explaining the pet they selected for the SPIKE Essential minifigure team.
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 <p style="text-align: center;">Boat Trip</p>				
#	Activity Name	TOPIC(s) and Standards	Objectives Students will	Prompt
<p>6</p> <p>⌚</p> <p>⌚</p>	<p>LESSON Boat Trip</p>	<p>SEQUENCES/LOOPS CSTA 1A-AP-10 Develop programs with sequences and simple loops, to express ideas or address a problem.</p> <p>COMPUTATIONAL THINKING CSTA 1A-AP-08 Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.</p> <p>SCIENCE SKILL PRACTICE: FORCES AND MOTION (Push/Pull)</p>	<ul style="list-style-type: none"> Follow instructions to create programs with sequences. Identify the main characters in a story. Practice helping a story character. Participate in collaborative conversations. Create step-by-step instructions (algorithms) to program tasks like pushing the boat in the water. 	<p>After students build the Boat Trip model, introduce them to step-by-step program sequences as they program the model to push the boat in the water.</p> <p>SAY/ASK <i>Maria and Sofie are going on a boat trip! How will they get the boat into the water? Build and program the model to help them. Notice how the program is a set of step-by-step instructions.</i></p> <p>MORE DETAILS Boat Trip lesson or access in the LEGO® Education SPIKE™ App.</p>
<p>7</p> <p>⌚</p>	<p>PROMPT Debugging Challenge</p>	<p>COMPUTATIONAL THINKING CSTA 1A-AP-14 Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.</p>	<ul style="list-style-type: none"> Identify and fix errors in a program (test and debug). 	<p>Introduce debugging as a method for fixing a program if it doesn't produce the desired results.</p> <ol style="list-style-type: none"> Share the sample programs shown below. Prompt students to run the program to find and fix the bug.




				<p>SAY/ASK Maria and Sofie want to launch the boat but are having problems. Can you help? Try these two programs and see if you can find the mistakes, then tell how you fixed them.</p>  <p>Then try this> Maria and Sofie want to hear birds but only hear a cat. Can you fix the program so they can hear birds?</p> 
<p>8</p> <p>Ⓛ</p>	<p>PROMPT More with ELA Storytelling</p>	<p>COMPUTATIONAL THINKING CSTA 1A-AP-08 Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.</p> <p>NARRATIVE WRITING CCSS.ELA-Literacy.W.1.3 Write narratives in which they recount two or more appropriately sequenced events, include some details regarding what happened, use temporal words to signal event order, and provide some sense of closure.</p>	<ul style="list-style-type: none"> • Write a story that uses sequence words to tell events in order. • Use a background and motor block to program parts of the story 	<ol style="list-style-type: none"> 1. Ask students to use the Boat Trip model to create a new story about Maria and Sofie's adventure. 2. The story needs to include: <ol style="list-style-type: none"> a. two different events told in order b. a motor block c. a background (Display Image) block that helps them tell a story by showing its setting. 3. Then have them write their story, using sequence words like <i>first</i>, <i>next</i>, and <i>then</i> to show the order. <p>SAY Maria and Sofie want to take another trip on their boat. Write a story for them. Include two different events that happen in order. First, add a background and a motor to your program. Then write your story. Use time words like first, next, and then to show what happens when.</p> <p>MORE DETAILS Display Image and Motor blocks in the Help section of the LEGO® Education SPIKE™ App, available on the web or downloaded.</p>


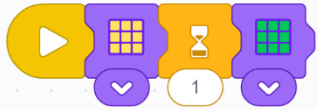
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9 	PROMPT More with Design Engineering	<p>COMPUTATIONAL THINKING CSTA 1A-AP-08 Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.</p> <p>DESIGN ENGINEERING NGSS K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.</p> <p>SPEAKING AND LISTENING CCSS.ELA-Literacy.SL.1.4 Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.</p>	<ul style="list-style-type: none"> • Build and program a model that represents an experience. • Use the model to share key details of the experience. 	<p>Maria and Sofie went on a great adventure together. Have students think about a great adventure they have experienced.</p> <ol style="list-style-type: none"> 1. Working with a partner, ask pairs to brainstorm an adventure, either real or imagined, they would like to experience. 2. Ask students to select one idea, then identify some key details of the experience. 3. Have students modify the boat trip build to construct and program a new model to share one or more of the key details in from their own adventure. <p>SAY/ASK <i>Think of something you did recently that you really enjoyed. What made it great? Build and program a model that shows something specific that you really liked.</i></p>
10 	PROMPT MORE WITH CS Computational Thinking 	<p>COMPUTATIONAL THINKING CSTA 1A-AP-11 Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.</p> <p>DESIGN ENGINEERING NGSS K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.</p>	<ul style="list-style-type: none"> • Build an object through a collaborative process. • Break down tasks to identify all the parts. 	<p>Lead students to explore decomposing, which involves breaking a task into its subtasks.</p> <ol style="list-style-type: none"> 1. Create a simple model using 3 to 4 LEGO bricks from your SPIKE Essential set. Then provide each student with the same bricks that you used. 2. Ask students to think about the steps needed to build the same model. 3. Working in pairs, have students write/draw the steps in order. 4. Have each pair swap directions with another group to test the steps. <p>SAY/ASK <i>Let's examine this LEGO structure I built? What are the steps I followed to build it? Work with a partner to write the directions for building this LEGO structure, one step at a time. When you are finished, we will exchange and test our directions with another group.</i></p>

