Sunny Mickey

By Julie Xu & Julie Lee

Motivation

- ➔ Create something useful for health awareness
- ➔ Is fun and personalizable

Wristwatch (informational)

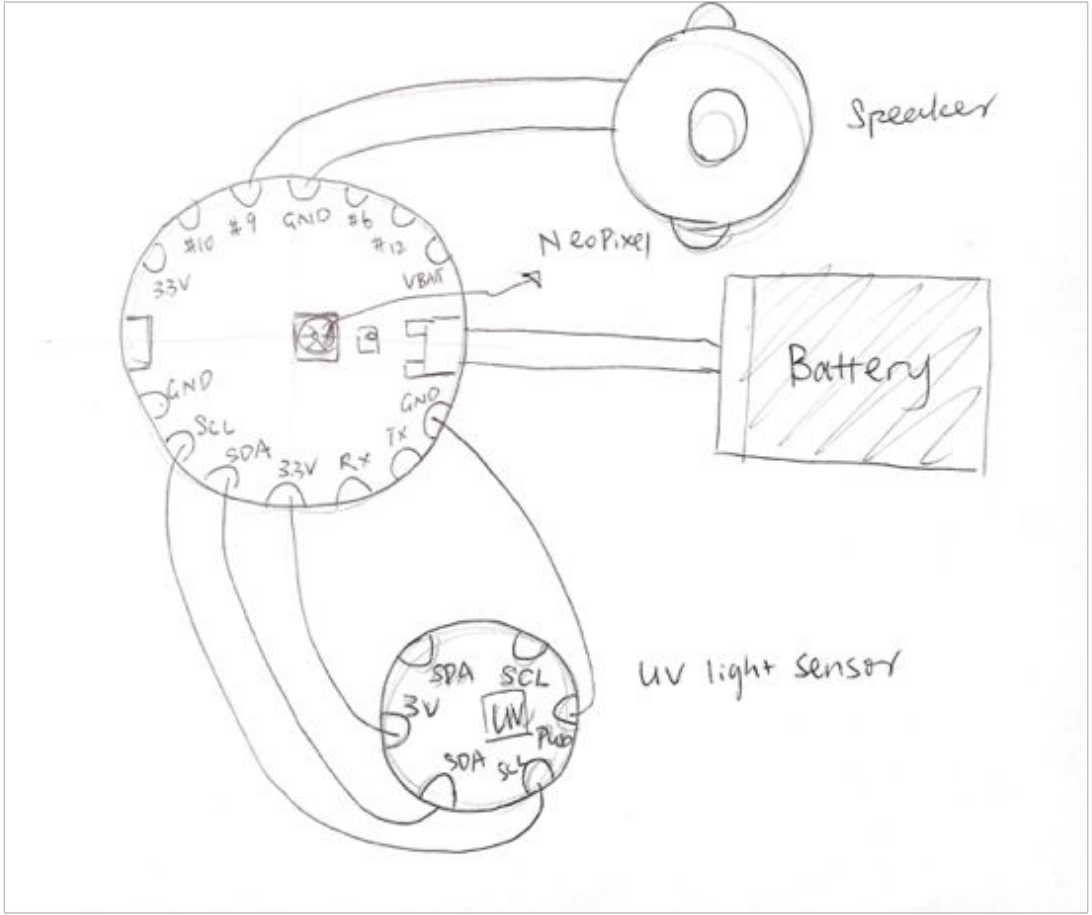
Ipod (customizable tune)

L’Oreal UV Nails (UV Sensing)

