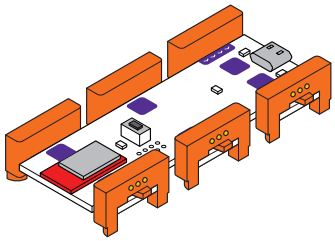
littleBits

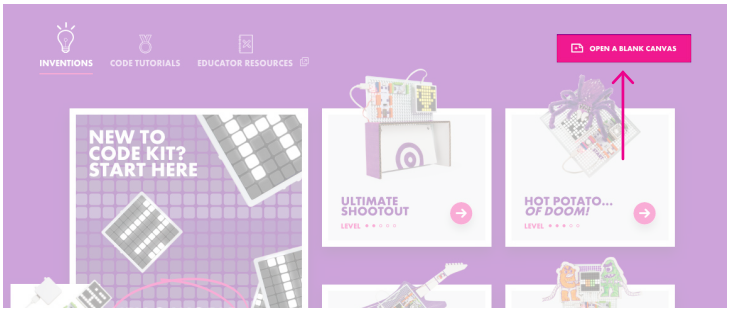
INTRODUCING... THE CODEBIT!



GETTING STARTED
Downloading the littleBits Code Kit app

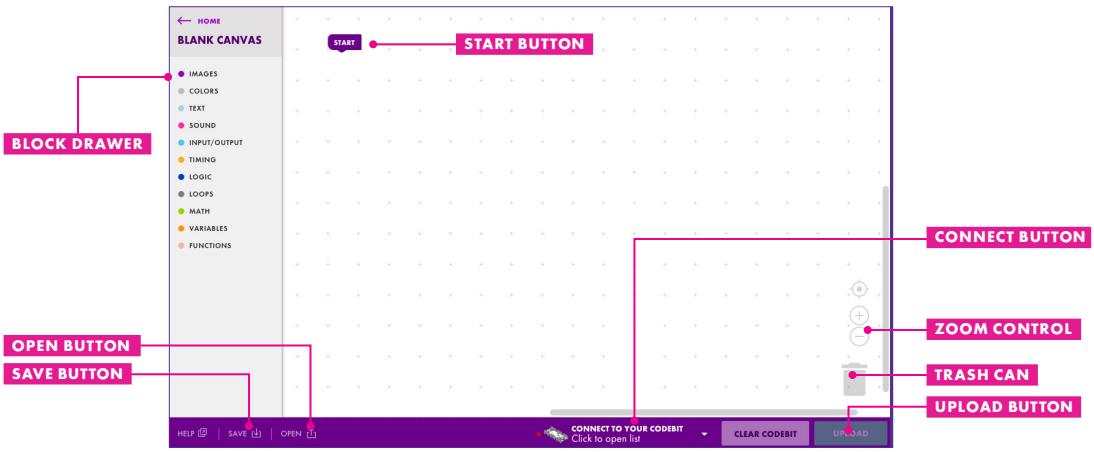
STEP 1 Download and open the littleBits Code Kit app at littleBits.com/code-kit-app

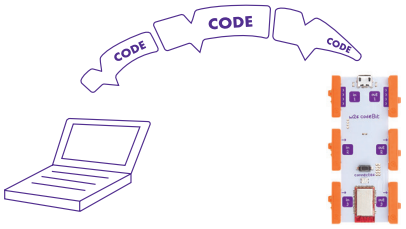
STEP 2 Click the pink "open blank canvas" button to start writing code.



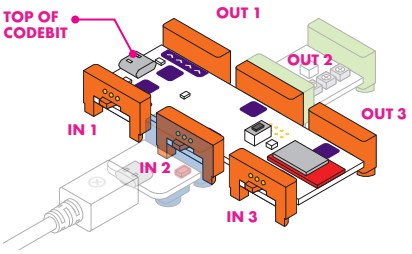
STEP 3 Get acquainted with the littleBits Code Kit app.

