LEGO® Education
STEAM Learning Progression

SPIKE™ Prime Grade 7

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™ Prime. 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 Forces and Motion (science), Modifying Programs (computer science), or Narrative Writing (ELA).
- ☑ lists the relevant standards, beginning with the most important standard in the learning. For example, a science activity will list NGSS standards first, while a computer science activity will list CSTA standards first.

To find what you need,

- ☑ scan the Topic(s) & Standards column or search with terms like *Data & Analysis* or *CSTA*.
- ☑ 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 use only bricks and require no hardware/software

Activities that will take approximately 20–30 mins

or Activities that will take approximately 45 or 90 mins

LESSON Longer activities with full lesson support

MORE DETAILS Links that lead to lesson details and teaching support

PROMPT Short activities to quickly expand or extend the learning

Additional Resources (Also see 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*
- ☑ *LEGO® Education SPIKE™ Prime FAQs*
- ☑ *LEGO® Education SPIKE™ Prime Resources – Download vs. Streaming*
- ☑ *LEGO® Education SPIKE™ Prime - Computer Science Courses*

#	Activity Name	Topic(s) and Standards	Objectives Students will	Prompt
1	PROMPT **Back to Back**	**Computational Thinking** **CSTA 2-AP-10** Use flowcharts and/or pseudocode to address complex problems as algorithms. **Skill Practice: Sequence of Events**	• Practice communicating with peers. • Investigate creating sequence of events.	Use a follow-the-steps activity to introduce students to the coding concept of sequencing. Organize pairs back-to-back and provide each partner with the same 5–6 bricks. Prompt students to take turns building and doing a Q&A together. **Say/Ask** *Build a model. Think about the steps you used to build it. Without showing the model, invite your partner to ask Yes/No questions about how to build something just like it. Remember to answer only with Yes or No. Then change roles and ask questions to build your partner's model. What happens? Was it easier to ask questions or answer them? Would this task be easier if you could give directions? Write out your instructions to create your pseudocode.* **More Details** Back to Back *lesson* or access in the LEGO® Education SPIKE™ App
2	PROMPT **Meet the Light Matrix**	**Computing Systems** **CSTA 2-CS-02** Design projects that combine hardware and software components to collect and exchange data. **Skill Practice: Sequence of Events**	• Follow instructions to create a program. • Explore programming the light matrix. • Describe coding steps in sequence.	Introduce students to the light matrix in their set as they prepare to program it. Using the Light Matrix tutorial, have students start with the hub. Then prompt them to describe the coding steps in words to a partner. **Say** *Turn on your hub. Follow the tutorial steps to make it work. Then tell your partner step by step what the code does. Say what happens in order.* **More Details** *The Light Matrix* tutorial in the START section of the SPIKE App, available on the web or downloaded.
3	PROMPT **Meet the Motor**	**Computing Systems** **CSTA 2-CS-02** Design projects that combine hardware and software components to collect and exchange data. **Skill Practice: Sequence of Events.**	• Follow instructions to create a program. • Explore programming a motor. • Describe coding steps in sequence.	Introduce students to the motor in their set as they prepare to program it. Using the Motor tutorial, have students start the motor. Then prompt them to describe the coding steps in words to a partner. **Say** *Connect a motor to your hub. Follow the tutorial steps to make it move. Then tell your partner step by step what the code does. Say what happens in order.* **More Details** *The Motor* tutorial in the START section of the SPIKE App, available on the web or downloaded.

