

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

HONG KONG PRODUCT DESIGN MAKEATHON 2017-2018 全港中小學產品設計大賽2017-2018



簡介：
本大賽為了提升學生對產品設計的興趣，鼓勵創意設計，展示學生在科學、科技、工程、數學等方面的學習成果。學生由概念圖開始到原型整合製作都全程負責，透過比賽學生有機會把想法帶到現實中實現，啟發學生的創意及設計才能。

比賽目的：

- 利用STEM知識應用於解決日常生活中遇到的難題
- 提升同學對產品設計的興趣

參賽資格：

- 全港中小學校學生
- 比賽將分為小學組及中學組

比賽題目：

- 智能家居、穿戴科技、衛生保健或復康產品

比賽日程：

- 2017年9月至2018年5月

活動簡介會：

- 2017年9月23日 地點：理工大學Z205室
時間：下午2時至4時

評審安排及獎品：

- 詳情請參閱官方網站

官方網頁：

- <http://www.ise.polyu.edu.hk/html/product-design-makeathon-2017/>

報名查詢熱線：31608443

主辦機構



THE HONG KONG
POLYTECHNIC UNIVERSITY
香港理工大學

DEPARTMENT OF INDUSTRIAL AND SYSTEMS ENGINEERING
工業及系統工程學系

協辦機構



DTSL

贊助機構

littleBits

brother.
at your side



TINKERINE™

支持機構（排名不分先後）

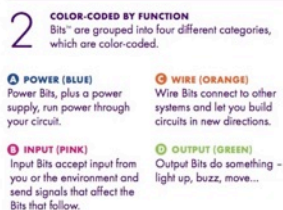
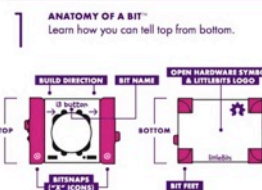
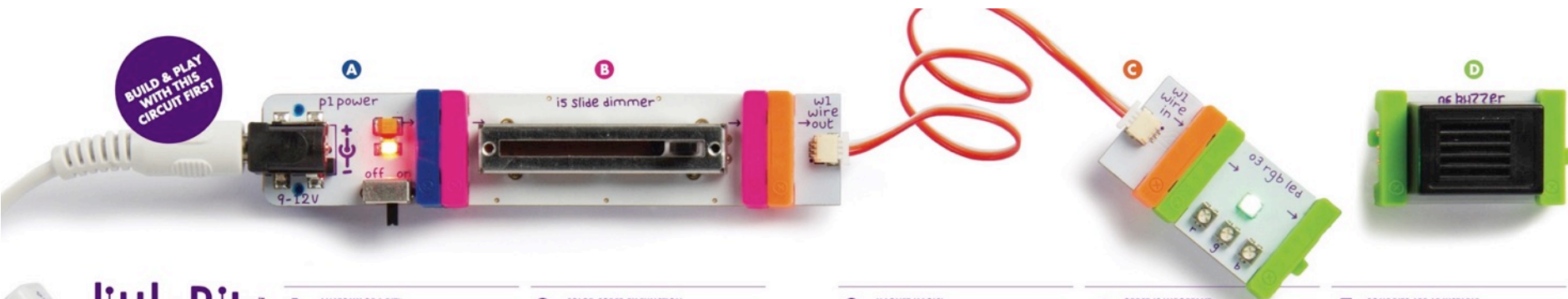


資訊科技教育領袖協會
Association of I.T. Leaders in Education

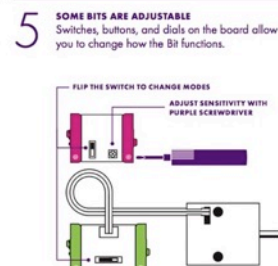
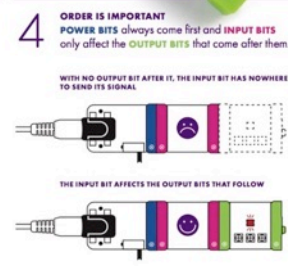
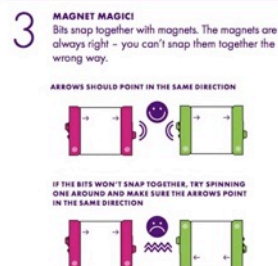


