Hong Kong Product Design Makeathon 2017-2018

全港中小學產品設 計大賽2017-2018

第七場工作坊 25 Nov 2017





What is Arduino?

- Open-source prototyping platform
- Building digital devices and interactive objects that sense, control physical devices
- Hardware: Arduino I/O board (microcontroller)
- Software: Arduino IDE (Integrated Development Environment)
- Able to read inputs sensors, button etc. and turn it into outputs - activating a motor, turning on an LED
- Can run independently or communicate with computer









How it works?





Arduino Leonardo

Structure of the board



Set up IDE

https://www.arduino.cc/en/Main/Software

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Home Buy Download	d Products 🖵 Learning 🖵 Forum Support 🖵 I	Blog LOG IN SIGN UP
DOWNLOAD		ENGLISH
	ARDUINO 1.6.10 The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and based on Processing and other open- source software. This software can be used with any Arduino board. Refer to the Getting Started page for installation instructions.	Windows Installer Windows ZIP file for non admin install Mac OS X 10.7 Lion or newer Linux 32 bits Linux 64 bits Linux ARM (experimental) Release Notes Source Code Checksums

Choose the correct Arduino board setting & Serial Port

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		Arduino Mega ADK Arduino Leonardo Arduino/Genuino Micro	ו	int programPort2 int programSet1 =	<pre>A6; //set program 0; //variable to n</pre>	m flow jumper read jumper l	2 port setting	
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Let's get started !

Example 1 (LED Blinking)









Power & Battery at a0 pin Bargraph at d5 pin

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Understanding the code

Example 2 (Fading LED)





Power & Battery & Slide Dimmer at a0 pin Bargraph at d5 pin

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Understanding the code

```
Int ledPin = 5; // Declare that LED is at Pin D5
void setup(){
}
         // nothing happens in setup
void loop(){
     // This will act as the inhale for the PWM value starting from zero to a max value of 255
 for(int fadeValue = 0; fadeValue <= 255; fadeValue ++){</pre>
    analogWrite(ledPin, fadeValue);
    delay( (1034 - analogRead(A0)) / 10 ); // wait for a moment before moving forward
     // This will act as the exhale for the PWM value starting from 255 to a min value of 0
 for(int fadeValue = 255; fadeValue >= 0; fadeValue --){
    analogWrite(ledPin, fadeValue);
    delay( (1034 - analogRead(A0)) / 10 ); // wait for a moment before moving forward
    }
```

Using Scratch Coding for littleBits Arduino

Download Scratch 2 Offline version

 Go to <u>https://scratch.mit.edu/scratch2download/</u> to download Scratch 2.0 offline version

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Upload the Arduino program to the Arduino board

Check the port & board on "Tools"

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		P.
littleBits_Scratch2		
<pre>const int maxNumReadings = 3;</pre>		^
<pre>int smoothingValues[sensorChannels][maxNumReadings]; int smoothingIndex[sensorChannels]; int smoothingTotal[sensorChannels];</pre>		- 1
int averageA1; int averageA0;		
<pre>int mlUltValor[3];</pre>		
<pre>void setup() {</pre>		
// Set the Serial baud rate to 38400 <mark>Serial.begin(38400);</mark>		
<pre>// Set up digital pins 1, 5, and 9 as outputs pinMode(1, OUTPUT); pinMode(5, OUTPUT); pinMode(9, OUTPUT);</pre>		
mlWltValor[0]=-1; mlWltValor[1]=-1-		~
Compiling sketch		
22		Arduino Leonardo on COM7

Download Java runtime

https://java.com/zh_TW/download/



Select the right port to connect the Arduino with scratch



Press "shift" & click "File" to choose the last option



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Stage 1 backdrop			
New backdrop:			

Green light indicate the connection being successful

We can now use the littleBits blocks for our functions

Example 3 (LED Blinking)









Power & Battery at a0 pin Bargraph at d5 pin

Set the program







Forever:

the function will keep repeating

analogWrite d5 100: Set pin d5(LED) to the brightness of 100

Wait 1 secs: hold the previous state for 1 second

analogWrite d5 0: Set LED to 0 brightness(turn off)