- **Start Block:** Your code blocks must be connected to the [START] block in order for them to run.
- **Block Drawer:** You can find all of the code blocks in the block drawer. The blocks are organized into different categories and are color coded based on those categories.
- **Open Button:** The open button allows you to opens a code file that was previously saved on your computer and display it on the code canvas.
- **Save Button:** The save button saves the code that you currently have on your code canvas.
- **Connect Button:** The connect button opens a menu that allows you to wirelessly connect to your codeBit.
- **Zoom Controls:** The zoom controls allow you to zoom in and out of your code on the code canvas.
- **Trash Can:** You can delete blocks by dragging them to the trash can.
- **Upload Button:** The upload button allows you to upload your code to your codeBit once you have connected to it.





The codeBit is a tiny computer that acts like a brain for your littleBits circuits and allows you to send code from your computer to your codeBit so you can program your own circuits.

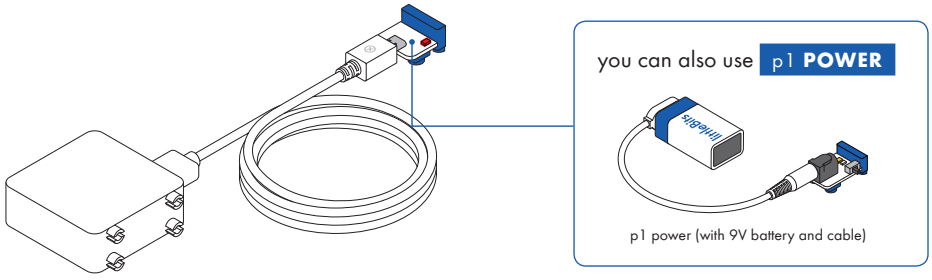


Just as our brain receives information from our senses, the codeBit receives data from the input Bits, like a button or a light sensor, that are attached to its IN 1, IN 2, and IN 3 bitSnaps. The codeBit uses the data it collected and the code you wrote to calculate things or make decisions. Then, it can respond by sending output signals to output Bits, like an RGB LED or a buzzer, that are attached to the OUT 1, OUT 2, and OUT 3 bitSnaps.

PART 1: CODING AN OUTPUT BIT

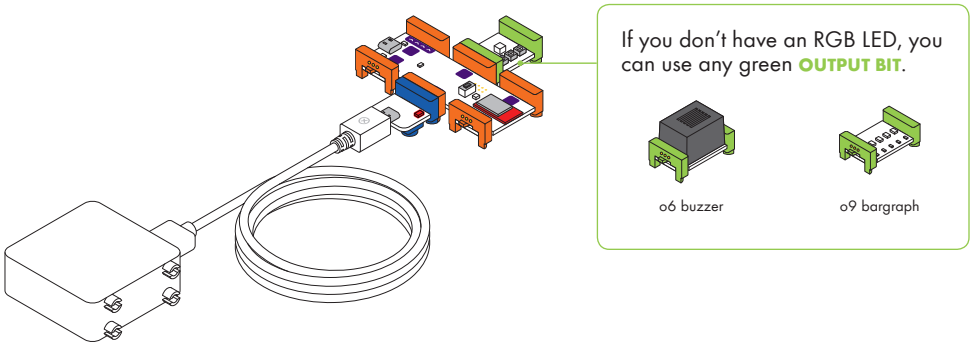
In Part 1, we're going to write a blink sketch that turns an output Bit, like a light or a buzzer, on for 1 second and then off for one second, on and off, again and again until you disconnect the circuit from power. Follow the instructions below to make your outputs blink.

STEP 1 Find a blue power Bit and connect it to a power source like a battery or wall outlet.



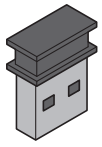
Note: If you are using a P1 power Bit, turn the switch to on.

