



Blinky Fish - Kickstarter Project

by [marc.cryan](#) on March 16, 2013

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Author: marc.cryan

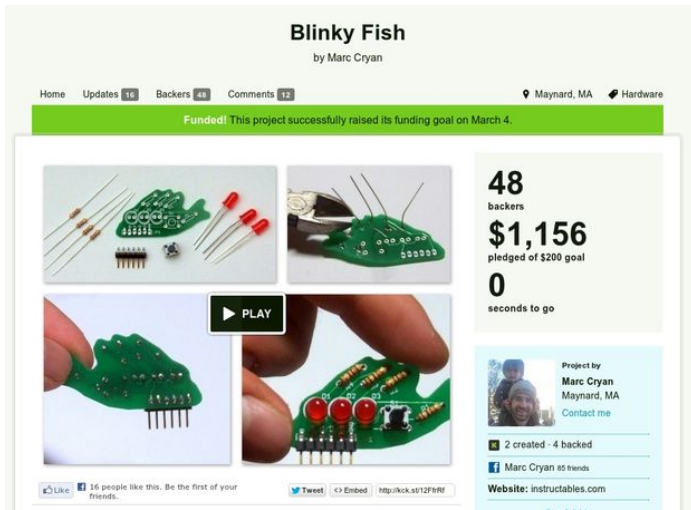
Married to Domestic_Engineer (but I call her Meghan).

Intro: Blinky Fish - Kickstarter Project

Instructions and documentation for the Blinky Fish Kit from [March 2013 Kickstarter project](#).

- Step-by-step assembly instructions
- Code example
- Eagle files
- Fabrication files
- Invoices

Note: I didn't include instructions for soldering or installing the Arduino software. Let me know if you have any trouble.

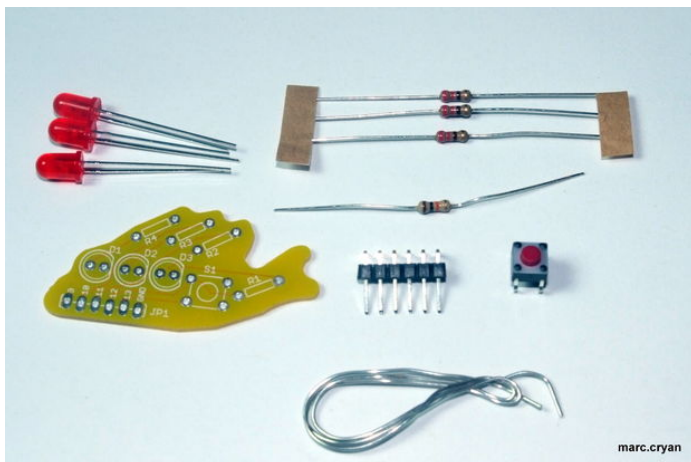


Step 1: The Parts

Here are the parts to make one blinky fish.

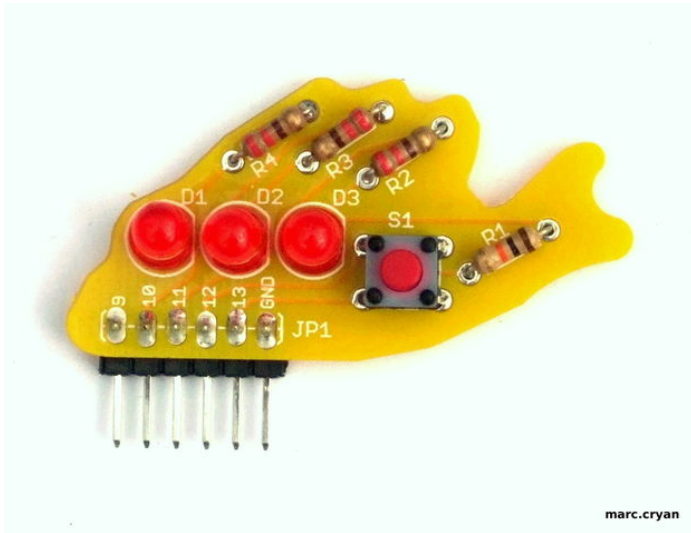
- 1 - Blinky Fish board
- 3 - Red LEDs
- 3 - 220ohm resistors
- 1 - 10Kohm resistor
- 1 - right angle header with 6 pins
- 1 - push button