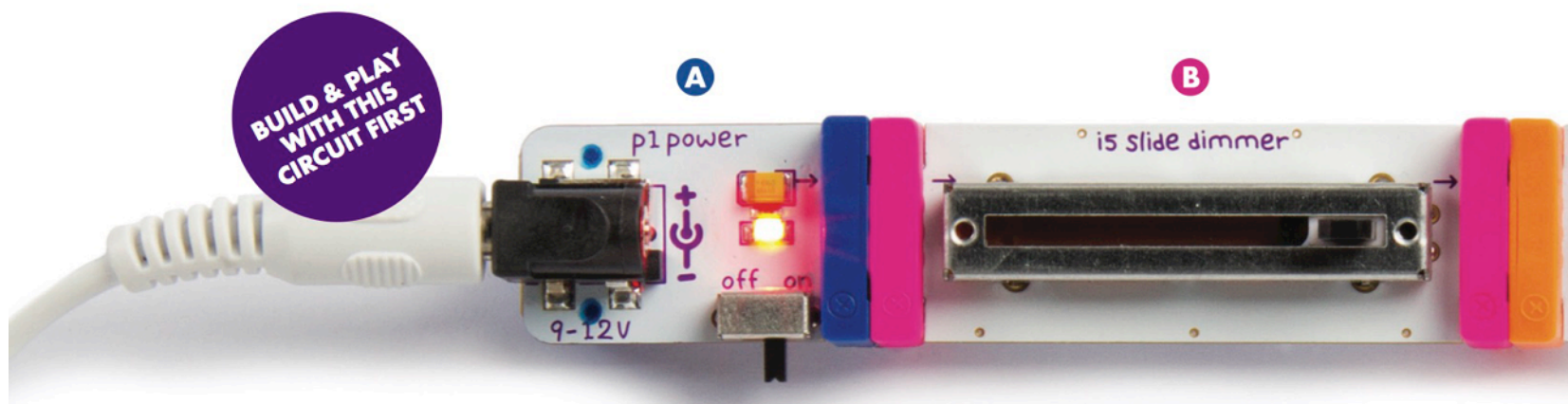
香港電腦教育學會
The Hong Kong Association
for Computer Education

