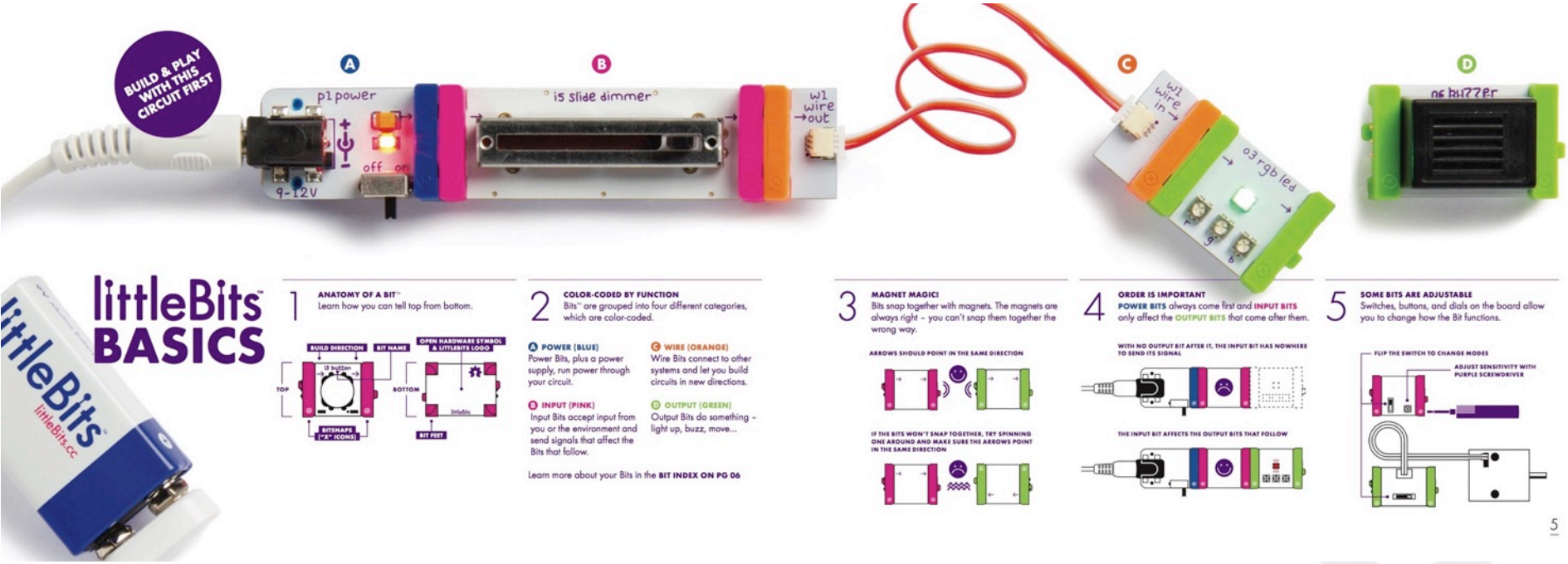
Hong Kong Product Design Makeathon 2017-2018

