# Lesson 3

Arduino Basics - OLED Displays

What Are We Doing to Learn Today

# What is an OLED Display?

- OLED displays, just like all other color displays, use three colors of pixels: Red, Green, and Blue

- From these three primary colors, we are able to make any other color by adjusting the brightness of each color

- For example, blue is just the blue pixel, black is no pixels, and white is every pixel being lit

- Many different display technologies exist, including LCD (perhaps the most common), meaning Liquid Crystal Display, the same you see in digital watches, and OLED (Organic light emitting diodes), a relatively new invention
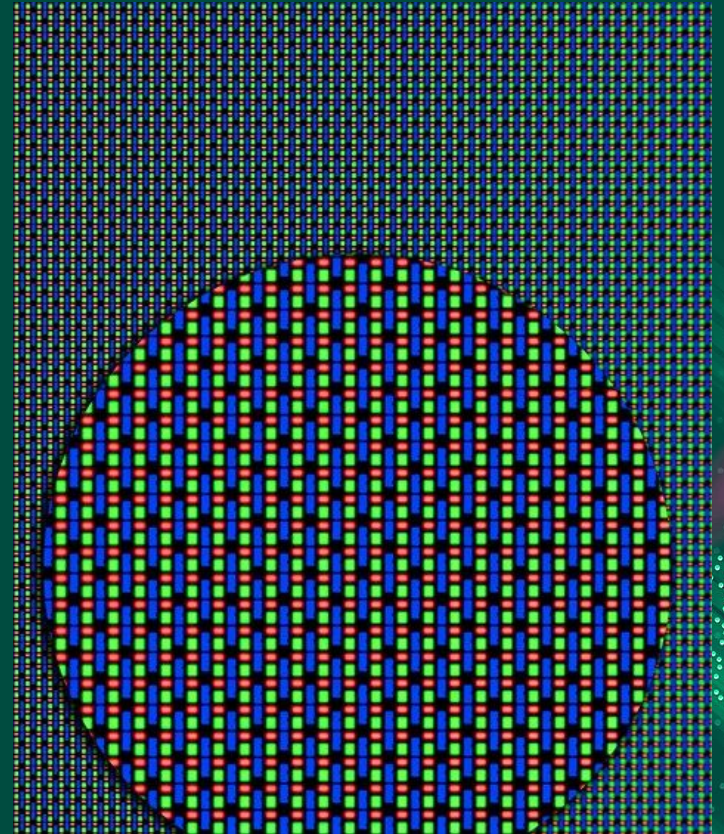
# What does OLED mean?

- OLED means Organic Light Emitting Diode, like the LEDs we learned about in the previous lesson

- As opposed to LCDs which require a backlight to reveal any colors, OLEDs emit their own light, meaning that colors are more vibrant

- OLEDs have an individual LED for each color, meaning that there is a high level of control over each color

- Bause LEDs are a relatively new invention, OLEDs, which require complex materials and manufacturing processes, were only popularized several years ago
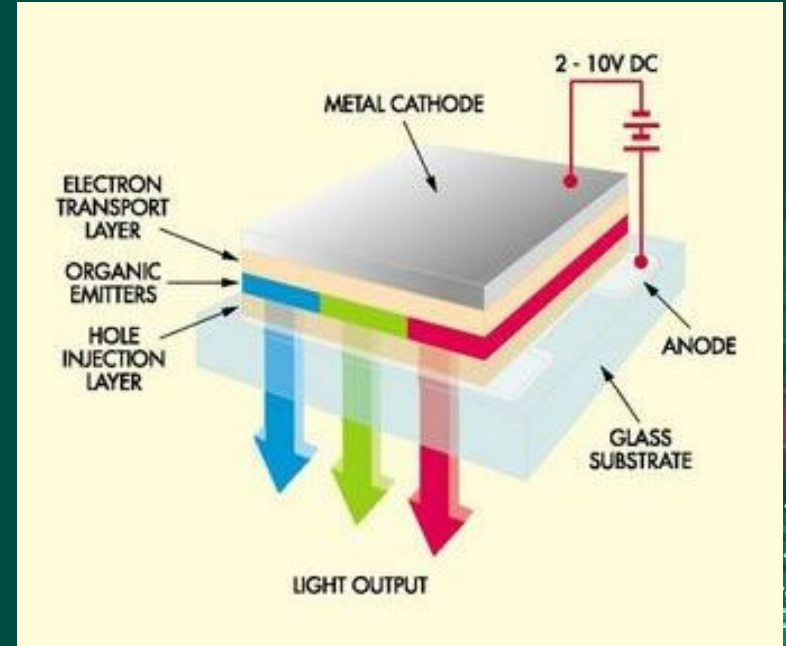
# How do we connect a display to an Arduino?