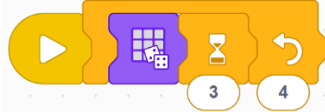

		Arctic Ride		
#	Activity Name	TOPIC(S) & Standards	Objectives Students will	Prompt
11 Ⓛ Ⓛ	LESSON ARCTIC RIDE	<p>COMPUTATIONAL THINKING CSTA 1A-AP-11 Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.</p> <p>DESIGN ENGINEERING NGSS K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.</p> <p>LANGUAGE CCSS.ELA-Literacy.L.1.1.I Use frequently occurring prepositions</p> <p>SCIENCE SKILL PRACTICE: HABITATS (Polar)</p>	<ul style="list-style-type: none"> • Use directional vocabulary to describe a sequence. • Break a problem down into smaller parts. • Practice helping a story character. • Participate in collaborative conversations. 	<ol style="list-style-type: none"> 1. After students build the Arctic ride model, prompt discussion about what the Arctic is like. 2. Have students program their model to travel in the Arctic so Leo can see some polar bears. 3. Ask questions about their travel which requires students to use directional words like <i>left</i>, <i>right</i>, and <i>straight</i>. <p>SAY/ASK <i>Leo is going on an Arctic adventure to see polar bears. How can he use his snowmobile to get there? What is it like in the Arctic? Tell me where Leo will go. Use words like left, right, and straight.</i></p> <p>MORE DETAILS Arctic Ride lesson or access in the LEGO® Education SPIKE™ App.</p>
12 Ⓛ	PROMPT More with Math Measuring	<p>COMPUTATIONAL THINKING CSTA 1A-AP-11 Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.</p> <p>MEASUREMENT AND DATA CCSS.MATH.Content.1.MD.A.2 Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.</p>	<ul style="list-style-type: none"> • Break a problem down into smaller parts. • Estimate and measure length with a LEGO brick as the unit. • Express length as a number of units. 	<p>Extend the <i>Arctic Ride</i> lesson to math as partners try to reach each other's second destination.</p> <ol style="list-style-type: none"> 1. Have students estimate the distance to the destination, using a 2x4 LEGO® brick as the measurement unit. 2. Have students create a program to travel to the destination. <p>SAY <i>With your partner, tell each other where Leo's next trip goes. Then use LEGO® bricks to measure the distance of each trip. Say how far it is by counting the number of bricks.</i></p>
13 Ⓛ	PROMPT Debugging Challenge	<p>COMPUTATIONAL THINKING</p>	<ul style="list-style-type: none"> • Identify and fix errors in a program (test and debug). 	<p>Remind students that debugging is a method for finding and fixing mistakes in a program if it doesn't produce the desired results.</p>

		<p>CSTA 1A-AP-14 Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.</p>		<ol style="list-style-type: none"> 1. Share the Arctic Ride Icy Obstacle debugging challenges with students. 2. Prompt students to run the program to find and fix the bug. 3. Ask students to explain how they found the problem and what steps they took to fix it.
<p>14 Ⓛ</p>	<p>PROMPT More with ELA Group Research</p>	<p>COMPUTATIONAL THINKING CSTA 1A-AP-08 Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.</p> <p>RESEARCH FOR WRITING CCSS.ELA-Literacy.W.1.7 Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions).</p>	<ul style="list-style-type: none"> • Research the Arctic using provided sources. • Write (or draw & label) an informational how-to text as a sequence of instructions. 	<ol style="list-style-type: none"> 1. Prompt students to learn more about exploring the Arctic. As a class, research other animals that live in the arctic. 2. Using LEGO bricks or other age-appropriate materials have students create three arctic animals. 3. Ask students to think of two or three words that describe each animal created. 4. Have each pair of students place their animals in a straight line, with a little distance between them. 5. Students can program their arctic snowmobile to stop at each animal. 6. Students can create a short video of their arctic animal journey, describing each animal along the way. <p>SAY <i>Learn more about exploring in the Arctic. Then work with your partner to build and create three animals we might find in the arctic. Program your arctic ride to stop at each animal. Then video your arctic adventure, describing each animal along the way.</i></p>


#	Activity Name	TOPIC(S) & STANDARDS	Objectives Students will	Prompt
15 	<p>PROMPT Meet the Light Matrix</p> 	<p>COMPUTING TERMINOLOGY CSTA 1A-CS-02 Use appropriate terminology in identifying and describing the function of common physical components of computing systems (hardware).</p>	<ul style="list-style-type: none"> Follow instructions to create a program. Use appropriate terminology when using hardware. 	<p>Introduce the light matrix to students.</p> <ol style="list-style-type: none"> Display the light matrix and have students predict the what the element does. Prompt them to complete <i>The Light</i> tutorial in their LEGO® Education SPIKE™ App. Ask students if they predicted the function of the element correctly. Regroup students and lead discussion about where they might see lights like this used in the real world. <p>SAY <i>Connect the light to your hub. Then create the program to turn it on.</i></p> <p>Then try this> <i>Use the steps to show a pattern on the light.</i></p> <p>MORE DETAILS <i>The Light</i> tutorial in the START section of the LEGO® Education SPIKE™ App, available on the web or downloaded.</p>





