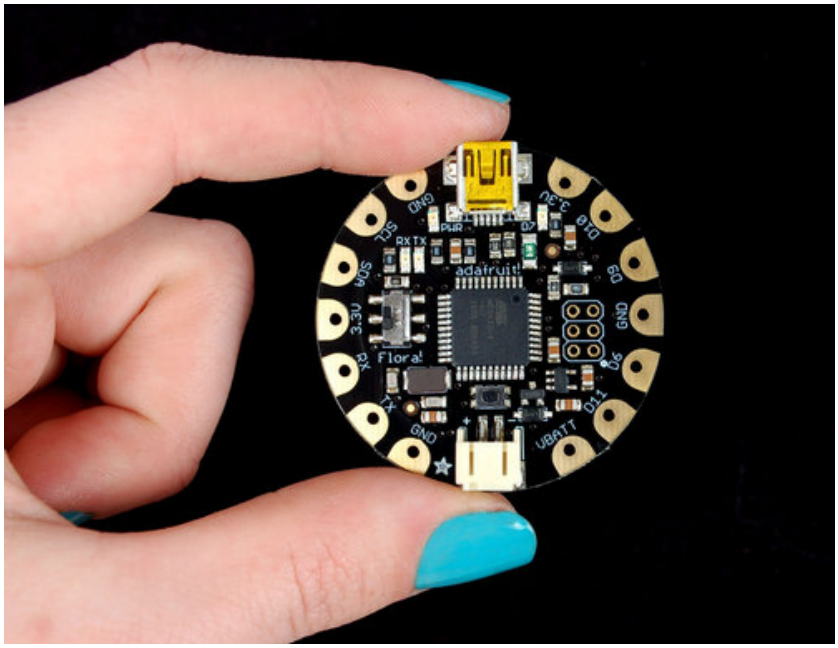
adafruit learning system

Getting Started with FLORA

Created by Becky Stern



Last updated on 2013-08-06 04:31:10 PM EDT

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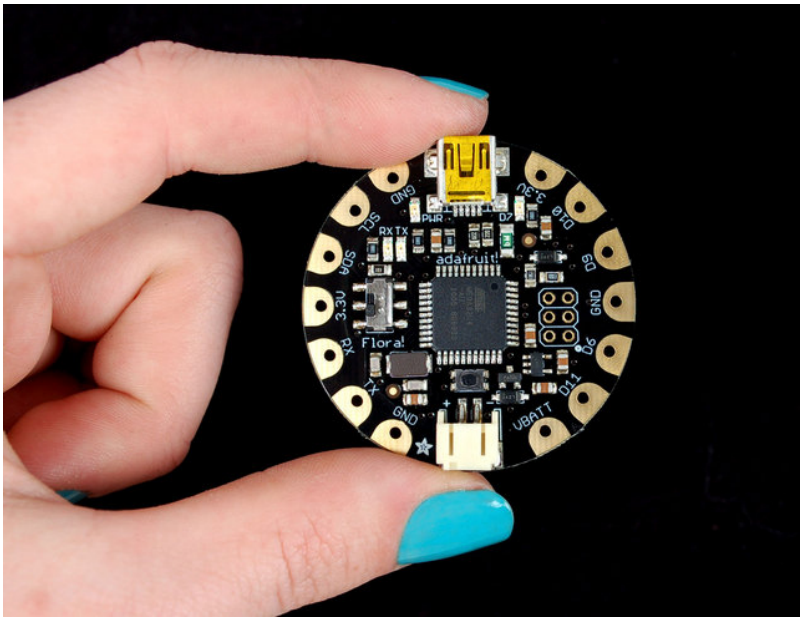
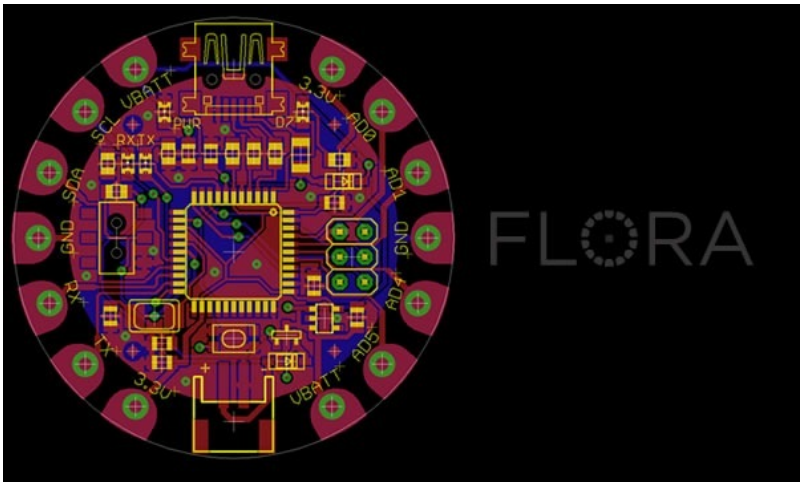
Overview



FLORA is Adafruit's wearable electronics platform. We designed it from the ground up to provide the best experience for Adafruit's community of makers, hackers, crafters, artists, designers and engineers. It's built around the Atmega32u4 chip, which has built-in USB support. No pesky special cables or extra parts for programming, just plug it in and get started making the wearables project of your dreams! Works on Windows and Mac.