Some solder

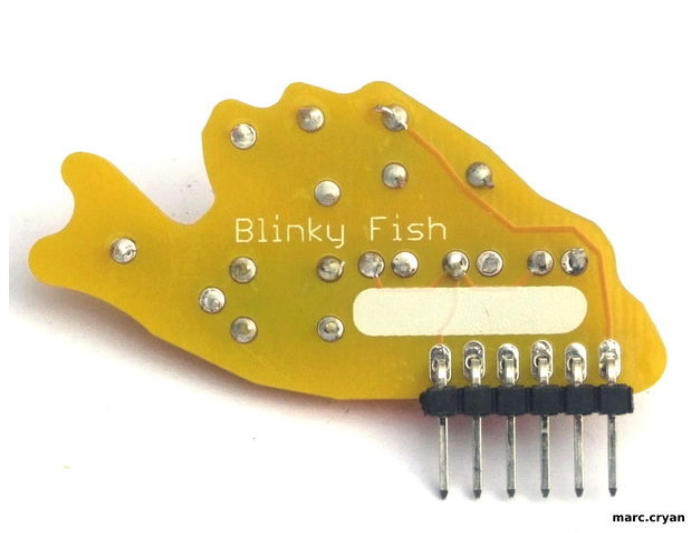


Step 2: Large Images

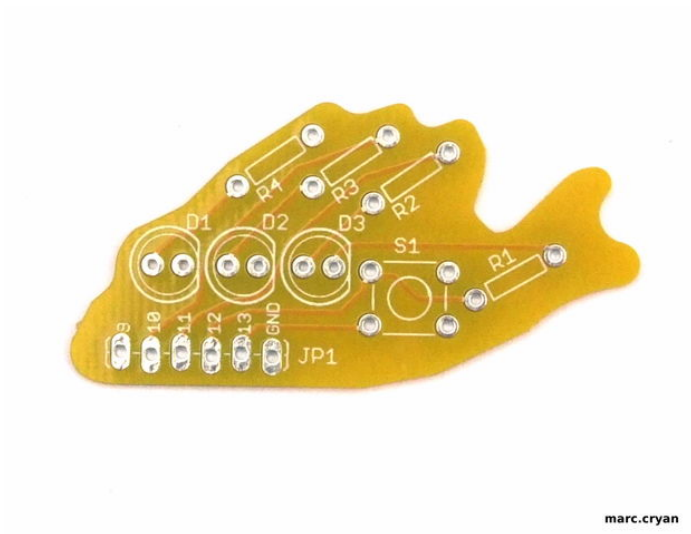
Here are the large images that shipped with the class room kits.



