LEGO education

Detroit Public Schools
Computer Science
Grades 6 – 8
2023 – 2024

LEGO® Education Brings STEAM Learning to Life

At LEGO® Education, our mission is to develop the builders of tomorrow. We believe STEAM Learning has become Prime for preparing even the youngest students for their future and for in-demand careers. LEGO® Education offers hands-on learning systems that make abstract concepts more tangible for young minds, enabling them to experience joy as they master STEAM subjects. This playful approach helps spark curiosity and lifelong learning.

Learning Promise

This curriculum is designed to ensure that ALL students will be able to engage in project-based, hands-on computer science learning experiences with lessons facilitated by teachers who are confident they are delivering an outstanding learning experience.

This program is designed to:

- Provide all Detroit Public Schools K-12 students with access to high-quality, project-based Computer Science learning experiences.
- Increase student engagement and ensure that all DPS K-12 students will see the relevance of and a meaningful connection to Computer Science in their own lives.
- Enable DPS K-12 Computer Science Teachers to facilitate hands-on, project-based learning experiences confidently and effectively.
- Enable administrators to effectively support teacher practice.

Organization of the Units

The units in this document and the lessons within each unit follow a learning progression that will enable you and your students to explore the power of learning through play in both unplugged and digital environments, but please don't feel that they must be followed lock step. Use your professional judgement to make adjustments to accommodate the learning styles and needs of your students.

Getting Started Lessons – Use these lessons the first time you use your LEGO® Education Learning Solutions. These lessons will help you and your students become familiar with the software and intelligent hardware in the LEGO SPIKE Prime learning kits.

Unplugged Lessons – These lessons use the BricQ Motion Prime solution, LEGO Education's non-digital solution. You will not need devices to complete these lessons and the build instructions can be found in the booklets that come inside the kit. If students do have access to their own device, the build instructions can also be found online under the Student Online Resources.

SPIKE Prime Lessons – These lessons follow a learning progression that increases in difficulty and complexity of both the model and the programming as you move through the unit. Follow the links to review a complete lesson plan, access video overviews, and review objectives and standards alignment.

Please leverage these plans when creating learning experiences for your students as they will provide the foundation you need to meet the needs of all your students.

Extension Activities – These activities are included at the bottom of this document. Consider these activities for the first time you use your LEGO® Education solution. These extensions will inspire you and your students to move beyond our inspiration lessons to ideate and iterate your own models and programs.

Organization of the Lesson

The lessons linked in this document follow the 5Es Inquiry Based Framework. This model progresses through 5 different stages of the learning process – Engage, Explore, Explain, Elaborate, Evaluate. Here are some suggestions for using this framework when delivering instruction and the corresponding ISTE standards.

- **Beginning of Class - Activate Prior Knowledge (Engage)** - Launch class by having students share/discuss their learning experience from the previous class session.
    - Where did you leave off? What obstacles did you encounter? In what ways did you overcome those challenges? What is the learning goal for today?
        - *ISTE 1.1a*: Empowered Learner: Students articulate and set personal learning goals, develop strategies, leveraging technology to achieve them, and reflect on the learning process itself to improve learning outcomes.
- **During Class – Collaboration and Communication (Explain)** - Ask students to share with one another their models and their programming for these models. Have them display their code to the class and then talk through the code, explaining what they expected to or observed happen and even demonstrating this using their model if possible.
    - What did you expect to happen with this program? Did your model perform as expected? What did you have to modify or change to improve the program or model?
        - *ISTE 1.6c:* Creative Communicator: Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.
- **End of Class** - **Reflection (Evaluate) -** Have students end the class each day by sharing with their partner/group/teachers the learning progress, accomplishments, and next steps.
    - What did you accomplish today? How did you collaborate with your partner? What could you do to improve your collaboration in the next class?
        - *ISTE 1.7c:* Global Collaborator: Students contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

The Power of Iteration

Build, Rebuild, Iterate. There is more than one way to build any model. Students may experience these builds more than once during your program. When repeating a build, reflect on what was learned in previous building experiences and how learnings can be used to improve and possibly address new goals or questions that arise.