全港中小學產品設計大賽2017-2018

第二場工作坊
11 Nov 2017

littleBits Basics



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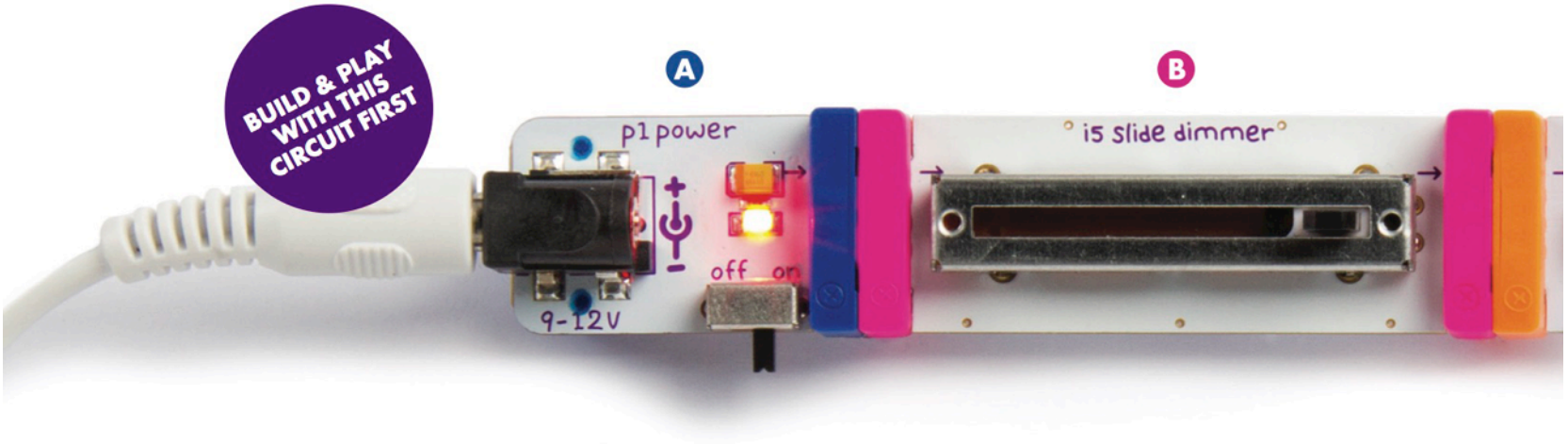
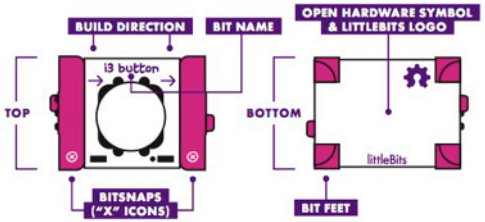


littleBits™ BASICS

1 ANATOMY OF A BIT™

Learn how you can tell top from bottom.



2 COLOR-CODED BY FUNCTION

Bits™ are grouped into four different categories, which are color-coded.

A POWER (BLUE)
Power Bits, plus a power supply, run power through your circuit.

B INPUT (PINK)
Input Bits accept input from you or the environment and send signals that affect the Bits that follow.

C WIRE (ORANGE)
Wire Bits connect to other systems and let you build circuits in new directions.

D OUTPUT (GREEN)
Output Bits do something – light up, buzz, move...

Learn more about your Bits in the **BIT INDEX ON PG 06**

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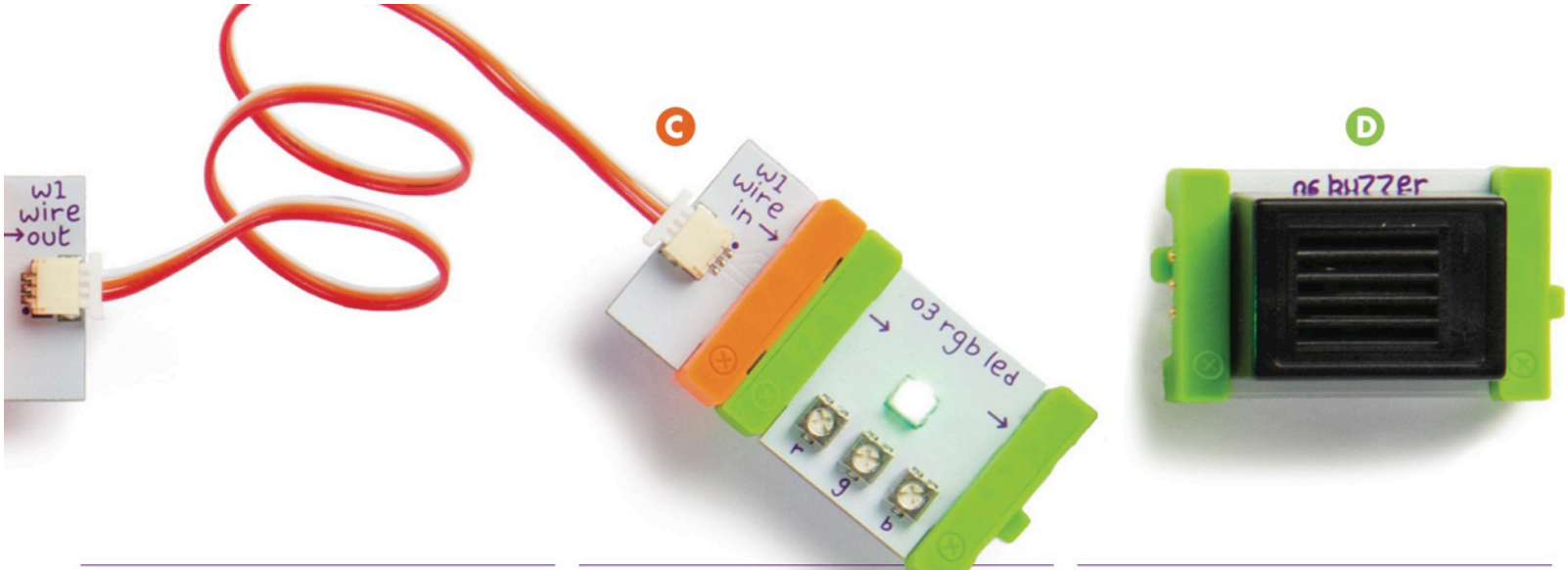


