

# [fit] Hardware, Hula Hoops, & Flow

## Lindsey Bieda

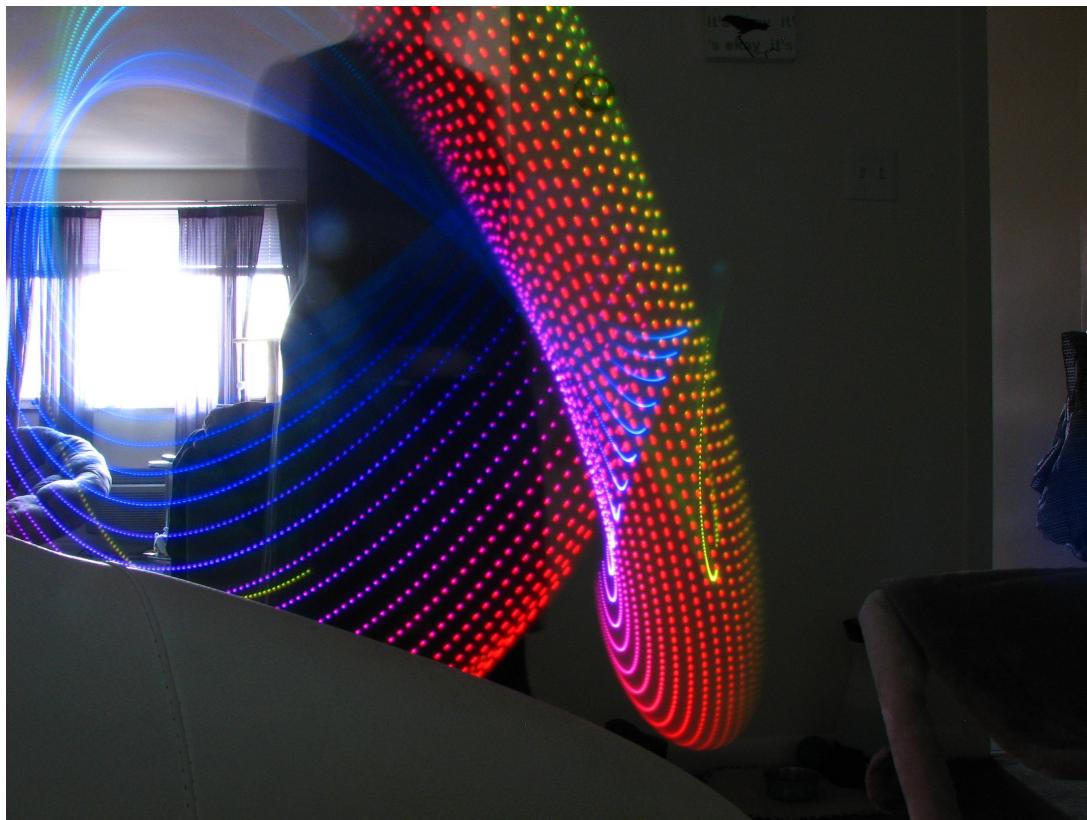
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.avatar @lindseybieda | 🎮 ekko#11472