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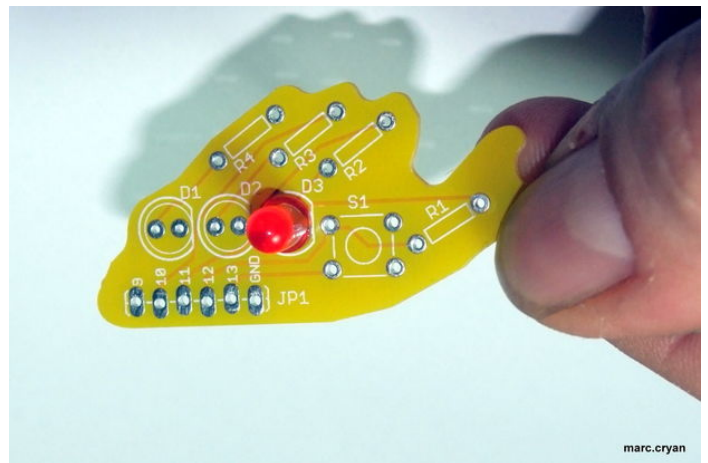
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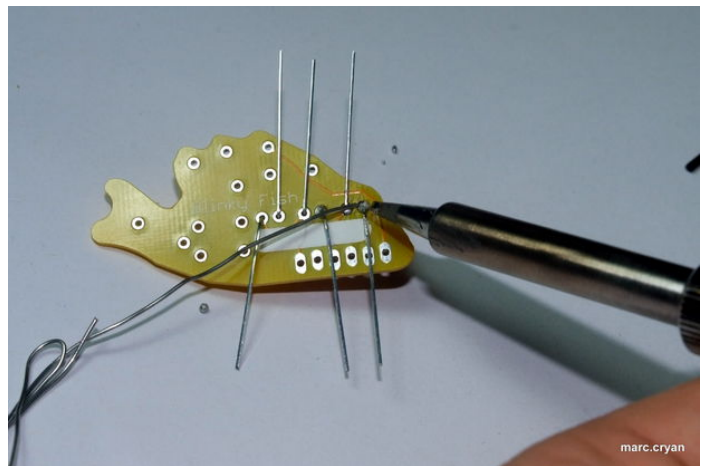
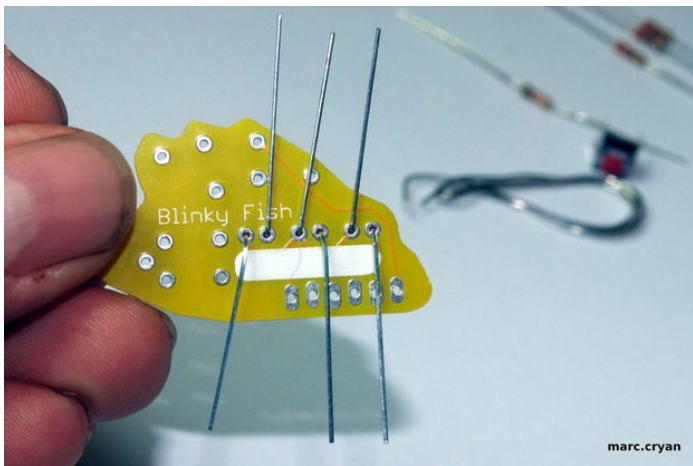
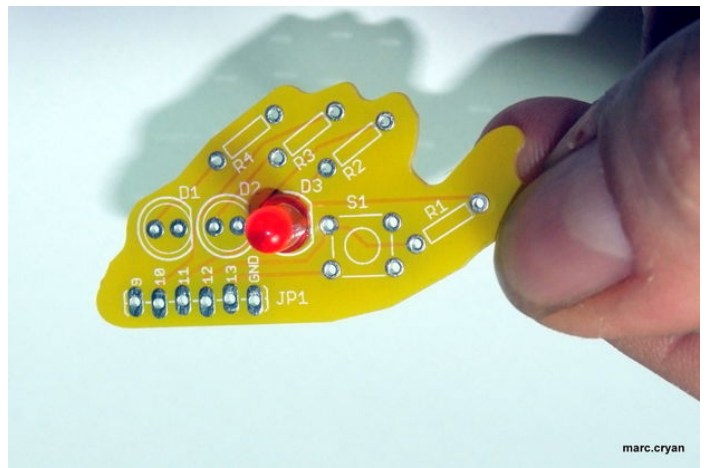
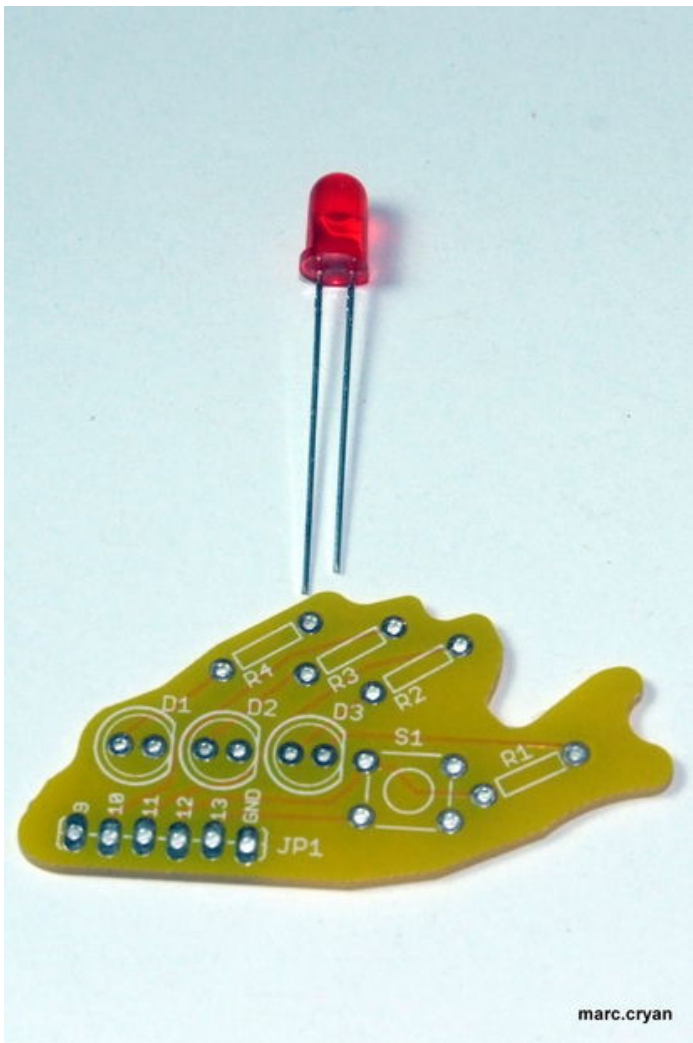
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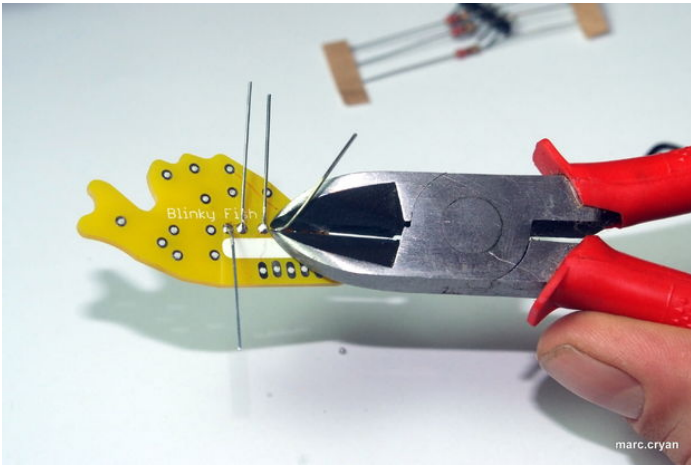
Step 3: LEDs