3 MAGNET MAGIC!

Bits snap together with magnets. The magnets are always right – you can't snap them together the wrong way.

ARROWS SHOULD POINT IN THE SAME DIRECTION

IF THE BITS WON'T SNAP TOGETHER, TRY SPINNING ONE AROUND AND MAKE SURE THE ARROWS POINT IN THE SAME DIRECTION

4 ORDER IS IMPORTANT

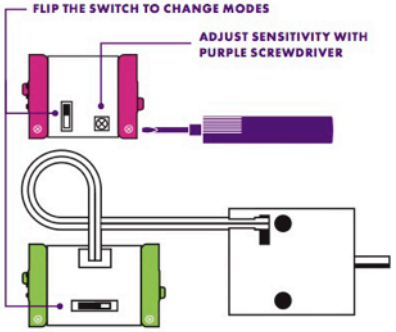
POWER BITS always come first and **INPUT BITS** only affect the **OUTPUT BITS** that come after them.

WITH NO OUTPUT BIT AFTER IT, THE INPUT BIT HAS NOWHERE TO SEND ITS SIGNAL

THE INPUT BIT AFFECTS THE OUTPUT BITS THAT FOLLOW

5 SOME BITS ARE ADJUSTABLE

Switches, buttons, and dials on the board allow you to change how the Bit functions.



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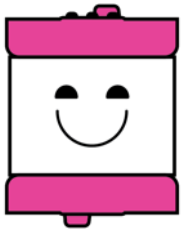
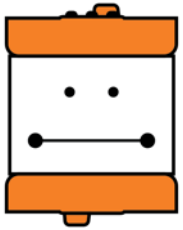
Types of Bits

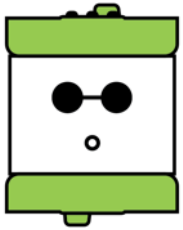
Power Bits. They are responsible for supplying power to the circuit.



Input Bits. Essentially they are the controller.

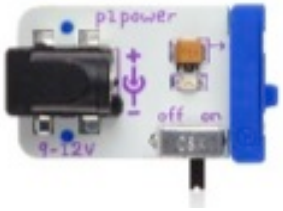
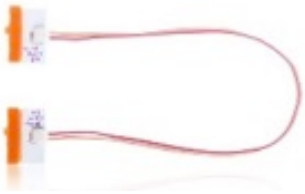


Wire Bits. These are the Bits to link input and output Bits together.



Output Bits. Component that turns electrical energy to another type.

Function of Bits

	Name: Power Bit Function: To supply electricity from battery to electrical circuit		Name: Wire Bit Function: To connect bits up when they are located elsewhere.
	Name: Pulse Bit Function: Allows the later Bits to turn on and off at a steady tempo.		Name: Button Bit Function: To allow or disallow power through to next block.

