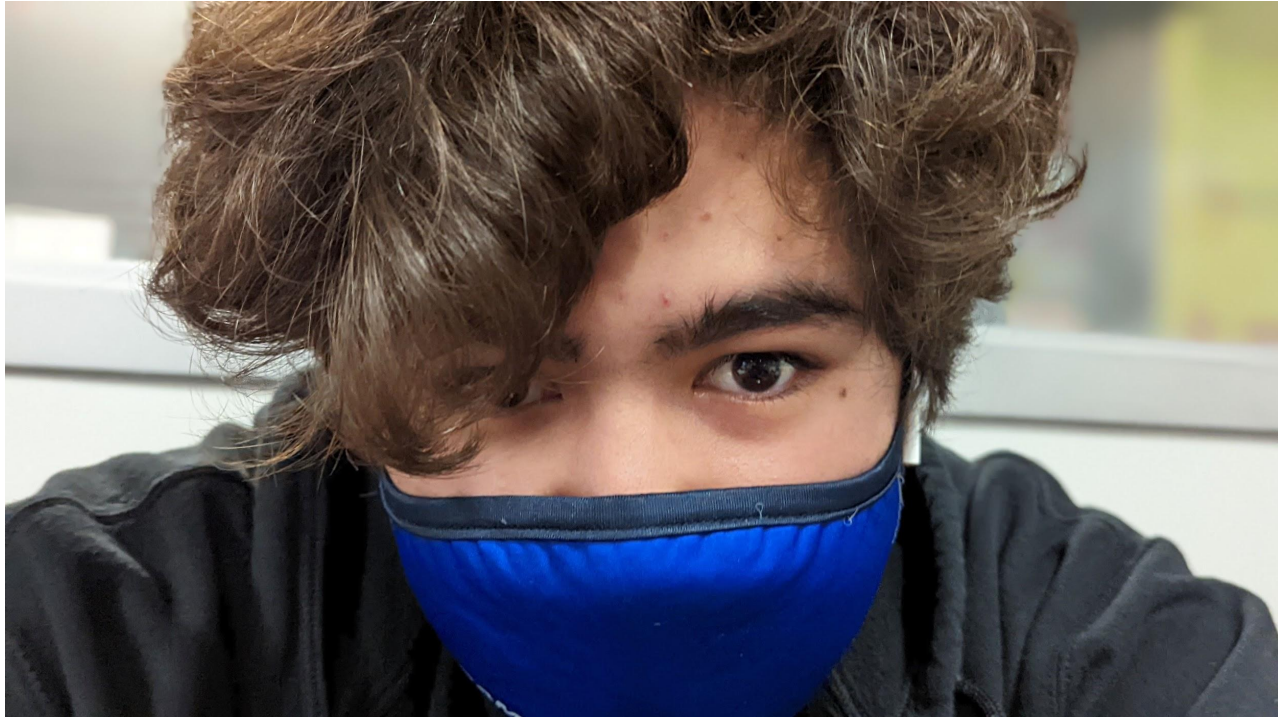


# How to use the cool lightbox thing :)

BY LEO WOU

>:( Why did you go to this slide? You weren't supposed to find this

- In any case, here's how you use the lightbox thing with arduinos and stuff



# Getting Started

- Mr. Landgreen probably has told you how to use a chromebook but I think I should give you a tutorial just in case you've forgotten



This is a keyboard, you use it to type your code



# Here are some further uses for a keyboard

- Looking things up online
- Looking up funny cat videos
- Typing essays
- Writing screenplays
- Writing stageplays
- Writing fanfiction related to Mr. Landgreen
- Writing fanfiction not related to Mr. Landgreen
- Writing romantic fanfiction that may or may not include Mr. Landgreen

# Coding

- In this project I used my computer keyboard to do coding
- Coding can also be used to get a job
- People code at a variety of different places
- One thing that is absent from the lives of many coders is women
- When I coded this light strip I used coding
- Coding can be fun sometimes, but is most often incredibly tedious and boring
- The end result when you code is fun though, so it can be compared to building a puzzle

