

# Summer Camp Guide

## Get ready for a summer of hands-on learning!

Forget Summer Brain Drain! With the littleBits Summer Camp Guide, your campers will engage in increasingly complex challenges that flex their technology literacy, critical thinking, creative confidence, and teamwork skills. Leveraging the STEAM+ Kit this program presents you with all of the tools and resources needed to easily implement your littleBits camp, with clear and organized guidelines for facilitators and parents' stamps of approval.

## What's in this guide?

The littleBits Summer Camp Guide includes a suite of resources, including 40+ hours of instructional STEAM content, to make your summer camp easy to implement and engaging for campers of all ages. We know no two camps are the same, so dive into the resources below to prep and customize your programming:

- Camp Materials
- Curriculum Overview
- littleBits Invention Cycle
- littleBits Invention Log
- Invention Advising Tips
- Tips and Troubleshooting
- Facilitator Resources



## Camp Materials

### littleBits Kits

The littleBits Summer Camp Guide was designed using the [STEAM+ Kit](#) and [STEAM+ Class Pack](#).

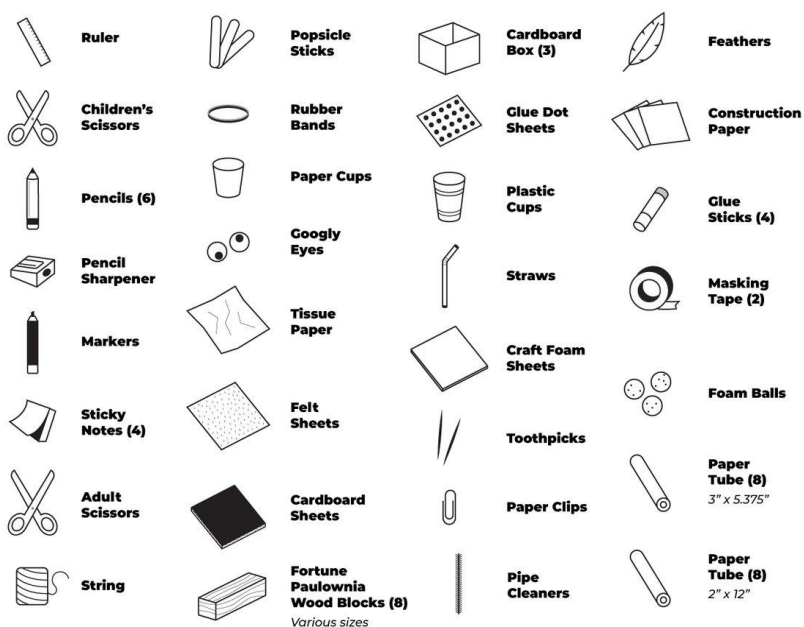
We recommend 1 STEAM+ Kit for up to 3 campers working together.

- The STEAM+ Kit contains 25 Bits, 35 accessories, a newly designed durable storage container, and printed teacher support materials
- The STEAM+ Class Pack is a collection of 10 STEAM+ Kits designed to serve up to 30 learners.
- Facilitators should have at least 1 extra Kit for building sample inventions or lending campers extra materials.
- If you have other littleBits Kits beyond the STEAM+ Kit, these are great add-ons for remixes and open challenges.

### Craft Materials

Creativity soars when campers 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 such as Amazon, or at your local craft store. The Sphero Craft Pack includes the materials below:



## Curriculum Overview

Your littleBits summer camp curriculum is divided into four sections:

1. Introduction to littleBits
2. Guided Challenges
3. Open Challenges
4. Coding Challenges

You can find the entire 2021 littleBits Summer Camp Curriculum at <https://classroom.littlebits.com/curriculum/summer-camp-2021> or by scanning the QR Code below.



### 1. Introduction to littleBits

Introductory lessons familiarize campers with the STEAM+ Kit and the littleBits Invention Cycle. Each introductory lesson can be completed in 1 hour. Students will need their [STEAM+ Kit Invention Guide](#) (hardcopy can be found inside the Kits) for these activities.