The FLORA is extremely beginner-friendly-- it is difficult to destroy the FLORA by connecting a battery backwards due to polarized connector and protection diodes. The onboard regulator means that even connecting a 9V battery will not result in damage or tears.

This guide is the first step in using FLORA, plugging it in and programming it to blink its onboard LED! After that you can move on to our Flora RGB Smart Pixels tutorial (http://adafru.it/aRT) and/or Flora GPS tutorial (http://adafru.it/aRP).



Adafruit created the FLORA from scratch after many months of research and we really think we came up with something that will empower some amazing wearable projects.

The FLORA is small (1.75" diameter). We wanted the smallest possible board for our wearable platform. It's based on our experiences shipping our own, shipping, customer-tested Atmega32u4 (http://adafru.it/296) Breakout Board (http://adafru.it/296).

FLORA has a small but easy to use onboard reset button to reboot the system. The power supply is deigned to be flexible and easy to use. There is an onboard polarized 2 JST battery connector with protection schottky diode for use with external battery packs from 3.5v to 16v DC in. Can be used with LiIon/LiPoly, LiFe, alkaline or rechargeable NiMh/NiCad batteries of any size.
The FLORA does **not** have a LiPo charger included by design, this allows safe use with multiple battery types and reduces risk of fire as it is not recommended to charge these batteries on fabric.

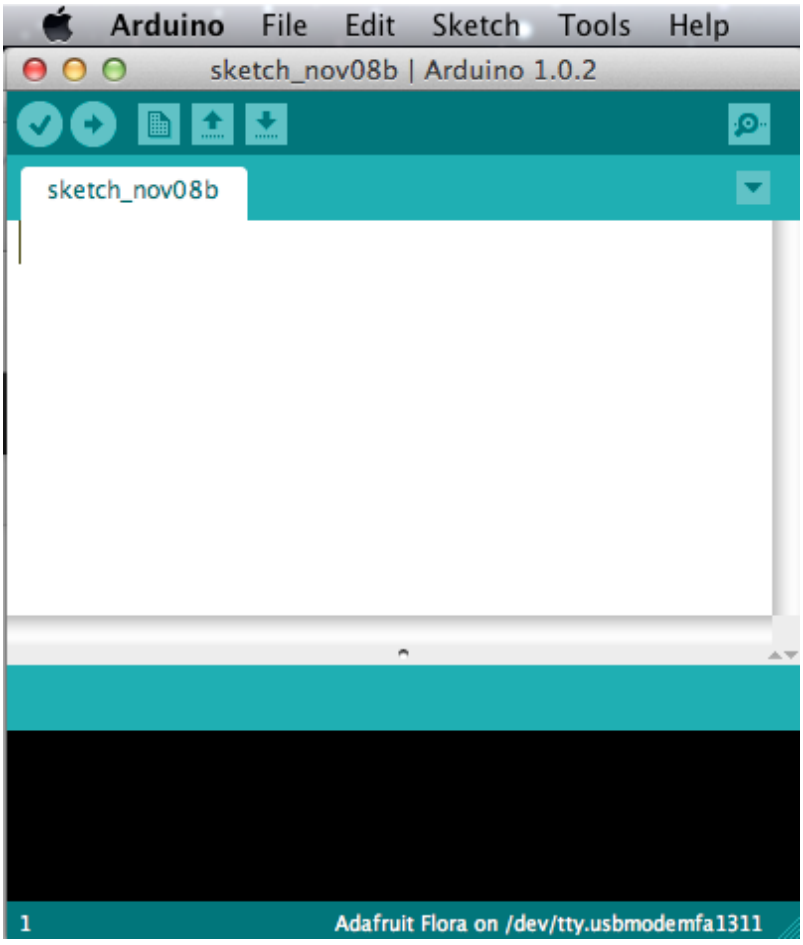
FLORA has built-in USB support. Built in USB means you plug it in to program it, it just shows up. No additional purchases are needed! Works with Mac, Windows, Linux, any USB cable works great. Currently the PCB comes with a mini B connector but future versions may change to microUSB.
The FLORA has USB HID support, so it can act like a mouse, keyboard, MIDI, etc. to attach directly to cellphones.

Download software

To start, please download our version of the Arduino IDE that's been updated to include the Flora drivers, libraries & code examples! We have versions for Windows and Mac OS X.