LEDs have to go in like this, or they will not work.

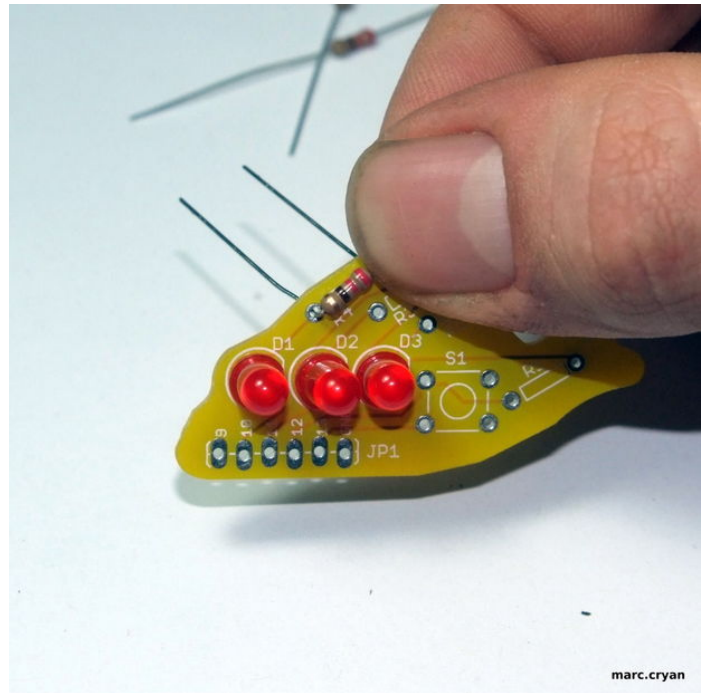
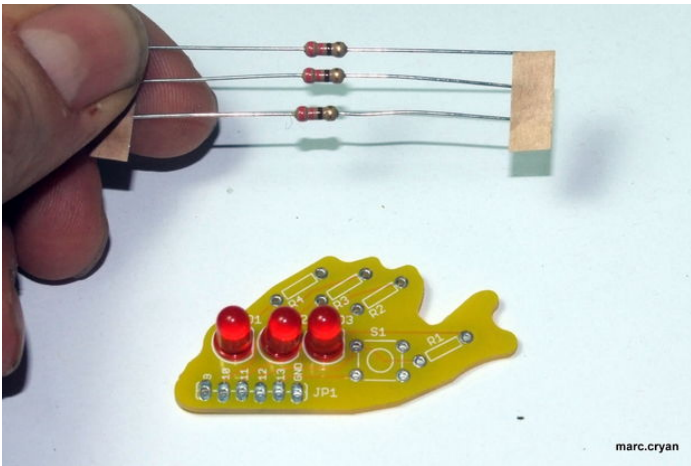