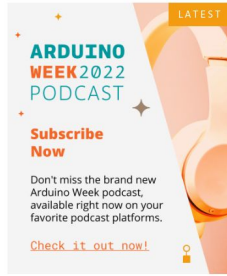
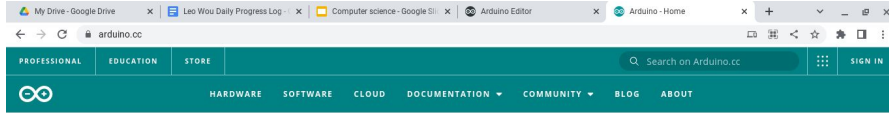
## But Leo? What website do I use to code?

Well, I'll tell you, you use [arduino.cc](https://arduino.cc), use your search bar and navigate to [arduino.cc](https://arduino.cc) whereupon you will sign in with your google account. After you sign in with your google account you will then install a chrome extension that allows you to code in arduino and then upload bits of code to your arduino project

# Directions

1. Go to arduino.cc

2. Click software

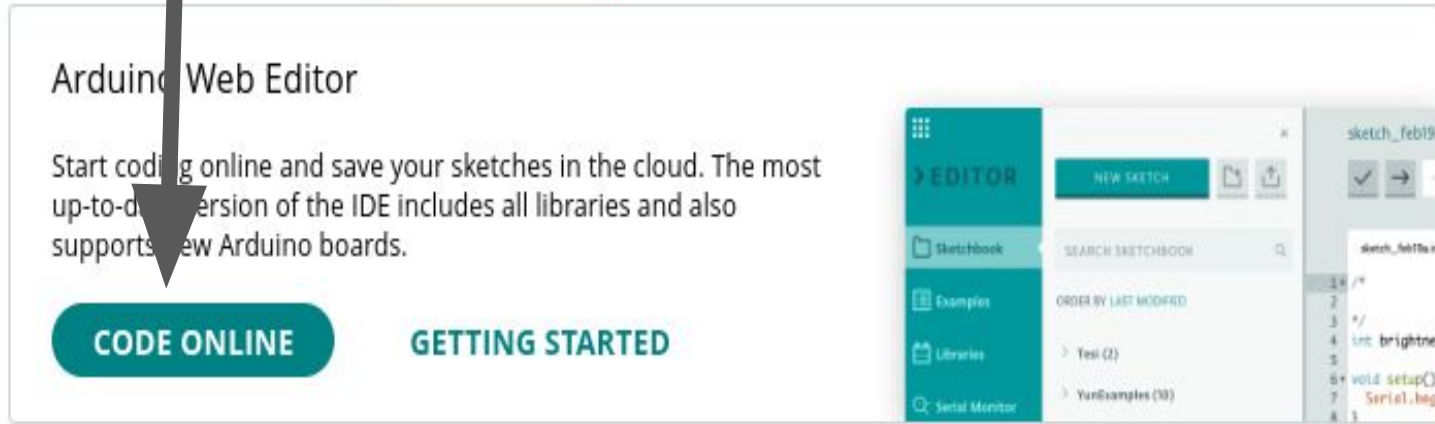


<https://store.arduino.cc/pages/braccioplusplus>





### 3. Click Code Online



The screenshot shows the Arduino Web Editor interface. A large, dark grey arrow points from the top left towards the 'CODE ONLINE' button. The interface includes a header with the title 'Arduino Web Editor' and a descriptive paragraph: 'Start coding online and save your sketches in the cloud. The most up-to-date version of the IDE includes all libraries and also supports new Arduino boards.' Below this text are two buttons: 'CODE ONLINE' (highlighted in a teal rounded rectangle) and 'GETTING STARTED'. To the right of the text is a preview of the IDE's workspace, which features a left sidebar with 'EDITOR', 'Sketchbook', 'Examples', 'Libraries', and 'Serial Monitor'. The main area shows a 'NEW SKETCH' button, a search bar, and a list of sketches. The rightmost pane displays a code editor with a snippet of C++ code for a serial monitor.

Arduino Web Editor

Start coding online and save your sketches in the cloud. The most up-to-date version of the IDE includes all libraries and also supports new Arduino boards.