For Windows, click here to download, (http://adafru.it/aRZ)then unzip and drag the Flora 1.02 folder onto your desktop (or whereever you wish to keep it).

For Mac, click here to download (http://adafru.it/aS0) then unzip. Move the application to your Applications folder.



Install Drivers! (Windows Only)

Mac users, you can skip to the next part of the tutorial - you don't need to install any drivers!

For Windows users, you'll need to install the drivers for the Flora. Begin by plugging in the Flora board. Look for a green power LED (left of the mini USB jack) and a pulsing red LED (right of the mini USB jack).

WinXP users, skip down past these few photos, you should get a popup asking you for a driver location, just browse to it as shown.

Windows 8

If you have Windows 8, you'll have to enable installation of (http://adafru.it/c1t)**unsigned (http://adafru.it/c1t)** drivers, check out this document from microsoft on how to do it (http://adafru.it/c1t) In order to get the drivers working in Windows 8 (as Device Manager is NOT an option) is to Disable Driver Signature Enforcement.

First, right-click on the downloaded **Adafruit Flora.inf** that's in flora-x.x.x\drivers (you downloaded the IDE and expanded it, right?) and select **Unblock** and click **Apply**.

Open an Administrive Command Prompt (on Start Screen type **cmd)** and when Command Prompt shows, right click it and at the bottom left click "Run as Administrator".

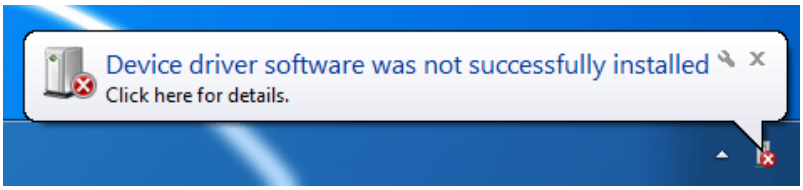
Once opened, type: **BCDEDIT /Set LoadOptions DDISABLE_INTEGRITY_CHECKS**

Hit Enter and now Type: **BCDEDIT /Set TESTSIGNING ON**

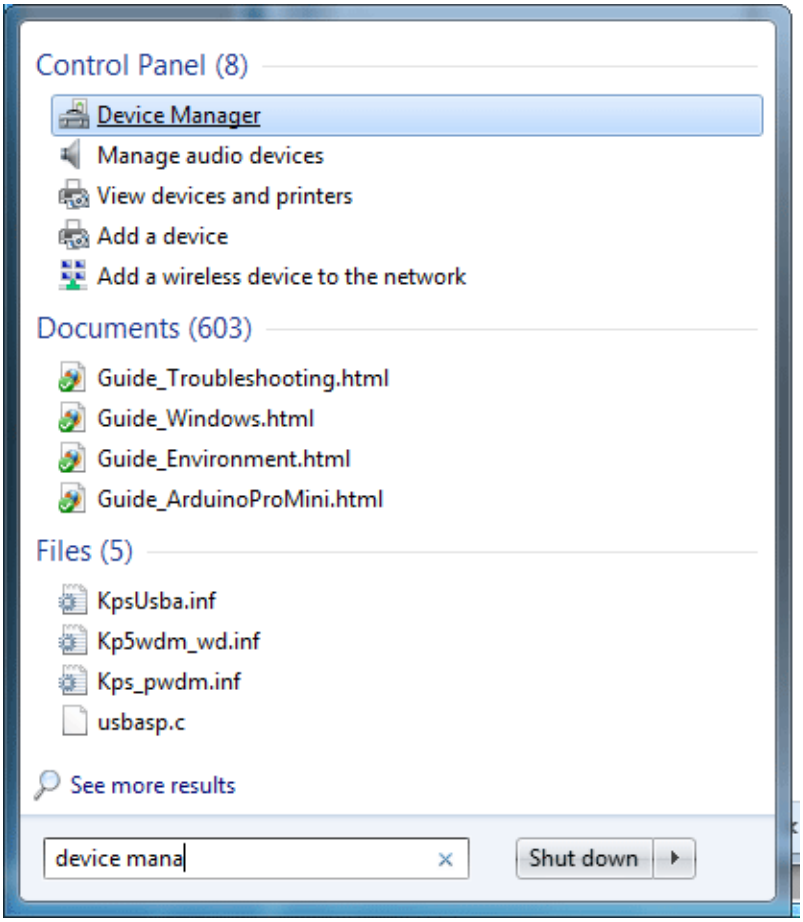
Hit Enter, and Reboot PC. *(thanks lance!)*