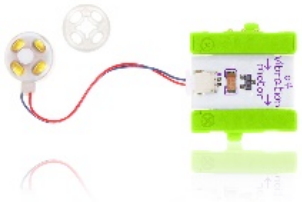
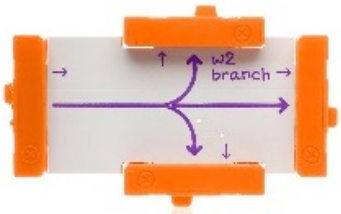
Function of Bits

	Name: Slide Dimmer Bit Function: To control how much power are allowed to pass to next building block.		Name: Long LED Bit Function: The long white wire will carry current from the Bit to the LED causing the LED to turn on.
	Name: Battery and Wire Function: To store and deliver electrical energy		Name: Buzzer Bit Function: Bzzz! The buzzer Bit makes a sound no one can ignore. Just like an alarm clock!

Function of Bits

	Name: Motor Bit Function: To convert electrical energy to rotational motion (Kinetic Energy)		Name: Sound Sensor Function: the current strength can be adjusted based on the sound of the environment.
	Name: Latch Bit Function: Converts a push button switch to a toggle switch.		Name: Light Sensor Function: the current strength can be adjusted based on the brightness of the environment.

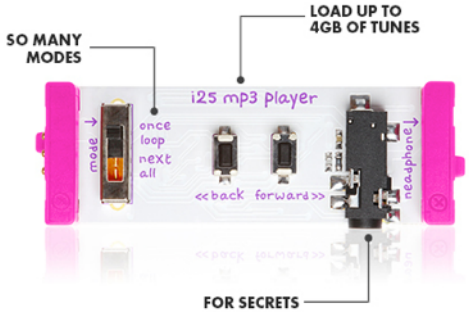
Function of Bits

	Name: Vibration Motor Bit Function: The vibration motor is very similar to the device that makes your cellphone shake when you get a text.		Name : Fan Bit Function: Use the fan to create a gentle breeze, perfect for cooling things off or blowing bubbles.
	Name: Branch Bit Function: it lets you connect the output of a single Bit to as many as 3 others, oriented in different directions.		Name: Servo Motor Bit Function: The servo is a controllable motor that can swing back and forth or be turned to a specific position.

