



Sphero After School Guide

Plan a fun and enriching after school program with Sphero!

Wondering how to integrate STEM learning into your after school program? Sphero robots and littleBits kits are the perfect hands-on solution for extending the learning day and getting students started with computer science and engineering principles. Sphero robots and kits are ideal for the full spectrum of students, ranging from beginners who haven't had an opportunity to code yet to those with block or even text-based coding experience.

What's in this Guide?

The Sphero After School Guide is designed to help you get started integrating Sphero robots and littleBits into your after school program. It is organized by Sphero robot/kit. Reference each of the following sections according to the Sphero robot/kit(s) that you have access to and the needs of your students.

- Facilitation options
- indi
- BOLT
- littleBits
- RVR+
- Support

You might start with just one Sphero robot/kit and then add more as your students grow their STEM skills and interest.

Facilitation Options

We know that every after school program is different—including the age range, purpose, and schedule. You may see the same group of students for two to three hours every day after normal school hours or you may be running weekly enrichment classes that students sign up for.

Pick and choose which option or options will work best for your situation.

Small group stations: The activities in this guide are ideal for exploration during station or free choice time. Introduce the activity to the whole group. Then allow students to visit the station and engage with the activity for one week or more.

Whole group: Use the activities with a large group (up to 30 students) at a time. Introduce the activity, then send students back to their work areas to learn, explore, and have fun.

The activities and resources in this guide are meant to be flexible, regardless of your exact implementation. Each activity starts with a link to a Sphero-created resource that is simple to launch. Then the activities are intentionally left open-ended to encourage student exploration and curiosity. Each activity is meant to take more than one day. Adapt the lessons according to student interest.





Sphero indi

indi engages young students, ages 4-7, in the fundamentals of computer science, computational thinking, and STEM in an entirely screen-free environment. Students place and adjust color tiles to control indi's movement and engage in open-ended, imaginative, play-based learning.



Materials

indi Student Kit

The indi Student Kit is ideal for one to three students at a time and includes:

- 1 Sphero indi robot
- 20 color tiles
- a set of challenge cards
- decorative stickers
- carrying case



indi Class Pack

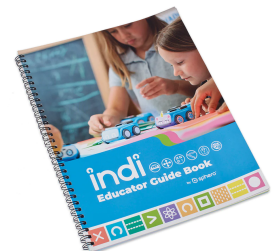
The indi Class Pack can accommodate an entire group of students and includes:

- 8 indi robots
- 8 individual carrying cases
- a charging case
- color tiles
- a standards-aligned educator guide



indi Educator Guide

The indi Educator Guide will help you incorporate indi into any content area and reinforce computational thinking skills through a series of standards-aligned lessons designed specifically for PK-2.



indi After sSchool Activities

Consider the following activities to get started using indi in your after school program. Each activity is meant to span multiple days. **Introduce** it to the whole group to the start and then give students a chance to **practice** and develop their skills in subsequent sessions.

Activity 1: Meet Sphero indi

Introduce: Use the [Meet Sphero indi](#) lesson plan to introduce indi to students. Students will learn that indi “sees” color with a color sensor located on its underside. Different colors give indi different instructions about directions to move. As a group, decode how indi responds to different color tiles.

Practice: Show students the [Beginner’s Programming Challenge Cards](#) (included with each student kit and class pack). Give students time to work through the challenges independently or in small groups. If students have extra time, they can make their own challenges for their friends.

Activity 2: The Longest Path

Introduce: Now that students know the effect of each color tile, introduce a fun and open-ended partner game for two or more students. One student places a green tile (start) and purple tile (celebrate) in different areas of the learning space. The other student(s) has to use other tiles to get indi from the starting point to the endpoint.

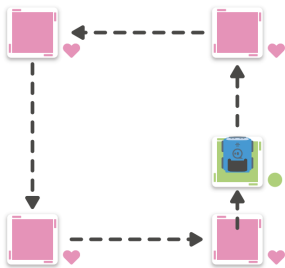
Practice: As students play this game, challenge them to program the path that:

- covers the longest distance
- uses the most tiles
- doesn’t use a certain color

Introduce a new challenge each session. Make up your own and encourage students to do the same!