Windows 7

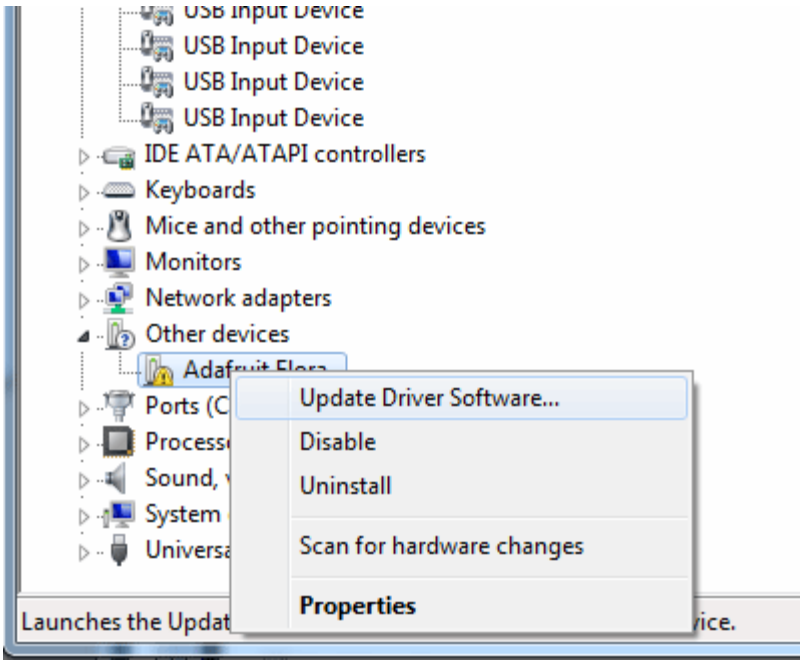
You'll see this pop up in the bottom right corner:



Now go to the Start menu (bottom left corner, the round windows logo) and click on it and start typing in **Device Manager**

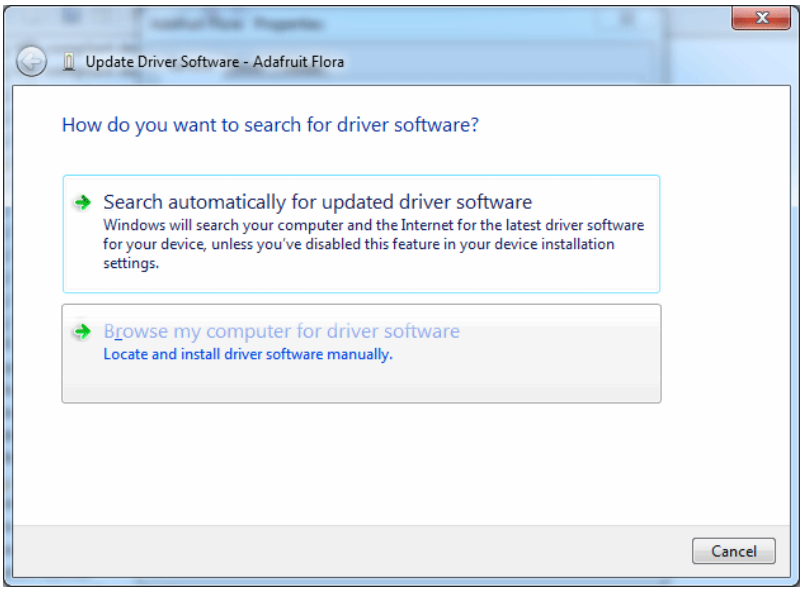


Click on the **Device Manager** (top icon in the menu) to launch it, scroll down until you see Adafruit Flora with a ! mark. Right click and select **Update Driver Software**

