



# LITTLE BITS CODE KIT TUTORIAL

## Required:

On your District Macbook, install the Little Bits OS application.

Mac OS app: <https://classroom.littlebits.com/kits/code-kit>

Scroll down and download the Mac OS app

Locate the app by clicking on LaunchPad and swipe to find the Little Bits App

**Build, code, play! littleBits puts invention at the heart of learning through play. These electronic building block magnetic “Bits” snap together to turn ideas into inventions, transforming the way kids learn.**

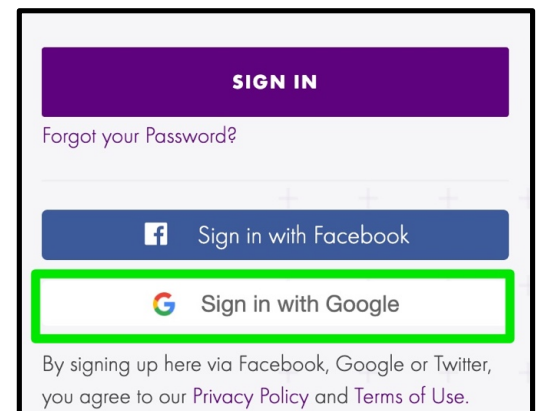
This lesson will take you step by step through setting up your account with Little Bits and an overview of the items contained in your Little Bits kit.

**Step 1:** Create an educator account by logging in to Classroom Little Bits at:

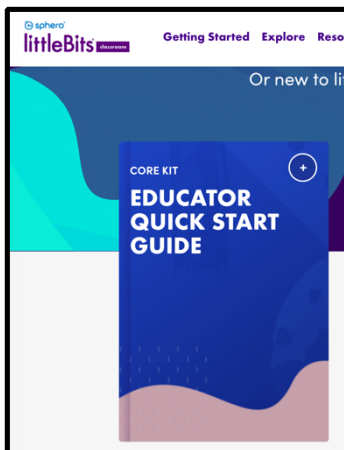
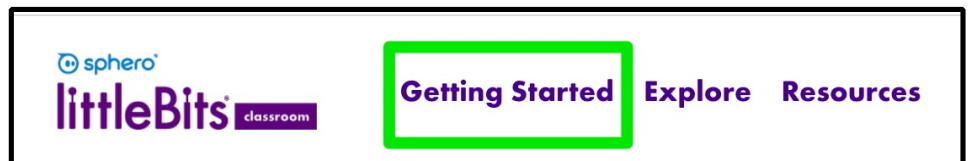
<https://classroom.littlebits.com/welcome>

Click on Login in the upper right of the browser window.

Then select Log in with Google using your Hickman Mills email address and password.



**Step 2:** To begin learning about your Little Bits kit, click on Getting Started.



**Step 3:** Click on the Educator Quick Start Guide for a great overview of Little Bits and how they work.

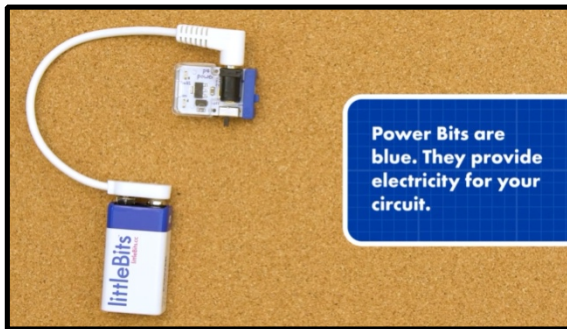
littleBits instruction can be scaffolded with step-by-step instructions and demonstrations for special needs students and English Language Learners

Because littleBits are opened-ended, gifted and talented students can build more complex projects

For group projects, students can assume different roles depending on their skill sets

## Bit Basics

Little Bits snap together with magnets so it's impossible to make a mistake, no wires or devices needed.