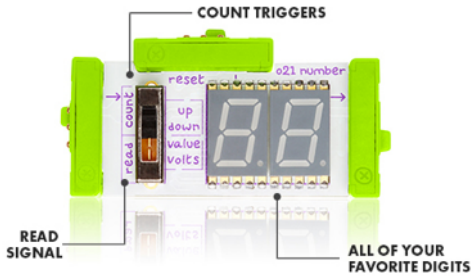
littleBits Smart Home Kit

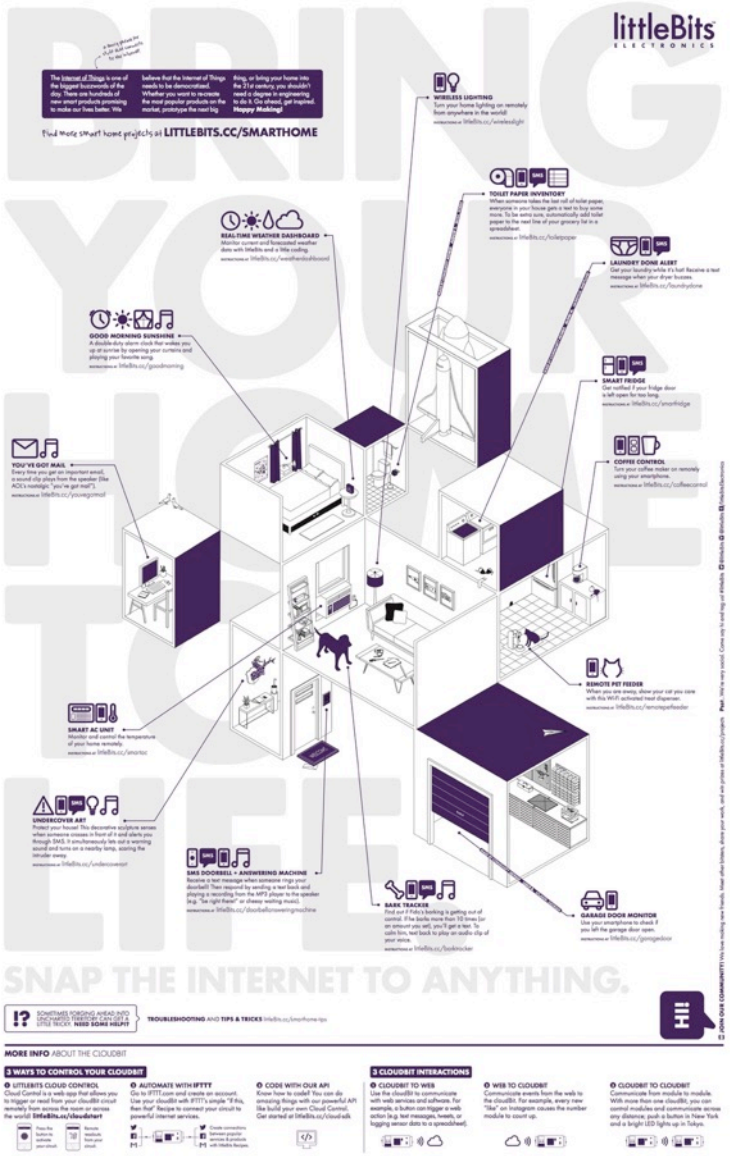
AC & IR

MP3 PLAYER



NUMBER





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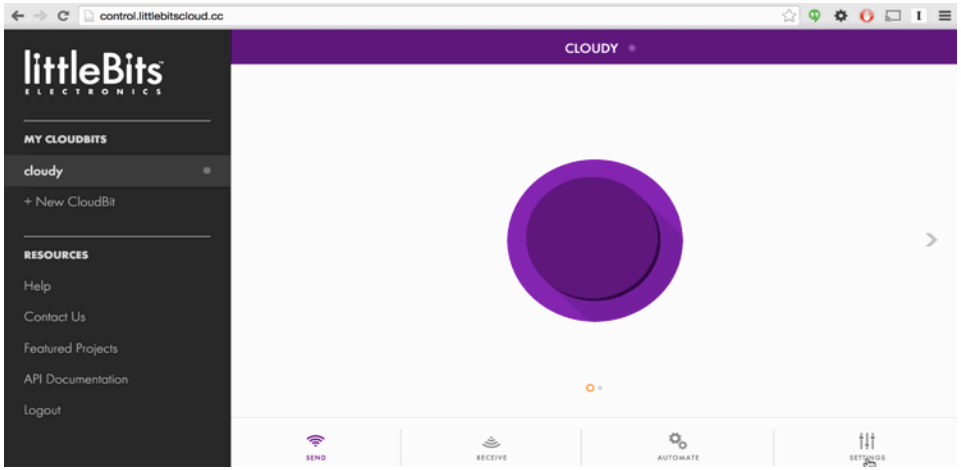
littleBits Cloud Control Platform