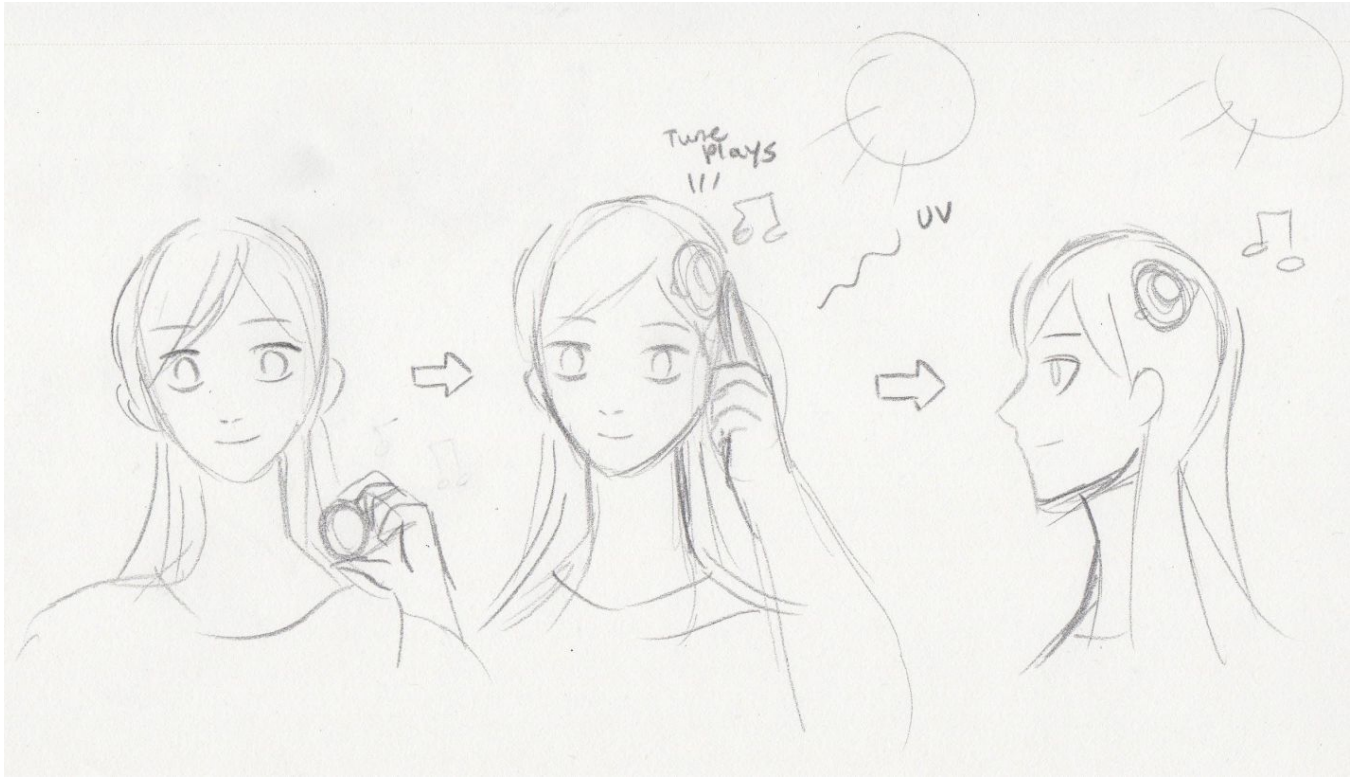
The Brief

Information is power, so we thought having an easy-to-wear device to have on daily would help provide an alert when there is a certain level of UV light that could cause sunburn and skin cancer. It will sound a tune and light up when a certain threshold of UV light is surpassed.

Circuit

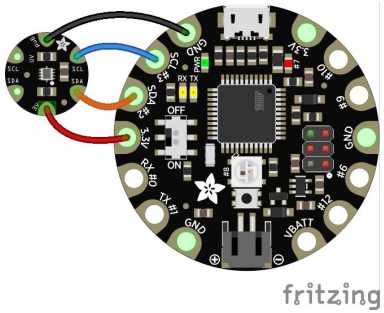

Speaker
NeoPixel
Battery
#10
#9
GND
#6
#12
3.3V
VBAT
GND
SCL
SDA
3.3V
RX
TX
GND
SDA
SCL
3V
SDA
SCL
UV light sensor