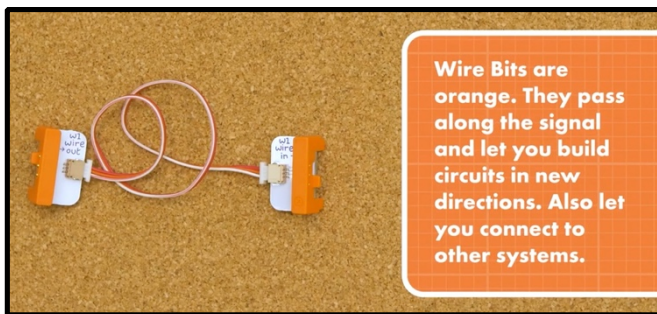
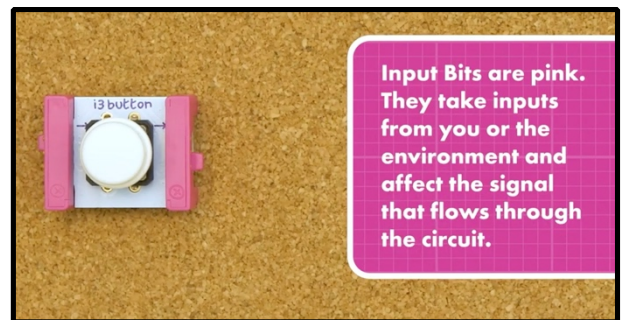
**Color Coded** - Each Bit is color-coded by its function. There are four colors

**Blue** bits are the Power Bits and provide the battery powered electricity. (Little Bits now come with a rechargeable battery.)

**Pink Bits** are the Input Bits.

Maybe you don't want your circuit to just be "on" all the time. Simply add a pink between your power and output Bits to add a control.

Inputs can be buttons, dimmers, sensors -- things that receive direction from you or the environment.



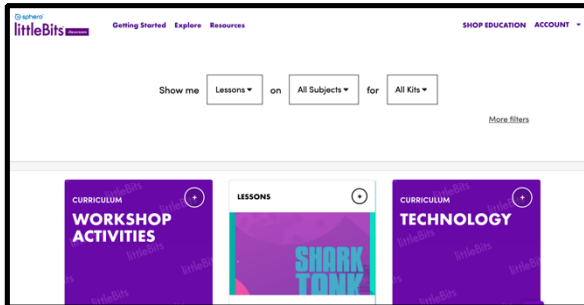
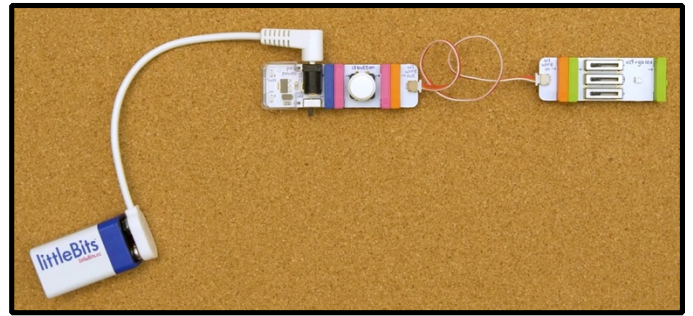
The **Orange Bits** are the wire bits. Orange Bits let you build your circuits in new directions (like with a wire or a fork) or connect to other systems (like coding on a computer).

And the **Green Bits** are the Output Bits. The output bits are the 'doers' because they receive signals and then DO something.



## Order Matters

Power Bits (blue) always come first. Input Bits (pink) only affect the output Bits (green) that come after them.