http://control.littlebitscloud.cc/

Cloud Control App



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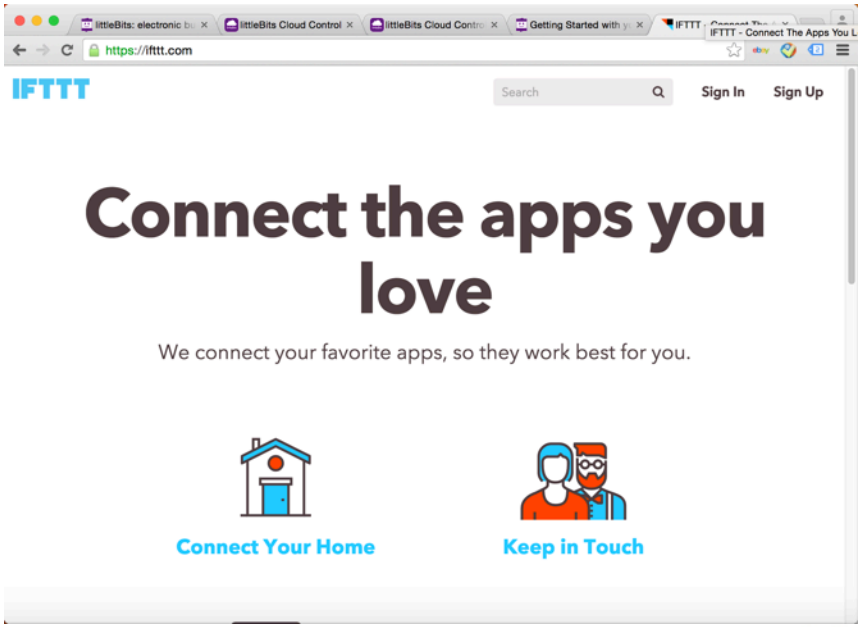
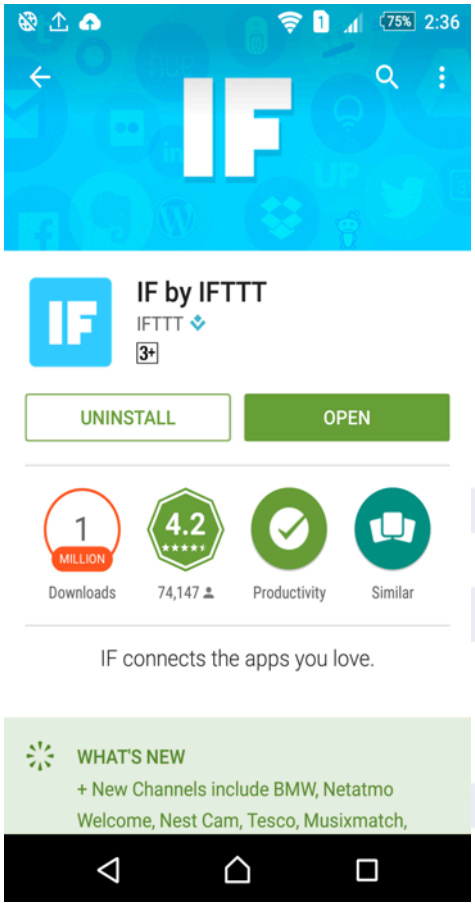
IFTTT App
(for Android phone only)

IFTTT Website: https://ifttt.com/





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littleBits IR Transmitter

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IR Power Plug

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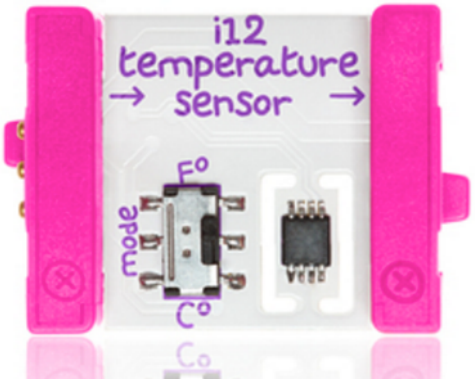
littleBits Sensors