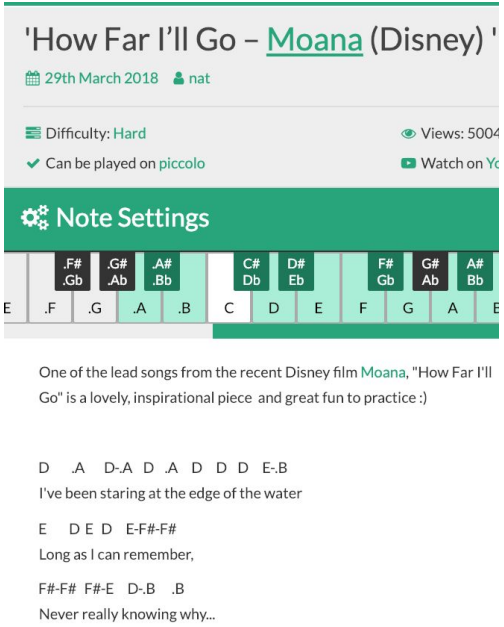
Interaction



Electronics Research

- UV Index
  - UV light is light in the "ultraviolet" spectrum
  - Important to protect yourself when the UV index gets above 4
- Flora UV Index Sensor - Si1145 Light Sensor
  - Coding is much similar to Flora Lux Sensor - TSL2561
- Music
  - Have each song represent a different level of UV light




'How Far I'll Go – Moana (Disney) '

29th March 2018 nat

Difficulty: Hard Views: 5004

Can be played on piccolo Watch on Yo

Note Settings

.F#/.Gb .G#/.Ab .A#/.Bb C#/Db D#/Eb F#/Gb G#/Ab A#/Bb

E .F .G .A .B C D E F G A B

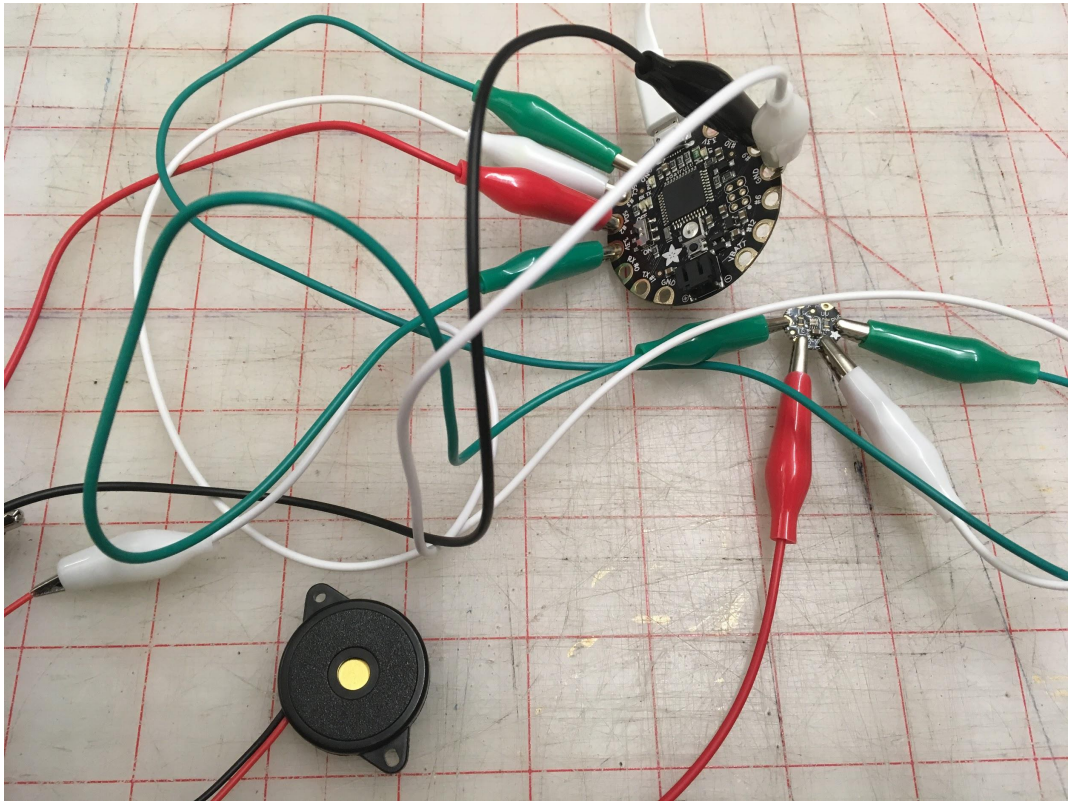
One of the lead songs from the recent Disney film Moana, "How Far I'll Go" is a lovely, inspirational piece and great fun to practice :)

D .A D-.A D .A D D D E-.B
I've been staring at the edge of the water

E D E D E-F#-F#
Long as I can remember,

F#-F# F#-E D-.B .B
Never really knowing why...