## Who?

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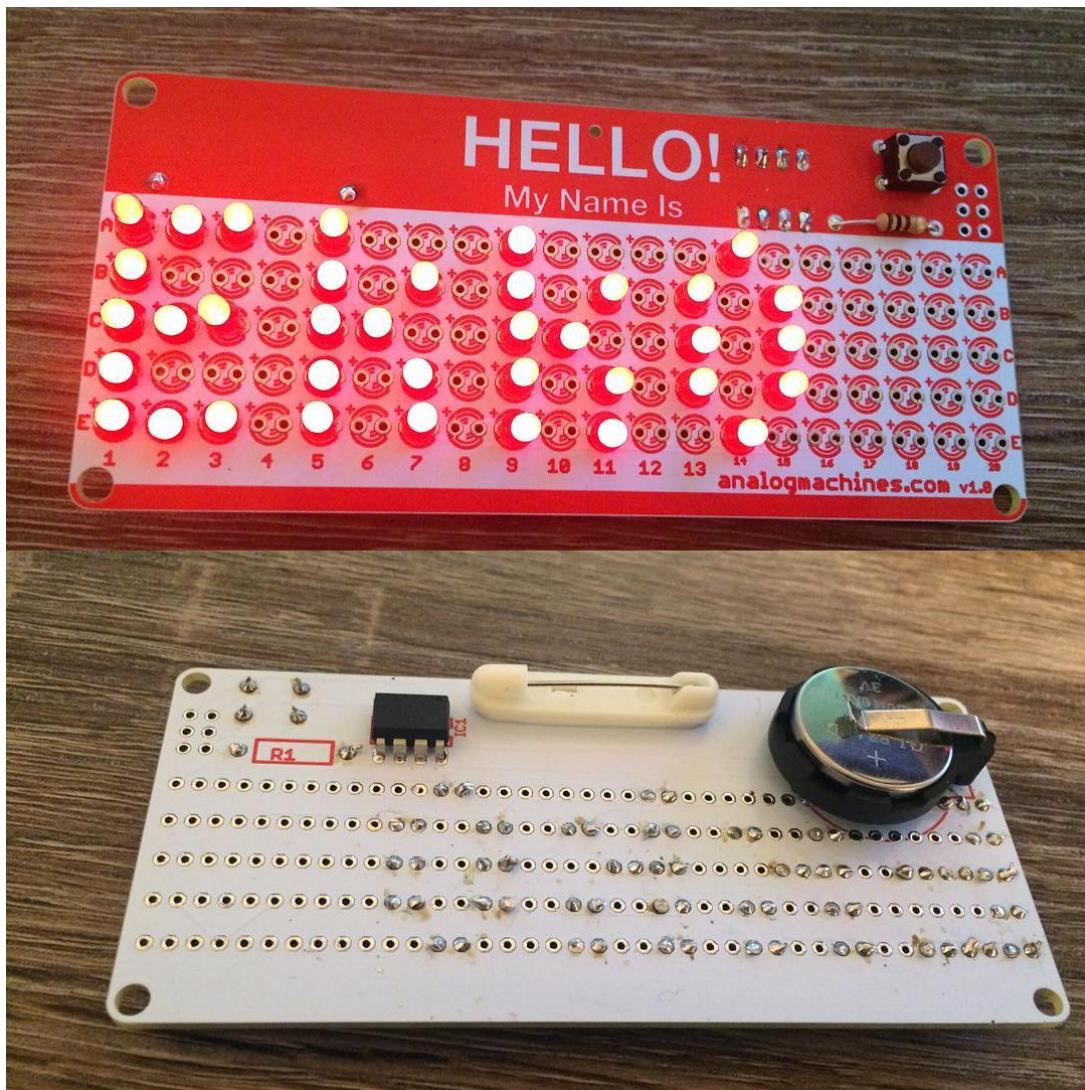
- Software Engineer (at Articulate)
- Beginner hula hooper
- Novice hardware tinkerer
- 🍵🍵🍵🍵🍵