Cross-Curricular Integration

While the Extension Activities provide some cross-curricular integration ideas, the sky is the limit on using these materials in all areas of your classroom. Here are a few ideas to seed your brilliance:

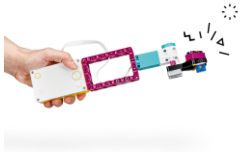
Foster Collaboration and Integration – Plan with colleagues in other departments to integrate these learning experiences into a comprehensive Project Unit that explores multiple content areas through hands-on learning and computer science.

Engage Curiosity – Use an experience at the beginning of a unit of study to inspire curiosity about the subject.

Explore Content Concepts – Use an experience to help students get hands on to explore the real-world application of science, technology, engineering, art, and mathematics. See LEGO Education SPIKE Prime Alignment for Michigan Academic Science Standards.

Elaborate Understanding – Use an experience as a unit capstone or a culminating project, allowing students to transfer learning from multiple different content areas to demonstrate understanding and progress with skills and concepts.

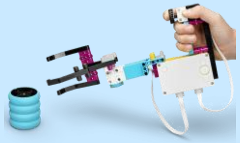
Unit 1: Getting Started

Time	Lesson Title	Lesson Summary	Topics	MI Academic Standards
35-45 Min	**Getting Started Tutorials:** Heart Program and SPIKE™ App	Explore and learn to program the intelligent hardware	Hardware Software Motors Sensors	**2.CS.02** Design projects that combine hardware and software components to collect and exchange data.
35-45 Min	Pass the Brick *in Supplementary Lessons Unit* 	Practice teamwork techniques by working through four engaging challenges.	Events Sequencing Motors Tilt Sensor Force Sensor	**2.CS.01** Recommend improvements to the design of computing devices, based on an analysis of how users interact with the devices. **2.AP.16** Incorporate existing code, media, and libraries into original programs and give attribution.
35-45 Min	Ideas the LEGO Way *in Supplementary Lessons Unit* 	Use LEGO bricks as a unique way to generate creative ideas.	Brainstorming Documentation Events Sequencing	**2.AP.15** Seek and incorporate feedback from team members and users to refine a solution that meets user needs.

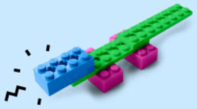
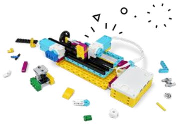
35-45 Min	What is this? *in Supplementary Lessons Unit* 	Define, customize, and communicate the use of a new "thing."	Events Sequencing Motors Loops	**2.AP.15** Seek and incorporate feedback from team members and users to refine a solution that meets user needs. **2.AP.16** Incorporate existing code, media, and libraries into original programs and give attribution.
35-45 Min	Going the Distance *in Supplementary Lessons Unit* 	Program a Rhino to start and stop before it hits something.	Events Sequencing Motors Conditionals Force Sensor	**2.AP.16** Incorporate existing code, media, and libraries into original programs and give attribution. **2.AP.17** Systematically test and refine programs using a range of test cases.
35-45 Min	Goal! *in Supplementary Lessons Unit* 	Collaborate to build a fun tabletop challenge and score as many goals as possible.	Events Sequencing Motors Control Structures	**2.AP.15** Seek and incorporate feedback from team members and users to refine a solution that meets user needs. **2.AP.18** Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts.

Unit 2: Invention Squad

Time	Lesson Title	Lesson Summary	Topics	MI Academic Standards
35-45 Min	Help! *in Invention Squad Unit* 	Define a problem by observing a scenario.	Events Sequencing Variables Conditionals Color Sensor	**2.AP.11** Create clearly named variables that represent different data types and perform operations on their values. **2.AP.13** Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.