**CODE ONLINE** GETTING STARTED

**EDITOR**

NEW SKETCH

Sketchbook

SEARCH SKETCHBOOK

ORDER BY LAST MODIFIED

Test (2)

YunExamples (30)

Serial Monitor

```
1 /*  
2  
3 */  
4 int brightness  
5  
6 void setup()  
7   Serial.begin  
8 }
```

## 4. Download extension

- In order to code you will be required to download the arduino editor chrome extension, once you download this you can begin to start coding

[Home](#) > [Apps](#) > [Arduino Create for Education](#)



### Arduino Create for Education



★★★★★ 5 | [Education](#) | 200,000+ users

Launch app

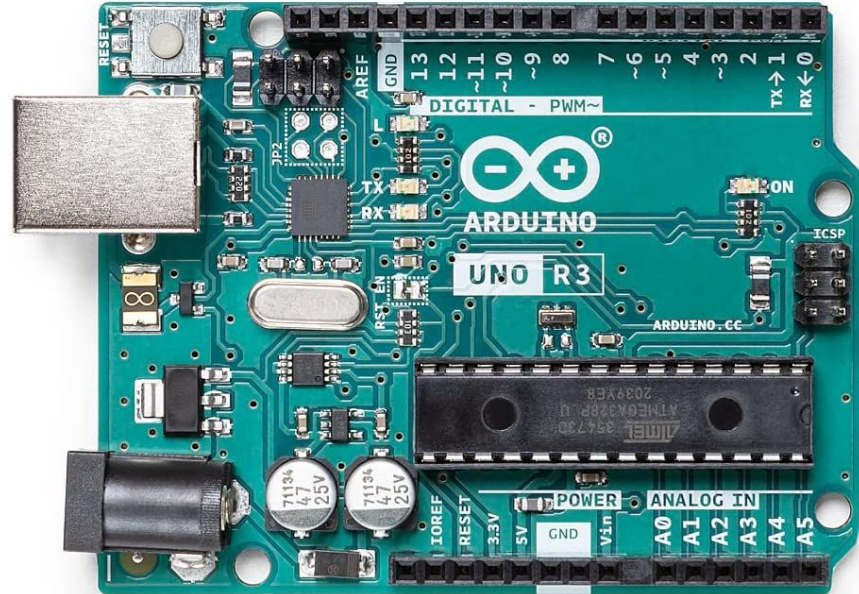
5. Now you are ready to start wiring the arduino



[www.free-smiley-faces.de](http://www.free-smiley-faces.de)