Activity 3: Loops

Introduce: Looping, or repeating a series of events, is a familiar pattern in life and an important principle in programming. Use the [Looping Patterns](#) lesson plan to introduce students to loops with indi. Show students the common loop with pink color tiles.



Practice: Then challenge students to design their own loops. Can students make loops with a different color tiles? With more than two, three, or four colors? Give students an opportunity to share the loops that they make with their peers. Take photos of the loops that students can make and see how many unique loops students in your after school program can find.

Note: Making loops often requires students to use more tiles than are included in each indi Student Kit. Consider combining the tiles from two student kits for this activity.



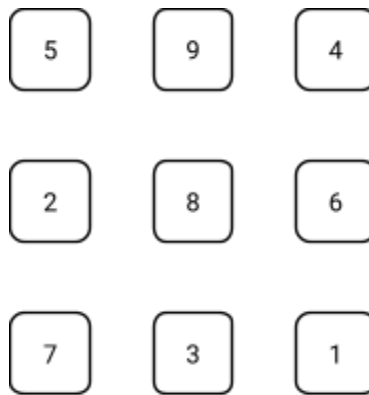
Activity 4: Tell Your Story

Introduce: Use the [Storytelling with indi](#) lesson plan to show students how an indi path can be used to tell a story. Together with students, make a creative indi path, then use classroom materials—like blocks and craft materials—to create the characters, setting and plot.

Practice: Give students a chance to create and share their own stories with indi!

Activity 5: Numbers All Around

Introduce: Label pieces of paper with the numbers 1 through 9. Lay them out in a random order on the floor. Then, together with students, program indi with color tiles to roll from 1 to 9. Shuffle the numbers and play again.



Practice: Direct students to play a few rounds of ordering numbers with indi independently or in small groups. Introduce new grade-appropriate math routines. For example, prompt students to connect three numbers in a math equation like $2 + 3 = 5$.



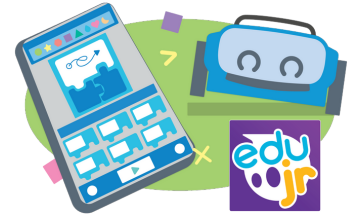
Go Further with Indi

Are students ready for more? Reference the lesson in the indi Educator Guide for more ideas. You may also want to try some of the following:

Sphero Edu Jr App

Level up your programming with indi by reconfiguring how indi responds to color tiles in the app designed specifically for pre-readers.

- [App Store \(iOS\)](#)
- [Google Play \(Android and Chrome OS\)](#)
- [Fire OS \(Kindle\)](#)



Sphero Global Challenge

The Sphero Global Challenge engages teams of three to five students in fun, theme-based challenges. Past seasons of the Sphero Global Challenge are available for purchase on the [Sphero website](#).

You may also choose to enroll one or more teams in the current season of the Sphero Global Challenge which runs each academic school year for most schools in the northern hemisphere.



Sphero BOLT

If your after school program includes students in grades 3 through 8 and you want to incorporate the fundamentals of programming and computer science, you should consider Sphero’s most advanced round robot: BOLT.

Materials

Sphero BOLT Programmable Robot

A single BOLT robot is perfect for up to two students.



Sphero BOLT Power Pack

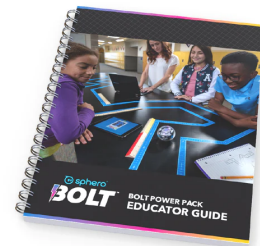
The BOLT Power Pack can accommodate a full classroom, up to 30 students, and includes:

- Power Pack case
- 15 Sphero BOLT robots
- 15 inductive charging cradles with USB cables
- 15 protractors with heading, directions, and clock
- 15 turbo covers
- maze tape and 124 stickers
- BOLT Power Pack Educator Guide



Sphero BOLT Educator Guide

The standards-aligned BOLT Educator Guide walks you through getting started with BOLT, our #1 robot used in schools across the globe, and includes eight cross-curricular classroom lessons for grades 3 and up.