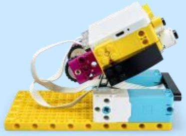
35-45 Min	Hopper Race *in Invention Squad Unit* 	Design multiple prototypes to find the most effective way to move a robot without using wheels.	Events Sequencing Prototype	**2.CS.01** Recommend improvements to the design of computing devices, based on an analysis of how users interact with the devices. **2.AP.16** Incorporate existing code, media, and libraries into original programs and give attribution.
35-45 Min	Super Cleanup *in Invention Squad Unit* 	Test the efficiency of two different solutions to determine the best design to meet specific criteria.	Events Sequencing Force Sensor	**2.CS.01** Recommend improvements to the design of computing devices, based on an analysis of how users interact with the devices. **2.AP.16** Incorporate existing code, media, and libraries into original programs and give attribution.
35-45 Min	Broken *in Invention Squad Unit* 	Figure out why something isn't working.	Troubleshooting Pseudocode Events Sequencing Conditionals	**2.CS.03** Systematically identify and fix problems with computing devices and their components. **2.AP.10** Use flowcharts and/or pseudocode to address complex problems as algorithms.
120+ Min	Design for Someone *in Invention Squad Unit* 	Use the complete design process to solve a real-world problem linked to prostheses.	Brainstorming Events Sequencing Conditionals	**2.CS.03** Systematically identify and fix problems with computing devices and their components. **2.AP.15** Seek and incorporate feedback from team members and users to refine a solution that meets user needs. **2.AP.16** Incorporate existing code, media, and libraries into original programs and give attribution.
45 Min	Design for You *in Invention Squad Unit* 	Exercise creativity, explore the design engineering process, and invent a desktop helper.	Brainstorming Prototype	**2.CS.01** Recommend improvements to the design of computing devices, based on an analysis of how users interact with the devices.

Unit 3: Kickstart a Business

Time	Lesson Title	Lesson Summary	Topics	MI Academic Standards
35-45 Min	Back to Back *in Kickstart a Business Unit* 	Not all code is on a computer. Write pseudocode that tells how to build a LEGO® model!	Algorithm Bug Decomposition Pseudocode	**2.AP.10** Use flowcharts and/or pseudocode to address complex problems as algorithms. **2.AP.13** Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.
35-45 Min	Place Your Order *in Kickstart a Business Unit* 	Follow a user guide video to replicate the actions of a "quality check" robot.	Pseudocode Decomposition Events Sequencing Variables Count Loops	**2.AP.10** Use flowcharts and/or pseudocode to address complex problems as algorithms. **2.AP.11** Create clearly named variables that represent different data types and perform operations on their values. **2.AP.13** Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.
35-45 Min	Out of Order *in Kickstart a Business Unit* 	Find and fix mistakes in a program to make a Delivery Cart work as intended.	Debugging Events Sequencing Conditionals	**2.CS.03** Systematically identify and fix problems with computing devices and their components. **2.AP.16** Incorporate existing code, media, and libraries into original programs and give attribution.
35-45 Min	Track Your Packages *in Kickstart a Business Unit* 	Remix programming stacks to use an X-Y tracking device to follow a path on a piece of paper.	Events Sequencing Conditionals Functions	**2.AP.12** Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. **2.AP.14** Create procedures with parameters to organize code and make it easier to reuse. **2.AP.16** Incorporate existing code, media, and libraries into original programs and give attribution.
90-120 Min	Keep it Safe! *in Kickstart a Business Unit* 	Figure out why something isn't working.	Troubleshooting Events Sequencing Conditionals	**2.CS.03** Systematically identify and fix problems with computing devices and their components. **2.AP.10** Use flowcharts and/or pseudocode to address complex problems as algorithms.

90-120 Min	Keep it Really Safe! *in Kickstart a Business Unit* 	Use compound conditions to reinforce the encryption pattern on a safe-deposit box.	Motors Events Sequencing While Loops Conditionals Variables Functions	**2.AP.12** Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. **2.AP.14** Create procedures with parameters to organize code and make it easier to reuse. **2.NI.05** Explain how physical and digital security measures protect electronic information.
120+ Min	Automate It! *in Kickstart a Business Unit* 	Create and program an automated helper that can identify and ship the correct package based on color.	Troubleshooting Pseudocode Events Count Loops Conditionals Variables Functions	**2.CS.01** Recommend improvements to the design of computing devices, based on an analysis of how users interact with the devices. **2.AP.11** Create clearly named variables that represent different data types and perform operations on their values. **2.AP.14** Create procedures with parameters to organize code and make it easier to reuse.