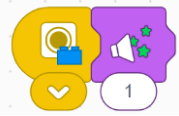
 Cave Car				
#	Activity Name	TOPIC(S) & STANDARDS	Objectives Students will	Prompt
16  	<p>LESSON</p>	<p>DEVELOP PROGRAMS CSTA 1A-AP-12 Develop plans that describe a program's sequence of events, goals, and expected outcomes.</p> <p>WAVES: LIGHT NGSS 1-PS4-2 Make observations to construct an evidence-based account that objects can be seen only when illuminated.</p>	<ul style="list-style-type: none"> Describe a program's sequence of events, goals, and expected outcome. Explore objects that can be seen if light is available. Practice helping a story character. Participate in collaborative conversations. 	<ol style="list-style-type: none"> Have students build and program the cave car model. Within the lesson, ask student to describe their programming steps and their learning about the role of light in seeing objects. <p>SAY/ASK <i>Daniel wonders what lives inside a dark cave. What do you think is hiding in the dark? Build and program a cave car for Daniel. Why does he need a light to see objects in the dark cave?</i></p> <p>MORE DETAILS Cave Car lesson or access in the SPIKE App</p>

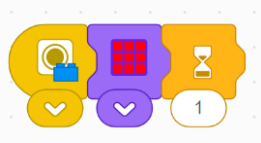

<p>17</p> <p>Ⓛ</p>	<p>PROMPT Debugging Challenge</p>	<p>COMPUTATIONAL THINKING CSTA 1A-AP-14 Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.</p>	<ul style="list-style-type: none"> Identify and fix errors in a program (test and debug). 	<p>Review debugging as a method for finding and fixing mistakes in a program if it doesn't produce the desired results.</p> <ol style="list-style-type: none"> Share the sample programs shown below. Prompt students to run the program to find and fix the bug. <p>SAY/ASK Daniel is trying to see inside a new cave. He wants the light matrix on the cave car to light up when the program runs. The program has a mistake. Can you help Daniel find and fix the bug?</p>  <p>Then try this> Daniel wants the cave car light to come on, wait for 2 seconds then turn blue. Can you fix the program so the light comes on for two seconds then turn blue?</p> 
<p>18</p> <p>Ⓛ</p>	<p>PROMPT More with Computer Science</p>	<p>SEQUENCES CSTA 1A-AP-10 Develop programs with sequences and simple loops, to express ideas or address a problem.</p> <p>NARRATIVE WRITING CCSS.ELA-Literacy.W.1.3 Write narratives in which they recount two or more appropriately sequenced events, include some details regarding what happened, use temporal words to signal event order, and provide some sense of closure.</p>	<ul style="list-style-type: none"> Identify repetition in stories and games. Use a loop block to include repetition in a program. 	<ol style="list-style-type: none"> As a class, read a story that includes repeated phrases or play a game that includes repeated actions like head, shoulders, knees and toes. Discuss the repetition. Share a sample code with multiple repeated steps and introduce the loop block to reduce the number of blocks needed. Have students apply repetition to programming by creating a repeating pattern with the motor or Light Matrix. <p>SAY Now that we've explored repetition in a [story/game], let's use it for our programs. Here's a program that repeats a task many times. Here's another way to do it, with a Repeat block. You can repeat a task a specific number of times, like 3 or 5, or you can repeat it forever.</p>

				<p>MORE DETAILS <i>The Light</i> tutorial in the START section and the Control Blocks (Forever or Repeat Loop) in the Help section of the LEGO® Education SPIKE™ App, available on the web or downloaded.</p>
<p>19</p> <p>⌚</p>	<p>PROMPT More with Math</p> <p>Data and Graphing</p>	<p>SEQUENCES CSTA 1A-AP-10 Develop programs with sequences and simple loops, to express ideas or address a problem.</p> <p>COLLECT DATA 1A-DA-06K-2 Collect and present the same data in various visual formats.</p> <p>REPRESENT AND INTERPRET DATA CCSS.MATH.Content.1.MD.C.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.</p>	<ul style="list-style-type: none"> • Collect and analyze data on colors in a random pattern. • Create different types of charts or graphs to present information. • Use computing tools to create and present data in various forms. • Represent data organized by color and express which categories show more or less frequently than others. 	<p>Explore loops further with students.</p> <ol style="list-style-type: none"> 1. Have students program the Light Matrix to give a random display. Sample code: repeats 4 times  <ol style="list-style-type: none"> 2. Have students use tick marks to record each color shown, placing these in a data table. 3. Ask which colors appear more or less frequently. 4. Optional: Introduce the Bar Graph block in the SPIKE App and challenge students to show their results in a bar graph with bars for each color.  <p>SAY/ASK Program your <i>Light Matrix</i> to show its lights in a random pattern. Count how many times each color shows. Write marks for each time in a table. Which colors show more often? Which ones show less often?</p> <p>Then try this> Use a <i>Bar Graph</i> block to record the colors in your SPIKE App.</p> <p>MORE DETAILS <i>The Light</i> tutorial in the START section and <i>Bar Graph Blocks</i> in the Help section of the SPIKE App, available on the web or downloaded.</p>