littleBits Basics

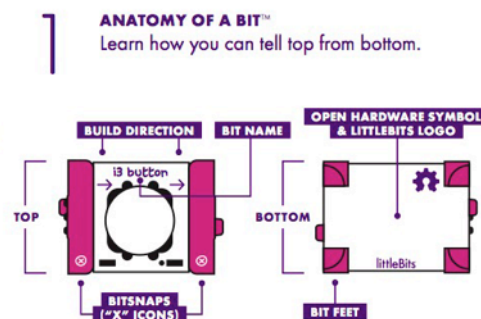


Learn more about your Bits in the **BIT INDEX ON PG 06**





littleBits™ BASICS



2 COLOR-CODED BY FUNCTION
Bits™ are grouped into four different categories, which are color-coded.

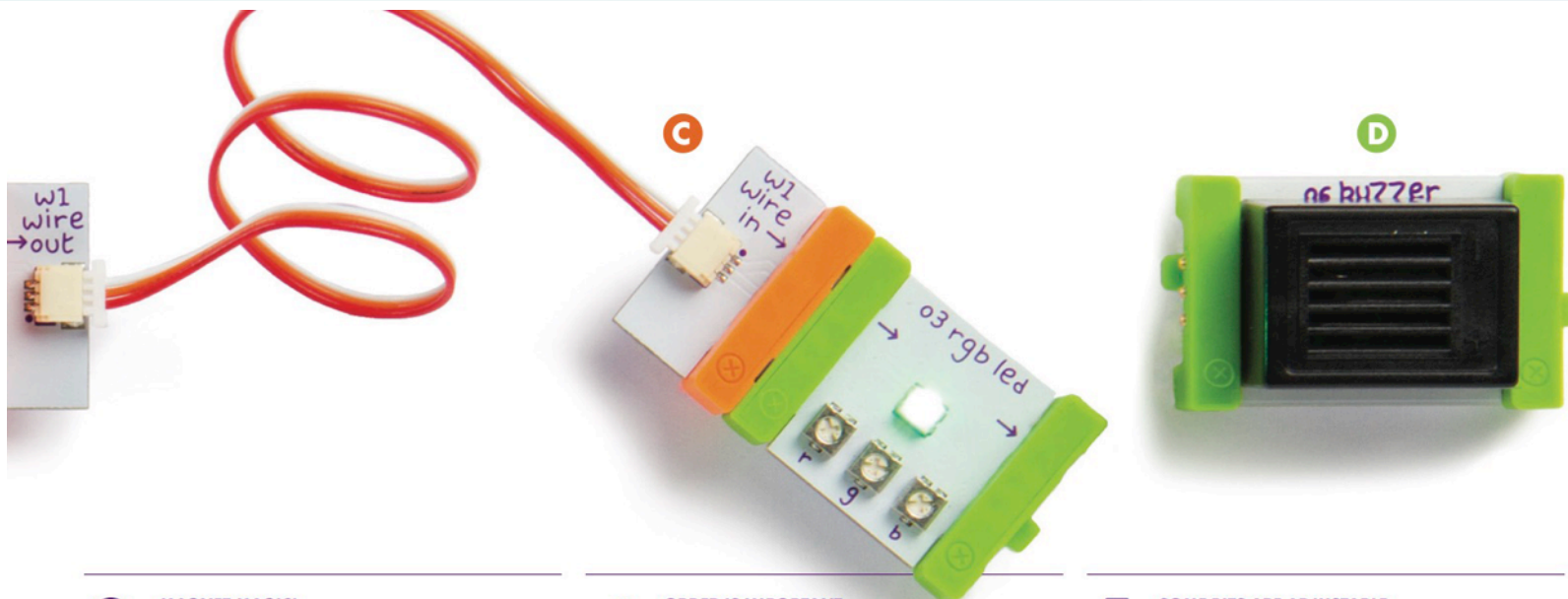
A POWER (BLUE)
Power Bits, plus a power supply, run power through your circuit.

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

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

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

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



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



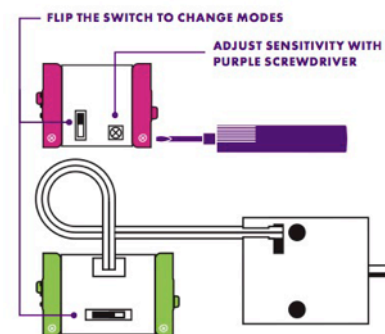
THE INPUT BIT AFFECTS THE OUTPUT BITS THAT FOLLOW



5

SOME BITS ARE ADJUSTABLE

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



5

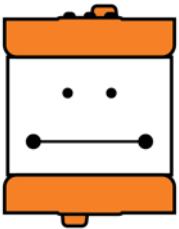
Types of Bits



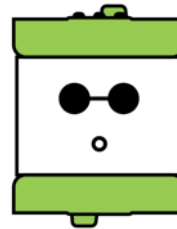
Power Bits. They are responsible for supplying power to the circuit.



Input Bits. Essentially they are the controller.

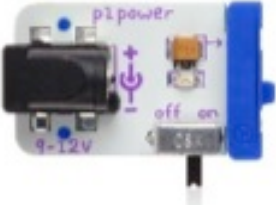
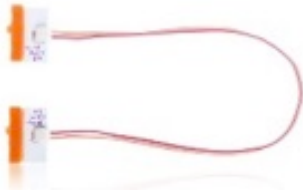




Wire Bits. These are the Bits to link input and output Bits together.