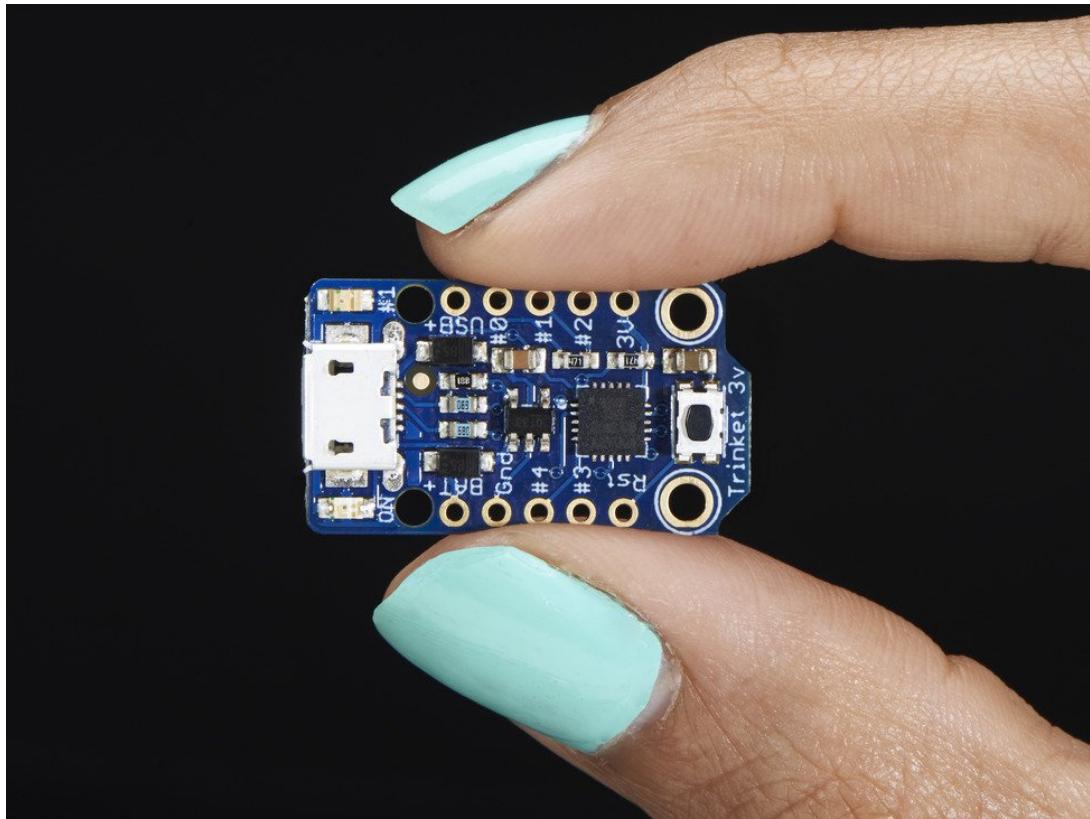
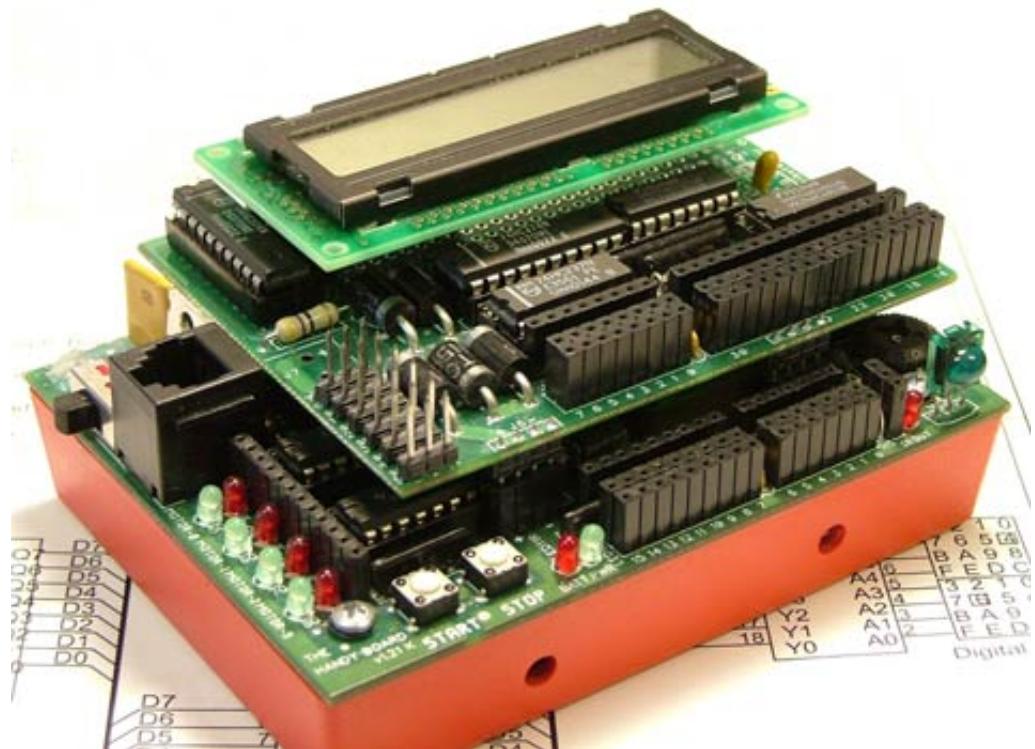


# Hardware

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- \$\$\$ Barrier to entry (getting cheaper)
- Intimidating
- How do I start without electrocuting myself?





## **Handyboard: \$200**

- 68HC11 8-bit microcontroller @ 2 MHz
- 32KB battery-backed SRAM

## **Trinket: \$7**

- ATtiny85 8-bit microcontroller @ 8 MHz
- 512 byte of SRAM

## **Hula Hooping**

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- \$20 barrier to entry
- Hey I used to do that as a kid
- Wait that looks hard



## Let's figure out an approach

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### Using SCIENCE!