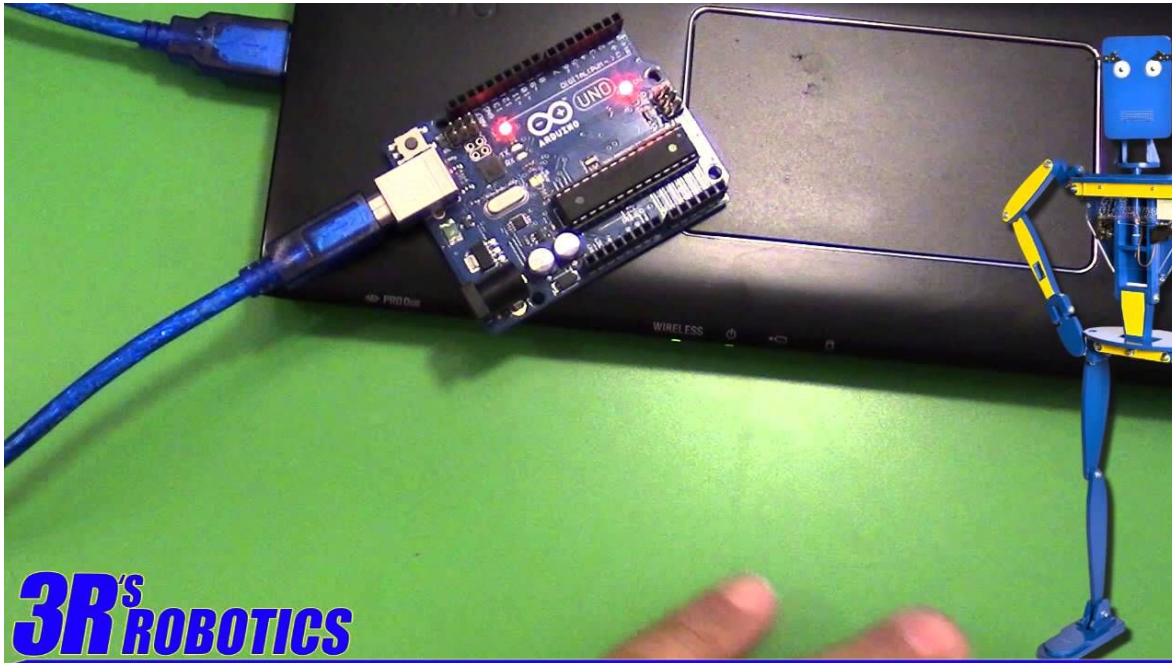
# Coding: Arduino

- An arduino is a little tiny computer that can store code on it, there are many different types of arduino with varying amounts of memory, size and computing power
- I used an arduino uno
- It looks like this