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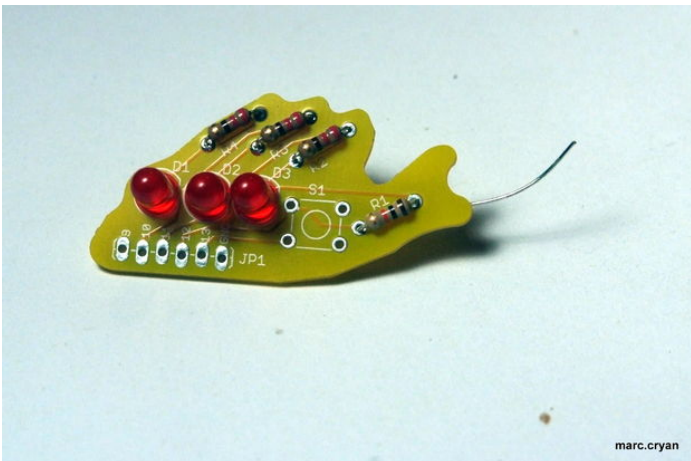




Step 4: Resistors: 220ohm



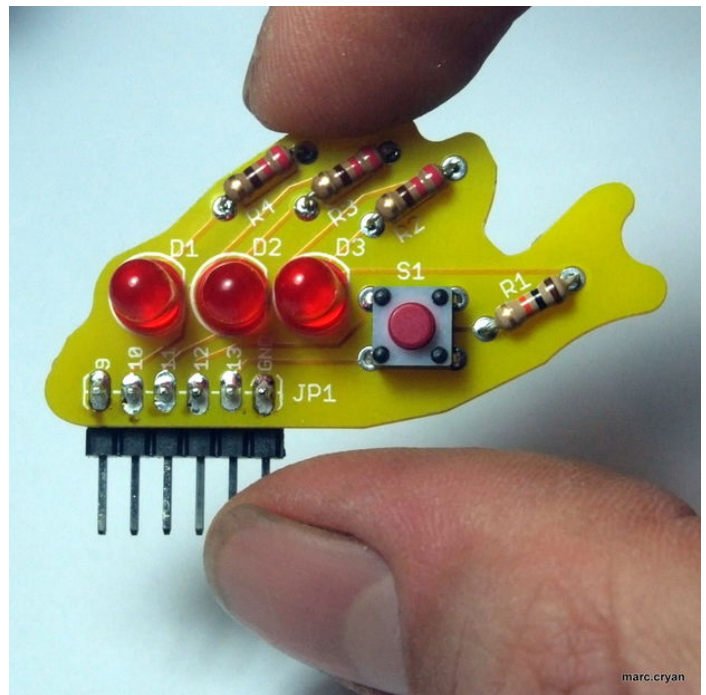
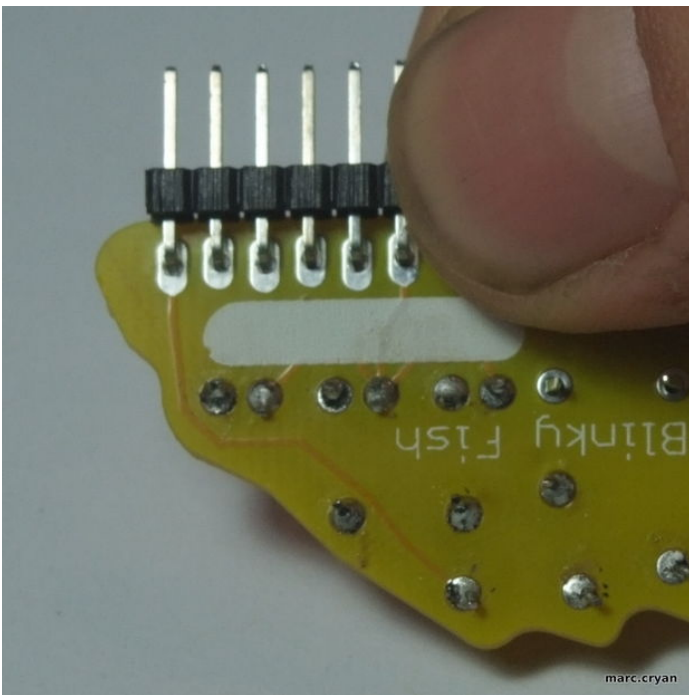
Step 5: Resistor: 10K



