LittleBits Circuit Design

Introduction

The best way to learn about littleBits is through experimentation and play. Complete the following challenges, which are designed to get you building simple circuits. While you're learning more about how littleBits work, think about the way in which electronics in our everyday lives work.

The Color Code

Bits are grouped into four color-coded categories:

- **POWER** is needed in every circuit and is the start of all your students' creations.
- **INPUT** Bits add control to the circuit, through information provided from your students and/or the environment, and send signals to the Bits that follow.
- **OUTPUT** Bits complete an action or a task (for example, light, buzz, or move). These are the Bits that "do something."
- **WIRE** Bits expand the circuit's reach and change direction. Students use the wire Bits to help place Bits exactly where they want, especially if they are embedding inside a structure. Some orange Bits also add a level of complexity and programmability to the circuit.

Connecting Together

Have a quick look at the diagram below. On the right is a color coded category chart.

Challenge 1

Let's start with a simple circuit. Find one of the lights in your collection (it will be green because it is an output) and snap it to a power Bit. (Hint: your power Bit will need to be connected to a 9V battery and turned on.)

Challenge 2

Imagine you want to create a flashlight. You don't want the light to be on all the time or the battery will run out. What input Bit would you add so that you could turn your flashlight on and off?

Extracted from the LittleBits Educators PDF available at: https://s3.amazonaws.com/littleBits_pdfs/littleBitsEducatorsGuide_FINAL.pdf
This modified worksheet is available at: https://github.com/dilwil/HiveWorksheets

Challenge 3

Now let's make a smart flashlight. What could you use to make your flashlight turn on automatically when it gets dark? (Hint: you might need to change the mode or sensitivity of a Bit you add to your circuit.)

Challenge 4

What other ways could you use this same circuit? If we put our circuit in a box, what would we need to change so that the light turns on whenever we open the box? (Hint: we will need to change one of the little switches on one of the Bits.)

Challenge 5

Now let's imagine we have something secret in the box, so we want to turn this circuit into an alarm. We already have it set up so that the light turns on when we open the drawer. What could we add so that instead of just turning on, the light flashes? What could we add so that people will notice the alarm even if they don't see the light?

Challenge 6

Let's change our circuit so we can run a little experiment. What if we don't want to have an alarm on our box, but we do want to know how many times it gets opened every day? The light sensor will tell us when the box is opened. What Bit could we add to count the number of times the light sensor is triggered?

Challenge - Up, up and beyond...

For the final challenge, using the Bits and your knowledge from the previous challenges, what else could you make with these Bits? Use your imagination.