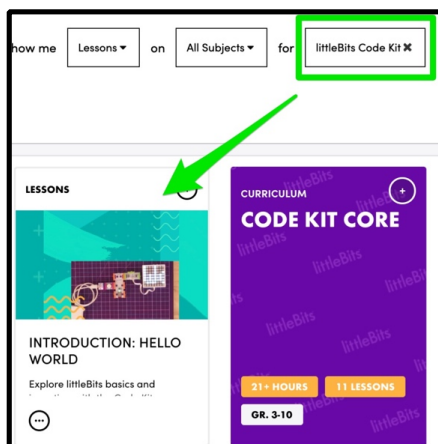
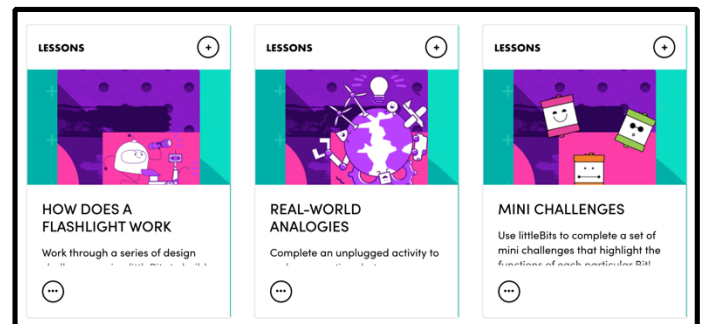
**Step 4:** Another great resource on the Little Bits website is the collection of lessons.

Lessons may be sorted by types, subjects, and by LittleBits kits.

<https://classroom.littlebits.com/explore/search?type=lessons>

Select a lesson that you wish to use to explore the Little Bits kit that you are working with.

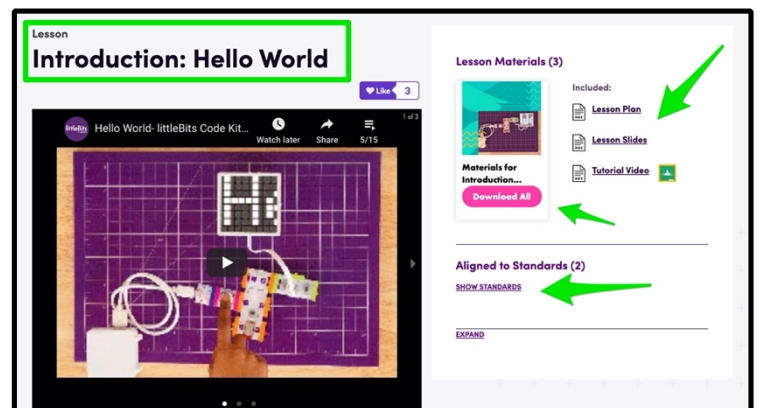
For this guide, I'm going to walk through the Hello World lesson.



**Step 5:** Locate and Open the Hello World lesson by selecting the littleBits Code Kit from the kit options.

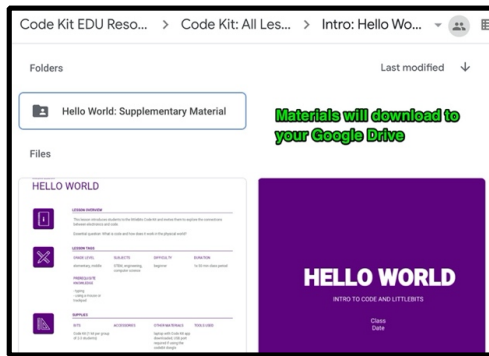
**Step 6:** The Hello World lesson, as all of the lesson included in the littleBits curriculum contain:

- Lesson Plan
- Lesson Slides
- Tutorial Video

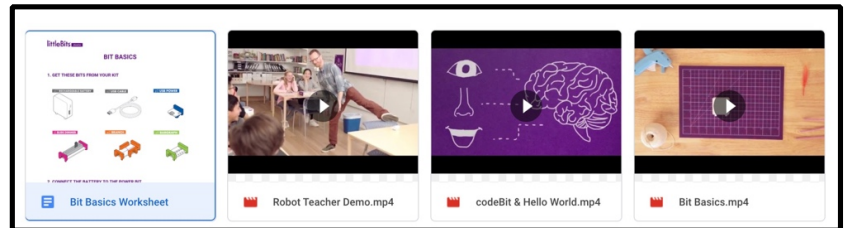


Downloading the lesson materials will bring them into your Google Drive.