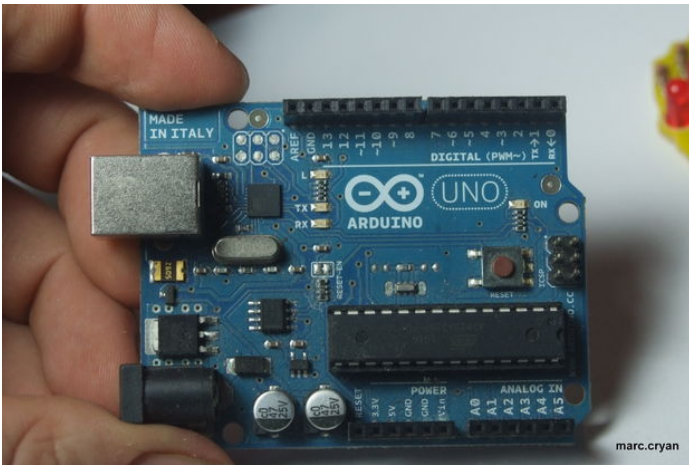
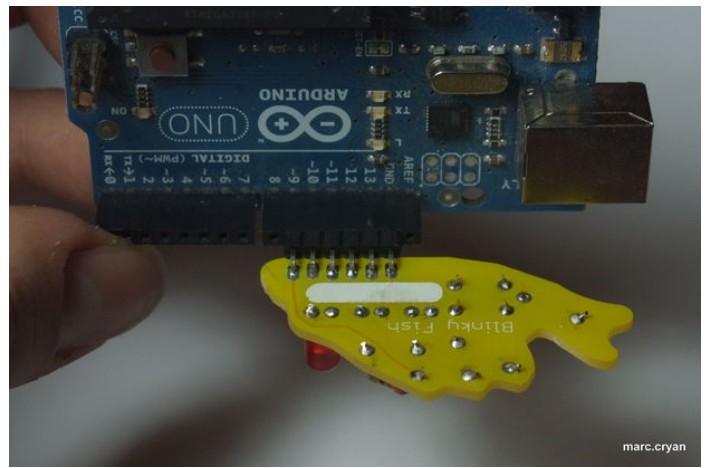
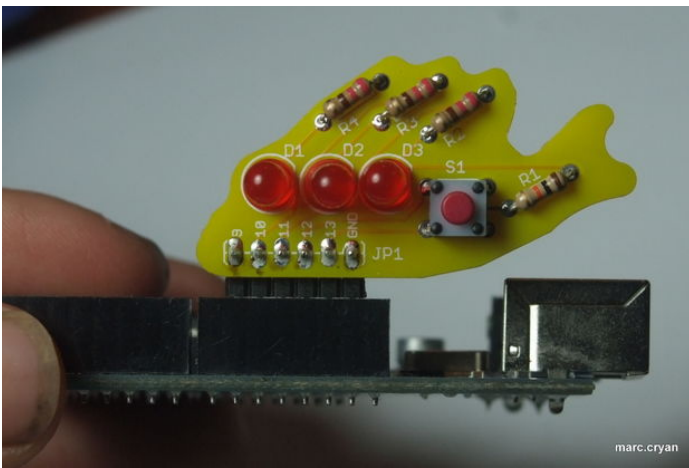
Step 6: Button



Step 7: Header



Step 8: Connect to Arduino



Step 9: Arduino Code

Here is the code shown in the Kickstarter video. Hold the button down and the LEDs light up one at a time, release the button and they go off one at a time.

You can copy and paste the code below into the Arduino program, get it here -- <http://arduino.cc/en/Main/Software>

```

//****ARDUINO CODE ****
// blinky_1
//LED'S on one at a time
// LED'S OFF one at a time

//Pins
int Led1 = 11;
int Led2 = 10;
int Led3 = 9;
int Button = 12;
int PullUp = 13;

int ButtonState = 0;
int oldButtonState = 0;

void setup() {
  pinMode(Led1, OUTPUT);
  pinMode(Led2, OUTPUT);
  pinMode(Led3, OUTPUT);
  pinMode(Button, INPUT);
  pinMode(PullUp, OUTPUT);
  digitalWrite(PullUp, HIGH);
}

void loop() {

  ButtonState = digitalRead(Button);

  if (ButtonState != oldButtonState){
    if (ButtonState == HIGH){
      digitalWrite(Led1, HIGH);
      delay(300);
      digitalWrite(Led2, HIGH);
      delay(300);
    }
  }
}

```

<http://www.instructables.com/id/Blinky-Fish-Kickstarter-Project/>


```

digitalWrite(Led3,HIGH);
delay(300);
}
else{
digitalWrite(Led3,LOW);
delay(300);
digitalWrite(Led2,LOW);
delay(300);
digitalWrite(Led1,LOW);
delay(300);
}
oldButtonState = ButtonState;
}
}