- [Intro to littleBits](#)
- [Intro to the littleBits Invention Cycle](#)

### 2. Guided Challenges

Guided challenges include step-by-step instructions for building a specific invention, plus ideas for remixes. Guided challenges can be completed in 2–3 hours. Additional remixes can be incorporated to extend the exercise. Students are encouraged to document their process in their [Invention Logs](#). Choose any of the “Invent a...” guided challenges from the STEAM+ Invention Guide to practice the Invention Cycle:

- [Self-driving Vehicle](#)
- [Art Machine](#)
- [Throwing Arm](#)
- [Security Device](#)

*If your campers have prior experience with littleBits, or prefer more of a challenge, put the instructions aside and create design challenge prompts (such as “Create a self-driving car”) to turn the lesson into a more open-ended experience. Suggested flow for the open pathway is included in these lessons.*

### 3. Open Challenges

Open challenges provide an invention prompt that campers can address in a variety of ways using littleBits and other materials. Iteration and design are key elements in these activities. Open challenges can be completed in 4–8 hours. Additional remixes can extend the activity. Depending on how deeply you want to engage in the material, you may choose to break up your lesson into several sessions, with the example below showing 1 Session = 2 hours.

#### 4 HOUR CHALLENGE:

Session 1: Create (Ideas and Prototypes), Play, Remix\*

Session 2: Continue Remixing (fine-tune prototypes), Share

- [Invent For Good](#)
- [Hack Your Classroom](#)
- [Chain Reaction Contraption](#)
- [Bitolympics](#)
- [Carnival Games](#)

### 3. Coding Challenges

Learners can use block or text programming through the [littleBits Fuse app](#) to create custom animations, bring life to their inventions, and learn more about conditionals, functions and variables. Each group will need one codeBit and an Internet-connected laptop/chromebook to run the Fuse app. Challenges can be completed in 1-2 Hours.

- [Introduction: Hello World!](#)
- [Inputs and Outputs](#)
- [Loops](#)
- [Logic](#)
- [Functions](#)
- [Ultimate Shootout](#)
- [Tug of War](#)
- [Change the World Arcade](#)
- [Hot Potato of Doom](#)

## Sample Schedules

Sample 10, 20 and 30-hour schedules are provided below:

### 10 HOURS

- Intro to littleBits (1 Hour)
- Intro to the littleBits Invention Cycle (1 Hour)
- Guided Challenge: Art Machine (2 Hour)
- Open Challenge: Invent For Good (4 Hour)
- Coding Challenge: Introduction: Hello World (1 Hour)
- Coding Challenge: Inputs and Outputs (1 Hour)

### 20 HOURS

- Intro to littleBits (1 Hour)
- Introducing the littleBits Invention Cycle (1 Hour)
- Guided Challenge: Self-driving Vehicle (2 Hour)
- Guided Challenge: Throwing Arm (2 Hour)
- Open Challenge: Hack Your Classroom (4 Hour)
- Open Challenge: Chain Reaction Contraption (4 Hour)
- Open Challenge: Bitolympics (4 Hour)
- Coding Challenge: Ultimate Shootout (1 Hour)
- Coding Challenge: Tug of War (1 Hour)