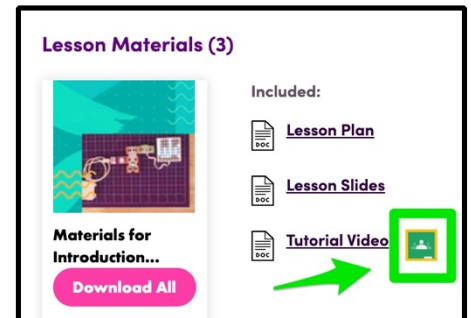




**Step 7:** Take a look inside the Supplemental Resources folder that you have downloaded for valuable materials.



**Step 8:** The LittleBits lesson tutorial video can be shared with your students via Google Classroom

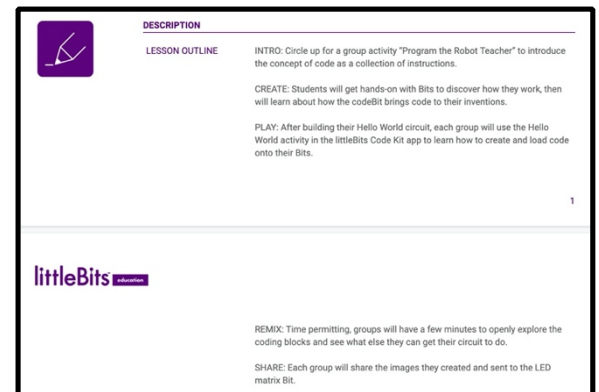


LESSON TAGS	GRADE LEVEL	SUBJECTS	DIFFICULTY	DURATION
	elementary, middle	STEM, engineering, computer science	beginner	1x 50 min class period
	<b>PREREQUISITE KNOWLEDGE</b> - typing - using a mouse or trackpad			
SUPPLIES	BITS	ACCESSORIES	OTHER MATERIALS	TOOLS USED
	Code Kit (1 kit per group of 2-3 students)		laptop with Code Kit app downloaded; USB port required if using the codeBit dongle	

**Step 9:** The littleBits lessons will help you plan ahead for the lesson by giving you information about everything you will need to have ready.

**Step 10:** littleBits lessons begin with an outline of what your students will do during the lesson steps.


- Intro
- Create
- Play
- ReMix
- Share



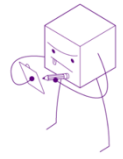
LESSON OBJECTIVES	<ul style="list-style-type: none"> <li>Students will be able to create circuits with littleBits.</li> <li>Students will be able to create and modify code with the Code Kit app and load it onto their codeBits.</li> <li>Students will be able to analyze and evaluate strengths and weaknesses of a basic instruction set.</li> </ul>
ASSESSMENT STRATEGIES	<ul style="list-style-type: none"> <li>During the Create phase, watch students construct their circuits to assess their understanding of how Bits go together and how circuits are constructed.</li> <li>During the Play and Remix phases, pay special attention to how students add code blocks to their programs and whether they upload their code to test it.</li> <li>During group discussions, listen to how students explain their understanding of code and circuit concepts. Note any challenging moments that should be revisited in the following lessons.</li> </ul>
STANDARDS	<b>CSTA</b> 1B-CS-01: Describe how internal and external parts of computing devices function to form a system. 1B-CS-03: Determine potential solutions to solve simple hardware and software problems using common troubleshooting strategies. 1B-AP-10: Create programs that include sequences, events, loops, and conditionals. 2-CS-03: Systematically identify and fix problems with computing devices and their components.

**Step 11:** Lesson Objective, Assessment Strategies and Standards Connections are stated within the lesson allowing you to fit lessons into your curriculum to support student learning.