4 🕒	**PROMPT** **Meet the Color Sensor**	**COMPUTING SYSTEMS** **CSTA 2-CS-02** Design projects that combine hardware and software components to collect and exchange data. **SKILL PRACTICE: SEQUENCE OF EVENTS**	• Follow instructions to create a program. • Explore programming a sensor. • Describe coding steps in sequence.	Introduce students to the Color Sensor in their set as they prepare to program it. Using the Color Sensor tutorial, have students start with the sensor. Then prompt them to describe the coding steps in words to a partner. **SAY** *Connect the Color Sensor to your hub. Follow the tutorial steps to make it work. Then tell your partner step by step what the code does. Say what happens in order.* **MORE DETAILS** *The Color Sensor* tutorial in the START section of the LEGO® Education SPIKE™ App, available on the web or downloaded
5 🕒	**PROMPT** **Meet the Distance Sensor**	**COMPUTING SYSTEMS** **CSTA 2-CS-02** Design projects that combine hardware and software components to collect and exchange data. **SKILL PRACTICE: SEQUENCE OF EVENTS**	• Follow instructions to create a program. • Explore programming a sensor. • Describe coding steps in sequence.	Introduce students to the Distance Sensor in their set as they prepare to program it. Using the Distance Sensor tutorial, have students start with the sensor. Then prompt them to describe the coding steps in words to a partner. **SAY** *Connect the Distance Sensor to your hub. Follow the tutorial steps to make it work. Then tell your partner step by step what the code does. Say what happens in order.* **MORE DETAILS** *The Distance Sensor* tutorial in the START section of the SPIKE App, available on the web or downloaded
6 🕒	**PROMPT** **Meet the Force Sensor**	**COMPUTING SYSTEMS** **CSTA 2-CS-02** Design projects that combine hardware and software components to collect and exchange data. **SKILL PRACTICE: SEQUENCE OF EVENTS**	• Follow instructions to create a program. • Explore programming a sensor. • Describe coding steps in sequence.	Introduce students to the Force Sensor in their set as they prepare to program it. Using the Force Sensor tutorial, have students start with the sensor. Then prompt them to describe the coding steps in words to a partner. **SAY** *Connect the Force Sensor to your hub. Follow the tutorial steps to make it work. Then tell your partner step by step what the code does. Say what happens in order.* **MORE DETAILS** *The Force Sensor* tutorial in the START section of the SPIKE App, available on the web or downloaded

7 L	**PROMPT** **Meet the Gyro Sensor**	**COMPUTING SYSTEMS** **CSTA 2-CS-02** Design projects that combine hardware and software components to collect and exchange data. **SKILL PRACTICE: SEQUENCE OF EVENTS**	• Follow instructions to create a program. • Explore programming a sensor. • Describe coding steps in sequence.	Introduce students to the Gyro Sensor in their set as they prepare to program it. Using the Gyro Sensor tutorial, have students start with the sensor. Then prompt them to describe the coding steps in words to a partner. **SAY** *Connect the Gyro Sensor to your hub. Follow the tutorial steps to make it work. Then tell your partner step by step what the code does. Say what happens in order.* **MORE DETAILS** *The Gyro Sensor* tutorial in the START section of the LEGO® Education SPIKE™ App, available on the web or downloaded

		Place your Order		
#	**Activity Name**	**TOPIC(S) & Standards**	**Objectives** Students will	**Prompt**
8 L L	**LESSON**	**COMPUTATIONAL THINKING** **CSTA 2-AP-10** Use flowcharts and/or pseudocode to address complex problems as algorithms. **COMPUTATIONAL THINKING** **CSTA 2-AP-13** Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.	• Use decomposition skills to break a complex problem down into smaller parts.	Have students practice creating pseudocode and decomposing problems using their quality check robot. Students can follow a user guide video to replicate the actions of a "quality check" robot. **SAY** *Create a robot to test the quality of your ideas. Use the pseudocode to write your program and then watch the robot go into action.* **MORE DETAILS** *Place Your Order* lesson or access in the LEGO® Education SPIKE™ App
9 L	**PROMPT** **More with Math and ELA**	**INFORMATIONAL WRITING** **CCSS.ELA-Literacy.W.7.2** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.	• Communicate ideas through informative texts.	Have your students create a 2-minute video tutorial or a user guide booklet describing how to set up and program the "quality check" robot. **SAY/ASK** *Make a tutorial to explain how to set up and program your quality check robot.*