Sphero Edu App

All BOLT robots must be paired via Bluetooth with the Sphero Edu app on an accompanying device. The Sphero Edu app works on iOS, Android, Fire OS, Windows, and macOS.

BOLT After School Activities

Consider the following activities to get started using BOLT in your after school program. Each activity is meant to span multiple days. **Introduce** it to the whole group to start and then give students a chance to **practice** and develop their skills in subsequent sessions.

Activity 1: Driving Obstacle Course

Introduce: Use the Introduction to Sphero Edu activity to teach students how to use the Sphero Edu app to connect to, aim, and drive their BOLT robots. Use classroom objects to set up a miniature obstacle course like the example below. Challenge students to drive their robot through the course.



Practice: Ask students to set up their own obstacle course for their peers. Students can race through the courses to see who has the best control over their robot. In the process, they'll learn how to adjust the speed setting for the best accuracy and race times.

Activity 2: Mazes

Introduce: Use the [BOLT Blocks 1: Roll Blocks](#) activity to guide students through making their first program on the Blocks Canvas. Students will learn how to adjust the inputs on a **roll block** to make BOLT roll accurately.

Practice: Use the maze tape in the BOLT Power Pack or painters' tape to lay out mazes on the floor. Start with a simple maze that includes only right-angle turns. Ask students to program BOLT's path through the maze. Add more and more complex mazes to build skill programming BOLT's movement.

Activity 3: Storytelling

Introduce: Complete [BOLT Blocks 2: Light and Sound Stories](#) to introduce how to add creativity to your programs with light and sounds.

Practice: Give students more time to tell their own stories with BOLT. Encourage them to start by retelling short, simple stories like Little Red Riding Hood. Once they get the hang of how to use the different light and sound blocks they'll be ready to create their own! Students can even construct their own sets and props to go along with their stories.



Activity 4: Pong and More Fun Games with BOLT

Introduce: Programming events enable students to change BOLT's behavior while a program is running! Teach them about programming events and play a fun game with your feet with [BOLT Blocks 4: On Collision Event Pong](#).

Practice: Prompt students to play more games with BOLT. Here are a few to try:

- [Tic Tac Toe](#)
- [Rock, Paper, Scissors](#)
- [Snake](#)

Challenge students to figure out how the programs work and then make their own modifications!

Activity 5: Engineering Challenges

Introduce: Build programming into fun engineering challenges that require students to design and build solutions with common materials you have around your after school program. The [Chariot Challenge](#) activity asks students to build a trailer that their BOLT can pull around while it rolls. Introduce the challenge to the group and then give students multiple days to test and refine their solution.



Practice: As time allows, give students more engineering challenges for their BOLT robots. Options include [Hydro-Hypothesis](#) and the [Bridge Challenge](#).



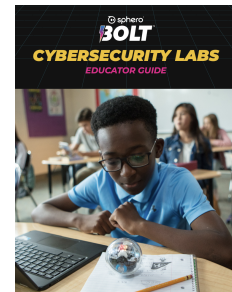
Go Further with BOLT

Are students ready for more? View our [BOLT Activity Progression Chart](#) for more activity ideas, including cross-curricular connections.