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





Function of Bits

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

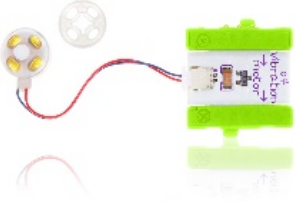

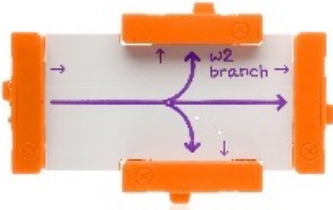

Function of Bits

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

Function of Bits

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

Function of Bits

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

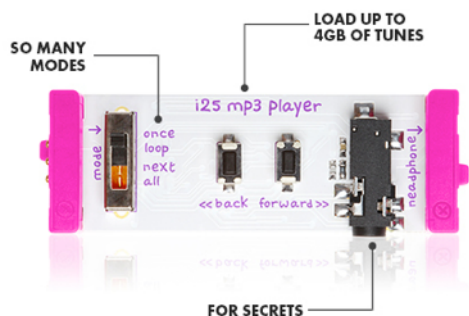
littleBits Smart Home Kit



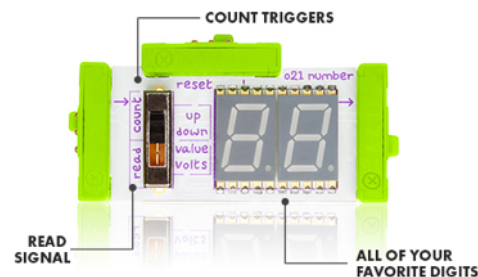
AC & IR



MP3 PLAYER



NUMBER



littleBits
ELECTRONICS

BRING YOUR HOME TO LIFE

THE INTERNET OF THINGS IS ONE OF THE BIGGEST TRENDS OF THE YEAR. THERE ARE THOUSANDS OF NEW SMART PRODUCTS PROMISING TO MAKE OUR HOMES "SMARTER".

Before that, the Internet of Things needs to be demonstrated. Whether you want to automate the most prosaic products or the most powerful, you need to get started. Here's how!

Find More Smart Home Projects at LITTLEBITS.CC/SMARTHOME

WIRELESS LIGHTING
Turn your home lighting on remotely from anywhere in the world.
littlebits.cc/wirelesslight

TOILET PAPER INVENTORY
When someone enters the bathroom, the toilet paper inventory is updated. It's a great way to keep track of your toilet paper supply.
littlebits.cc/toiletpaper

LAUNDRY DONE ALERT
Get your laundry when it's done. Receive a text message when your dryer finishes.
littlebits.cc/laundrydone

SMART THERMO
Get notified if your fridge door is left open for too long.
littlebits.cc/smartthermo

COFFEE CONTROL
Turn your coffee maker on remotely using your smartphone.
littlebits.cc/coffeecontrol

REMOTE PET FEEDER
When you are away, show your cat you care with this WiFi-enabled feed dispenser.
littlebits.cc/remotepetfeeder

SMART AC UNIT
Monitor and control the temperature of your home remotely.
littlebits.cc/smartac

UNDERCOVER ART
Protect your house. This decorative module senses when someone enters a room and alerts you through email. It's a convenient way to keep your home safe.
littlebits.cc/undercoverart

SMS DOORBELL + ANSWERING MACHINE
Receive text messages when someone rings your doorbell. Then respond by sending a text back and playing a recording from the MP3 player in the speaker. (eg. "Go right back" or "Always waiting music").
littlebits.cc/smsdoorbell

BAKE TRACKER
Get notified when your cake is ready to eat. The module sends you a text when the cake is done. You can also use it to track other things.
littlebits.cc/baketracker

GARAGE DOOR MONITOR
Get your smartphone to alert if you left the garage door open.
littlebits.cc/garagedoor

YOU'VE GOT MAIL
Every time you get an important email, a cloud of light from the speaker plays AOL's message, "you've got mail".
littlebits.cc/youvegotmail

REAL-TIME WEATHER DASHBOARD
Monitor current and forecasted weather data with littleBits and a WiFi module.
littlebits.cc/realtimeweather

SMART HOME MONITORING
A double-duty alarm clock that wakes you up or sends you a text message when your sensors and playing your favorite song.
littlebits.cc/smarthomemonitoring

SNAP THE INTERNET TO ANYTHING.

! ? SOMETIMES ORIGINAL IDEAS AND TECHNIQUES ARE NEEDED TO GET THE MOST OUT OF YOUR SMART HOME. NEED SOME HELP?