1. Internets!
2. Friends
3. Failure?



# Flow

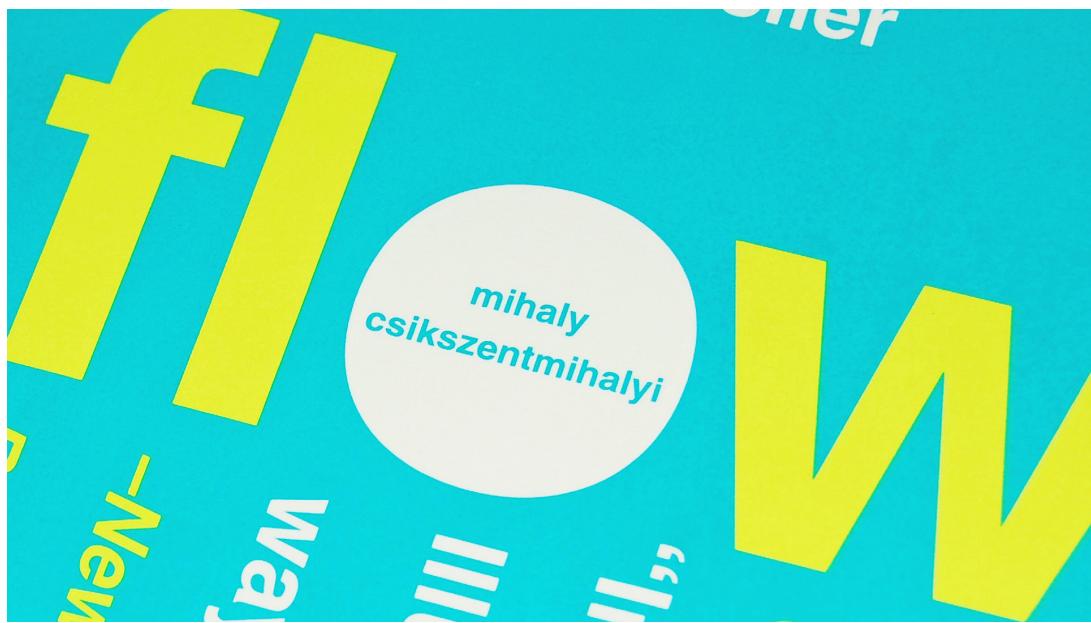


## Flow

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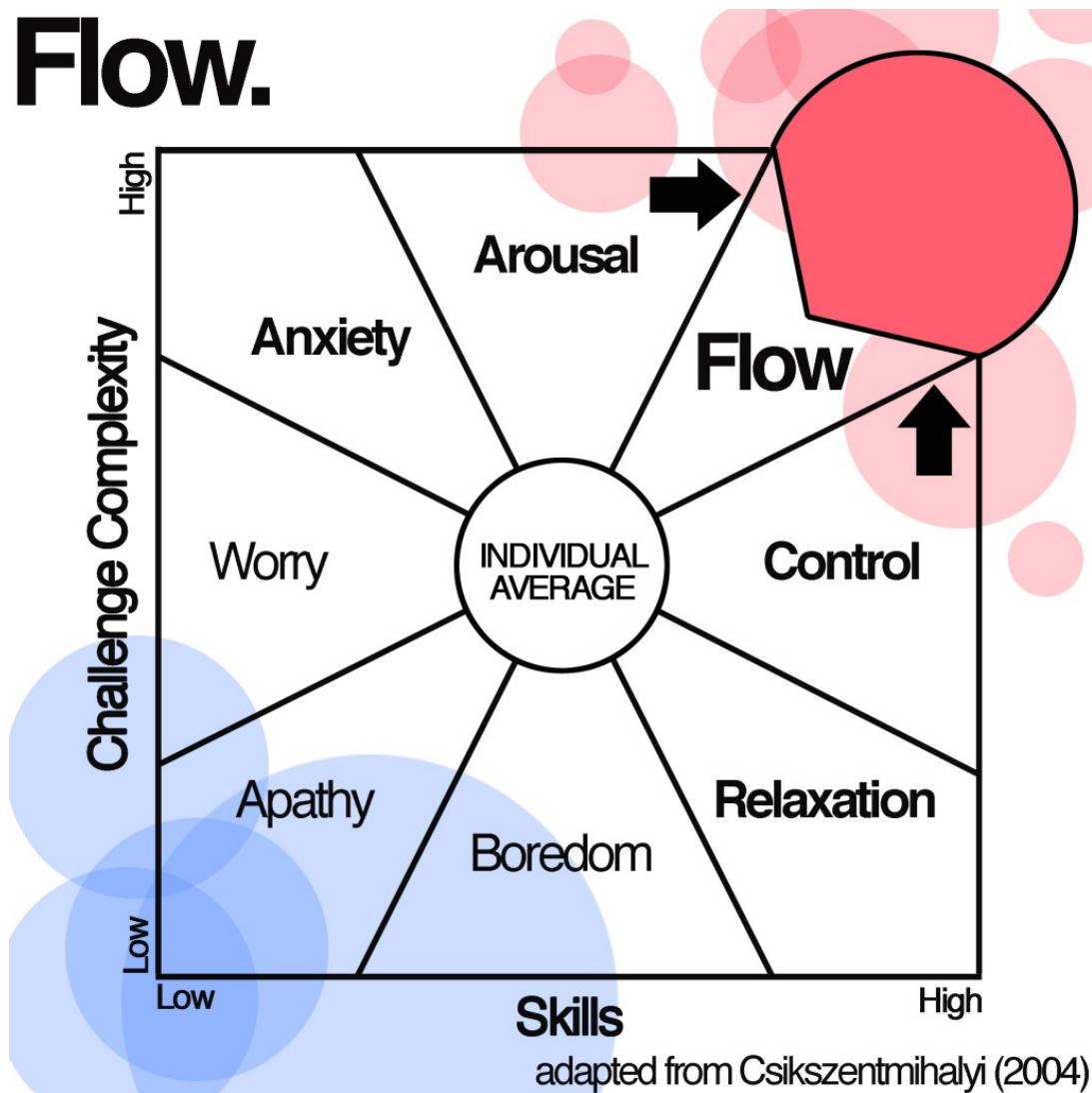
- When you are fully immersed in a task and have an energized focus
- Mihály Csíkszentmihályi (Me-High Cheek-sent-me-high)