		Out of Order		
#	**Activity Name**	**Topic(s) & Standards**	**Objectives** Students will	**Prompt**
10 (L)(L)	**Lesson**	**Computing Systems** **CSTA 2-CS-03** Systematically identify and fix problems with computing devices and their components. **Informational Writing** **CCSS.ELA-Literacy.W.7.2** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. **Number System** **CCSS.MATH.Content.7.NS.A.3** Solve real-world and mathematical problems involving the four operations with rational numbers.	• Identify and fix programming problems.	Have your students find and fix mistakes in a program to make a Delivery Cart work as intended. Students will first need to build the cart and then look for errors in the program. **Say** When things don't go well, you have to debug. Your delivery cart doesn't seem to work well. Can you fix it? **More Details** *Out of Order* lesson or access in the LEGO® Education SPIKE™ App
11 (L)	**Prompt** **More with Math and ELA**		• Communicate and express ideas clearly. • Collaborate with peers.	Have your students create a detailed checklist of elements to verify when they're coding. Introduce them to adding comments to their programs, focusing on the importance of making their comments precise and easily understood by anyone. **Say/Ask** *How can you use comments to explain your program? Practice adding comments to your program focusing on being precise and clear.*

		Track your Packages		
#	**Activity Name**	**Topic(s) & Standards**	**Objectives** Students will	**Prompt**
12 (L)(L)	**Lesson**	**Modify Programs** **CSTA 2-AP-16** Incorporate existing code, media, and libraries into original programs, and give attribution. **Ratios & Proportional Relationships** **CCSS.MATH.Content.7.RP.A.1** Compute unit rates associated with ratios of fractions,	• Develop their ability to recognize patterns and create effective programs.	Have students create a tracking system by remixing programming stacks to use an X-Y tracking device to follow a path on a piece of paper. **Say** *To follow our packages, we need to create a tracking system. Build your tracker and program it to follow the route.* **More Details** *Track Your Packages* lesson or access in the SPIKE App

13	PROMPT **More with Math and ELA**	including ratios of lengths, areas and other quantities measured in like or different units.	• Investigate proportions using equations. • Solve real world problems.	Have your students create a proportional table to find the relation between motor rotation and length of the line traced. Have them transform that relation in the shape of px + q = r. **SAY/ASK** *Let's investigate the relation between motor rotation and length by creating a proportional table.*

		Keep it Safe!		
#	**Activity Name**	**TOPIC(S) & Standards**	**Objectives** Students will	**Prompt**
14	LESSON	**COMPUTATIONAL THINKING** **CSTA 2-AP-12 6-8** Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. **CYBERSECURITY** **CSTA 2-NI-05 6-8** Explain how physical and digital security measures protect electronic information. **LANGUAGE: VOCABULARY** **CCSS.ELA-Literacy.L.7.6** Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.	• Explore conditional programming. • Be able to explain the principles of digital security.	Have students use conditions to lock or unlock the door of a safe-deposit box that they build. **SAY** *Locks and passwords are safety devices that are used everywhere to keep things safe. Build and program your safe including a conditional.* **MORE DETAILS** *Keep it Safe!* lesson or access in the LEGO® Education SPIKE™ App
15	PROMPT **More with Math and ELA**		• Understand key terminology.	Have your students explore the meaning of digital security terminology, like: ▷ Boolean ▷ Conditions ▷ Encryption ▷ Case-sensitive **SAY/ASK** Share what you learn about digital security and terminology.

		Keep it Really Safe!		
#	**Activity Name**	**TOPIC(S) & Standards**	**Objectives** Students will	**Prompt**
16	LESSON	**COMPUTATIONAL THINKING** **CSTA 2-AP-12 6-8** Design and iteratively develop programs that combine control	• Explore compound conditional programming.	Have students use compound conditions to reinforce the encryption pattern on a safe-deposit box. Students will update their safe to be more secure.

		structures, including nested loops and compound conditionals. **LANGUAGE: VOCABULARY** **CCSS.ELA-Literacy.L.7.6** Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.		**SAY** *Let's make our safes even safer by adding additional layers of security.* **MORE DETAILS** *Keep it Really Safe!* lesson or access in the SPIKE App
17 L	**PROMPT** **More with Math and ELA**		• Understand key terminology	Have your students explore the meaning of digital security terminology, like: ▷ Boolean ▷ Conditions ▷ Compound Conditions ▷ AND, OR, NOR, NOT ▷ Encryption ▷ Case sensitive **SAY/ASK** Share what you learn about digital security and terminology.