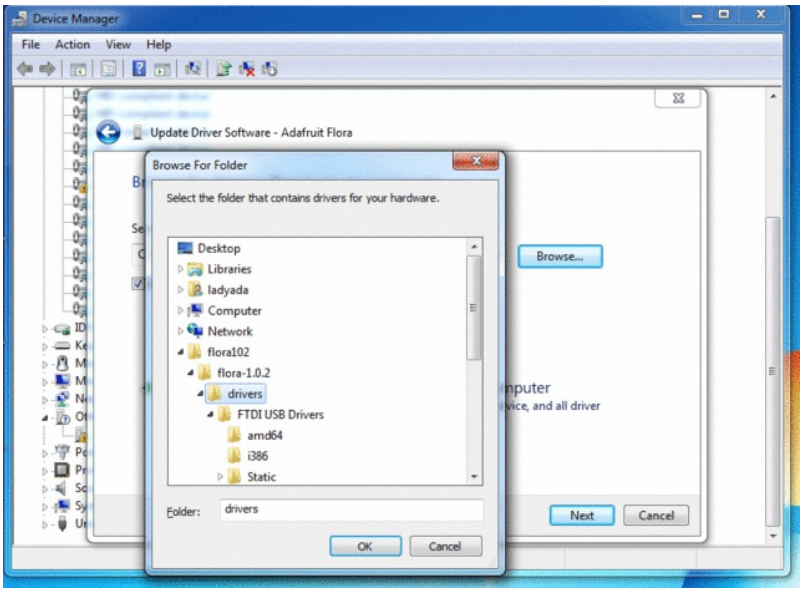


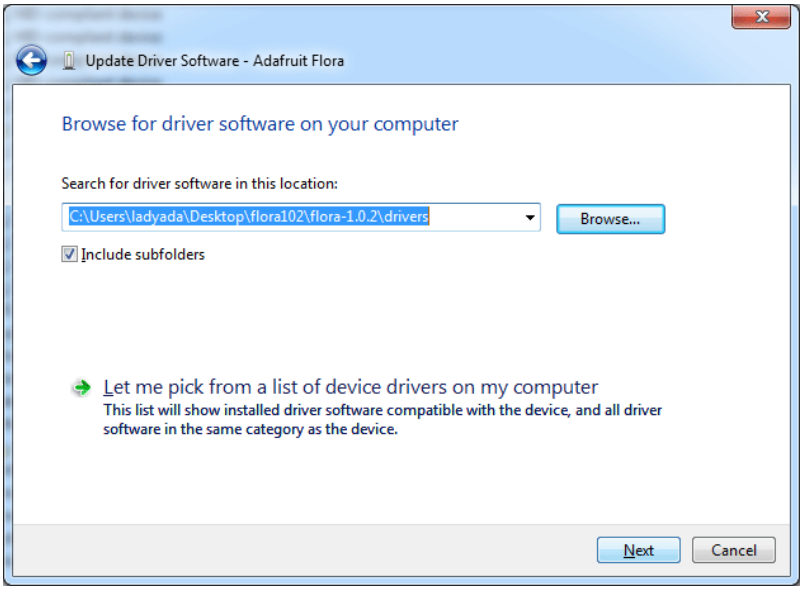
Locating the Driver File (Win 7 & XP)

OK if you have XP you'll basically start from here, click **Browse my computer for driver software**



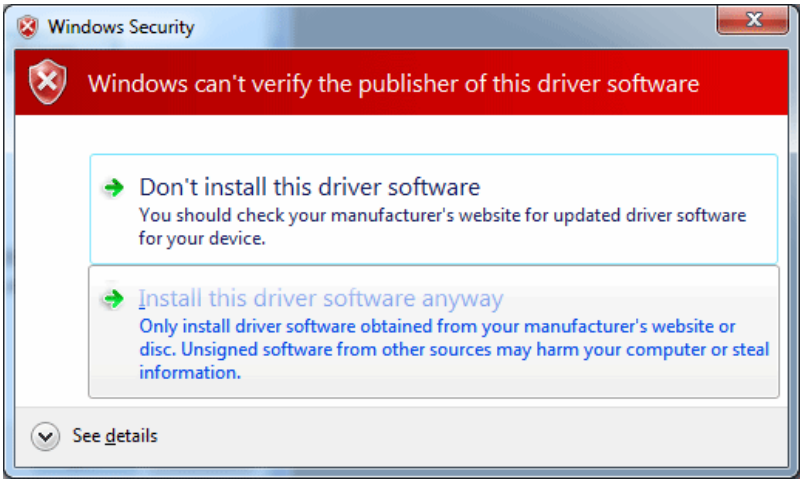
Then browse to the uncompressed Flora IDE folder, and **select the drivers folder** (not any other folder!) and click **OK**.





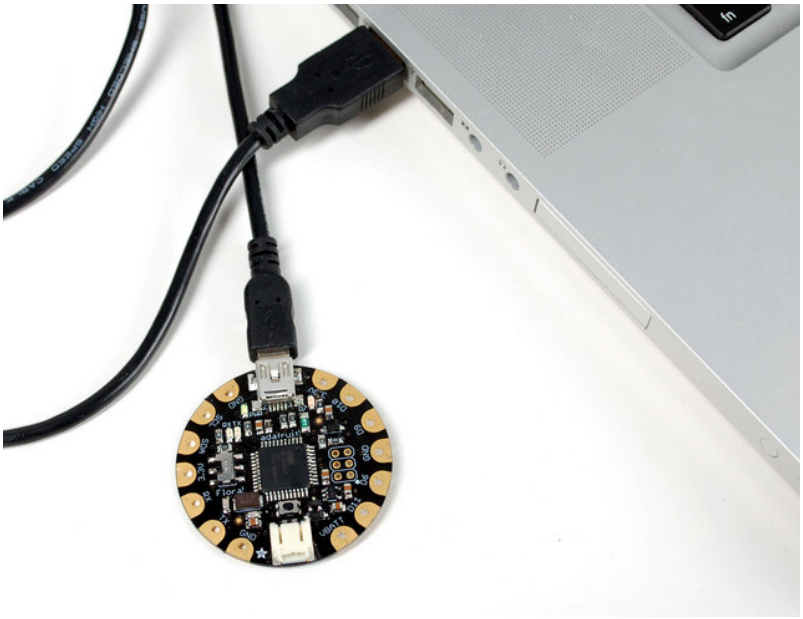
Make sure the folder next to the **Browse...** button is correct, then click **Next**.