**High Skill + High Challenge = Flow**



## High Challenge?

# Flow.



"Enjoyment appears at the boundary between boredom and anxiety" --  
Mihály Csíkszentmihályi

## Why care about flow?

- Helps in improving skill
- Intellectually and emotionally stimulating
- Fun!

"[Flow] makes the present instant more enjoyable, and it builds the self-confidence that allows us to develop skills..." -- Mihály Csíkszentmihályi

## Recall:

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- Hardware: high challenge
- Hula hooping: high challenge

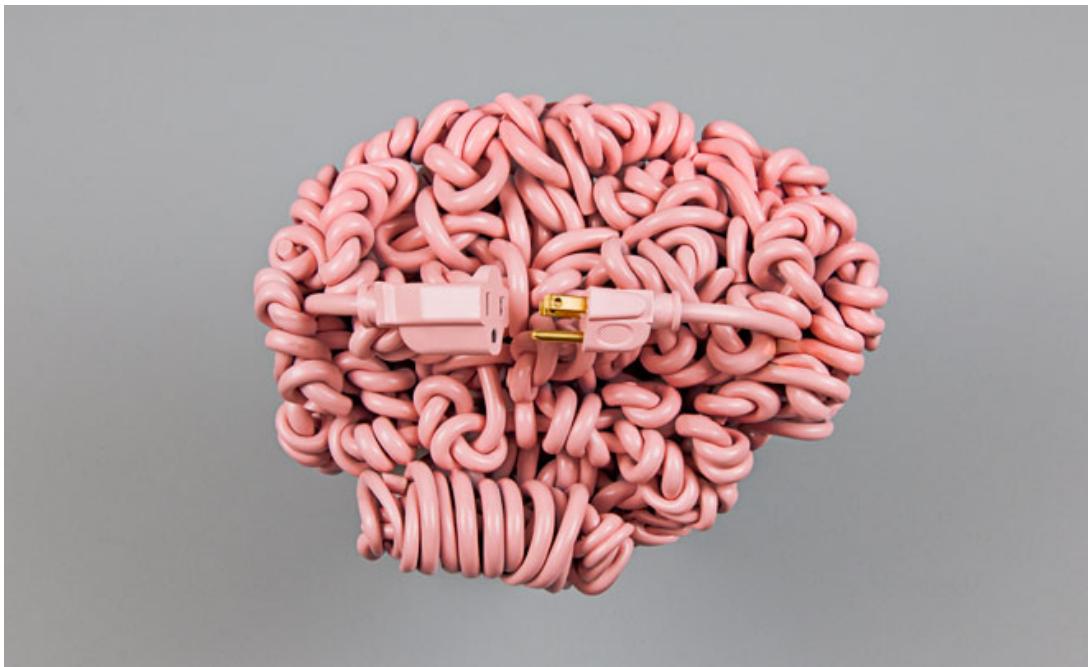
## Let's Flow!