		Automate it!		
#	**Activity Name**	**TOPIC(S) & Standards**	**Objectives** Students will	**Prompt**
18 L L	**LESSON**	**DESIGN ENGINEERING** **NGSS MS-ETS1-4** Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. **COMPUTING SYSTEMS** **CSTA 2-CS-02 6-8** Design projects that combine hardware and software components to collect and exchange data. **SPEAKING & LISTENING** **CCSS.ELA-Literacy.SL.7.5** Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.	• Use computational thinking skills to produce a complete solution to a problem.	Have students create and program an automated helper that can identify and ship the correct package based on color. **MORE DETAILS** *Automate it!* lesson or access in the LEGO® Education SPIKE™ App
19 L	**PROMPT** **More with Math and ELA**		• Use different media types to communicate and express ideas clearly. • Collaborate with peers.	Ask your students to use text, images, sketches, etc. to record their design process, creating an invention notebook to document their work. Have them present their projects to a wider audience (e.g., a school-wide assembly or by publishing online videos). Ask your students to create a website presenting their factory or business. **SAY/ASK** *Document your design process and share it through a website.*

		RoboChef		
#	**Activity Name**	**Topic(s) & Standards**	**Objectives** Students will	**Prompt**
20 🕒🕒	**Lesson**	**Design Engineering** **NGSS MS-ETS1-1** Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. **NGSS MS-ETS1-2** Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. **Speaking & Listening** **CCSS.ELA-LITERACY.SL.7.6** Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.	• Collaborate to solve various challenges. • Use engineering design skills to design and build a device that performs a specific task.	Have students collaborate to build a device that can complete a task to help in the kitchen. Encourage students to think like an engineer to create a device that is user-friendly and efficient. Challenge students to expand their build to produce a device that can accomplish more than one task in the kitchen. **More Details** *Share the RoboChef placemat* lesson with students for this challenge.
21 🕒	**Prompt** **More with Math and ELA**		• Communicate ideas clearly. • Collaborate with peers.	Ask students to share the challenges they encountered when attempting to develop a solution. Ask them to share their solutions in one of the following ways: ▷ As a presentation to the class ▷ As part of a class discussion ▷ In small groups ▷ As a partner pair Ask the students to give positive and constructive feedback to their classmates. **Say/Ask** *Make a presentation to share the problems you have tried to solve and how the solutions met the need. Share you presentation for the class*

		Code Your Moves		
#	**Activity Name**	**Topic(s) & Standards**	**Objectives** Students will	**Prompt**
22 🕒🕒	**Lesson**	**Computational Thinking** **CSTA 2-AP-10** Use flowcharts and/or pseudocode to address complex problems as algorithms. **Computational Thinking**	• Create and follow a set of step-by-step pseudocode instructions. • Decompose, identify, and fix problems in their pseudocode.	Have students practice programming using unplugged coding. **Say** Use pseudocode to write a program for a dance move.

		CSTA 2-AP-13 Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.		**MORE DETAILS** *Code Your Moves* lesson or access in the LEGO® Education SPIKE™ App

		Break Dance		
#	**Activity Name**	**TOPIC(S) & Standards**	**Objectives** Students will	**Prompt**
23 L L	**LESSON**	**DATA & ANALYSIS** **CSTA 2-DA-09 6-8** Refine computational models based on the data they have generated. **RATIOS & PROPORTIONAL RELATIONSHIPS** **CCSS.MATH.CONTENT.7.RP.A.2** Recognize and represent proportional relationships between quantities.	• Effectively use different data types such as time (seconds), speed, and degrees of rotation.	Have students build the break dance model and then synchronize motor movements of to keep in rhythm with light and beats. Students will need to move the arms and legs. **SAY/ASK** *How much time do you spend sitting down? Let's create a robot that will get you up and moving. Program your robot to move to the beat and sync up the light.* **MORE DETAILS** *Break Dance* lesson or access in the SPIKE App
24 L	**PROMPT** **More with Math and ELA**	**NUMBER SYSTEM** **CCSS.MATH.CONTENT.7.NS.A.3** Solve real-world and mathematical problems involving the four operations with rational numbers.	• Communicate and express ideas clearly. • Conduct research.	Have the students research and discuss why it's important to get up and move at regular intervals when sitting for long periods in class, at the computer, watching TV, playing video games, etc. **SAY/ASK** *Why is it important to incorporate movement into your day? Let's do some research to find out.*
25 L	**PROMPT** **More with Math and ELA**		• Investigate how fractions appear in music. • Solve real world problems.	Have your students explore or explain beats in terms of fractions. Have them play polymetric beats (e.g., 2/4 with 3/8, 5/4 with 4/4). **SAY/ASK** *How can we use fractions with music? Let's explore the beats and use numbers to explain them.*