Sphero BOLT Activity Progression					
Programming CORE: Complete these activities to build strong foundations for programming BOLT					
Draw (Visual Movement, Distance, Position, Speed & Color)	Beginning Block (If, Then, Sense, Speak, & Max LED)	Intermediate Block (Color Channels (Sense), Sensors, Sense, & Color & Comments)	Advanced Block (Position, Variables, Camera Control, If Then, & Comparators)	Beginning Text (Specialty Movement, Lights, & Sounds)	
<ul style="list-style-type: none"> Draw 1: Shapes 	<ul style="list-style-type: none"> Blocks 1: Roll Block Squares Blocks 2: Light & Sound Stories Blocks 3: Matrix Emotions 	<ul style="list-style-type: none"> Blocks 4: On Collision Event Pong Blocks 5: If Then Animal Toss Blocks 6: Sensor Scoping Sidetick 	<ul style="list-style-type: none"> Blocks 7: Flashlight Function Tag-a-War Blocks 8: Hot BOLTatoes & Variables 	<ul style="list-style-type: none"> Test 1: Hello World 	
Subject Area Activities: Choose and adapt activities to fit your classroom and grade level needs					
Science <ul style="list-style-type: none"> Planetary Motion El Corazon/The Heart Circuit Coding Challenge Giant Rican Turfles Acceleration Equations Hydro Hypothesis Atom Tracks Helmets for the Win Organ Quiz 	Technology <ul style="list-style-type: none"> The Ethics of Computing (Cyber) How the Internet Works (Cyber) Intro to Cryptography (Cyber) Types of Hackers (Cyber) Shopping Cyberhacking (Cyber) The Powers of 2 (AP CSP) Variables (AP CSP) Morse Code/Data Structures 	Engineering <ul style="list-style-type: none"> Tractor Pull Chariot Challenge Bridge Challenge Sphero City Swim Meet Jousting Tournament 	Art <ul style="list-style-type: none"> Light Painting Art for Social Justice Historical Projections American Art 	Math <ul style="list-style-type: none"> Draw 3: Perimeter Geometric Transformation Area of a Rectangle Mathematical Darts Linear Relationships Fun Fun Functions 	Language Arts & Social Studies <ul style="list-style-type: none"> Draw 2: Spelling Programming the Nile What a Character Avoid the Minotaur

BOLT Cybersecurity Labs

Sphero's free, award-winning lessons were developed to make it easy to teach cybersecurity principles to students. Bring cybersecurity to life and engage your students in the world of computer security and cyber ethics. Get started with our [educator guide](#).



Code Mats

Code mats offer a simple, accessible way to learn block-based coding, basic math principles, and collaborative problem solving with any round Sphero robot. Each two-sided code mat comes with three sets of 10 double-sided coding cards that provide guided, hands-on coding lessons. Choose either our [City/Golf](#) or [Space/Soccer](#) mat to add more fun to your after school program.

Sphero Global Challenge

The Sphero Global Challenge engages teams of three to five students in fun, theme-based challenges. Past seasons of the Sphero Global Challenge are available for purchase on the [Sphero website](#).

You may also choose to enroll teams in the BOLT event for the current season of the Sphero Global Challenge which runs each academic school year for most schools in the northern hemisphere.





Sphero RVR+

If you are looking to integrate both computer science and engineering into your after school program for older students, RVR+, our most customizable robot for beginner to advanced programmers, is the perfect robot for you.

Materials

Sphero RVR+ Programmable Robot

A single RVR+ robot is perfect for up to three students and includes:

- 1 Sphero RVR+ robot
- swappable mounting plates
- color tiles
- rechargeable battery



Sphero RVR+ Multi-Pack

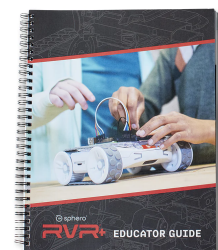
The RVR+ Multi-Pack can accommodate an entire group of students and includes:

- 6 RVR+ robots
- color tiles
- swappable mounting plates
- rechargeable batteries
- a standards-aligned educator guide



RVR+ Educator Guide

This standards-aligned guide walks you through getting started with RVR+ and includes eight ready-to-run, cross-curricular classroom lessons to inspire you and your students. The guide is also compatible with the original RVR robot.



Sphero Edu App

All RVR+ robots must be paired via Bluetooth with the Sphero Edu app on an accompanying device. The Sphero Edu app works on iOS, Android, Fire OS, Windows, and macOS.

RVR+ After School Activities

Consider the following activities to get started using RVR+ in your after school program. Each activity is meant to span multiple days. **Introduce** the topic and the concept, then give students a chance to **practice** and develop their skills in subsequent sessions.