When you get this scary window next, click **Install this driver software anyway**.



That's it! Thankfully you only have to do this once.

Blink onboard LED

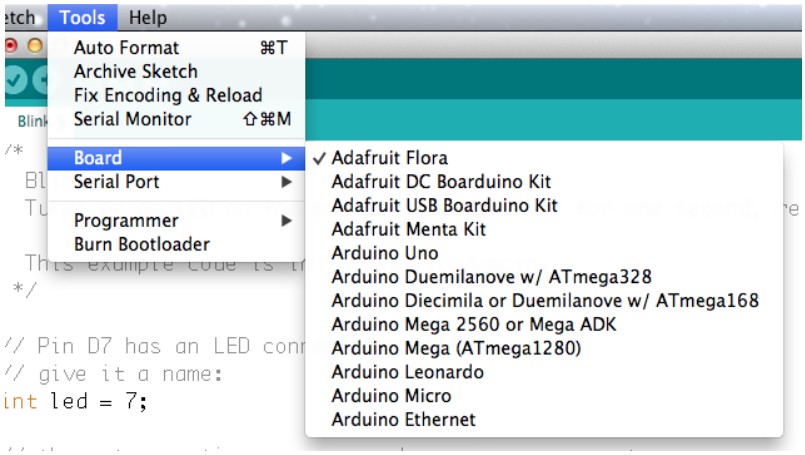


Next it's time to load up a program on your FLORA. There is an LED on board, so let's blink it! Plug in the USB cable and paste the following code into the Adafruit Flora IDE:

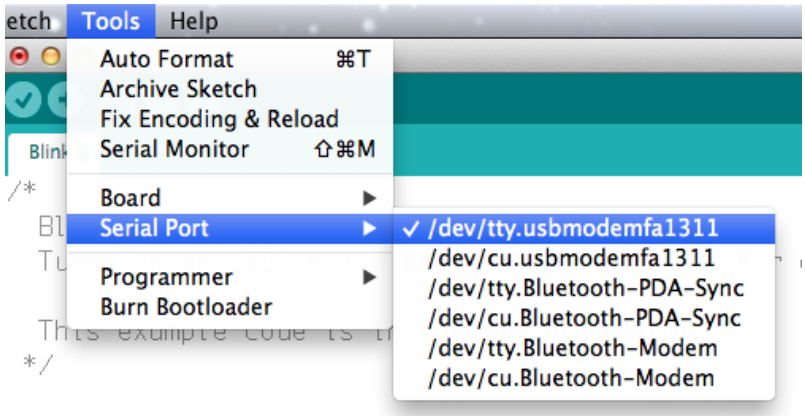
```
// Pin D7 has an LED connected on FLORA.
// give it a name:
int led = 7;

// the setup routine runs once when you press reset:
void setup() {
  // initialize the digital pin as an output.
  pinMode(led, OUTPUT);
}

// the loop routine runs over and over again forever:
void loop() {
  digitalWrite(led, HIGH);   // turn the LED on (HIGH is the voltage level)
  delay(1000);               // wait for a second
  digitalWrite(led, LOW);    // turn the LED off by making the voltage LOW
  delay(1000);               // wait for a second
}
```



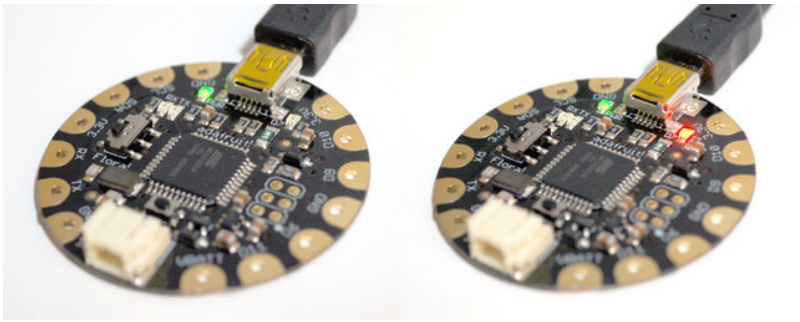
From the Tools menu, under "Board," choose "Adafruit Flora"



Also in the Tools menu, under "Serial Port," choose the one that contains the phrase "usbmodem" if you have a Mac.

If you're using a Windows computer, it will be named **COM**something, but not COM1 or COM2 (so it will be whatever comes after those two if they exist, such as COM3 or COM4).