		Rebuild The World with Dance Technology		
#	**Activity Name**	**Topic(s) & Standards**	**Objectives** Students will	**Prompt**
26 🕒	**Lesson**	**Impacts of Computing** **CSTA 2-IC-20** Compare tradeoffs associated with computing technologies that affect people's everyday activities and career options. **Science & Technical Subjects** **CCSS.ELA-LITERACY.RST.6-8.9** Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.	• Investigate STEAM careers and reflect on how you could create a high-tech stage for a dance performance. • Explore the ways they use technology every day.	Have students watch the Rebuild the World with Dance Technology video and meet Yamilée Toussaint Beach, a dance technologist. Students will explore the intersection of dance and technology by learning about Yamilée's STEAM journey. Students will complete a challenge to design a high-tech stage for an unforgettable performance. **More Details** Rebuild the World with Dance Technology lesson, teacher resources, classroom slides, and more.

		Repeat 5 Times		
#	**Activity Name**	**Topic(s) & Standards**	**Objectives** Students will	**Prompt**
27 🕒🕒	**Lesson**	**Computational Thinking** **CSTA 2-AP-11** Create clearly named variables that represent different data types and perform operations on their values. **Speaking & Listening** **CCSS.ELA-LITERACY.SL.7.4** Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation. **CCSS.ELA-LITERACY.SL.7.5** Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.	• Declare multiple numeric variables. • Perform simple math operations on the variables.	Have students use variables to count the number of sit-ups and calories burned during a workout. Students will program their model to repeat actions. **Say** *Time for some exercise! Let's count how many reps we can do in sit-ups. Program Leo to do sit-ups and add in a counter to keep track of the movement.* **More Details** *Repeat 5 Times* lesson or access in the LEGO® Education SPIKE™ App
28 🕒	**Prompt** **More with Math and ELA**		• Communicate and express ideas clearly. • Create a presentation. • Conduct research.	Have your students find examples of training programs and explore the differences between them. Have them link the type of exercise and number of reps to the effect it would have on the body. Have them create a presentation about different workout programs. **Say/Ask** *Make a presentation to show the effect that different types of exercise have on the body.*

29 🕒	PROMPT **More with Math and ELA**	**RATIOS & PROPORTIONAL RELATIONSHIPS** **CCSS.MATH.CONTENT.7.RP.A.2** Recognize and represent proportional relationships between quantities.	• Explore linear relationships. • Create graphs. • Understand the relationship between variables.	Have your students explore linear relations in various ways. Have them trace a linear graph of the value of the different variables (e.g., count, calories, work) in relation to the number of sit-ups done by Leo. **SAY/ASK** *Let's graph our workout to see the relationship between the number of sit-up Leo does to the count, calories, and work done.*