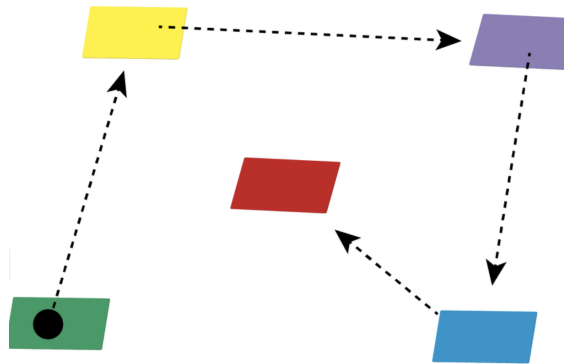
Activity 1: RVR+ Movement

Introduce: After showing students how to use the Sphero Edu app to connect to, aim, and drive their RVR+ robot, give students the driving challenge introduced on page 22 of the [RVR+ Educator Guide](#). Can students push cardboard boxes or other classroom objects around in different patterns?

Practice: Now that students know the basics, prompt them to explore the difference between the **roll** and **drive blocks** by completing the [RVR+ 1: Movement](#) activity. If you have more time, set up mazes and obstacle courses and give students time to program RVR+'s pathways.

Activity 2: RVR+ Color Sensor

Introduce: Like Indi, RVR+ is equipped with a color sensor. Direct students to the [RVR+ Blocks 2 : Color Sensor and Events](#) activity to learn how it works.



Practice: The last step in the activity directs students to make their own course. Now that they know more about the RVR+ color sensor and programming events, which courses can they make? Which colors will they use? Give students an open-ended opportunity to explore what they can program with the color sensor.

Activity 3: RVR+ Light Sensor

Introduce: Use the Automatic Headlights lesson on page 48 of the [RVR+ Educator Guide](#) to introduce the light sensor and show students one possible way to use the feature with and **if/then blocks**. The robot will turn on its headlights when the light levels in the room are below a certain threshold.

Practice: Students can use the [RVR+ Blocks 5: Conditionals and the Light Sensor](#) to continue learning about the intermediate block programming and find other uses for the light sensor. With these two examples, students should have a lot of ideas for continued exploration.

Activity 4: Ramp It Up

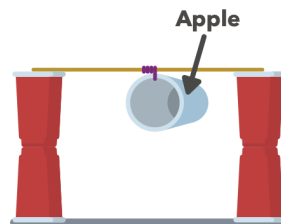
Introduce: RVR+ is your tough and tenacious tankbot that can drive on not only flat surfaces but on inclines as well! Follow the instruction on page 56 of the [RVR+ Educator Guide](#) to build ramps and measure the angle of different ramps.



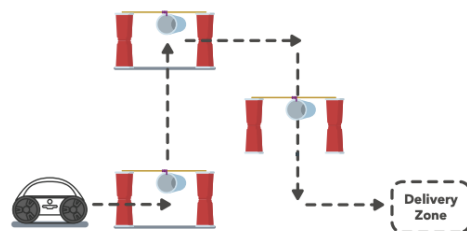
Practice: Prompt students to build different ramps. Then ask them to design an accessible ramp to get RVR+ from point A at a lower elevation to point B at a higher elevation.

Activity 5: Apple Picker

Introduce: Build student engineering skills with a fun design challenge as outlined on page 62 of the [RVR+ Educator Guide](#). Using plastic cups, a dowel, and pipe cleaners, construct an “apple” on an “apple tree” as shown in the image below. Challenge students to build a mechanism on top of RVR+ to pick the apple off the tree as RVR+ rolls by.



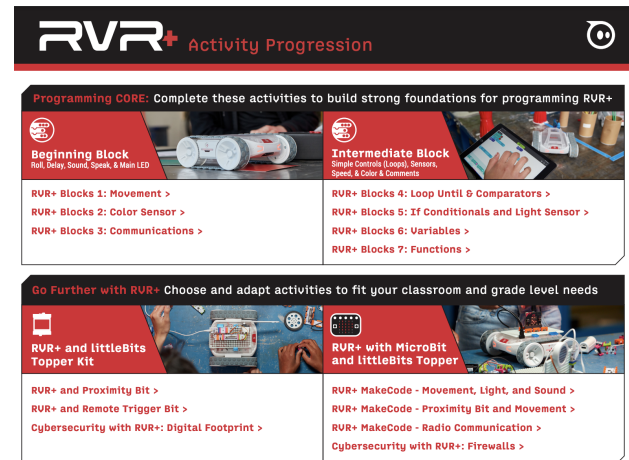
Practice: Set up an obstacle course of apple trees around your space. See which group of students can pick the most apples in the least amount of time. Add programming challenges to level up student programming. For example, you might ask students to use a variable to keep track of the number of apples picked.