**Step 12:** The slides contained in the Hello World lesson walk you through the introduction of the littleBits lesson.


**TODAY WE WILL...**

1. Program me!
2. Try out littleBits
3. Create our first programmed circuit with Code Kit
4. Remix our circuit
5. Share what we've created

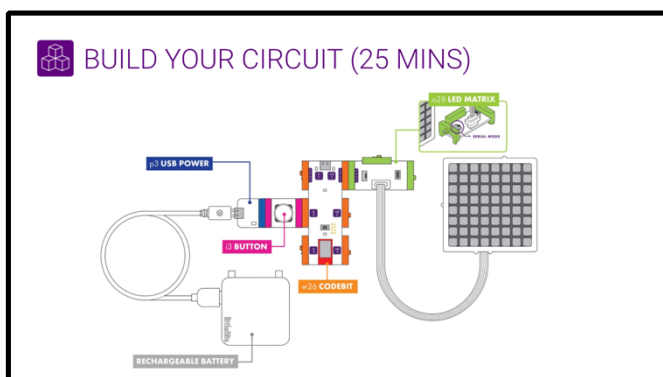


**OUR MISSION:**


- We're going to build mini computers and use code to make games with littleBits





Your students will be challenged to complete a mission, and given a list of needed bits.





**1. GET THESE BITS FROM YOUR KIT**

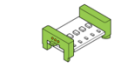

**RECHARGEABLE BATTERY**


**USB CABLE**


**USB POWER**

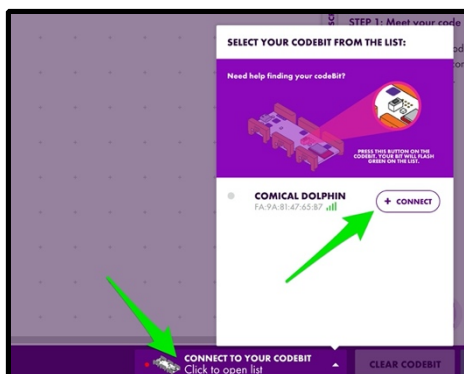
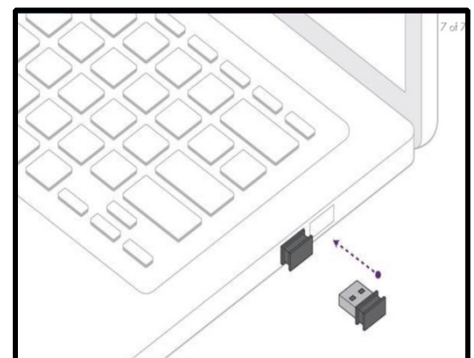

**SLIDE DIMMER**


**BRANCH**


**BAROGRAPH**

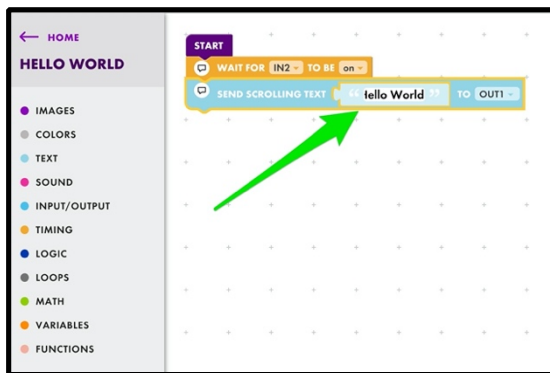
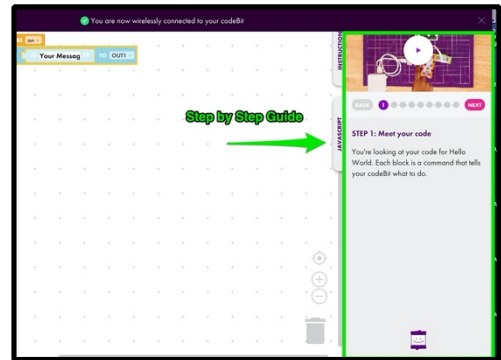
The graphic gives students a visual representation of the circuit challenge. This is also a good time to revisit the colors of the bits and which bits have what function.

**Step 13:** Once the circuit has been assembled, plug the **codeBit dongle** into the USB port on the computer. This will allow your code to be sent wirelessly to the circuit.