TROUBLESHOOTING AND TIPS & TRICKS littlebits.cc/smarthome

MORE INFO ABOUT THE CLOUDBIT

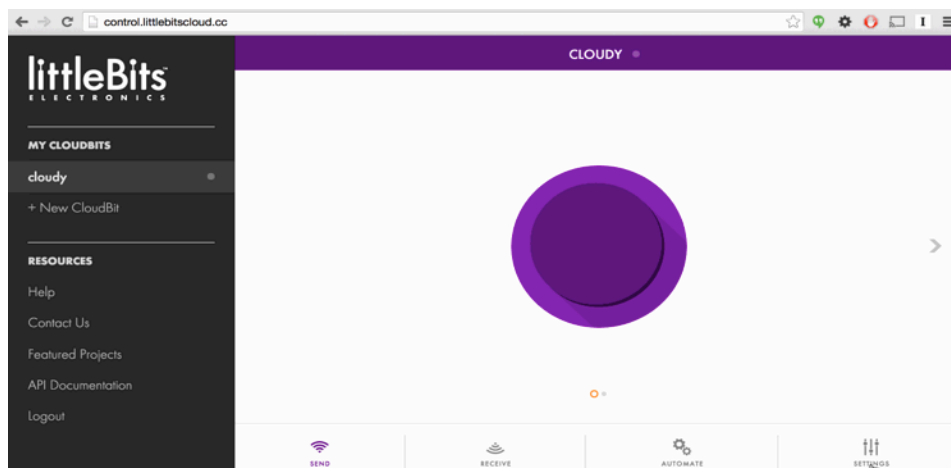
5 WAYS TO CONTROL YOUR CLOUDBIT

- 1. CLOUDBIT CLOUD CONTROL**
Cloud Control is a web app that allows you to trigger or send your cloudbit control remotely from across the globe or across the world. littlebits.cc/cloudbit
- 2. AUTOMATE WITH IFTTT**
Go to IFTTT.com and create an account. Use your cloudbit with IFTTT's simple "If this, then that" Recipe to connect your cloudbit to powerful internet services.
- 3. CODE WITH OUR API**
Know how to code? You can do amazing things with our powerful API. (We build your own Cloud Control. Get started at littlebits.cc/cloudbit.)
- 4. CLOUDBIT INTERACTIONS**
Use the cloudbit to communicate with web services and software. For example, a button can trigger a web service to log messages, tweets, or logging sensor data to a spreadsheet.
- 5. WEB TO CLOUDBIT**
Communicate events from the web to the cloudbit. For example, when "like" on Instagram causes the number module to start up.
- 6. CLOUDBIT TO CLOUDBIT**
Communicate events from module to module. With more than one cloudbit, you can control modules and communicate across any distance, push a button in New York and a light LED lights up in Tokyo.

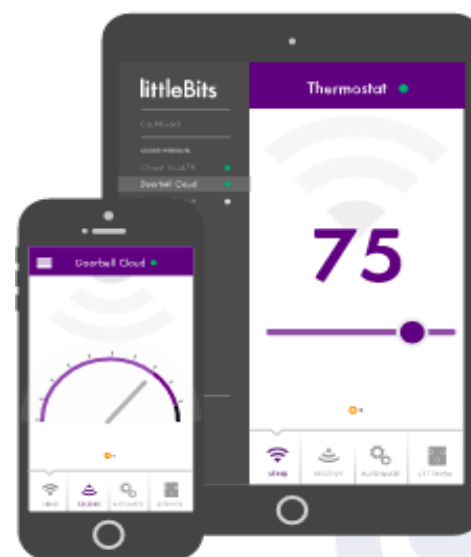
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littleBits Cloud Control Platform

<http://control.littlebitscloud.cc/>



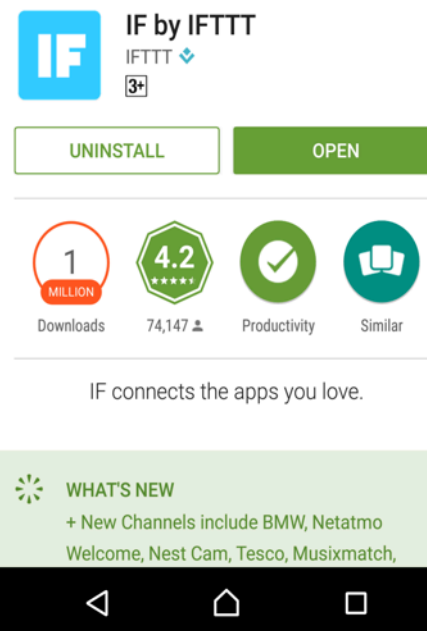
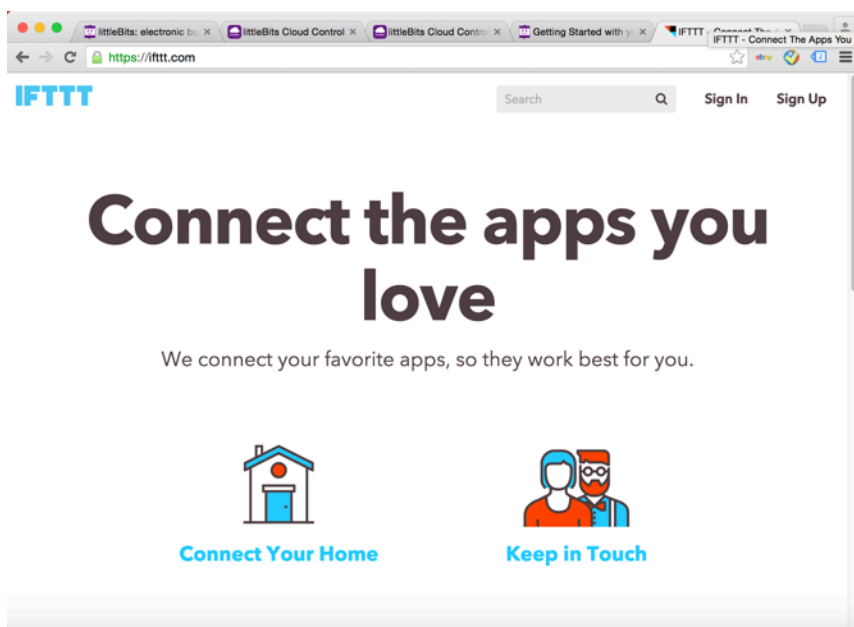
Cloud Control App