```

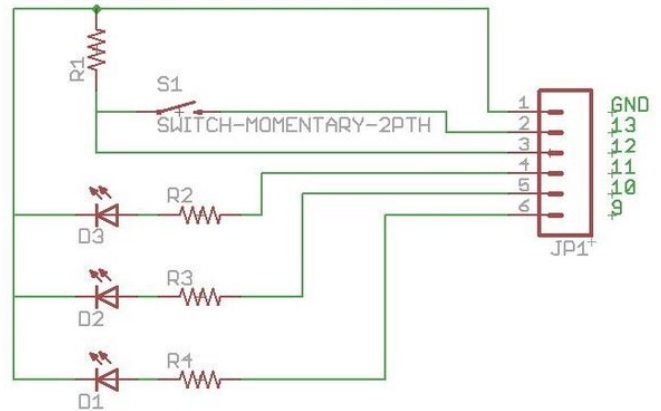
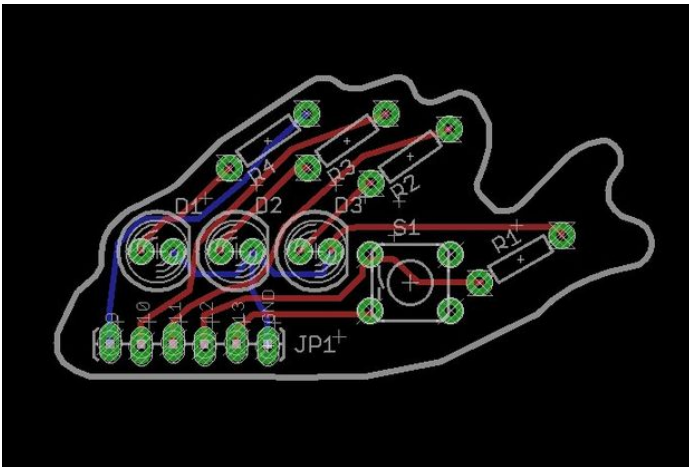
Step 10: Eagle files that you can change

Here are the designs in a format that you can open and change.

A sample version can be downloaded here <http://www.cadsoftusa.com/download-eagle/>

The schematic is Blinky_2.sch

The board design is Blinky_2.brd



File Downloads



Blinky_2.sch (26 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'Blinky_2.sch']



Blinky_2.brd (10 KB)

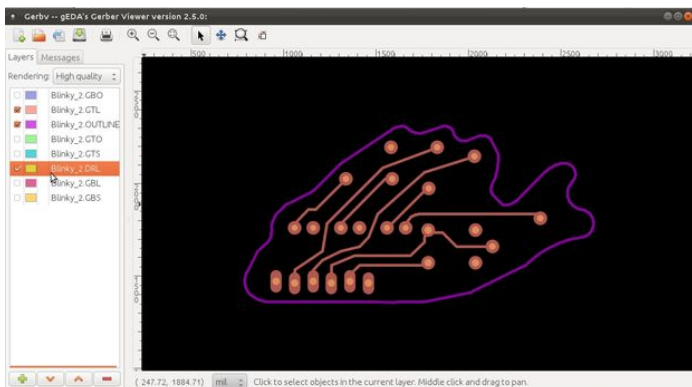
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'Blinky_2.brd']

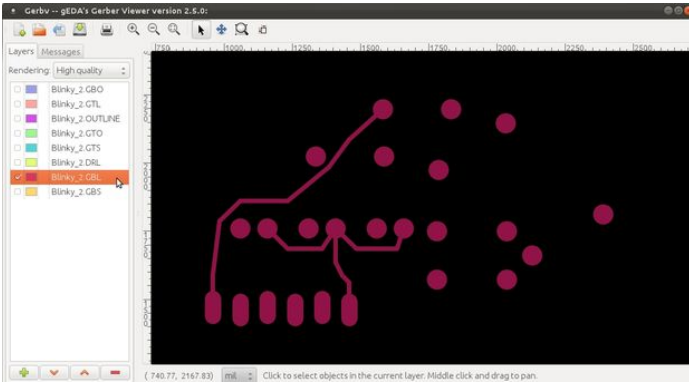
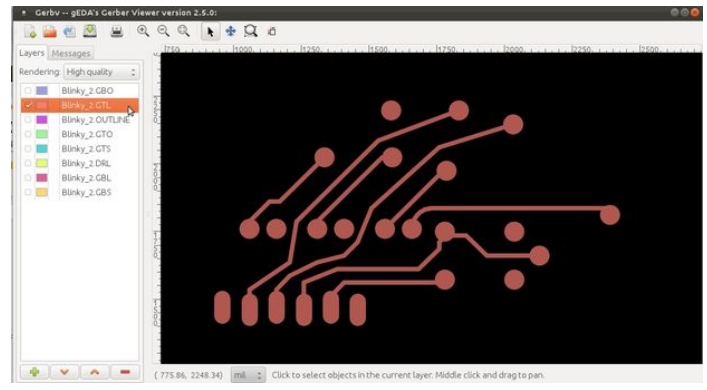
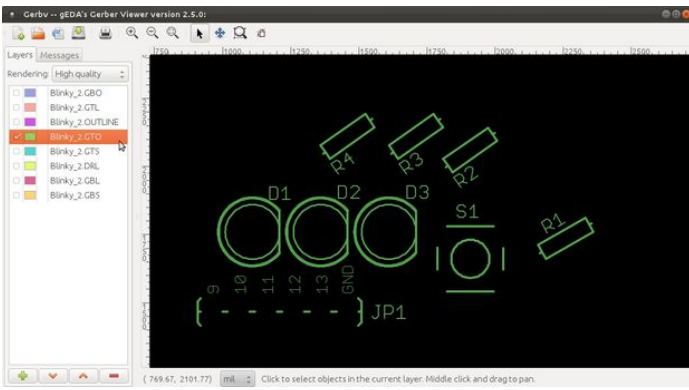
Step 11: Fabrication Files