**Step 14:** Connect your CodeBit wirelessly to the App by clicking on Connect to Your Codebit. Then locate your CodeBit and click + **CONNECT**

**Step 15:** The CodeBit app has step by step instructions included with the Hello World lesson.

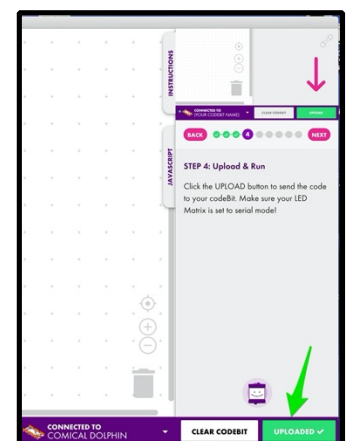


**Step 16:** To modify the text block so that the matrix will show the words Hello World, tap inside the text box and replace the words with Hello World, or your chosen text.

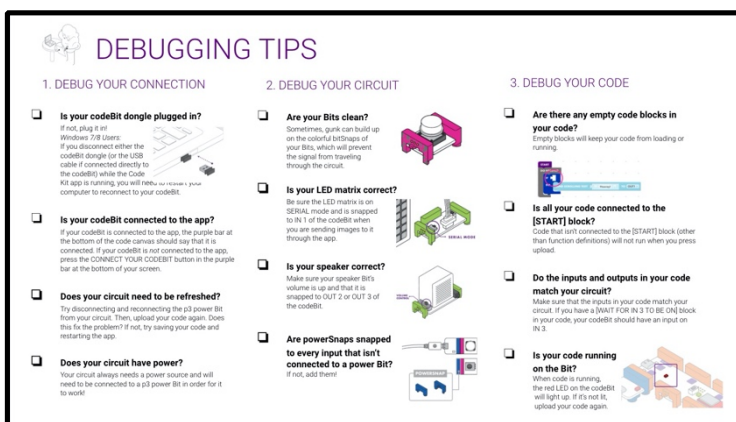
**Step 17:** When you are finished with your code, make sure your codeBit is connected and click on upload to send the program to your codeBit.



Then press the button on your circuit and your design should show on the Matrix.



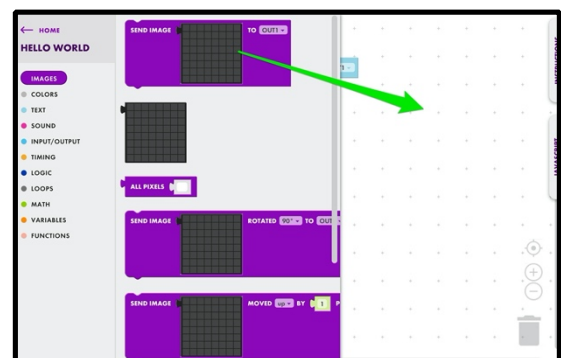
is

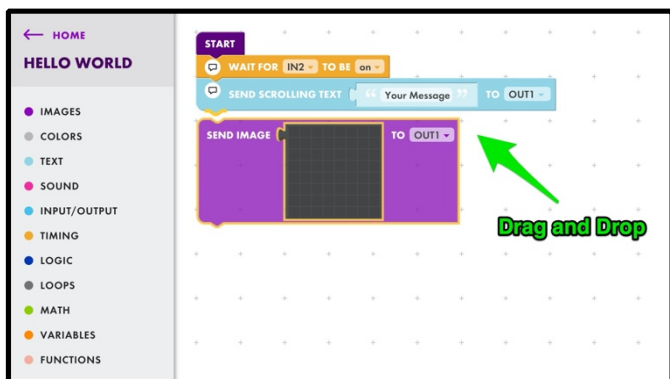


**Step 18:** What do you do if your students' code doesn't work? This is where the Debugging Tips in the slide presentation come in handy.

Debugging is a powerful piece of computational thinking, celebrate the failures- that's where the real learning takes place!