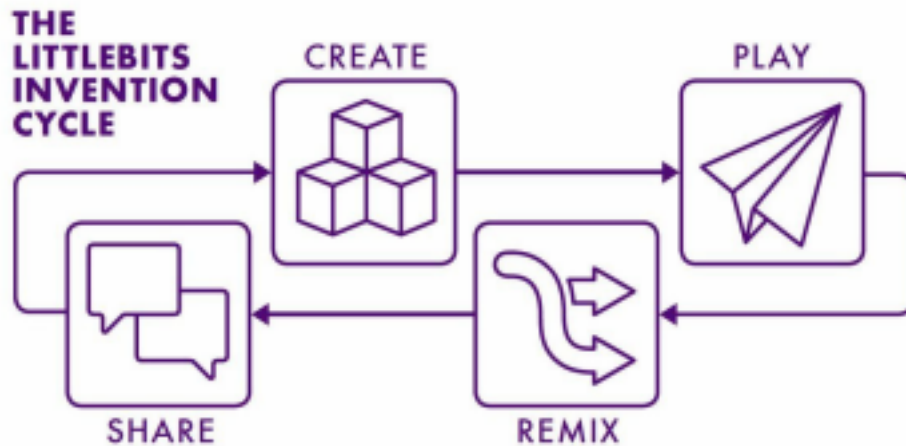
### 30 HOURS

- Intro to littleBits (1 Hour)
- Introducing the littleBits Invention Cycle (1 Hour)
- Guided Challenge: Self-driving Vehicle (2 Hour)
- Guided Challenge: Throwing Arm (2 Hour)
- Guided Challenge: Security Device (2 Hour)
- Open Challenge: Hack Your Classroom (4 Hour)
- Open Challenge: Chain Reaction Contraption (4 Hour)
- Open Challenge: Invent For Good (4 Hour)
- Open Challenge: Carnival Games (8 Hour)
- Coding Challenge: Change the World Arcade (2 Hour)

## The littleBits Invention Cycle

The littleBits Invention Cycle is a framework for approaching an engineering or design process. Each phase is full of activities and prompts that help campers explore ideas and develop their inventions.

The phases work well in order, but the design process is always a little messy. A student's path through the Invention Cycle can be flexible. Each phase represents a different way of thinking and making and sometimes it's good to mix these things up. For example, campers may want to share their work and gather feedback before they begin remixing. It can also be helpful for campers to play with and evaluate a previously made invention before creating their own.



**Definition:** Explore new ideas and bring them to life. You can start by brainstorming, tinkering with Bits, and building from your imagination, or you can jump-start your challenge by building something from instructions. Don't worry if it doesn't work or if it isn't perfect. The important thing is to create your first model so you have something to experiment with.

*Note For Facilitators: The Create phase is the launchpad for an invention journey. It's where campers explore problems and opportunities, create lists of ideas, evaluate available resources, and create their first prototype to test.*



## PLAY

Definition: Use it! Playing with what you've created is fun, and also an important part of inventing! Playing is like a test run. It's a chance to see how well your invention works and look for ways you can make it better.

*Note For Facilitators: Play is a natural way for campers to explore and evaluate their creations without worrying too much about perfection. In this phase, campers are reflective about their play, and gather information about their prototype's first test run and the circuits they've created.*



## REMIX

Definition: Improve your invention. Keep experimenting! Add new Bits, swap parts with other inventions, or take all the pieces apart and put them together in a different way.

*Note For Facilitators: Remix is where campers kick their experimentation into high gear. You should encourage them to test as many variations and improvements as they can, based on their reflections during Play. Encourage campers to challenge themselves by pushing beyond their comfort zone when it comes to inventing. Sometimes really wonderful ideas are hidden in unexpected places.*



## SHARE

Definition: Inspire others. Show the world what you've created. Get inspired by exploring what others have shared. Create, play with, and remix other inventions. This is how awesome new inventions are born.

*Note For Facilitators: The Share phase is where campers reflect on the whole invention process, figure out how to best tell their story, and share it with others. This reflection helps them develop critical skills that they will need as inventors, or in whatever profession they choose. Learning from other campers' stories and interacting with their inventions will also help to deepen this active learning process.*

## IN SUMMARY

The four phases form a cycle because the process doesn't need to end with sharing. What they learn through sharing can be great fuel for another run through creating, playing, remixing, and sharing. It also serves as a reminder that an invention is never perfect or complete. There is always room for more exploration and improvement.