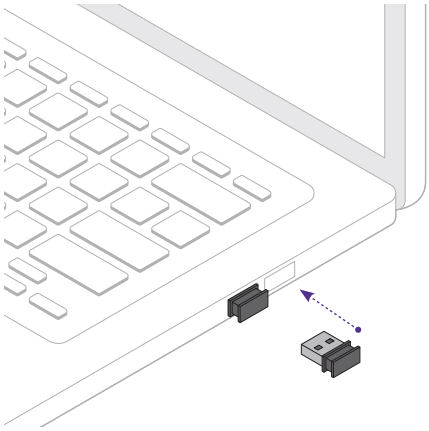
STEP 2 Snap your power Bit to the codeBit at IN 2. Then, find a green output Bit like the o3 RGB LED, o9 bargraph, or o6 buzzer, to the OUT 2 bitSnap of the codeBit.



Note: If someone before you has already loaded code onto the codeBit, some of your output Bits may light up, make sounds, or move.

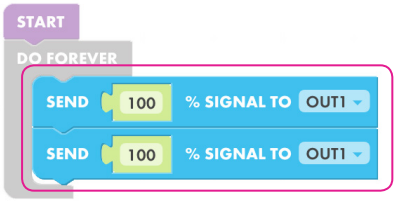
STEP 3 Plug your USB Dongle into the USB port of your computer.


USB dongle

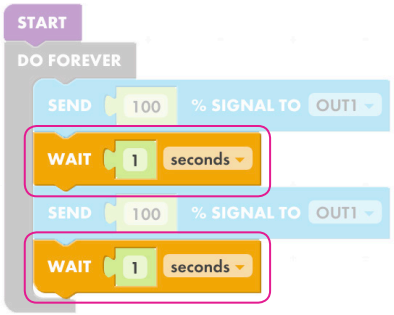


STEP 4 In the Loops category of the block drawer, find a dark gray [DO FOREVER] block and attach it to the [START] block.

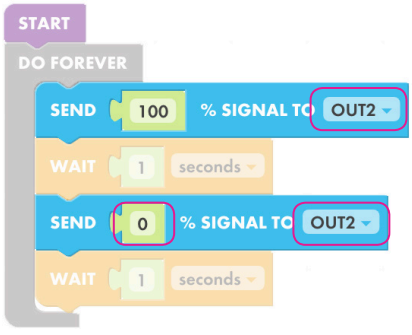
STEP 5 In the Inputs/Outputs category, find a light blue [SEND 100% SIGNAL TO OUT1] block and put it inside of the [DO FOREVER] block. Add a second [SEND 100% SIGNAL TO OUT1] block just beneath the first inside of the [DO FOREVER] block.



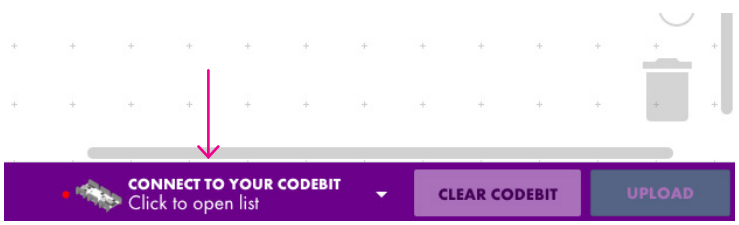
STEP 6 In the timing category, find a yellow [WAIT 1 SECONDS] block and drag it out to the [DO FOREVER] loop between the two [SEND 100% SIGNAL TO OUT1] blocks. Drag a second [WAIT 1 SECONDS] block to the bottom of the [DO FOREVER] loop.