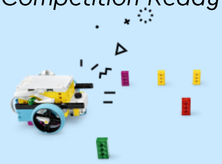
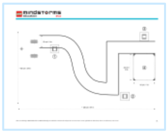
Unit 4: Life Hacks

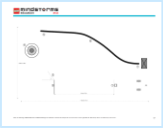
Time	Lesson Title	Lesson Summary	Topics	MI Academic Standards
30-45 Min	Break Dance *In Life Hacks Unit* 	Synchronize motor movements of a "break dancer" to keep in rhythm with light and beats.	Events Sequencing Count Loops Variables Conditionals Color Sensor	**2.DA.09** Refine computational models based on the data they have generated. **ISTE-S.4.c** Develop, test and refine prototypes as part of a cyclical design process.
45-90 Min	Rebuild the World with Dance Technology	Help a dance technologist design a high-tech stage for an unforgettable performance.	Design Constraints Choreography Synchronize	**ISTE-S.4.b** Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks. **ISTE-S.4.c** Students develop, test and refine prototypes as part of a cyclical design process. **MI Career Development Model: Career Awareness** Target 2: Contextualized Academics • Introduce Career Zones through Academic Subject Matter *Target 3: Career Awareness* • Engage Students in Career Awareness Activities
30-45 Min	Repeat 5 Times *In Life Hacks Unit* 	Use variables to count the number of sit-ups and calories burned during a workout.	Events Sequencing Count Loops Conditionals Variables Motors	**2.AP.11** Create clearly named variables that represent different data types and perform operations on their values.
90-120 Min	Rain or Shine *In Life Hacks Unit* 	Create a way of displaying a weather forecast using qualitative cloud data.	Events Sequencing Conditionals Variables Motors Data	**2.DA.07** Represent data using multiple encoding schemes. **2.DA.08** Collect data using computational tools and transform the data to make it more useful and reliable. **ISTE-S.5.b** Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.

90-120 Min	Wind Speed *In Life Hacks Unit* 	Create a way to display wind speed using quantitative cloud data.	Events Sequencing Conditionals Variables Motors Data	**2.DA.07** Represent data using multiple encoding schemes. **2.DA.08** Collect data using computational tools and transform the data to make it more useful and reliable. **ISTE-S.5.b** Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
90-120 Min	Veggie Love *In Life Hacks Unit* 	Use live forecast data to decide whether tomato plants will need to be watered this week.	Events Sequencing Count Loops Conditionals Controls Variables Motors Data	**2.DA.07** Represent data using multiple encoding schemes. **2.DA.08** Collect data using computational tools and transform the data to make it more useful and reliable. **2.AP.11** Create clearly named variables that represent different data types and perform operations on their values. **ISTE-S.5.b** Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
45-90 Min	Rebuild the World with Agriculture *See p.10 in the Teacher Resource Guide*	Help a fourth generation farmer automate strawberry picking, which is currently done only by hand.	Agriculture Automation	**ISTE-S.5.d** Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions **MI Career Development Model: Career Awareness** Target 2: Contextualized Academics • Introduce Career Zones through Academic Subject Matter Target 3: Career Awareness • Engage Students in Career Awareness Activities
120+ Min	Brain Game *In Life Hacks Unit*	Record multiple values at the same time in an array (list), and compare values	Events Sequencing Count Loops Conditionals Controls Arrays Variables Motors Color Sensor	**2.DA.09** Refine computational models based on the data they have generated. **ISTE-S.4.c** Develop, test and refine prototypes as part of a cyclical design process.

			Data	
120+ Min	The Coach *In Life Hacks Unit* 	Design, build, and program a training coach to improve the process of mastering something.	Events Sequencing Count Loops Conditionals Controls Arrays Variables Motors Color Sensor Data	**2.CS.02** Design projects that combine hardware and software components to collect and exchange data. **2.IC.20** Compare tradeoffs associated with computing technologies that affect people's everyday activities and career options. **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.