Functional Prototype



Coding

```
#include <Wire.h>
#include "Adafruit_SI1145.h"
#include <Adafruit_NeoPixel.h>
#ifdef __AVR__
  #include <avr/power.h>
#endif

#define PIN 8
Adafruit_NeoPixel strip = Adafruit_NeoPixel(1, PIN, NEO_GRB + NEO_KHZ800);

#define NOTE_B0  31
#define NOTE_C1  33
#define NOTE_CS1 35
#define NOTE_D1  37
#define NOTE_DS1 39
#define NOTE_E1  41
#define NOTE_F1  44
#define NOTE_FS1 46
#define NOTE_G1  49
#define NOTE_GS1 52
#define NOTE_A1  55
#define NOTE_AS1 58
#define NOTE_B1  62
#define NOTE_C2  65
```

- ➔ Include Flora UV Index Sensor - Si1145, NeoPixel, buzzer
- ➔ Define frequency to tunes

Coding

```
int melody2[] = { //i'll make a man out of you
NOTE_E5,NOTE_B4,NOTE_D5,NOTE_A4,NOTE_B4,NOTE_D5,
NOTE_A4,NOTE_B4,NOTE_C5,NOTE_D5,NOTE_A4,
NOTE_E5,NOTE_B4,NOTE_D5,NOTE_A4,NOTE_B4,NOTE_D5,
NOTE_A4,NOTE_B4,NOTE_C5,NOTE_D5,NOTE_D5,

int noteDurations2[] = {
  4,4,4,4,8,2,
4,8,2,4,2,
4,4,4,4,8,2,
3,4,4,4,2,
```

➔ 4 melodies matching 4 UV index intervals

Coding

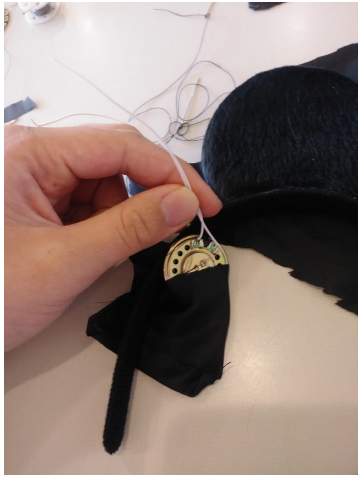
```
if (UVindex > 4 && UVindex<6 && shouldChime ){ //only chime when we a
   strip.setPixelColor(0,200,200,200); //white
   strip.show();
   delay(5000);
   strip.setPixelColor(0,0,0,0);
   strip.show();
   delay(100);
  for (int thisNote = 0; thisNote<112; thisNote++) { //under the sea
    int noteDuration =1500/ noteDurations[thisNote];
    tone(buzzer, melody[thisNote], noteDurations);
    int pauseBetweenNotes = noteDuration * 1.30;
  delay(pauseBetweenNotes);
  noTone(buzzer);
   }
  Serial.println("====================");
  Serial.println("CHIME");
  shouldChime = false;
  resetTimer();
 }
```

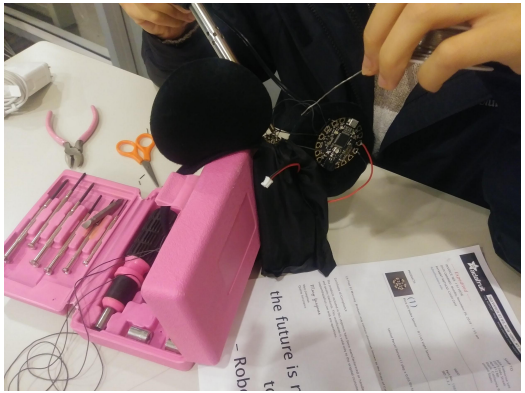
- ➔ Set 4 UV index intervals
- ➔ NeoPixel
- ➔ Music
- ➔ Reset timer