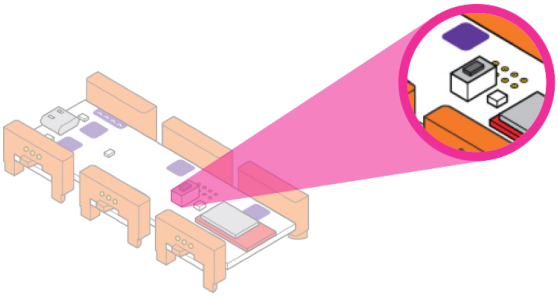
STEP 7 Change the percentage in the second [SEND 100% SIGNAL TO OUT 2] block to "0" % signal and the output to "OUT 2" in both of the [SEND 100% SIGNAL TO OUT 1] blocks



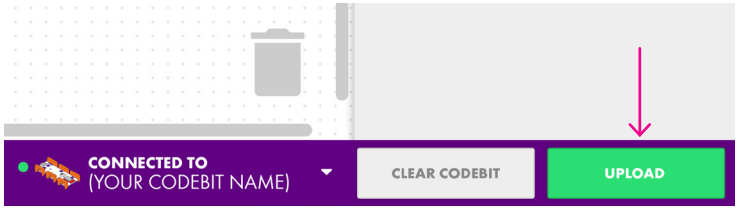
STEP 8 Wirelessly connect to your codeBit with the "Connect to your codeBit" button.



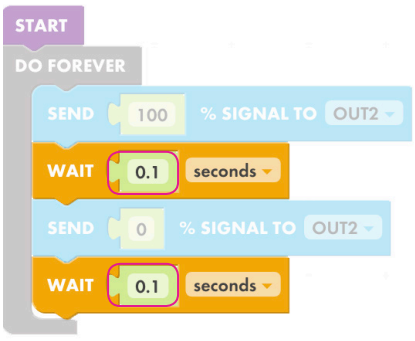
STEP 9 A menu will pop up with the names of nearby codeBits. Find your codeBit by pressing the button on your codeBit. When you've pressed your codeBit's button, you should see a green circle in the menu next to your codeBit's name. To connect, press the "Connect" button next to your codeBit.



STEP 10 Click the 'Upload' button to upload your code to your codeBit.



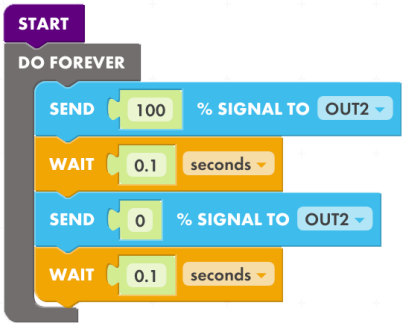
STEP 11 In the app, change the wait time in the [WAIT 1 SECONDS] block to 0.1 seconds and upload your code again. What happens?



> **Note:** Each time you make a change to your code, you will need to click the upload button to see the change reflected in your Bits.

STEP 12 Check out your invention! Your code should turn the output Bit on for 0.1 second, then off for 0.1 second and will repeat, causing it to flicker on and off very quickly. How would you change your code to have it pulse faster or slower?