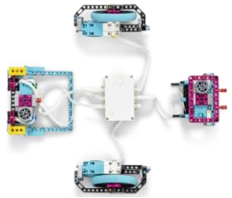
Unit 5: Competition Ready

Time	Lesson Title	Lesson Summary	Topics	MI Academic Standards
45-90 Min	Training Camp 1 *In Competition Ready Unit* 	Build a Practice Driving Base and make precise and controlled movements.	Pseudocode Events Sequencing Count Loops Conditionals Motors Gyro Sensor	**2.CS.01** Recommend improvements to the design of computing devices, based on an analysis of how users interact with the devices. **2.AP.16** Incorporate existing code, media, and libraries into original programs and give attribution.
45-90 Min	Training Camp 2 *In Competition Ready Unit* 	Use sensors to control motors and interact with objects on the competition field.	Events Sequencing Count Loops Conditionals Variables Motors Distance Sensor	**2.AP.11** Create clearly named variables that represent different data types and perform operations on their values. **2.AP.12** Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. **2.AP.13** Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.
35-45 Min	Training Camp 3 *In Competition Ready Unit* 	Write programs using the Color Sensor to make the Driving Base autonomous.	Events Sequencing Forever Loops Conditionals Variables Functions Motors Color Sensor	**2.AP.11** Create clearly named variables that represent different data types and perform operations on their values. **2.AP.12** Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. **2.AP.14** Create procedures with parameters to organize code and make it easier to reuse.
90+ Min	Robot Challenge: Training Mat 1 	Design and build extensions onto the Driving Base and program it to autonomously retrieve objects.	Events Sequencing Loops Conditionals Variables Motors Sensors	**2.AP.11** Create clearly named variables that represent different data types and perform operations on their values. **2.AP.12** Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.

90+ Min	Robot Challenge: Training Mat 2 	Write a program that makes the driving base move autonomously and turn with precision.	Events Sequencing Loops Conditionals Variables Functions Motors/Sensors	**2.AP.12** Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. **2.AP.13** Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.
90+ Min	Robot Challenge: Training Mat 3 	Design and build extensions onto the Driving Base and program it to autonomously complete two tasks.	Events Sequencing Loops Conditionals Variables Functions Motors/Sensors	**2.AP.12** Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. **2.AP.13** Decompose problems and subproblems into parts to facilitate the design implementation, and review of programs.

Unit 6: Advanced Competition Ready

(requires SPIKE Prime Expansion Kit)

Time	Lesson Title	Lesson Summary	Topics	MI Academic Standards
45-90 Min	Training Camp 2 *In Competition Ready Unit* 	Use sensors to control motors and interact with objects on the competition field.	Events Sequencing Count Loops Conditionals Variables Motors Distance Sensor	**2.AP.11** Create clearly named variables that represent different data types and perform operations on their values. **2.AP.12** Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. **2.AP.13** Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.
90-120 Min	Assembling an Advanced Driving Base *In Competition Ready Unit* 	Use effective teamwork to build and present a strong competition-ready Driving Base	Events Sequencing Loops Conditionals Motors Distance Sensor Color Sensor	**2.CS.01** Recommend improvements to the design of computing devices, based on an analysis of how users interact with the devices. **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.
90-120 Min	My Code, Our Program *In Competition Ready Unit* 	Use My Blocks to write organized programs that'll help the Advanced Driving Base perform quickly and reliably.	Events Sequencing Loops Conditionals Variables Functions Motors Distance Sensor Color Sensor	**2.AP.13** Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs **2.AP.14** Create procedures with parameters to organize code and make it easier to reuse. **ISTE-S.5.c** Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.

90-120 Min	Time for an Upgrade 	Build motorized tools that can help solve competition tasks.	Events Sequencing Loops Conditionals Motors Sensors	**2.AP.17** Systematically test and refine programs using a range of test cases. **ISTE-S.5.d** Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions. **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.

Extension Activities

Build to Launch

Modules 1-3 (10-12 days)

Taking STEAM Learning to new heights! LEGO® Education partnered with NASA and the Artemis I team to bring students and teachers an out-of-this-world STEAM learning series. Build to Launch is an exploration of the technology, STEAM concepts and careers behind the Artemis I mission to the Moon. Join the LEGO® Space Team and their Artemis I team counterparts for an interactive digital learning adventure. Each episode students will find themselves in the shoes of NASA engineers, scientists, and of course astronauts. Through open ended lessons students will get hands-on and solve similar problems the Artemis I team faces as they build towards launch.