## littleBits Invention Log

The Invention Log is a workbook that campers can use to document their invention process. It contains questions that help them reflect as they work through problems and record their experiences. Encourage campers 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 campers explore different ways of communicating information. Each lesson pairs with the Invention Log and supports campers as they bring their ideas to life using the Invention Cycle. Be sure to print out a copy for each student.

## Invention Advising Tips

Anyone can be an Invention Adviser - whether you're a seasoned STEAM expert, or are just getting started teaching the concepts. We've put together our best tips to help you guide campers and inspire them to create inventions with littleBits and the littleBits Invention Cycle. Use this section to supplement your lessons, add constraints to a challenge, or swap out brainstorm and remix prompts.



## littleBits Invention Log Phases



### CREATE

The Create phase is about brainstorming and creating a prototype of your idea. In the Invention Guide, guided challenges have a different Create phase than the open challenges.

- In guided challenges, step-by-step instructions for an invention are provided. This gives campers a jump start on the invention and is helpful for those new to littleBits.
- In open challenges, campers create a prototype of an invention from an idea they brainstorm.



### PLAY

The goal of the Play phase is for campers to test the prototype they made in the previous Create phase and reflect on how it can be improved.



### REMIX

In the Remix phase, campers will improve and adapt their inventions to fit criteria they've decided upon. There are three prompts per challenge in the Invention Guide. However, if a student is stuck, use this list to guide them. Remixing is a phase in the Invention Cycle that you can repeat until you have an invention that you feel successfully accomplishes the challenge. You may remix your initial prototype once, or 50 times!



### SHARE

The goal of the Share phase is for campers to explain their invention and collect feedback about it.

## Tips & Troubleshooting

### SETUP & CLEANUP

- To identify which Bits belong to which Kit, you can number Kit storage containers and use a sharpie to add numbers to the bottom of each Bit (i.e. all Bits in Kit storage container #1 would be labeled #1).
- The back of the Invention Guide has a map showing where the Bits fit into the durable storage unit.

### WORKING IN TEAMS

- Keep groups small (max 3 campers to a Kit)
- Create Individual Roles : When breaking off into groups, it can be helpful to give campers specific roles to keep them engaged and participating. Try these or make up your own:
- The Troubleshooter: This person is responsible for making sure the circuit works.
- The Scribe: This person reminds the group to record their processes and leads the charge with the Invention Log.
- The Ideas Person: This person is in charge of adding wacky ideas to the mix at every phase.
- The Questioner: This person questions everything in every phase of the Invention Cycle.

### CARE AND MAINTENANCE OF YOUR BITS

- Cleaning Bits: If you find that you're getting a poor connection between Bits, cleaning is a good first step to troubleshoot the problem.
- The best way to clean Bits is to wipe them with a dry cloth. If any of the electrical connectors are oxidized (you may see dark deposits on them), put a small amount of isopropyl alcohol on a soft, clean cloth and gently wipe the deposits. Do not use any other cleaning products on your Bits!

*Note: Some electrical connector cleaners have chemicals that can damage the plastic part of the Bit, and therefore are not recommended.*

### POWER SOURCE

Every circuit that campers build will require a power source, so maintaining power is an important part of managing littleBits in the classroom. Signs of low batteries may include:

- Low or flickering lights (especially when you try to run one of the motors in the circuit)
- Erratic behavior with the servo motor
- Motors that won't run

When you see that batteries are running low, it's time to recharge or replace them. USB power can also be used instead of 9V batteries.

### WHEN IN DOUBT, CONTACT US!

Our team of specialists is ready and waiting to help you out Monday through Thursday from 8am - 5pm MST. [support@sphero.com](mailto:support@sphero.com)

## Growing littleBits in your Camp (and Beyond!)

Congratulations! You've made your way through the littleBits Summer Camp Guide (trumpets sound!). By now you've likely tried out some of the provided challenges (and hopefully created some of your own!) and experienced first-hand the joy that littleBits powered by Sphero brings to the learning experience. 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/spheroedu>
- **Facebook:** <https://www.facebook.com/GoSphero>
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