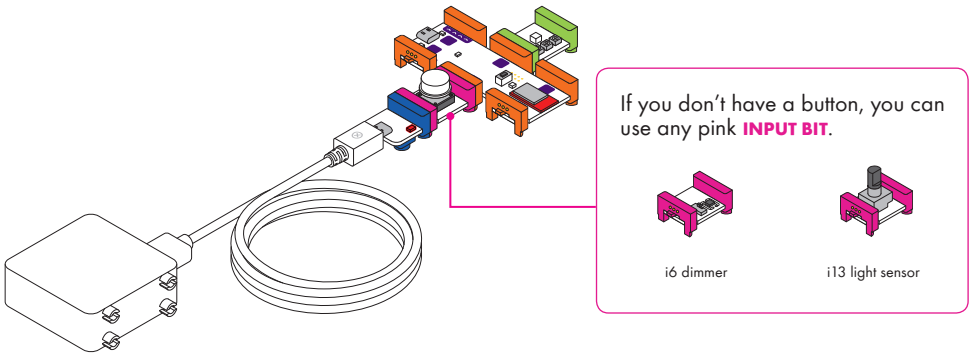
HOW IT WORKS



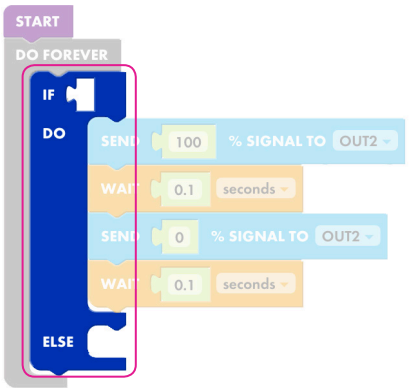
Inside that forever loop, the codeBit sends 100% of the signal to the green output Bit that is attached to the OUT 2 bitSnap, causing the output Bit to turn on. The code then waits 1 second, with the signal at 100%. Then it sends 0% of the signal to the same output Bit, causing the output Bit to turn off. It then waits another second and goes back to the beginning of the forever loop.

PART 2: CODING AN INPUT BIT

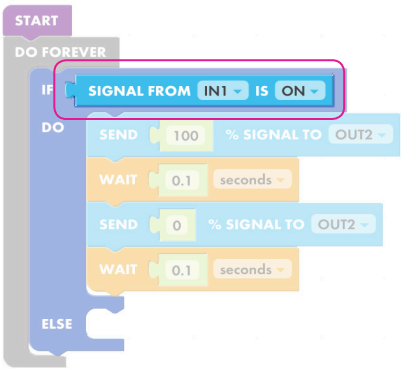
STEP 1 Add a pink input Bit to your circuit between your power Bit and codeBit on its IN 2 bitSnap.



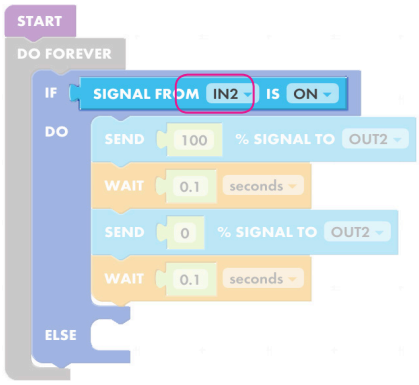
STEP 2 In the app, begin with the code you wrote from Part 1 and add an [IF DO ELSE] block inside of the [DO FOREVER] loop. Then, drag your existing code into the "DO" part of the [IF DO ELSE] block.



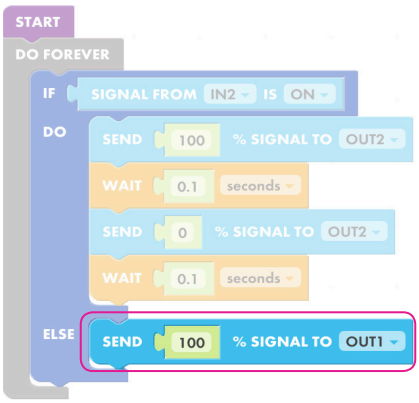
STEP 3 In the Inputs/Outputs category, find a light blue [SIGNAL FROM IN 1 IS ON] block and add it to the "IF" part of the [IF DO ELSE] block.



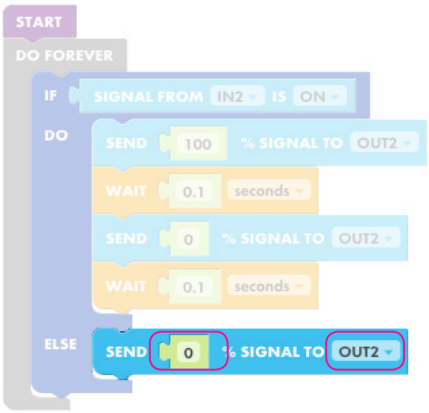
STEP 4 Change the input in the [SIGNAL FROM IN 1 IS ON] block to "IN 2". Here, we are using code to control whether the blink sketch will occur. If the signal from IN 2 is ON, we will play the blink sketch. Next we will determine what will occur when IN 2 is OFF.