		Rain or Shine?		
#	**Activity Name**	**TOPIC(S) & Standards**	**Objectives** Students will	**Prompt**
30 🕒🕒	LESSON	**DATA & ANALYSIS** **CSTA 2-DA-08 6-8** Collect data using computational tools and transform the data to make it more useful and reliable. **STATISTICS & PROBABILITY** **CCSS.MATH.CONTENT.7.SP.C.7** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. **SPEAKING & LISTENING** **CCSS.ELA-LITERACY.SL.7.4** Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation. **CCSS.ELA-LITERACY.SL.7.5** Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.	• Explore the use of live weather data to control an output.	Have students create a way of displaying a weather forecast using qualitative cloud data. Students will build a robot that can indicate what the forecast is based on movements. **SAY** *Let's create something that can help us forecast the weather. Create a program that will let the weather model indicate if it is sunny or rainy based on inputting a location.* **MORE DETAILS** *Rain or Shine* lesson or access in the LEGO® Education SPIKE™ App
31 🕒	PROMPT **More with Math and ELA**		• Use different media types to communicate and express ideas clearly. • Take on roles to express ideas.	Have your students play the role of a TV weather forecaster. Watch some online videos about how weather forecasts are presented and have your students create their own presentations using their LEGO models and other presentation materials. They can even suggest good places to go for a long weekend! **SAY/ASK** *Time to make a prediction! You will take on the role of the weather forecaster to share the weather in various locations.*
32 🕒	PROMPT **More with Math and ELA**		• Make predictions. • Use tools to calculate accuracy. • Collect and use real world data.	Because weather forecasts are trying to predict what will happen in the future, they're not always accurate. Have your students develop a probability model and use it to find probabilities of weather events. Compare the probabilities from the model to observed frequencies. Have students evaluate the model and explain possible sources of

				discrepancy if the agreement between the model and observed frequency is not good. **SAY/ASK** *Let's make that prediction a little more reliable! Develop a model that could represent the probability of weather events in our area.*

		Wind Speed		
#	**Activity Name**	**TOPIC(S) & Standards**	**Objectives** Students will	**Prompt**
33 L L	**LESSON**	**DATA & ANALYSIS** **CSTA 2-DA-08** Collect data using computational tools and transform the data to make it more useful and reliable. **EXPRESSIONS & EQUATIONS** **CCSS.MATH.CONTENT.7.EE.B.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. **SPEAKING & LISTENING** **CCSS.ELA-LITERACY.SL.7.4** Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation. **CCSS.ELA-LITERACY.SL.7.5** Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.	• Explore the use of live weather data to control an output.	Have students create a way to display wind speed using quantitative cloud data. Students will program their model to indicate the amount of wind when they input a city to the program. **SAY** *How can we find the speed of the wind? Program your model to track the wind in various cities.* **MORE DETAILS** *Wind Speed* lesson or access in the LEGO® Education SPIKE™ App
34 L	**PROMPT** **More with Math and ELA**		• Explore the use of live weather data to control an output. • Use different media types to communicate and express ideas clearly. • Take on roles to express ideas.	Have your students record and issue warnings based on their wind speed weather forecasts. As part of their forecast, encourage them to also explain how the wind works. **SAY/ASK** *Make a presentation to share the forecast and warnings based on the wind speed. Make sure to include an explanation on how wind works.*
35 L	**PROMPT** **More with Math and ELA**		• Interpret and explain data. • Discuss appropriate size units for measurement.	When your students are programming the motor angle to show the wind speed: ▷ Explain that they're interpreting statements about the relative position of two numbers ▷ Explain that they're writing statements of order for rational numbers in this real-world context (e.g., they write "a wind speed of 13.8 > 24.4 m/s" to express the fact that the wind speed is faster). They'll choose units of an appropriate size for measurements, and program the motor to move the angle proportionally.

				Have students work with different units (e.g., mph, kph, knots). **SAY/ASK** *Explain how the model is working to show the wind speed based on the way the motor moves.*

		Veggie Love		
#	**Activity Name**	**TOPIC(S) & Standards**	**Objectives** Students will	**Prompt**
36 L L	**LESSON**	**DATA & ANALYSIS** **CSTA 2-DA-08** Collect data using computational tools and transform the data to make it more useful and reliable. **COMPUTATIONAL THINKING** **CSTA 2-AP-11 6-8** Create clearly named variables that represent different data types and perform operations on their values.	• Calibrate a scale to display accurate data in a useful and reliable way.	Have students use live forecast data to decide whether tomato plants will need to be watered this week. Students will program their model to indicate the water needed. **SAY** *Help us figure out when to water the plants. Create a model to show when to water the tomato plants.* **MORE DETAILS** *Veggie Love* lesson or access in the LEGO® Education SPIKE™ App
37 L	**PROMPT** **More with Math and ELA**		• Create comparisons of models to real world uses of tools • Communicate and express ideas clearly.	Have your students meet someone who works in the farming industry and find out if they use similar tools. Ask them to compare this life hack scale with the real instruments that farmers use in their fields. **SAY/ASK** *Let's look at instruments that farmers use and compare our forecasting tool.*
38 L	**PROMPT** **More with Math and ELA**		• Investigate scale and calibration.	Have your students use the same scale to calibrate different values: ▷ Wind speed over time ▷ Temperature over time Have them define how the calibration should be made. **SAY/ASK** *Let's try to use our scale to calibrate different values.*