<p>20</p> <p>⌚</p> <p>⌚</p>	<p>PROMPT More with ELA</p> <p>Group Research</p>	<p>SEQUENCES CSTA 1A-AP-10 Develop programs with sequences and simple loops, to express ideas or address a problem.</p> <p>INFORMATIVE WRITING CCSS.ELA-Literacy.W.1.2 Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure.</p> <p>RESEARCH FOR WRITING CCSS.ELA-Literacy.W.1.7 Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions).</p> <p>SCIENCE SKILL PRACTICE: ANIMAL SURVIVAL NEEDS</p>	<ul style="list-style-type: none"> • Build and program a model of an animal that lives in a cave habitat. • Use research to learn what animals that live in caves look like, eat and other interesting facts. • Write an informative text about an animal that lives in a cave, including facts from research. 	<p>Group Research</p> <ol style="list-style-type: none"> 1. As a class, research animals that live in caves. 2. Prompt students to write an informational text about an animal that lives in the cave, including description of what it looks like, eat, moves, plays and other interesting facts. 3. Working in pairs, have students build a model and program the animal from their research. The model could demonstrate an interesting fact about their animal or how the animals move, eats or plays. <p>SAY/ASK <i>Learn about animals that live in caves. Choose one animal. Write a sentence to describe what the animal looks like. Write a second sentence to tell what it eats, and a third sentence to share another fact.</i></p> <p>Then try this> <i>Build a model of your animal and program it. Your model could show how your animal eats, moves or plays.</i></p>
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#	Activity Name	Topic(s) & Standards	Objectives Students will	Prompt
<p>21</p> <p>⌚</p>	<p>PROMPT Meet the Color Sensor</p> 	<p>COMPUTING TERMINOLOGY CSTA 1A-CS-02 Use appropriate terminology in identifying and describing the function of common physical components of computing systems (hardware).</p>	<ul style="list-style-type: none"> • Follow instructions to create a program. • Use appropriate terminology when using hardware. 	<p>Introduce students to the Color Sensor.</p> <ol style="list-style-type: none"> 1. Display the color sensor and have students predict what the element does. 2. Prompt students to complete <i>The Color Sensor</i> tutorial in their LEGO® Education SPIKE™ App. 3. Ask students if they predicted the function of the element correctly. 4. Regroup students and lead discussion about where they might color sensors used in the real world. <p>SAY <i>Connect the Color Sensor and the Motor to your hub. Create the program to use the Color Sensor to turn on the motor.</i></p> <p>MORE DETAILS <i>The Color Sensor tutorial in the START section of the LEGO® Education SPIKE™ App, available on the web or downloaded.</i></p>

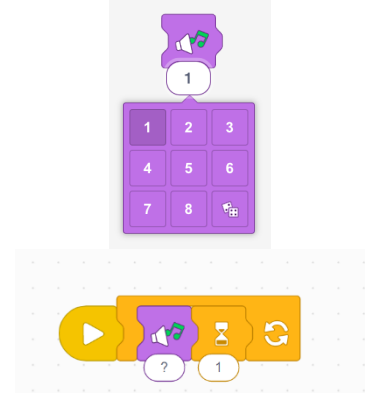
		Animal Alarm		
#	Activity Name	TOPIC(s) & Standards	Objectives Students will	Prompt
22  	LESSON	<p>SEQUENCES/LOOPS CSTA 1A-AP-10 Develop programs with sequences and simple loops, to express ideas or address a problem.</p> <p>WAVES: SOUND NGSS 1-PS4-4 Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.</p> <p>DESIGN ENGINEERING NGSS K-2-ETS 1-3 Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.</p>	<ul style="list-style-type: none"> • Identify cause and effect. • Develop a program to solve a problem. • Use appropriate terminology when using hardware. • Practice helping a story character. • Participate in collaborative conversations. 	<ol style="list-style-type: none"> 1. Have students build and program the animal alarm to meet Leo's needs. 2. Within the lesson, reinforce that Leo wants to know when different kinds of animals come by so that he can see them. <p>SAY/ASK <i>Leo doesn't want to miss any of the animals walking by his campsite while he's asleep. Build an animal alarm to tell him when animals go by. Program it to make a sound when a blue animal comes by.</i> Then try this> <i>Program again for a red animal.</i></p> <p>MORE DETAILS Animal Alarm lesson or access in the LEGO® Education SPIKE™ App</p>
23 	PROMPT Debugging Challenge	<p>COMPUTATIONAL THINKING CSTA 1A-AP-14 Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.</p>	<ul style="list-style-type: none"> • Identify and fix errors in a program (test and debug). 	<p>Review debugging as a method for finding and fixing mistakes in a program if it doesn't produce the desired results.</p> <ol style="list-style-type: none"> 5. Share the sample programs shown below. 6. Prompt students to run the program to find and fix the bug. <p>SAY/ASK <i>Leo wants to hear an applause when a yellow creature walks by. The program has two mistakes. Can you help Leo find and fix the bugs?</i></p> <div data-bbox="1528 1230 1705 1344" style="text-align: center;">  </div> <p>Then try this> <i>Leo wrote down the steps for a program, but when he runs the program, it isn't working. Can you help Leo find and fix the bugs? (Hint: There are four bugs in this code)</i></p>