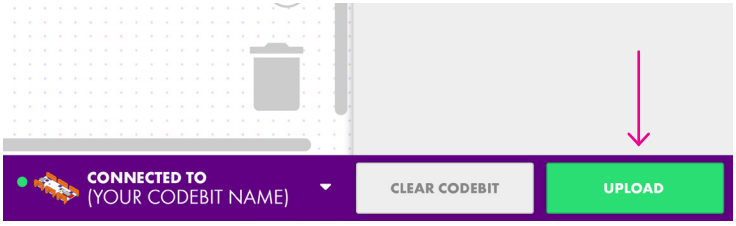
STEP 5 Add a light blue [SEND 100% SIGNAL TO OUT 1] input block to the "ELSE" part of the [IF DO ELSE] block.



STEP 6 Change the percentage of signal in the last [SEND 100% SIGNAL TO OUT 1] block to "0" and change the output to "OUT 2". If the signal from IN 2 is OFF, it will send a signal of '0' to our output on OUT 2.

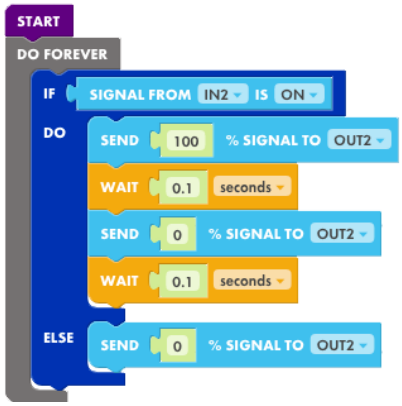


STEP 7 Upload your code again. Remember to click the "upload" button each time you make a change to your code.



STEP 8 Try out your invention. When you turn your input on, your output will turn on for one second, then off for one second and repeat until you turn the input to an off state. If you are using Bits with variable signal, like a dimmer, make sure they are turned to their '0' or 'OFF' state.

HOW IT WORKS



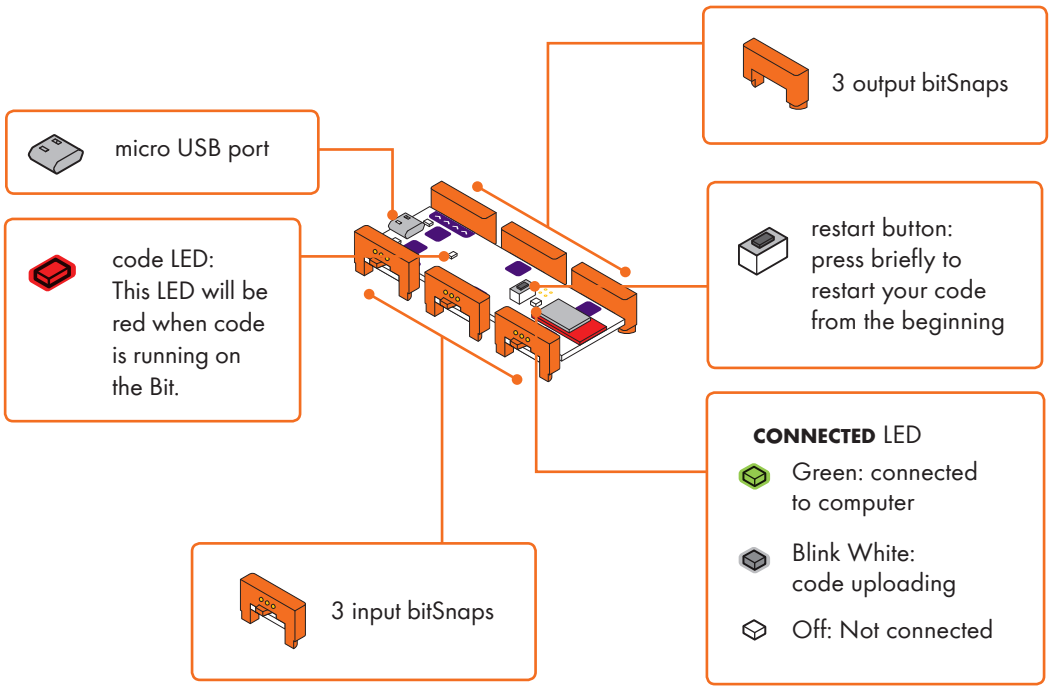
The code you just added tells the codeBit that IF the signal from the pink input Bit on the codeBit's IN 2 bitSnap is more than 50% of the incoming signal, it will run the 'do' part of the [IF DO ELSE] block that contains our code from part 1. If the signal from the pink input Bit on the codeBit's IN 2 bitSnap is more than 50% of the incoming signal, it will run the 'else' part of the [IF DO ELSE] block that sends 0% of a signal, turning the output Bit on OUT 2 off.