Go Further with RVR+

Are students ready for more? View our [RVR+ Activity Progression Chart](#) for more activity ideas.



RVR+ also plays well with third party hardware. Consider trying some of the following:

littleBits RVR+ Topper Kit

This kit combines the best of Sphero with the best of littleBits in an easy and approachable kit that allows you to fully utilize RVR+'s onboard capabilities with littleBits adaptability to create your own inventions. Try activities like [RVR+ & littleBits Topper Kit: Proximity Bit](#) to activate littleBits inventions built on top of RVR+ with RVR+'s movement. Learn more about the kit [here](#).



BBC micro:bit

Have a micro:bit? Plug it into the USB port on top of RVR+ and then challenge your students to program it with either MakeCode or micro:bit's Python editor. Learn about how to integrate third-party hardware like a micro:bit on the [Sphero Public SDK](#).

Sphero Global Challenge

The Sphero Global Challenge engages teams of three to five students in fun, theme-based challenges. Past seasons of the Sphero Global Challenge are available for purchase on the [Sphero website](#).

You may also choose to enroll teams in the BOLT event for the current season of the Sphero Global Challenge which runs each academic school year for most schools in the northern hemisphere.





littleBits

Add littleBits to your after school program to boost student engineering skills. littleBits engage your students in complex challenges that flex their technology literacy, critical thinking, creative confidence, and teamwork skills.

Materials

littleBits STEAM+ Coding Kit

The STEAM+ Coding Kit contains 25 Bits, 35 accessories, a durable storage container, and printed teacher support materials.

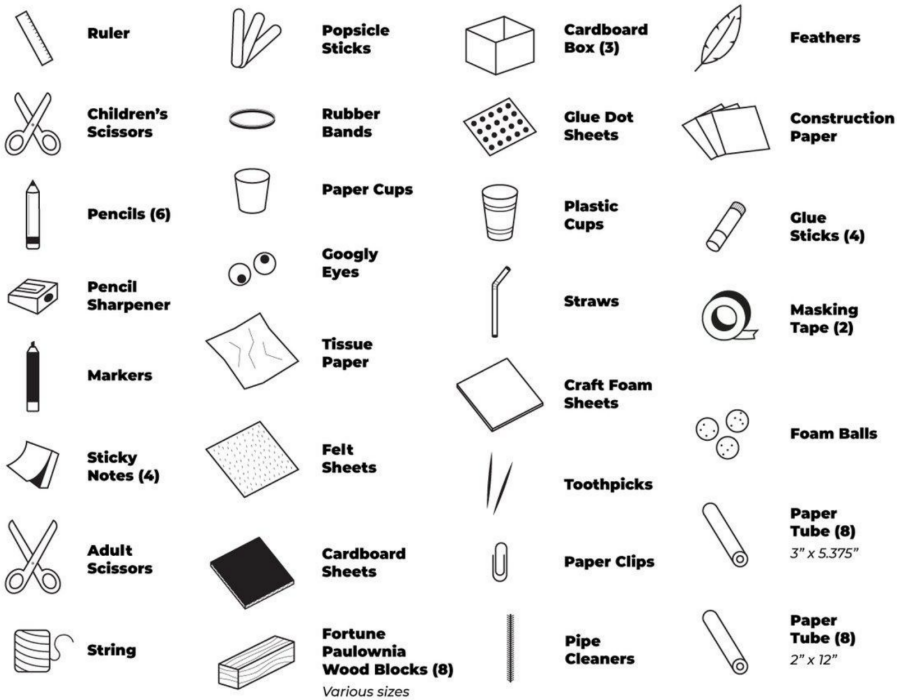


littleBits STEAM+ Coding Class Pack

The STEAM+ Coding Class Pack is a collection of 10 STEAM+ Coding Kits designed to serve up to 30 learners. Plan on reserving at least one extra kit for building sample inventions or lending students extra materials.