**Step 19:** Try modifying your code, drag the text code block to the trash can in the app. Then click on the Image coding blocks and drag the top selection to the programming window.

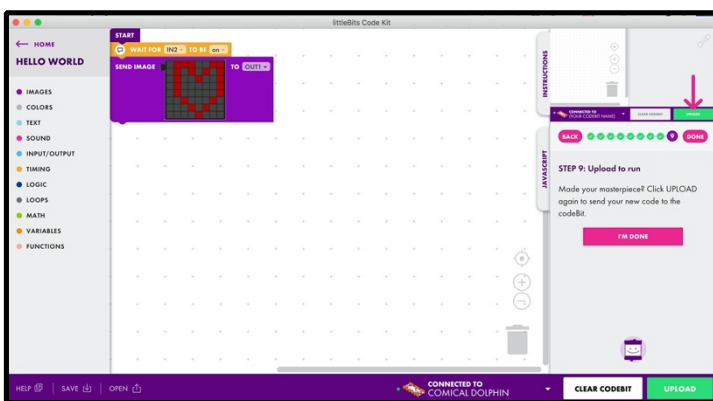




**Step 20:** Next, drag the image block up to connect it with

**Step 21:** When finished, click Clear codeBit, otherwise the past code will remain on the device.

Then click Upload, when you see the green button change to Uploaded. Press the button on your circuit to see your design on the LED matrix.



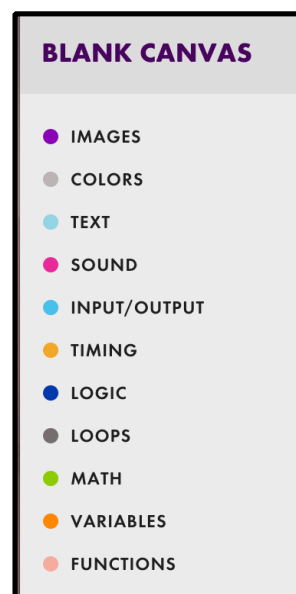
**Step 22:** The inputs (the pink bits) are the bits that tell the output bits (the green bits) what to do.

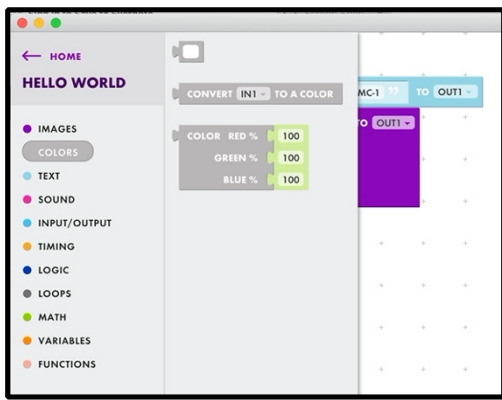
Inputs include switch, slide, touch, and push.

The outputs (the green bits) do whatever the pink bits tell them to do. Outputs include lights, sounds, colors, text, sounds, motion and the LED matrix.

**Step 23:** Coding blocks within the Little Bits Code Kit App include many options.

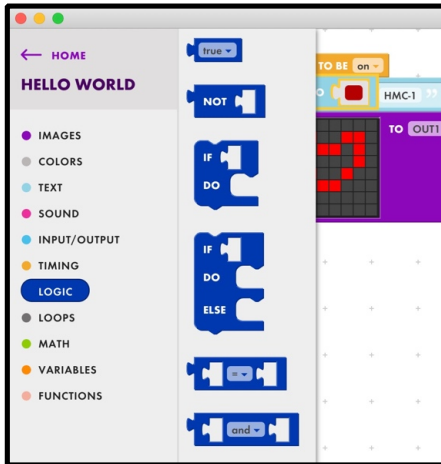
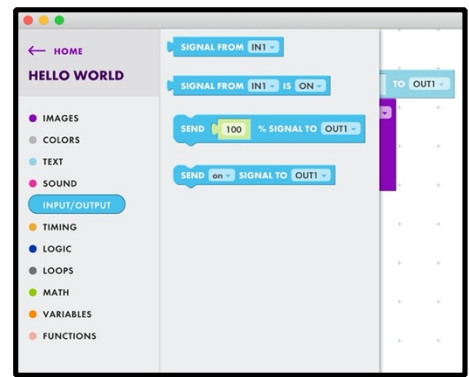
Working through the lessons will familiarize you and your students on these options.