				<ol style="list-style-type: none"> 1. When the color sensor sees green 2. Turn the light matrix green 3. Wait 2 seconds 4. Turn the light matrix off 
<p>24</p> <p>Ⓛ</p>	<p>PROMPT More with Math</p> <p>Data and Graphing</p>	<p>COLLECT DATA CSTA 1A-DA-06 Collect and present the same data in various visual formats.</p> <p>MEASUREMENT AND DATA CCSS.MATH.Content.1.MD.C.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.</p>	<ul style="list-style-type: none"> • Collect and analyze data on different animals that walk by the camp. • Interpret data to compare how many more or less are in one category than another. • Use coding blocks and computing tools to create and present data in visual form. 	<p>With the animal alarm model</p> <ol style="list-style-type: none"> 1. Have students use the <i>Add One to Bar Graph Block</i> to count how many creatures walk by Leo's camp. 2. Discuss the data, asking students to use words like <i>more or less</i> when comparing how many of each color were noticed. 3. Reinforce how technology can help us gather data. <p>SAY/ASK Leo wants to know how many animals walk by. He also wants to know how many of each color. Use the <i>Add One to Bar Graph Block</i> to count what the Color Sensor sees as creatures walk by. Tell me which colors it counted. Use words like <i>more or less</i> to say how many of each color. How did the coding block help you get the information?</p>  <p>Sample code that counts one color at a time.</p> <p>MORE DETAILS The <i>Add One to Bar Graph</i> block in the Help section of the LEGO® Education SPIKE™ App, on the web or downloaded.</p>
<p>25</p> <p>Ⓛ</p> <p>Ⓛ</p>	<p>PROMPT More with ELA</p> <p>Group Research</p>	<p>SEQUENCES/LOOPS CSTA 1A-AP-10 Develop programs with sequences and simple loops, to express ideas or address a problem.</p> <p>INFORMATIVE WRITING CCSS.ELA-Literacy.W.1.2 Write informative/explanatory texts in which they</p>	<ul style="list-style-type: none"> • Build and program a model to show how a nocturnal animal moves at night. • Observe to gather evidence for the natural phenomena that moving at night helps some animals to survive. • Write three informative 	<p>Group Research</p> <ol style="list-style-type: none"> 1. As a class, research different nocturnal animals. 2. Have students write an informative text about an animal that could walk by Leo's campsite. Include how moving at night helps the animal meet needs like staying safe or getting food.

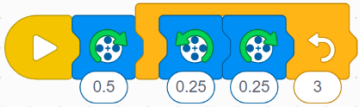
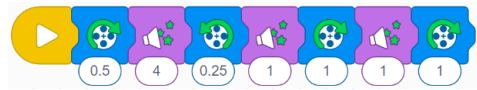
		<p>name a topic, supply some facts about the topic, and provide some sense of closure.</p> <p>DESIGN ENGINEERING NGSS K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.</p> <p>STRUCTURE AND FUNCTION NGSS 1-LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.</p> <p>SCIENCE SKILL PRACTICE: NOCTURNAL ANIMALS Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.</p>	<p>sentences to explain learning about nocturnal animals.</p>	<p>3. Prompt them to build a model of the animal and program it to demonstrate how it moves at night.</p> <p>SAY <i>Learn about animals that could walk by Leo's campsite. Build a model of one animal and program it to show how it moves at night.</i></p>
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#	Activity Name	TOPIC(s) & Standards	Objectives Students will	Prompt
<p>26</p> <p>(L)</p>	<p>PROMPT</p> <p>More with ELA</p> <p>Storytelling and Design Engineering</p>	<p>COMPUTING TERMINOLOGY CSTA 1A-AP-15 Using correct terminology, describe steps taken and choices made during the iterative process of program development.</p> <p>SEQUENCES/LOOPS CSTA 1A-AP-10 Develop programs with sequences and simple loops, to express ideas or address a problem.</p> <p>NARRATIVE WRITING CCSS.ELA-Literacy.W.1.3 Write narratives in which they recount two or more appropriately sequenced events, include some details regarding what happened, use temporal words to signal event order, and provide some sense of closure.</p>	<ul style="list-style-type: none"> • Design, build, and program a model of hidden treasure. • Write a story about finding a hidden treasure and what to do with it. • Describe two sequenced events, using time words to show the right order. 	<p>Share a quick story prompt: <i>Maria, Sofie, Leo, and Daniel found a secret treasure map. It's led them to some hidden treasure.</i></p> <ol style="list-style-type: none"> 1. Ask students to build and program a model of the hidden treasure the team finds. Encourage students to use either the light or color sensor in their build. 2. Ask students why they selected to use either the light or color sensor in their build. 3. Then have them write a story about the search or what the team does with the treasure. <p>SAY <i>Build and program a model of the hidden treasure that Maria, Sofie, Leo, and Daniel find. Then write a story about their adventure. You can write about their search for the treasure OR you can write about what they do with the treasure they found. Include at least two events and use time words to show the right order.</i></p>



		<p>DESIGN ENGINEERING NGSS K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.</p>		
<p>27</p> <p>Ⓛ</p>	<p>PROMPT Brick Patterns</p> 	<p>CSTA CORE PRACTICE DEVELOPING AND USING ABSTRACTIONS</p> <p>MATH SKILL PRACTICE PATTERNS</p>	<ul style="list-style-type: none"> • Create patterns with LEGO® bricks. • Identify the missing piece of a pattern. 	<p>Creating Patterns with LEGO® bricks</p> <ol style="list-style-type: none"> 1. Tell students that they're going to create patterns with LEGO® bricks. 2. Model for students how to create a pattern using the bricks or elements in the SPIKE Essential set. 3. Have students to create their own patterns. Encourage students to explore creating different types of patterns (e.g., color, shape, size, etc.). 4. Challenge students to create a pattern with a missing part. Ask partners to identify the missing piece of each other's pattern. <p>SAY/ASK <i>Make a pattern using LEGO bricks. For example, you can repeat colors, shapes, or sizes. Then make a pattern that's missing one part. Take turns seeing if your partner can tell what piece is missing.</i></p>
<p>28</p> <p>Ⓛ</p>	<p>PROMPT More with Computer Science</p> <p>Random Sounds and Wait Block</p>	<p>COMPUTING TERMINOLOGY CSTA 1A-AP-15 Using correct terminology, describe steps taken and choices made during the iterative process of program development.</p> <p>LANGUAGE CCSS.ELA-Literacy.L.1.5.C Identify real-life connections between words and their use (e.g., note places at home that are cozy).</p>	<ul style="list-style-type: none"> • Use icon blocks to program a random sound generator. • Connect computing terminology to everyday uses of the words. • Use correct terminology to explain how different blocks in the provided code work. 	<p>Dance Party</p> <p>Have students create and program a random sound generator to help the four friends play music for a dance party.</p> <ol style="list-style-type: none"> 1. Share the Music Block and point out the random option (with dice on it). 2. Ask students how this icon block works. 3. Introduce/review computing terminology such as <i>Wait Block</i> and connect it to everyday uses such as <i>waiting</i> for a light to turn green or a special school event. 4. Then prompt students to use the correct words to describe the blocks: <i>event block, music block, wait block, loop block.</i>