Sphero Craft Pack

Creativity soars when students combine their Bits with other materials and their inventions come to life. We recommend having an assortment of building and design materials for the group to share. Each lesson will list the specific materials needed per group. We offer the Sphero Craft Pack, or, you can purchase materials from an online vendor or at your local craft store.

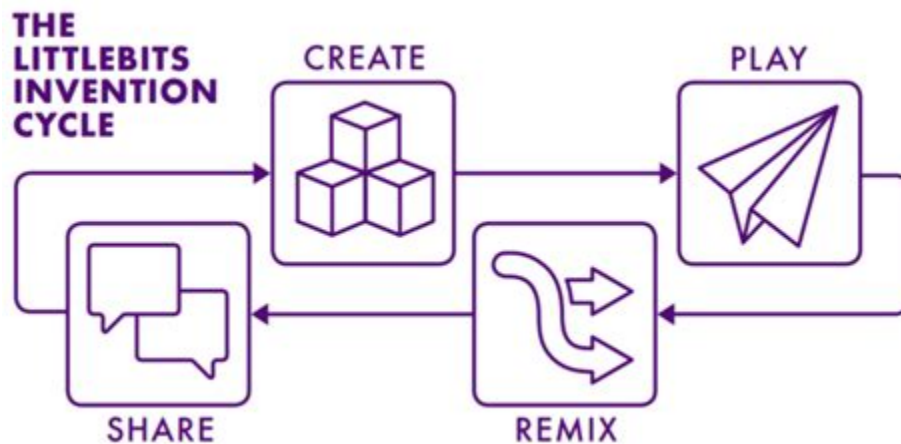


littleBits After School Activities

The STEAM and STEAM+ Core curriculum is a great place to start with littleBits in your program. Each lesson can span multiple days. **Introduce** the topic and the concept, then give students a chance to **practice** and develop their skills in subsequent sessions.

Activity 1: Introducing littleBits

Introduce: Lead a guided exploration about littleBits basics by following the instruction in the [Introducing littleBits lesson plan](#). Discuss the purpose and use of each bit color: blue, pink, orange, and green. Then introduce the littleBits Invention Cycle.



Practice: Equipped with this essential knowledge, ask students to complete the paper ball challenge as outlined in the [littleBits Invention Cycle Lesson](#): Using Bits and the provided craft materials, groups will need to move as many paper balls from one square (starting square) to the other (goal square).

Activity 2: Art Machines

Introduce: Follow the instructions in the [Invent an Art Machine lesson](#) to introduce a challenge: create and remix an art bot that draws on its own with the Bits in your littleBits Kit. Show videos like [this one](#) as necessary to get students started.

Practice: Give students ample time to create and remix their inventions. Encourage students to share their inventions and learn from each other. Then, hold an art show to present the artwork created by students in a gallery setting.

Activity 3: Invent a Security Device

Introduce: Use the lesson plan to introduce the project: students connect what they've learned about sensor circuits to construct a backpack alarm that protects their belongings. Show a [video](#) to show students the project and the basic circuit.

Practice: Ask students to remix the invention for another purpose!



Activity 4: Hack Your Classroom

Introduce: The more students play with littleBits, the more ideas they'll have for their own inventions. Introduce a more open-ended design challenge with the [Hack Your Classroom Lesson Plan](#). Students will use the littleBits Invention Cycle to create an invention for the classroom of the future. Generate a list of possible ideas as a group by asking:

"You spend a lot of time in the school and in our classroom. How could you make it even better? Think of something that could be made easier, more exciting, or that you wish existed."

Practice: Gives students a chance to work through the littleBits Invention Cycle to prototype an invention and share it with their peers.

Activity 5: Codeable Inventions

Introduce: The codeBit included in the STEAM+ Coding kits allows students to program the bits in their inventions with the [Fuse app](#). Use the [Intro to the Fuse App lessons](#) to introduce students to the block-based programming environment.