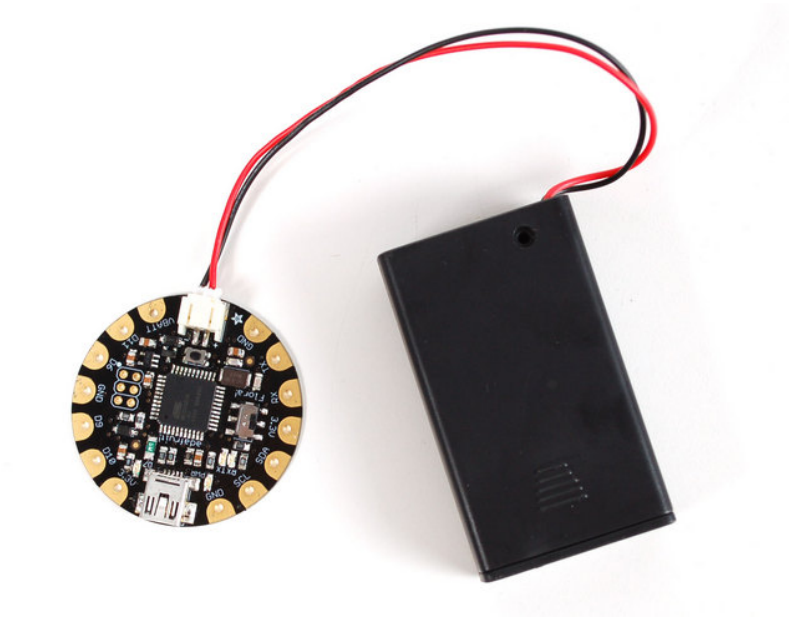
Press the Upload button to transmit the program to the FLORA. It looks like an arrow pointing to the right.



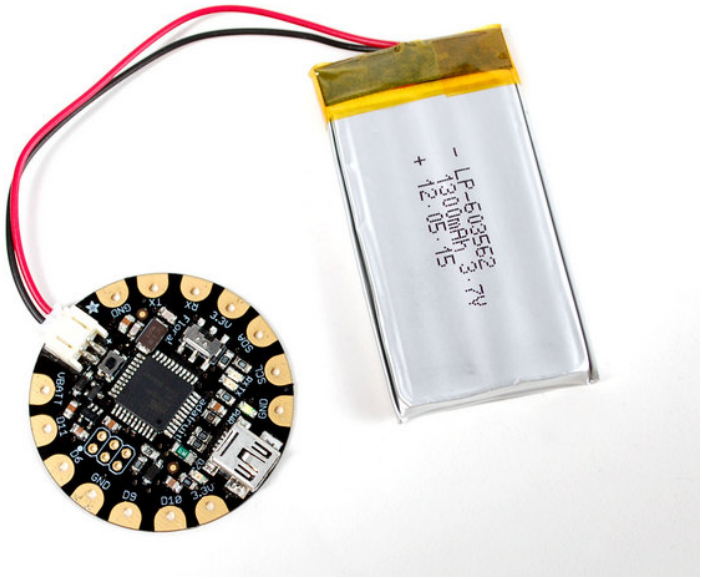
That's it! The on board LED marked "D7" should blink on and off repeatedly, and you've successfully programmed your FLORA!

Power your FLORA

The Flora runs at 3.3V with an onboard regulator to keep the voltage steady. You'll need to power the board with a 3.6V or greater battery. For that reason, we find 3 x AA or AAA or a lithium-polymer battery to be ideal. You can only power FLORA through its onboard JST port.

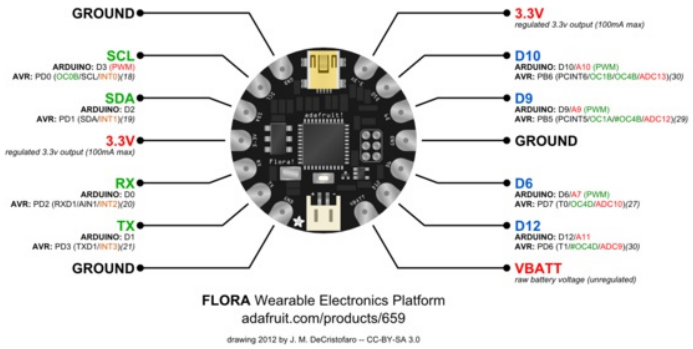


After loading your program onto the FLORA, you'll want to unplug the USB cable and go portable with battery power! USB will always power the board, but battery power (through the JST connector) can be turned on and off with Flora's onboard switch (near the "Flora!" text on the board). We recommend our 3xAAA holder (http://adafru.it/727) for beginners, which conveniently plugs into FLORAs JST port.