				<div data-bbox="1428 194 1795 584" data-label="Image">  </div> <p data-bbox="1234 617 1990 747">SAY/ASK <i>Maria, Sofie, Daniel, and Leo want to have a dance party. They all want to play different kinds of music. To make everyone happy, use the Music Block and program it to play random music. How does the code block work?</i></p>
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#	Activity Name	TOPIC(s) & Standards	Objectives Students will	Prompt
<p>29</p> <p>Ⓛ</p>	<p>PROMPT More with Computer Science</p> <p>Repeat Loops with Bricks</p> 	<p>SEQUENCES/LOOPS CSTA 1A-AP-10 Develop programs with sequences and simple loops, to express ideas or address a problem.</p> <p>COMPUTING TERMINOLOGY CSTA 1A-AP-15 Using correct terminology, describe steps taken and choices made during the iterative process of program development.</p>	<ul style="list-style-type: none"> • Use movement to demonstrate understanding of loops in coding. • Use correct terminology to explain how different blocks will create different loop results. 	<ol style="list-style-type: none"> 1. Assign a movement to a brick color and prompt students to complete that action (e.g., stand up, sit down, palms up/down, hands up/down, face forward/back, etc.) when you show that brick color. 2. Repeat the prompt; this time using another brick as a signal to repeat the movement (loop). Note the repeated motion to help prepare students for using a loop in their programming. 3. Optional: Explain the difference between the <i>Repeat Loop</i> block (a <i>for</i> loop) that repeats all the blocks inside it a certain number of times and the <i>Forever Block</i> (a <i>while</i> loop) that repeats all the blocks inside it forever. <p>SAY <i>When I show this color brick, I want you to [insert specific action]. When I show this special brick, I want you to do the action again and again. In coding, we use a loop block to tell the program to do something again and again.</i></p> <p>MORE DETAILS <i>Repeat Loop or Forever Loop (Control Blocks) in the Help section of the LEGO® Education SPIKE™ App, available on the web or downloaded.</i></p>





		Underwater Quest		
#	Activity Name	TOPIC(S) & Standards	Objectives Students will	Prompt
30 Ⓛ Ⓛ	LESSON	<p>SEQUENCES/LOOPS CSTA 1A-AP-10 Develop programs with sequences and simple loops, to express ideas or address a problem.</p> <p>DESIGN ENGINEERING NGSS K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.</p> <p>SCIENCE SKILL PRACTICE: FORCES AND MOTION (Push)</p>	<ul style="list-style-type: none"> • Understand that an action can be repeated. • Recognize and use patterns. • Develop programs that use simple loops (repetitions) to address a problem. • Practice helping a story character. • Participate in collaborative conversation. 	<ol style="list-style-type: none"> 1. Have student build and program the submarine model. 2. During the lesson, have students apply their learning from the looping activity to program it for repeated motion. <p>SAY/ASK <i>Maria is curious to explore life below the sea. How can she use her submarine to travel underwater? Build her a submarine. Then use loops to program it to move certain ways over and over. How did that make Maria's search easier?</i></p> <p>MORE DETAILS Underwater Quest lesson or access in the SPIKE App</p>
31 Ⓛ	PROMPT Debugging Challenge	<p>COMPUTATIONAL THINKING CSTA 1A-AP-14 Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.</p>	<ul style="list-style-type: none"> • Modify an existing program to make the solution work properly. 	<ol style="list-style-type: none"> 1. Share examples of programs that need debugging (fixing) to work correctly. 2. Start by prompting students to compare code, using the first example and the code provided in <i>Underwater Quest</i>. Ask what has changed about the program. (The sound block has been removed.)  <ol style="list-style-type: none"> 3. Then share another example and ask students to test to identify why this program won't work.  <p>SAY/ASK <i>Let's look at some code examples. For the first one, what did I change? For the second one, why won't this program work? What can you change to fix the problem?</i></p>
32 Ⓛ	PROMPT More with ELA	<p>SEQUENCES/LOOPS CSTA 1A-AP-10 Develop programs with sequences and simple loops, to express ideas or address a problem.</p>	<ul style="list-style-type: none"> • Build and program a model that demonstrates problems facing turtles. • Research to learn about 	<p>Group Research</p> <ol style="list-style-type: none"> 1. Extend students' underwater study through a class research project on why it is important to look after wildlife like turtles.