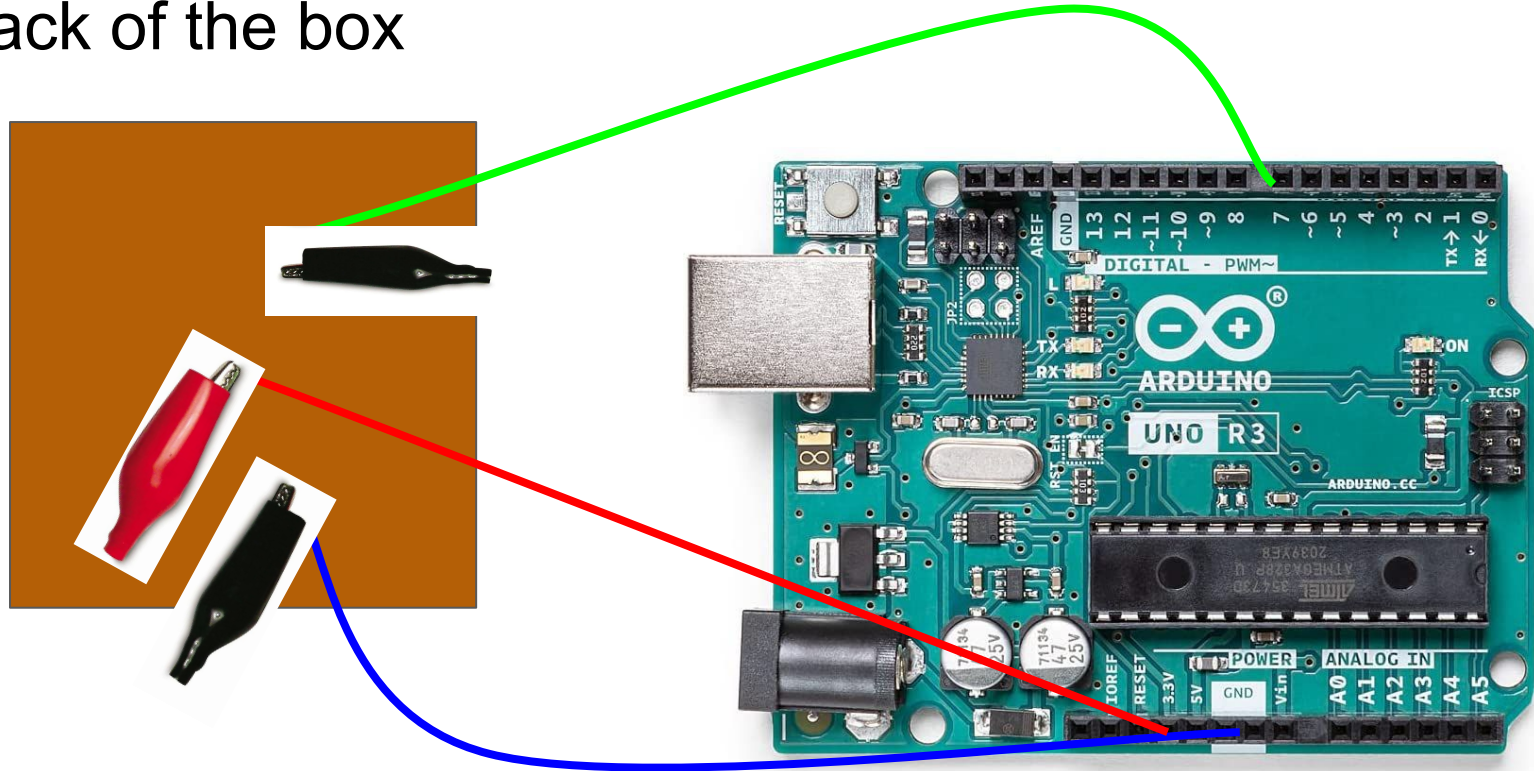


I wasn't in charge of making the infinity box, so you have to ask Mr. Landgreen about that

- In order to get the infinity box working you must first attach the box to the arduino Uno and then the arduino uno to the computer



In order to attach the uno to the box you must use alligator clips and wires and attach them to the arduino and the back of the box



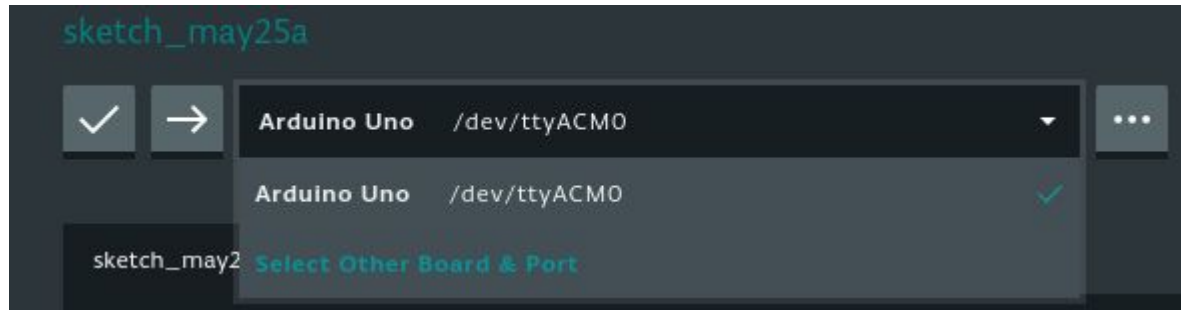


Once you have the arduino attached to both the computer and the lightbox you will be able to start your coding adventure



Your first step will be to test if your arduino is connected

If your wiring is correct you will be able to see that the arduino is connected to the computer, by clicking the dropdown box and making sure the arduino is checked





# Arduino Code/Libraries

Once you open your new sketch you will encounter two functions, one that says setup and one that says loop, don't touch these yet

```
void setup() {  
  
}  
  
void loop() {  
  
}
```

# Libraries

In order to use certain parts you need to include a library, in order to use the neopixel lightstrip you must include the neopixel library in the code and let the code know some basic things about the neopixel lightstrip, you can do this by navigating to the libraries menu on the left of the screen and searching for adafruit neopixel library and clicking include

## > EDITOR

 Sketchbook

 Examples

 Libraries

 Monitor

 Reference

 Help

 Preferences

 Features usage



CLOUD

### LIBRARY MANAGER



SEARCH LIBRARIES



SHOWING LIBRARIES FOR UNO

DEFAULT

FAVORITES

CUSTOM

This tab lists read-only [libraries](#) authored and maintained by the Arduino Team and its partners.