	Activity	**Time**	**Objectives**	**Suggested Builds** **Lessons in bold are covered in Units 1-3*
Module 1 Getting to Space Teacher Guide Student Lessons	Mini-Mission: Moving Objects	15 min	Ignite a discussion with students about moving objects	
	Mission: Operation Autopilot Career Connection: Maria, Flight Director	45-90 min	Design and build a prototype of an autonomous vehicle	SPIKE Prime: **Out of Order, Training Camp 2, Automate It**
	Mission: STEAM Work is Teamwork Career Connection: Daniel, Program Manager	45-90 min	Plan and design a Space Launch System rocket to be built in sections	SPIKE Prime: **Assembling an Advanced Driving Base** BricQ Motion Prime: **Pass the Ball**
Module 2	Mini-Mission: Testing	15 min	Ignite a discussion with students about testing	

Testing and Transport Teacher Guide Student Lessons	Mission: Building a Bullseye Career Connection: Avery, Engineer	45-90 min	Design and build a device to reach a target	BricQ Motion Prime: Ski Slope
	Mission: The Path to the Pad Career Connection: Zach, Ground Systems Technician	45-90 min	Design and build a transport vehicle	SPIKE Prime: **Out of Order, Training Camp 2** BricQ Motion Prime: Gymnast
Module 3 Working in Space Teacher Guide Student Lessons	Mini-Mission: Working in Space	15 min	Ignite a discussion with students on what they think it is like to work in space	
	Mission: Staying Safe in Space Career Connection: Leo, Safety Officer	45-90 min	Design and build an alert system	BricQ Motion Prime: Strike the Ball
	Mission: The Right Tool for the Job Career Connection: Sofie, Scientist	45-90 min	Design and build a tool that can be used in space	BricQ Motion Prime: **Free Kick**

Extension Activities (as time allows)

<table>
<tr><th colspan="4">Tufts University Robotics Playground</th></tr>
<tr><td colspan="4">Tufts University has created a series of placemats to inspire engineering design and programming using the SPIKE Prime solution. Each placemat consists of 2 slides which present a challenge, some careers connected to the challenge, and suggestions on how to build and program a solution. The placemat also gives ideas on how students can iterate and elaborate on their solution. Use as time allows.</td></tr>
<tr><th></th><th>Activity</th><th>Time</th><th>Objectives</th></tr>
<tr><td rowspan="4"><b>Getting Started with SPIKE Prime</b></td><td>Greetings Earthlings</td><td>30-45 min</td><td>Build a robot that greets people with a wave, a fist bump, a high five or some other welcoming movement!</td></tr>
<tr><td>Puppet Show</td><td>30-45 min</td><td>Create a puppet that moves using SPIKE Prime.</td></tr>
<tr><td>Garden</td><td>30-45 min</td><td>Show us what's in your garden – a blooming blossom, a vigorous vegetable, a robotic rake?</td></tr>
<tr><td>Simple Car</td><td>30-45 min</td><td>Build a sturdy car using a few pieces as possible.</td></tr>
</table>

	Percussion Playtime	30-45 min	Create a percussion instrument for a band.
	Space Exploration	30-45 min	Create a rocket ship, a tool for a space traveler, or even an alien being!
	Proverbial SPIKE Prime	30-45 min	Choose a familiar or favorite proverb from another part of the world and make it come to life using SPIKE Prime.
	Clean Sweep	30-45 min	Create a sweeper to clear the floor of LEGO bricks or other small LEGO elements.
	Ball Thrower	30-45 min	Design a machine to throw a small plastic ball as far as possible.
Dr. E's SPIKE Prime Class	Getting to Know You	15 min	Think about who ***you*** are and what represents ***you*** – and then build it! *Note: Use the Default Program (Heart Program)*
	Silly Walks	30-45 min	Build a robot that moves forward – without using wheels! *Note: Use the Default Program (Heart Program)*
	Biomimicry	90-120+ min	Create a bio-inspired robot that mimics structure-function designs found in nature
	Top Spinner	30-45 min	Build a top – and spin it! *Note: Use the Default Program (Heart Program)*
	Spirograph Drawing Machine	45-90 min	Create geometric artistic designs with rotating motors
Clean up our Oceans	Trash Pusher	30-45 min	Build a robot that can push trash to a safe disposal zone.
	Trash Pick Up	30-45 min	Build a robot that can pick up trash and place it in a container for disposal.
	Trash Identifier	30-45 min	Design a robot that can identify what is trash and what is not – and then dispose of the trash only.
	Team Trash Pick Up	30-45 min	Pair up with a partner or group and create a two-robot system that picks up and disposes of trash.
	Trash Removal Boat	30-45 min	Create a boat for your trash collection/disposal robot so that it can help clean up trash floating in the water.