MORE INFORMATION

w26 CODE BIT

MEET THE BIT

The codeBit levels up your littleBits circuits by allowing you to program how your Bits work.



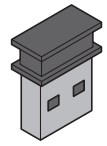
HOW IT WORKS

The codeBit is a miniature computer that you can use to control your circuit's behavior.

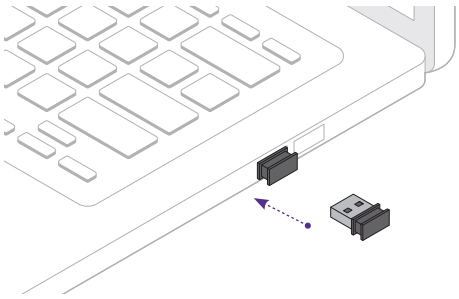
Just like all other Bits, the codeBit needs to be connected to a power Bit in order to work. If you turn the power off, the Bit will stop working, but the code will still be on there and will start running when you turn the power back on.

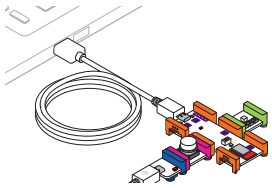
CONNECTING YOUR CODEBIT TO THE LITTLEBITS CODE KIT APP

Use the codeBit dongle to wirelessly connect to the littleBits Code Kit app and upload the code you write in the app to your codeBit.



USB dongle

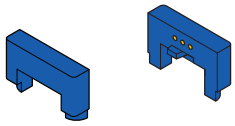




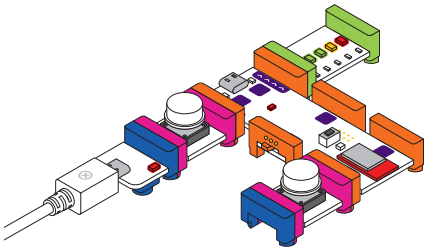
Note: You can also use the USB cable included with your codeBit dongle to connect and upload code from the app to your codeBit. If you decide to connect with the USB cable, be sure you are also powering your circuit with a power Bit.

POWERING YOUR CODEBIT

Every circuit needs a source of power! You can use the p3 power Bit with a USB cable and either a rechargeable battery or AC adapter to power your circuit. You can also use a p1 power Bit with a 9-volt battery and battery cable.



powerSnaps



If you are using multiple input Bits with the codeBit, you will need to power each input separately. Instead of using multiple wire Bits to split the power coming from one power Bit, you can add blue powerSnaps to any additional input bitSnap that doesn't have a powerBit already attached to it.

USING YOUR CODEBIT WITH THE LED MATRIX

If you have an LED matrix Bit, you can send images or scrolling text to be displayed on the LED matrix. Your codeBit will need to use serial communication to send images or scrolling text to the LED matrix. Serial communication is a way to send complex information between computers and other devices and is made up of a series of 'on' and 'off' signals.

For example, the codeBit can turn your code into serial data and sent it to the LED matrix to tell it what to do.

Note: Only Bits with the serial communication icon are able to send and read serial data. Some Bits without the serial icon may interfere with serial signals if placed between the codeBit and the LED matrix.

For more information about the codeBit and an intro to all its features, visit littleBits.com/tips-tricks/codeBit.