IFTTT App (for Android phone only)

IFTTT Website: <https://ifttt.com/>



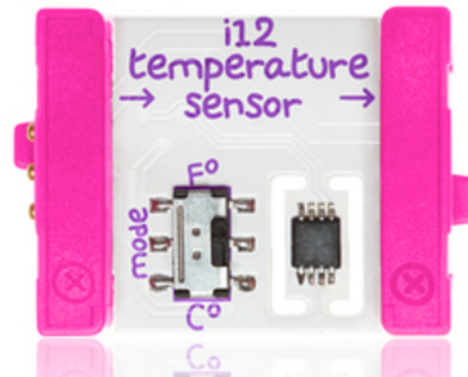
littleBits IR Transmitter



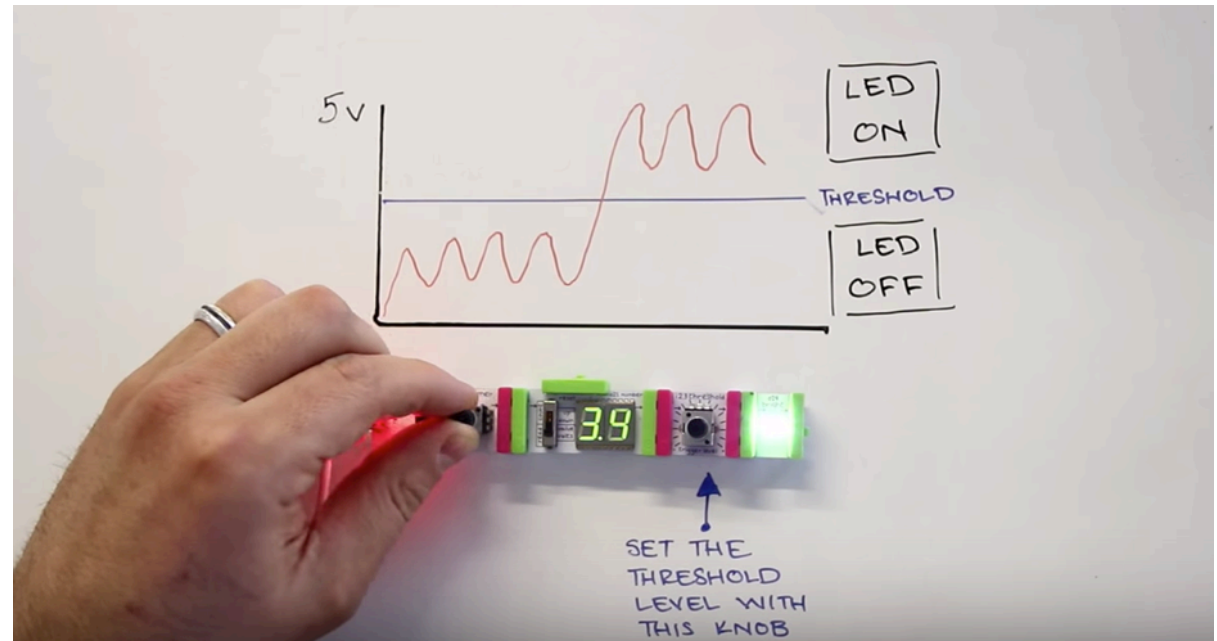
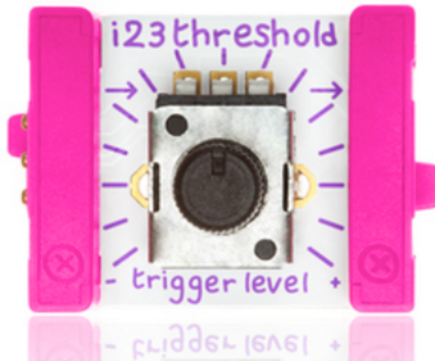
IR Power Plug