These are the file that you send to the manufacturer when you order printed circuit boards.

Each file shows a layer of the circuit board.

You can view the actual files with a gerber viewer, but they are difficult to change correctly -- I am using GerbV Gerber File Viewer <http://gerbv.gpleda.org/>





File Downloads



toFAB_21.zip (21 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'toFAB_21.zip']

Step 12: Parts

Here is a large order of parts from DigiKey -

This table does NOT include the 10K resistor and the circuit boards.

| Index | Quantity | Part Number | Description | Customer Reference | Unit Price USD | Extended Price USD |
|---------------------|----------|--------------------|----------------------------------|--------------------|----------------|--------------------|
| 1 | 1000 | 160-1853-ND | LED RED 5MM RND DIF | RED LED | 0.05711 | \$57.11 |
| 2 | 2500 | CF14JT220RCT-ND | RES 220 OHM 1/4W 5% CARBON FILM | 220 RES | 0.00675 | \$16.88 |
| 3 | 100 | 952-2328-ND | 36 POS SIL VERT PIN HDR | RA HEADER | 0.7425 | \$74.25 |
| 4 | 300 | 450-1804-ND | SWITCH TACTILE SPST-NO 0.05A 12V | BUTTON | 0.07584 | \$22.75 |
| 5 | 1 | KE1132-ND | SOLDER NO-CLEAN .025" 23AWG 1LB | SOLDER | 123.61 | \$123.61 |
| 6 | 1 | SMDSWLF.020 4OZ-ND | SLD WIRE NO-CLEAN 96.5/3/.5 4OZ. | 1 | \$21.75 | \$21.75 |
| Subtotal | | | | | | \$316.35 |
| Shipping | | | | | | unknown |
| Estimated Sales Tax | | | | | | \$19.77 |
| Total | | | | | | unknown |

Step 13: Order printed circuit boards from China

Here are the details of the PCB order.

This is from Golden Phonix PCB -- they have 'quick quotes' here.

This is the manufacturer used by the SparkFun company BatchPCB -- they are good for small orders especially if you are ordering multiple designs.

Order Detail Status And Specification

Type: PCB

Gerber File: [MACR01 3.12 toFAB_21.zip](#)

45% Complete

Order Received | Payment Received | CAM Review Complete | **Order In Production** | Waiting To Ship | Shipped

2013-03-12 15:11 | 03-12 15:26 | 03-13 11:03

| Order Detail Status | Time |
|---------------------|---------------------|
| Order In Production | 2013-03-13 15:37:43 |
| CAM Review Complete | 2013-03-13 11:03:59 |
| Payment Received | 2013-03-12 15:26:52 |
| Payment Auditing | 2013-03-12 15:11:44 |
| Order Received | 2013-03-12 15:09:58 |

Board Spec: 2layers, 0.062", FR4-TG130, 1oz, HAL, YELLOW SOLDER MASK, TWO SIDE MASK, WHITE SILK SCREEN, TWO SIDE SILK, Complex Shape, 1.89" x 0.95"

Special Notes: Shipped As Individual Boards

| Type | Quantity | Lead Time | Unit Price | Total Price | Total: \$321.57 USD |
|------|----------|-----------|------------------|--------------|----------------------------|
| PCB | 300 pcs | 5 days | \$1.0719 USD/pcs | \$321.57 USD | |

TOTAL: **\$321.57 USD**