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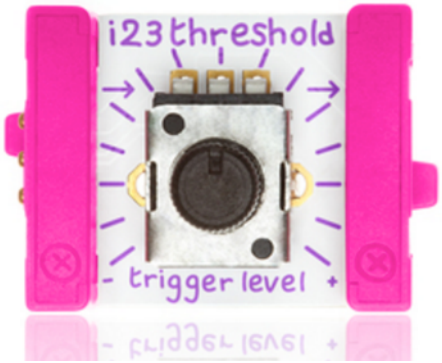
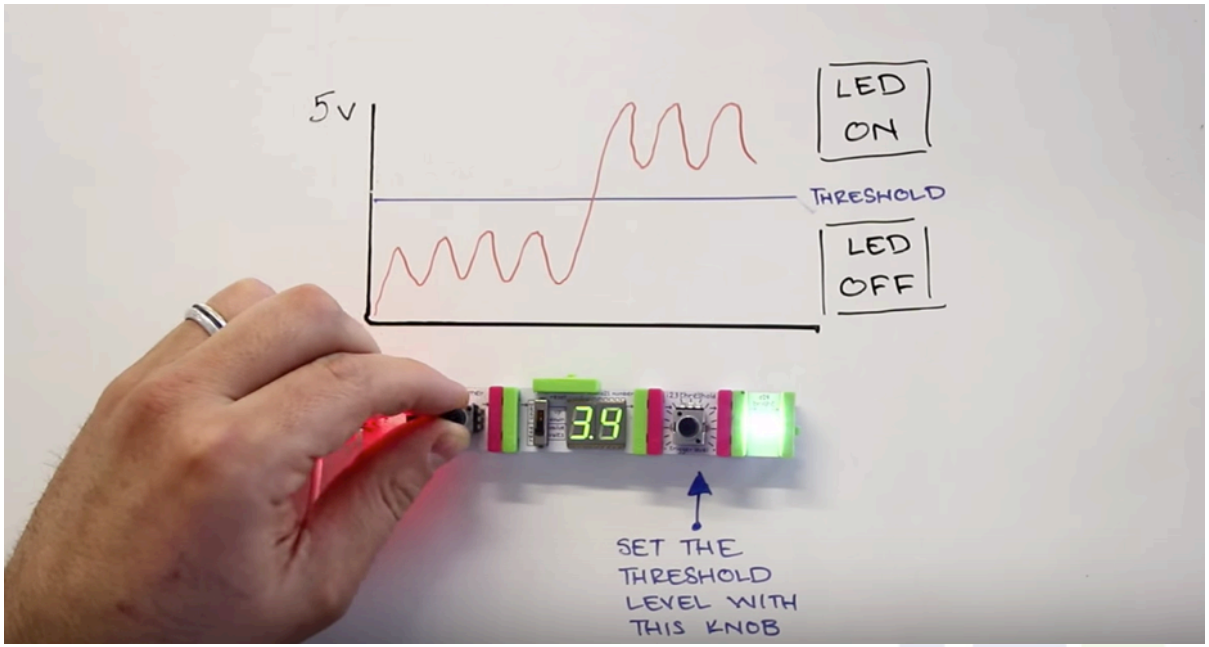
Threshold





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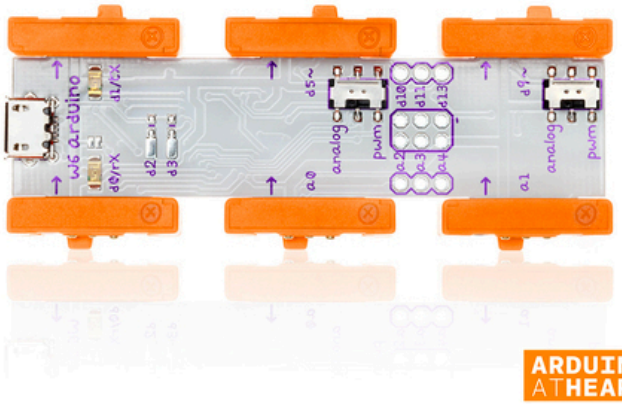
littleBits Arduino Coding Kit



- Eliminate the complexity of prototyping using electronic components and breadboards.
- Support both Arduino C and Scratch Programming