#### ARDUINO UNO WIFI DEV ED LIBRARY

This library allows users to use network features like rest and mqtt. Includes some tools for the ESP8266. [More info.](#)

> Examples

#### ARDUINOBEARSSL

Port of BearSSL to Arduino. [More info.](#)

> Examples

#### ARDUINOCLOUDTHING

# Adding Libraries + Setting things up

- Once you include the library you can begin doing the basic setup for using the neopixel lightstrip, this includes defining what pin the infinity box is connected to and also declaring how many lights are in the lightstrip

```
#include <Adafruit_NeoPixel.h>
#ifdef __AVR__
#include <avr/power.h> // Required for 16 MHz Adafruit Trinket
#endif

// Which pin on the Arduino is connected to the NeoPixels?
// On a Trinket or Gemma we suggest changing this to 1:
#define LED_PIN    7

// How many NeoPixels are attached to the Arduino?
#define LED_COUNT 19

// Declare our NeoPixel strip object:
Adafruit_NeoPixel strip(LED_COUNT, LED_PIN, NEO_GRB + NEO_KHZ800);
```

# Setup Function

The arduino code is composed of two functions, the loop and the setup function, the setup function runs once and it must run before the rest of the code does, the loop function runs over and over again. In this setup function I had to let the strip begin and show in order to make sure it was ready to accept code and display the code, I also declared some variables below the setup function

```
void setup() {  
  #if defined(__AVR_ATtiny85__) && (F_CPU == 16000000)  
    clock_prescale_set(clock_div_1);  
  #endif  
  // END of Trinket-specific code.  
  
  strip.begin();           // INITIALIZE NeoPixel strip object (REQUIRED)  
  strip.show();            // Turn OFF all pixels ASAP  
  strip.setBrightness(100);  
  Serial.begin(9600);  
}  
int animationNum = 0;  
int count = 0;
```

# Animation Functions

- Since my project is based around making animations I have created many functions for different animations on the lightbox
- I then put a switch statement that can change which function to call
- Here is a tour of two of my more visually interesting functions

```
void loop() {  
  switch (animationNum) {  
    case 1://code for first animation  
      gammaColorTest();  
      break;  
    case 2:  
      rainbowBreathe();  
      break;  
    case 3:  
      sparkles();  
      break;  
    case 4:  
      firework();  
      break;  
    case 5:  
      rainbowLowDownHalf();  
      rainbowHighDownHalf();  
      break;  
    case 6:  
      randomBlink();  
      break;  
  }  
}
```

# Firework

- My firework function
- First I create a random HSV color, I then choose a random number out of 19
- I then used a for loop to fill all the pixels in the lightstrip to the random color
- Finally, I use the random number out of 19 to set one of the pixels on the strip white

```
void firework () {  
    uint32_t randomColor = strip.gamma32(strip.ColorHSV(random(0, 65536)));  
    int y = random(19);  
    for (int j = 0; j < 19; j++) {  
        strip.setPixelColor(j, randomColor);  
    }  
    strip.show();  
    // HSVtoRGB(&r, &g, &b, x, 1, 100);  
    strip.setPixelColor(y, 255, 255, 255);  
    strip.show();  
    delay(1000);  
}
```

# Sparkles

- For this function I created two random colors
- I then set every other color on the lightstrip to one of the randomly generated colors, and then I set every other color to the other color
- I then set it to loop so it switches colors very quickly

```
void sparkles() {  
  uint32_t randomLowColor = strip.gamma32(strip.ColorHSV(random(0, 32767)));  
  uint32_t randomHighColor = strip.gamma32(strip.ColorHSV(random(32768, 65536)));  
  // HSVtoRGB(&r, &g, &b, x, 1, 100);  
  for (int i = 0; i < 18; i += 2) {  
    strip.setPixelColor(i, randomLowColor);  
    delay(50);  
  }  
  // HSVtoRGB(&r, &g, &b, y, 1, 100);  
  for (int j = 1; j < 18; j += 2) {  
    strip.setPixelColor(j, randomHighColor);  
    delay(50);  
  }  
  strip.show();  
}
```



# weezer

Demonstration, I will now demonstrate the project running through every single function I created once

<https://photos.app.goo.gl/YjFabv9sPC5GbGWFA>

<https://photos.app.goo.gl/KWozGBwNtqMV5tBz9>

<https://photos.app.goo.gl/FA1qhJD9a9vS7B758>

<https://photos.app.goo.gl/FdJEKknECwgKa2dg8>