		Rebuild The World with Agriculture		
#	**Activity Name**	**Topic(s) & Standards**	**Objectives** Students will	**Prompt**
39 🕒	**Lesson**	**Impacts of Computing** **CSTA 2-IC-20** Compare tradeoffs associated with computing technologies that affect people's everyday activities and career options. **Science & Technical Subjects** **CCSS.ELA-LITERACY.RST.6-8.9** Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.	• Explore how professionals apply STEAM skills every day in their careers. • Investigate design mechanisms to automate a process using technology and design a possible solution.	Have students watch the Rebuild the World with Agriculture video and meet Tyler Froberg, a fourth-generation farmer and former agricultural science teacher. Students will explore the challenges associated with automating strawberry picking and learn about Tyler's STEAM journey. Students will complete a challenge to design an automated strawberry picker. **More Details** Rebuild the World with Dance Agriculture lesson, teacher resources, classroom slides, and more.

		Brain Game		
#	**Activity Name**	**Topic(s) & Standards**	**Objectives** Students will	**Prompt**
40 🕒🕒	**Lesson**	**Data & Analysis** **CSTA 2-DA-09 6-8** Refine computational models based on the data they have generated. **Computational Thinking** **CSTA 3A-AP-14 9-10** Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables. **Reading: Informational Text** **CCSS.ELA-LITERACY.RI.7.4** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical	• Explore ways of storing values in an array and use that information for a specific purpose. • Develop their ability to recognize patterns and create effective programs.	Have students record multiple values at the same time in an array (list) and compare values. **More Details** *Brain Games* lesson or access in the LEGO® Education SPIKE™ App
41 🕒	**Prompt** **More with Math and ELA**		• Understand key terminology. • Create a presentation. • Communicate and express ideas clearly.	Ask your students to prepare a presentation to explain the game, making sure they correctly use technical terms, like: ▷ Probability ▷ Mean ▷ Average ▷ Array ▷ Index of array **Say/Ask** *Make a presentation to explain your game.*

42	**PROMPT** **More with Math and ELA**	meanings; analyze the impact of a specific word choice on meaning and tone. **STATISTICS & PROBABILITY** **CCSS.MATH.CONTENT.7.SP.C.8** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.	• Investigate the relationship between two variables.	Have your students explore various statistics concepts. ▷ Collect and organize data to find probabilities of events. **SAY/ASK** *Let's look at the statistics behind how many tries it took you to get to the right sequence.*

		The Coach		
#	**Activity Name**	**TOPIC(S) & Standards**	**Objectives** Students will	**Prompt**
43	**LESSON**	**DATA & ANALYSIS** **CSTA 2-DA-09 6-8** Refine computational models based on the data they have generated. **COMPUTATIONAL THINKING** **CSTA 3A-AP-14 9-10** Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables. **READING: INFORMATIONAL TEXT** **CCSS.ELA-LITERACY.RI.7.4** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.	• Design a solution that can help improve everyday life.	Have students design, build, and program a training coach to improve the process of mastering something. **SAY** *Help yourself with mastering something by creating a coach.* **MORE DETAILS** *The Coach lesson* or access in the LEGO® Education SPIKE™ App
44	**PROMPT** **More with Math and ELA**		• Communicate and express ideas clearly. • Create written or media artifacts to document learning.	Ask your students to use text, images, sketches, etc. to record their design process, creating an Inventor Notebook to document their work. Have them create a website presenting their training program. **SAY/ASK** *Use different media to document your design process.*