## LED Hula Hoop steps:

1. Design
2. Solder

3. Code
4. Dance



**Chance for flow at every step!**

**Mistakes Happen**



**Things Break**



# The Hoop Will Drop

**Curse you gravity**



**This is okay!**

**This is GOOD!**



**Hard things are important to flow**

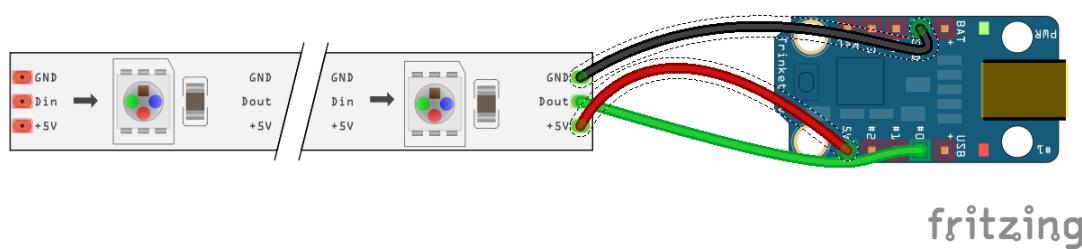
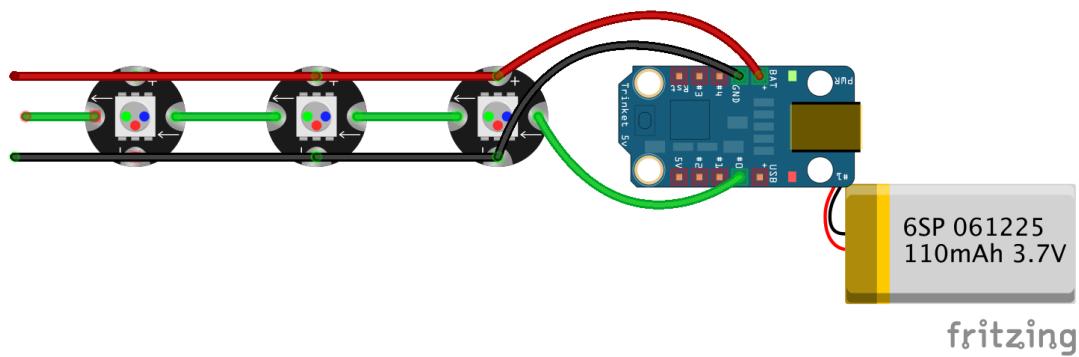
**Flow is good for your brain**



**Therefore, hard things are good for  
your brain**

**Failure is just a step on the way to a happy  
brain! 💙**

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```C

**include <Adafruit\_NeoPixel.h>**

**ifdef AVR**

```
#include <avr/power.h>
```

**endif**

**define PIN 0**

```
Adafruit_NeoPixel strip = Adafruit_NeoPixel(40, PIN, NEO_GRB +
NEO_KHZ800);
```

```
void setup() { strip.setBrightness(127); strip.begin(); strip.show(); // Initialize all pixels to 'off' }

void loop() { uint16_t i; uint16_t c = 1;

// go through all the pixels and change the color for(i=0; i<strip.numPixels(); i++){
strip.setPixelColor(i, c, c, c); }

c++; // increment the color delay(20); // sleep for a bit so we can see it }
```

```
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```c
void loop() {
    uint16_t i;
    uint16_t c = 1;

    for(i=0; i<strip.numPixels(); i++){
        strip.setPixelColor(i, c, c, c);
    }

    c++;
    delay(20);
}
```

## Flicker fusion threshold:

Around 13 milliseconds

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Basic electronics kit (or MVHardware stuff)

- Soldering iron (hopefully with a stand)
- Solder
- Desoldering pump
- Helping hand tool

## Thank you



## Some kits to practice soldering

- [Make: Color Visualizer Kit](#)
- [Solder: Time II Watch Kit](#)
- [LED Dice \(Die\) Kit](#)
- [Adafruit MintyBoost USB Charger Kit](#)
- [MiniPOV 4 Kit - DIY Full-Color POV and Light Painting Kit](#) (my first ever)
- [Conway's Game of Life Kit](#)

# References & Resources

- Flow by Mihaly Csikszentmihalyi
- Beyond Boredom and Anxiety by Mihaly Csikszentmihalyi
- [Adafruit Guide To Excellent Soldering](#)
- [Adafruit NeoPixel Überguide](#)
- [Instructables: Make a Hula Hoop](#)