<p>(L)</p>	<p>Group Research</p>	<p>PERSUASIVE WRITING CCSS.ELA-Literacy.W.1.1 Write opinion pieces in which they introduce the topic or name the book they are writing about, state an opinion, supply a reason for the opinion, and provide some sense of closure.</p> <p>RESEARCH FOR WRITING CCSS.ELA-Literacy.W.1.7 Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions).</p> <p>CCSS.ELA-Literacy.W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.</p> <p>DESIGN ENGINEERING NGSS K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.</p>	<p>ocean wildlife like turtles.</p> <ul style="list-style-type: none"> Express their findings through a model. 	<p>Optional: provide background from the Oceans Fact Sheet and Sea Turtle Presentation Deck or other materials.</p> <ol style="list-style-type: none"> Prompt them share their findings in a model they design, build, and program. <p>SAY <i>Let's learn more about the turtles that Maria sees underwater. They need our help to stay safe and healthy. After you explore more about them, tell us what you learned. Build and program a model to show a problem that turtles have.</i></p> <p>MORE DETAILS Build the Change Oceans Fact Sheet and learning materials in Build the Change – Biodiversity and Climate Change, Case Study 4</p>
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		Treehouse Camp		
#	Activity Name	TOPIC(S) & Standards	Objectives Students will	Prompt
33 Ⓛ	LESSON 	<p>MODIFY PROGRAMS CSTA 1A-AP-14 Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.</p> <p>DESIGN ENGINEERING NGSS K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.</p>	<ul style="list-style-type: none"> Identify and fix errors in a program (test and debug). Test to ensure the program works correctly. Practice helping a story character. Participate in collaborative conversations. 	<ol style="list-style-type: none"> Have students build and program the treehouse, prompting them to program the roof to open. Guide them to understand that the provided program doesn't work, and they will need to debug (fix) it. <p>SAY <i>Sofie is looking forward to seeing the moon from her treehouse! Build the treehouse model. Then try the program that makes the treehouse roof open. Oh no! It doesn't work. Look carefully at the program. Find the problem and fix it, so that Sofie gets a great view of the sky.</i></p> <p>MORE DETAILS Treehouse Camp lesson or access in the LEGO® Education SPIKE™ App</p>
34 Ⓛ	PROMPT Meet the Gyro Sensor 	<p>SEQUENCES/LOOPS CSTA 1A-AP-10 Develop programs with sequences and simple loops, to express ideas or address a problem.</p> <p>COMPUTING TERMINOLOGY CSTA 1A-CS-02 Use appropriate terminology in identifying and describing the function of common physical components of computing systems (hardware).</p>	<ul style="list-style-type: none"> Follow instructions to create a program. Use appropriate terminology when referring to hardware. 	<p>To prepare students for the next activity, introduce them to the Gyro Sensor that is built into the hub.</p> <ol style="list-style-type: none"> Use gesture to clarify tilting and explain that the Gyro Sensor recognized movement like this. Then have students complete the Built-In Gyro Sensor tutorial activity. <p>SAY <i>Learn how to use the Gyro Sensor that is built into the hub. Connect a motor to the hub with Port A. Write the program to use the Gyro Sensor to make the motor turn. Tilt the hub and see what happens.</i></p> <p>MORE DETAILS The Gyro Sensor tutorial in the START section of the SPIKE App, available on the web or downloaded.</p>
35 Ⓛ	PROMPT More with Computer Science	<p>SEQUENCES/LOOPS CSTA 1A-AP-10 Develop programs with sequences and simple loops, to express ideas or address a problem.</p>	<ul style="list-style-type: none"> Use sensors to make the treehouse roof open and close automatically. Practice testing coding solutions to compare 	<p>Add a sensor.</p> <ol style="list-style-type: none"> Prompt students to include a sensor (e.g., gyro, color) in Sofie's treehouse to open and close the roof automatically.

	<p>Comparing Solutions</p>	<p>DESIGN ENGINEERING NGSS K-2-ETS1-3 Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.</p>	<p>strengths and weaknesses.</p>	<p>2. Direct them to try at least two different ways of using the sensor, and then compare the strengths and weaknesses of each solution.</p> <p>SAY/ASK <i>Let's make Sofie's treehouse roof open and close automatically. Code a sensor to help her. Try two different ways of using the sensor. Which works better? Tell me what's good or not good about each way you tried.</i></p> <p>MORE DETAILS <i>Tilt or Color Sensor blocks (Event Blocks) in the Help section of the LEGO® Education SPIKE™ App, available on the web or downloaded.</i></p>
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#	Activity Name	TOPIC(S) & Standards	Objectives Students will	Prompt
<p>36</p> <p></p>	<p>PROMPT More with ELA Storytelling</p>	<p>COMPUTING TERMINOLOGY/DEVELOP PROGRAMS CSTA 1A-AP-15 Using correct terminology, describe steps taken and choices made during the iterative process of program development.</p> <p>NARRATIVE WRITING CCSS.ELA-Literacy.W.1.3 Write narratives in which they recount two or more appropriately sequenced events, include some details regarding what happened, use temporal words to signal event order, and provide some sense of closure.</p>	<ul style="list-style-type: none"> • Use appropriate terminology when describing programming steps. • Tell stories prompted by random animal sounds. 	<p>Storytelling around the Campfire Have students play some sounds to help Sofie start some storytelling around the campfire.</p> <ol style="list-style-type: none"> 1. Prompt them to program the <i>Animal Sounds Block</i> using the random option (with dice) and use the Gyro Sensor to start the program (with a tilt or other motion). 2. As different animal sounds play, have students write stories about the animal for Sofie to tell. <p>SAY <i>Sofie wants to tell some stories about animals at a campout. Help her choose the animals by playing some different animal sounds. Use the Animal Sounds Block set to the play different sounds (look for the dice). Then use the Gyro Sensor to start the program. For each animal sound you hear, write a short story that Sofie can tell her friends. Then tell me about your code and the sensors you used.</i></p> <div data-bbox="1514 1279 1709 1393" data-label="Image"> </div> <p>MORE DETAILS <i>The Gyro Sensor tutorial in the START section and the Tilt Sensor Block (Event Blocks) in the Help section of the LEGO® Education SPIKE™ App, both available on the web or downloaded.</i></p>