More advanced users may wish to use a rechargeable lithium polymer battery (http://adafru.it/258) for their smaller size and longer duration. These batteries pose added risk if abused, shorted, bent, crushed, or punctured. FLORA does not have onboard charging, so you would also need a separate LiPoly charger (http://adafru.it/259).

FLORA pinout diagram



For handy reference, we've created this pinout diagram illustrating all the alternate functions for each of the pins on the FLORA.

FLORA projects

Flora Pixel Brooch (http://adafru.it/aTj)

Flora TV-B-Gone (http://adafru.it/aUk)

GPS Jacket (http://adafru.it/aWF)

Capacitive Touch with Conductive Fabric (http://adafru.it/aWG)

Wearable Piezo Tones (http://adafru.it/aWH)

LED Ampli-Tie (http://adafru.it/c1u)

Plush Game Controller (http://adafru.it/c9F)

FLORA techniques

Flora snaps (http://adafru.it/aUl)

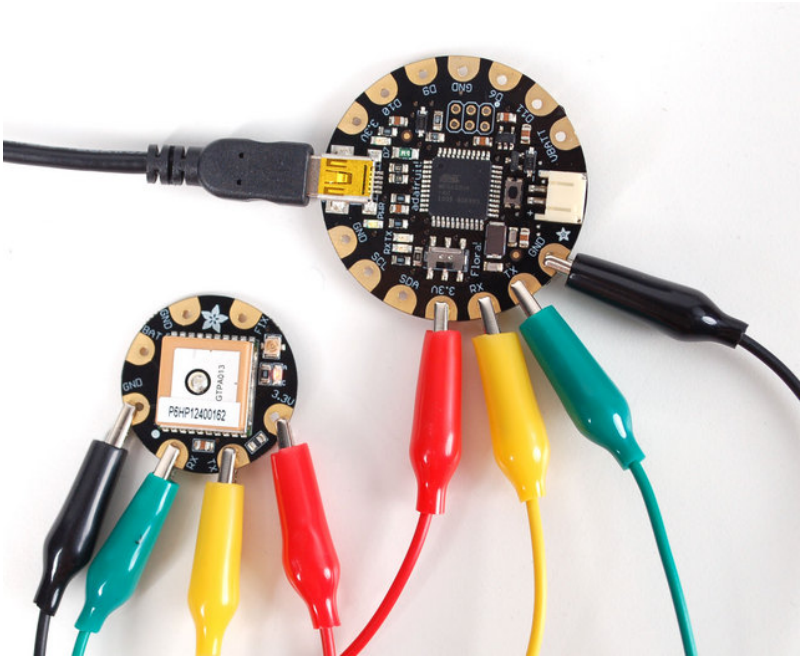
Conductive thread (http://adafru.it/aVx)

Capacitive Touch with Conductive Fabric & Flora (http://adafru.it/aWG)

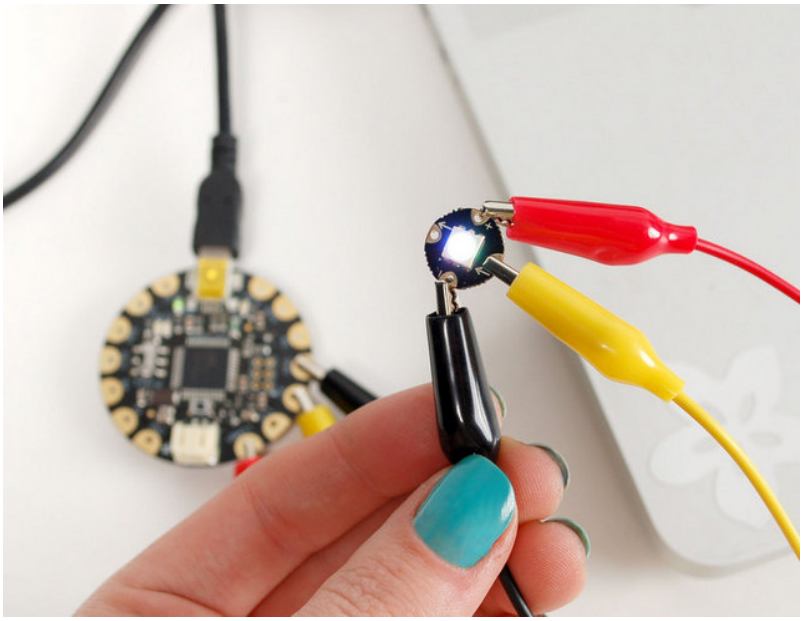
FLORA modules

FLORA Accelerometer + Compass (http://adafru.it/aYS)

FLORA Luminosity Sensor (http://adafru.it/c9H)



FLORA GPS (http://adafru.it/aRP)



Flora RGB Smart NeoPixels (http://adafru.it/c9J)