Practice: Once students have a basic understanding of how to use the Fuse App, they can work through the [Code Kit Core Curriculum](#) to boost their understanding of programming topics from loops to logic to variables.



Go Further With littleBits

Are students ready for more? View our [littleBits Essential Content](#) sheet for more activity ideas, including cross-curricular activities.

littleBits ESSENTIAL CONTENT

Kits & Curriculum: Find the units that work best with your curriculum

STEAM+ Coding Kit	STEAM Student Set	Code Kit	Makerspace Invention Wall	RVR+ Topper Kit
<ul style="list-style-type: none"> STEAM+ Core STEAM+ Coding (Square Matrix) STEAM+ Coding (Round Matrix) STEAM+ Engineering Design Intro to the Fuse App 	<ul style="list-style-type: none"> STEAM Core STEAM Engineering Design Computational Thinking ELA for Elementary ELA for Middle School 	<ul style="list-style-type: none"> Code Kit Core Intro to the Fuse App Computational Thinking ELA for Elementary ELA for Middle School 	<ul style="list-style-type: none"> STEAM+ Core STEAM+ Coding (Square Matrix) STEAM+ Coding (Round Matrix) STEAM+ Engineering Design Computational Thinking 	<ul style="list-style-type: none"> Intro to the Topper Kit Behave RVR Micro:Bit Adapter

Subject Area Activities: Choose and adapt activities to fit your classroom and grade level needs

Science	Technology	Engineering
<ul style="list-style-type: none"> Invent a Creature Purist Squares using littleBits Space Lesson: Satellite Dish 	<ul style="list-style-type: none"> Password Security and Protection Scrabble Challenge Technology of Digital Devices 	<ul style="list-style-type: none"> Introducing the littleBits Invention Cycle Invent for Good Build your Dream A-Mazing Race
Social Studies	Math	Language Arts
<ul style="list-style-type: none"> No Contact Inventions Facts Wheel (Chicago, World's Fair, 1893) Ancient Mythology: Build an Object of Power 	<ul style="list-style-type: none"> Lock Lost Sale Half Aisle Catapults & Projectile Motion 	<ul style="list-style-type: none"> Dink with Storytelling Use your Wit with littleBits Reinventing Canons

Standards Alignment: Align student learning with littleBits to your standards.

STEAM+ Coding Kit	STEAM Student Set	Code Kit
<ul style="list-style-type: none"> Crosswalk 	<ul style="list-style-type: none"> Crosswalk 	<ul style="list-style-type: none"> Crosswalk

littleBits Invention Log

The Invention Log is a workbook that students can use to document their invention process. It contains questions that help them reflect as they work through problems and record their experiences. Encourage students to explore different methods of expressing themselves. A combination of drawings, words, and charts not only bring the log to life, but also let your students explore different ways of communicating information. Each lesson pairs with the Invention Log and supports students as they bring their ideas to life using the Invention Cycle. [Be sure to print out a copy for each student.](#)

Sphero Global Challenge

The Sphero Global Challenge engages teams of three to five students in fun, theme-based challenges. Past seasons of the Sphero Global Challenge include littleBits Events are available for purchase on the [Sphero Website](#).





Support

Visit the [Sphero Support website](#) to find answers to our most common support questions including:

- product maintenance
- product troubleshooting
- classroom management

Supplemental Resources

Sphero is inspiring the creators of tomorrow and setting them up for success. We couldn't be more excited about the future of education and the part we're playing. For more information about Sphero and to get involved in our community you can find links to additional resources below.

- **Sphero Blog:** <https://sphero.com/blogs/news>
- **Support:** <https://support.sphero.com/>
- **Contact Us:** <https://sphero.com/pages/contact-us>
- **Brand Assets:** <https://brandfolder.com/organizations/sphero>
- **Facebook:** <https://www.facebook.com/GoSphero>
- **Twitter:** <https://twitter.com/sphero>
- **Instagram:** <https://www.instagram.com/sphero>
- **TikTok:** <https://www.tiktok.com/@gosphero>