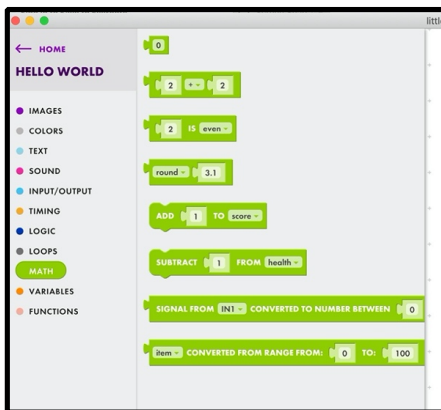
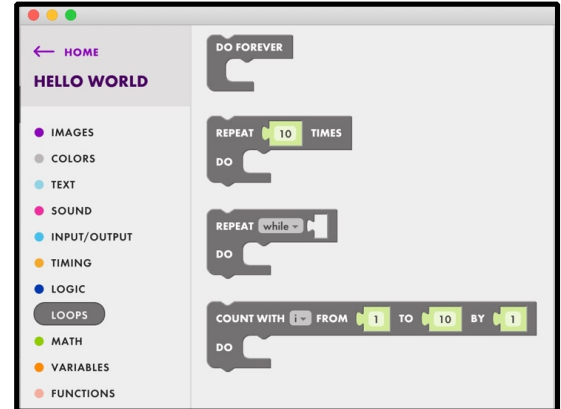
Colors coding blocks

Input/Output coding blocks



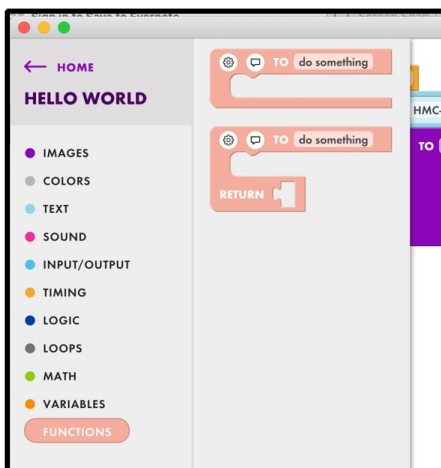
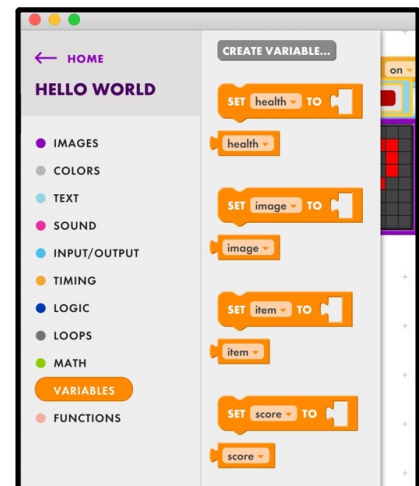
Logic coding blocks

Loops coding blocks



Math coding blocks

Variables coding blocks



Functions coding blocks.



## Resources:

Classroom: <https://classroom.littlebits.com/explore/search>

Lessons: <https://classroom.littlebits.com/explore/search?type=lessons>

Inventions: <https://classroom.littlebits.com/explore/search?type=inventions>

Little Bits YouTube channel: [https://www.youtube.com/channel/UC\\_2hEbur8-gPYMYI5Z5\\_48A](https://www.youtube.com/channel/UC_2hEbur8-gPYMYI5Z5_48A)

Bitopedia: Describes all the bits and what they do  
<https://classroom.littlebits.com/bit-o-pedia>

Educator Tips  
<https://classroom.littlebits.com/educator-tips>