		The Great Desert Adventure		
#	Activity Name	TOPIC(S) & Standards	Objectives Students will	Prompt
37   	LESSON	<p>COMPUTATIONAL THINKING CSTA 1A-AP-11 Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.</p> <p>SEQUENCES CSTA 1A-AP-12 Develop plans that describe a program's sequence of events, goals, and expected outcomes.</p> <p>SEQUENCES/LOOPS CSTA 1A-AP-10 Develop programs with sequences and simple loops, to express ideas or address a problem.</p> <p>DESIGN ENGINEERING NGSS K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.</p> <p>NGSS K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.</p>	<ul style="list-style-type: none"> • Apply their engineering design skills to solve a problem. • Break down the problem to identify what's needed in a strong solution. • Describe a program's sequence of events, goals, and expected outcome. 	<ol style="list-style-type: none"> 1. Review learning from the previous lessons to help the team get to the pyramids. 2. Prompt students to design, build, program, and test their solution, using at least one motor or sensor. Optional: The use of a story map or storyboard might be helpful for students to use as part of the planning process. They can draw or write the programming steps needed as well as stating what the program will do. <p>SAY <i>It's time for another great adventure. Create a way for Sofie, Daniel, Maria, and Leo to get to the pyramids. Use at least one motor or sensor. Design, build, program and test your solution.</i></p> <p>MORE DETAILS The Great Desert Adventure lesson or access in the SPIKE App</p>

<p>38</p> <p>Ⓛ</p>	<p>PROMPT More with ELA</p> <p>Storytelling</p>	<p>NARRATIVE WRITING CCSS.ELA-Literacy.W.1.3 Write narratives in which they recount two or more appropriately sequenced events, include some details regarding what happened, use temporal words to signal event order, and provide some sense of closure.</p>	<ul style="list-style-type: none"> • Write a story that includes two or more sequenced events. • Use time order words to show the events in order. 	<p>Have students write a story about why the team decided to visit the pyramids, how they got there, and what they saw when they arrived.</p> <ol style="list-style-type: none"> 1. ASK/SAY <i>Why do you think the team wanted to visit the pyramids? Now that they have your model, what was their trip like to get there? What did they see at the pyramids? Brainstorm about these questions. Then write a story with at least two main events. Use time words to put them in order.</i>
<p>39</p> <p>Ⓛ</p>	<p>PROMPT More with Math</p> <p>Data and Graphing</p>	<p>COLLECT DATA 1A-DA-06K-2 Collect and present the same data in various visual formats.</p> <p>MEASUREMENT AND DATA CCSS.MATH.Content.1.MD.C.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.</p>	<ul style="list-style-type: none"> • Create a data table to show the number of bricks of each color used in a model. • Use icon blocks to program a bar graph that shows the data visually. 	<ol style="list-style-type: none"> 2. After their adventure to the pyramids, have students disassemble their models and organize the pieces by color. 3. Prompt them to create a data table that shows the number of bricks of each color used. 4. Challenge students to use their SPIKE Essential hub and color sensor to make a Bar Graph Block to show the data in their SPIKE app. 5. Ask students to compare data with others describing where they used more or less. <p>SAY <i>Take apart your desert model. Sort the pieces by color. Then make a table to show how many of each color you counted. You can do that a paper table. Or you can do it in the SPIKE App, using the Bar Graph blocks.</i></p> <p>MORE DETAILS Bar Graph Blocks in the Help section of the LEGO® Education SPIKE™ App, available on the web or downloaded.</p>

#	Activity Name	TOPIC(s) & Standards	Objectives Students will	Prompt
<p>40</p> <p>⌚</p> <p>⌚</p>	<p>PROMPT</p> <p>More with ELA Storytelling</p>	<p>SEQUENCES/LOOPS CSTA K-2 1A-AP-10 Develop programs with sequences and simple loops, to express ideas or address a problem.</p> <p>DESIGN ENGINEERING NGSS K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.</p> <p>SPEAKING AND LISTENING CCSS.ELA-Literacy.SL.1.4 Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.</p>	<ul style="list-style-type: none"> • Define success criteria to help evaluate a solution. • Compare and contrast different solutions to determine which one meets the specified need. • Engage effectively in a range of collaborative discussions. 	<p>Have students apply their experience from helping Maria, Sofie, Leo, and Daniel to solve problems in different stories. Have students create their own stories for the team.</p> <ol style="list-style-type: none"> 1. Model use of the Display Image block random setting (with dice) to create unexpected backgrounds in the LEGO® Education SPIKE™ App. 2. Ask students to run the block when starting the program, and then to start a story with the setting they see.  <ol style="list-style-type: none"> 3. Then challenge students to build a model to go with the background to help tell a story. <p>SAY/ASK <i>Think about the stories Maria, Sofie, Daniel, and Leo shared with you. Create a new one for them. Use the random image block in the App to choose a place. Build and program a model to go with the location. Then tell the story.</i></p> <p>MORE DETAILS Display Image block in the Help section of the LEGO® Education SPIKE™ App, available on the web or downloaded.</p>