The Making

Stitching + Soldering

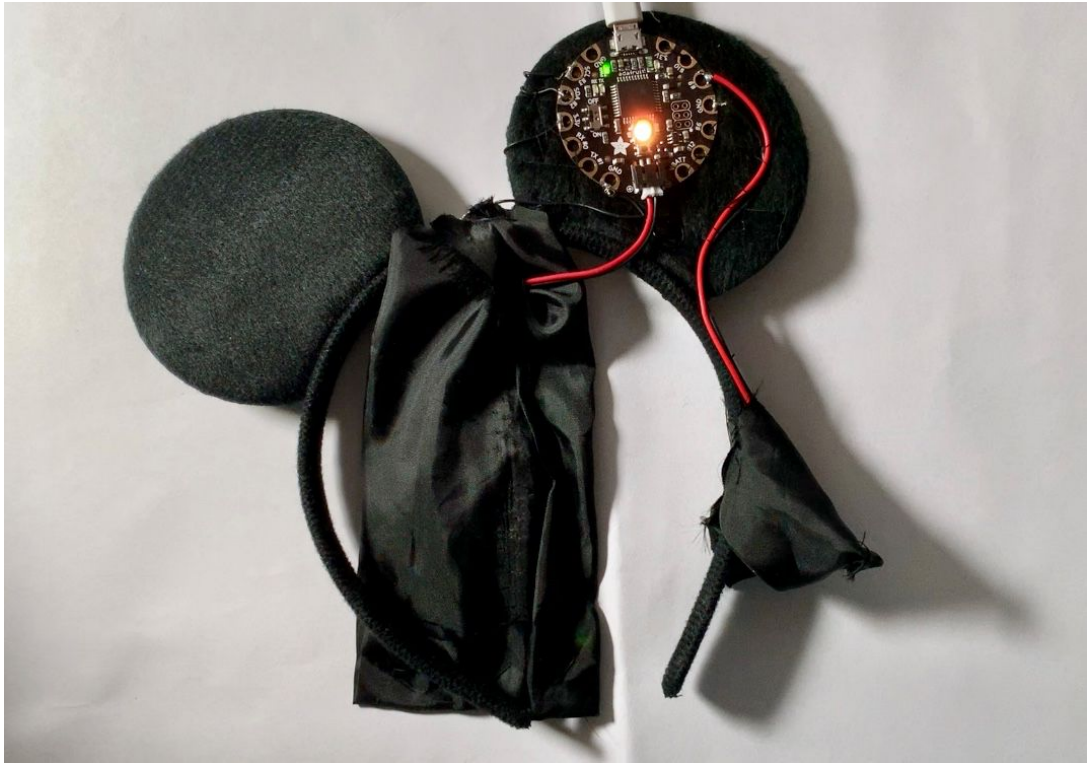
- ➔ Battery Pocket
- ➔ Speaker Pocket
- ➔ Flora, UV Sensor (non-conductive thread)
- ➔ Soldering (wires)





Final Materials

- ➔ Mickey mouse ear set
- ➔ Adafruit flora
- ➔ Piezo
- ➔ UV Index Sensor
- ➔ Wires
- ➔ Battery
- ➔ Regular thread
- ➔ Black fabric



Sunny Mickey
User Guide

UV Level 4-6

♪ Under the Sea

Moderate: apply broad spectrum SPF 30+ sunscreen every 2 hours

UV Level 6-8

♪ I will Make a Man Out of You

High:
Reduce time in the sun between 10 a.m. and 4 p.m
Apply broad spectrum SPF 30+ sunscreen every 2 hours

UV Level 8-10

♪ Circle of Life

Very High:
Seek shade and wear protective clothing
Reduce time in the sun between 10 a.m. and 4 p.m
Apply broad spectrum SPF 30+ sunscreen every 2 hours

UV Level 10-12

♪ How Far Will I Go

Extremely High:
Seek shade and wear protective clothing
Reduce time in the sun between 10 a.m. and 4 p.m
Apply broad spectrum SPF 30+ sunscreen every 2 hours
Watch out for bright surfaces

Source: https://learn.adafruit.com/adafruit-si1145-breakout-board-uv-ir-visible-sensor/what-is-the-uv-index

Lessons Learned

- Need user testing
  - Speaker appears to be too loud
- Definitely use ventilation when you solder
- Difficult to test out the product when weather is not permitting
- Don’t be afraid to hybridize codes

Resources

UV Light Sensor
https://www.adafruit.com/product/1981

UV Index
https://learn.adafruit.com/adafruit-si1145-breakout-board-uv-ir-visible-sensor/what-is-the-uv-index

Music
https://noobnotes.net/how-far-ill-go-moana/

Coding
https://learn.adafruit.com/sunscreen-reminder-hat/code