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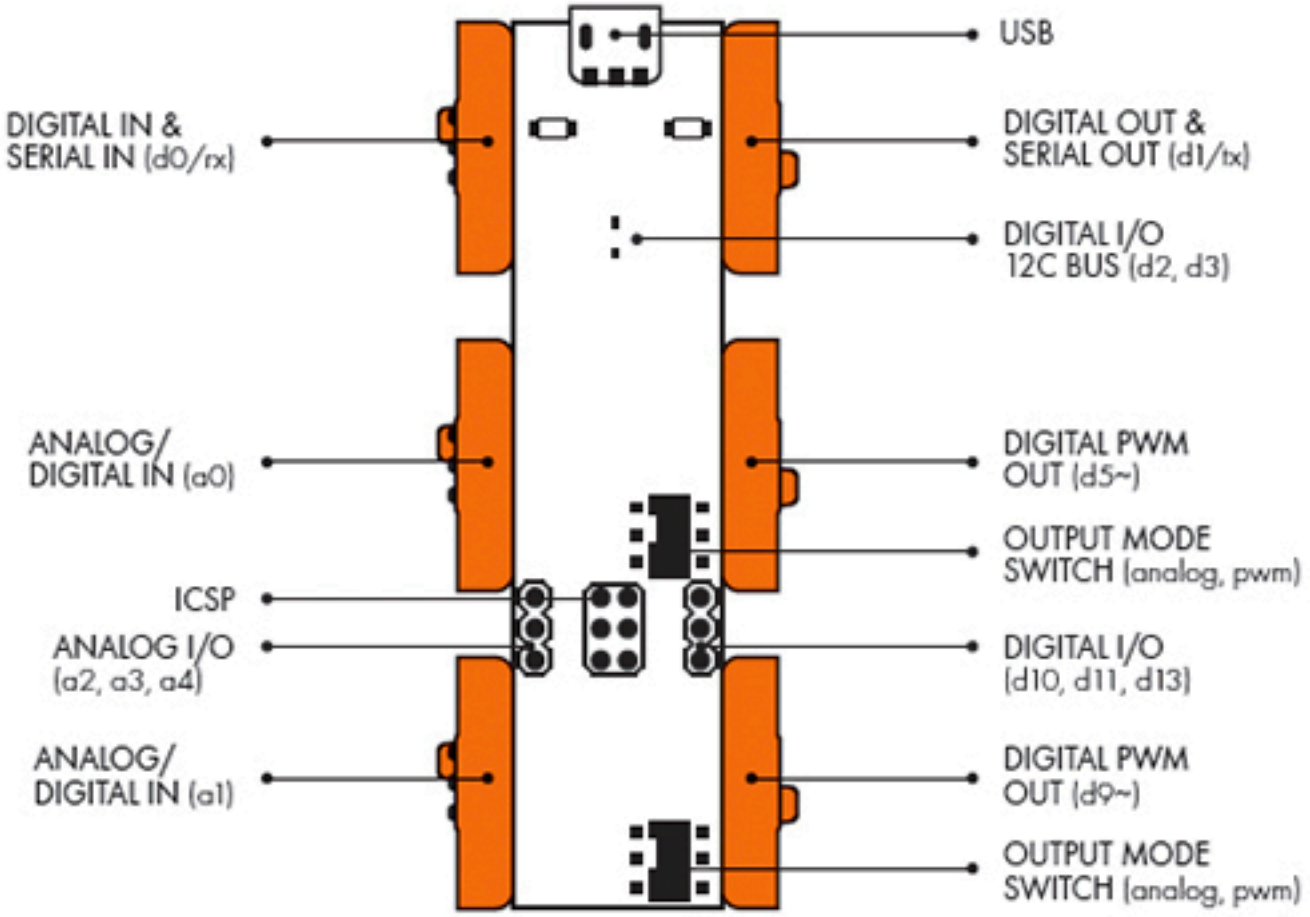

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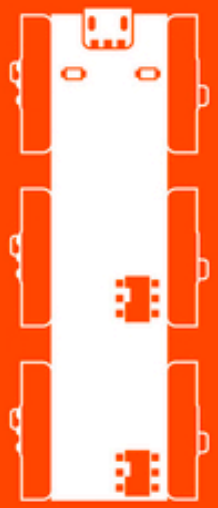
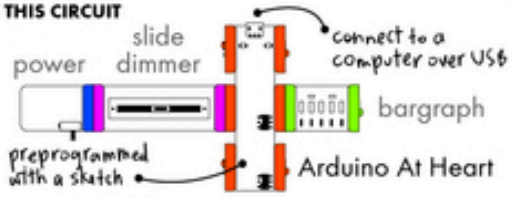


w6

ARDUINO ARDUINO ATHEART

The Arduino At Heart™ module allows you to easily incorporate computer programming into your littleBits circuits. It is built upon the Arduino™ programming environment. If you're new to programming microcontrollers, littleBits takes care of the electronics so you can focus on coding. All of the resources available for the Arduino community, including community support, can be utilized with this module. There are three inputs and three outputs so you can program advanced hardware interactions or communicate with software. You're only limited by your imagination! Get started with 10 sample sketches at littleBits.cc/Bits/arduino-atheart.

TRY THIS CIRCUIT



① Start with a blue power module and turn it on.

② Connect the slide dimmer to pin a0 and the bargraph to pin d5.

③ Move the slide dimmer to change the speed of fading.

COLOR CODE

Power - blue
Input - pink
Output - green
Wire - orange

You always need a **blue** and a **green**; **pink** and **orange** are optional, in between.

MORE INFO littleBits.cc/Bits/arduino-atheart Ages 14 to ∞

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