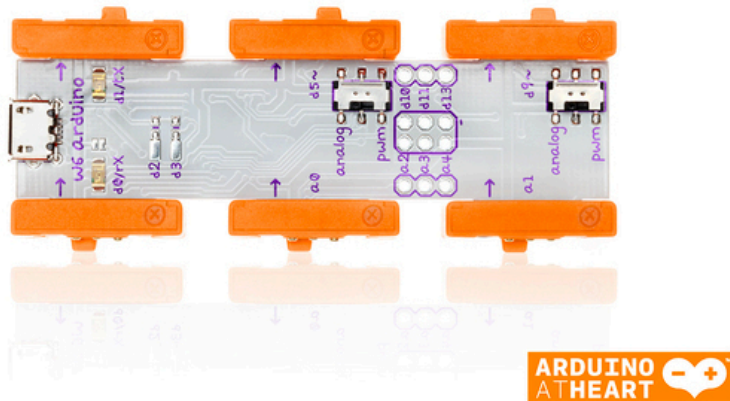
littleBits Sensors



Threshold

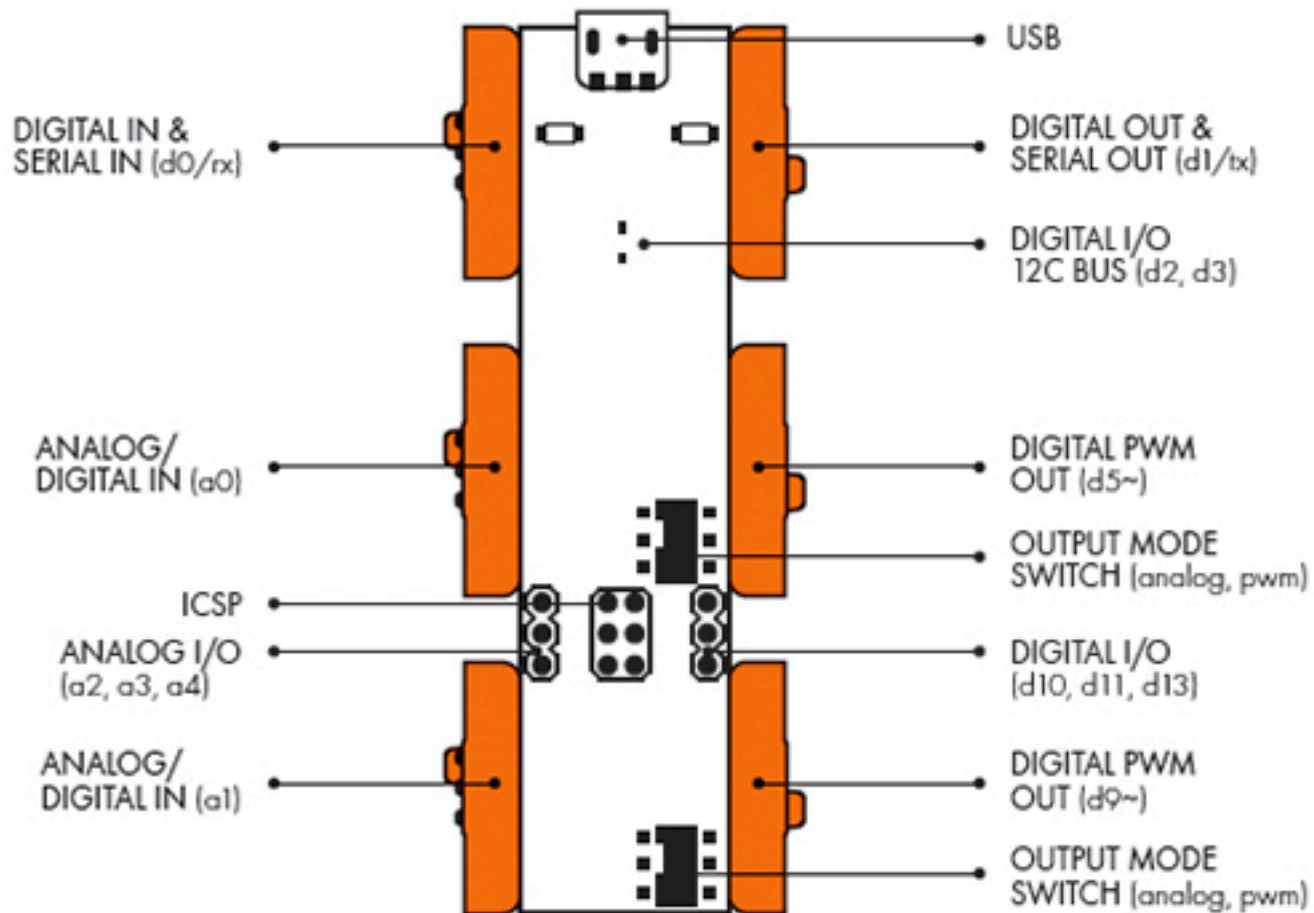


littleBits Arduino Coding Kit

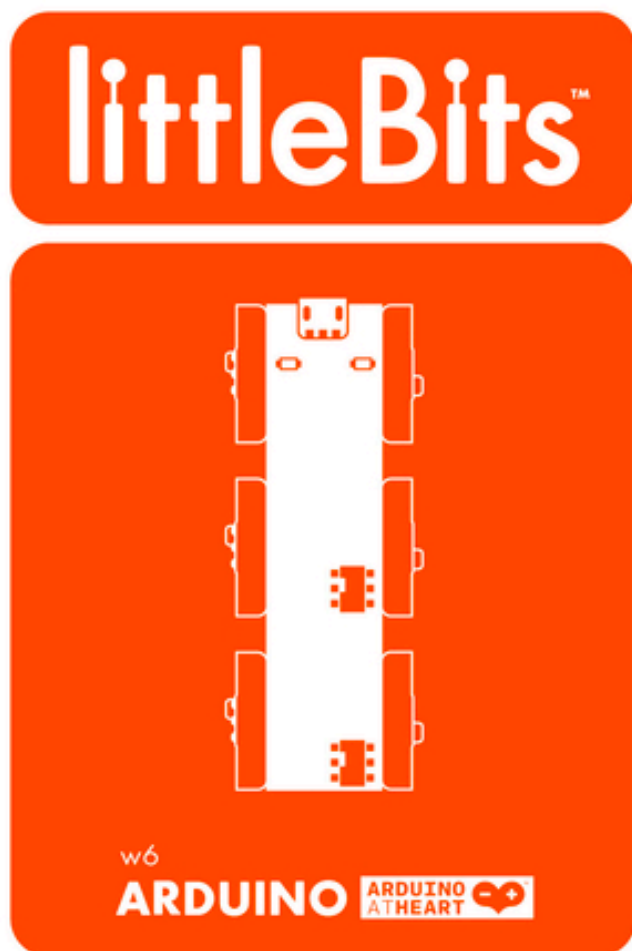


- Eliminate the complexity of prototyping using electronic components and breadboards.
- Support both Arduino C and Scratch Programming

littleBits Arduino Coding Kit

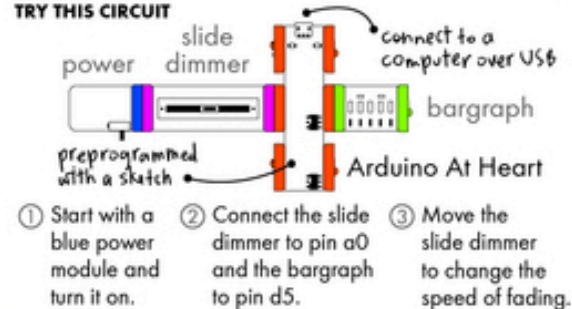


littleBits Arduino Coding Kit



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



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 ∞