- Unlike tri-color OLEDs, our OLEDs are simply black and white, otherwise known as black and white monochrome

- Like almost all components, the OLED displays require a 5V input from the Arduino (VCC), and a GND/Ground connection

- The other two lines are critical to transferring data from the Arduino to the display

- SCL is the serial clock line, this is where the "clock" is transported to give the display some sense of time

- SDA is the serial data line, meaning that it actually transfers the 1's and 0's that decide which pixels will light up
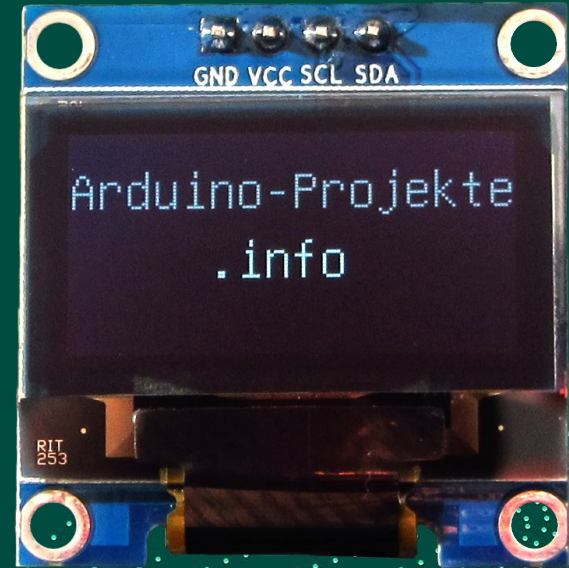
# Breadboard Basics
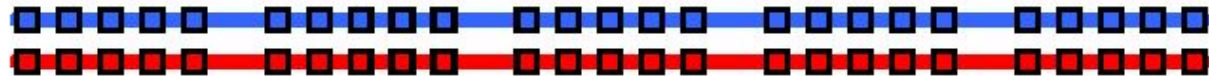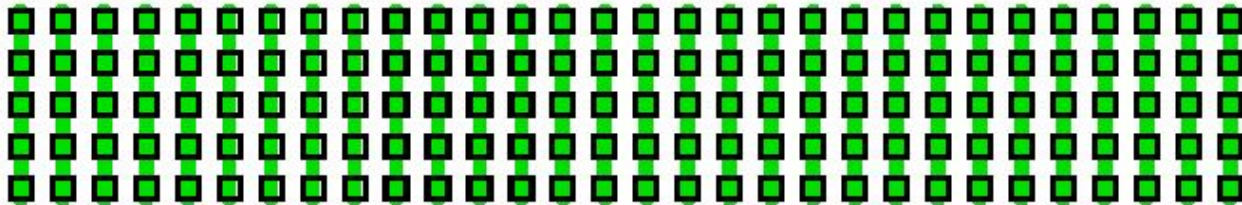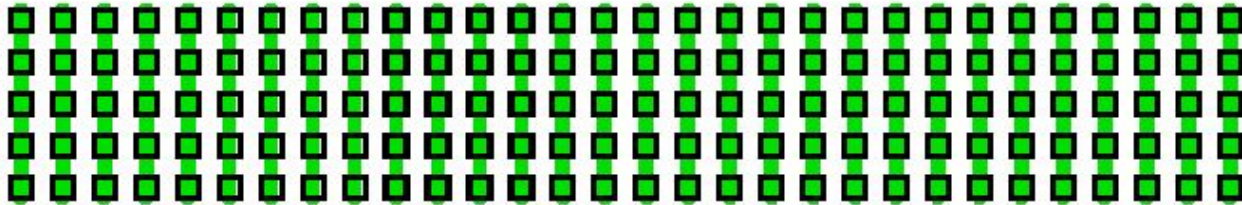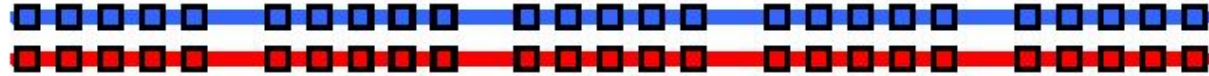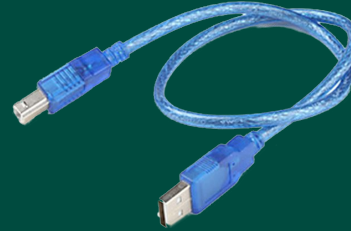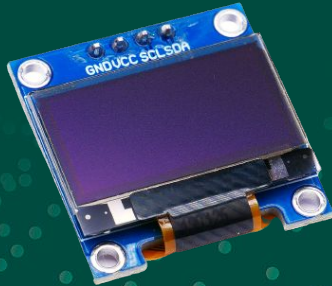
# What We're Building:
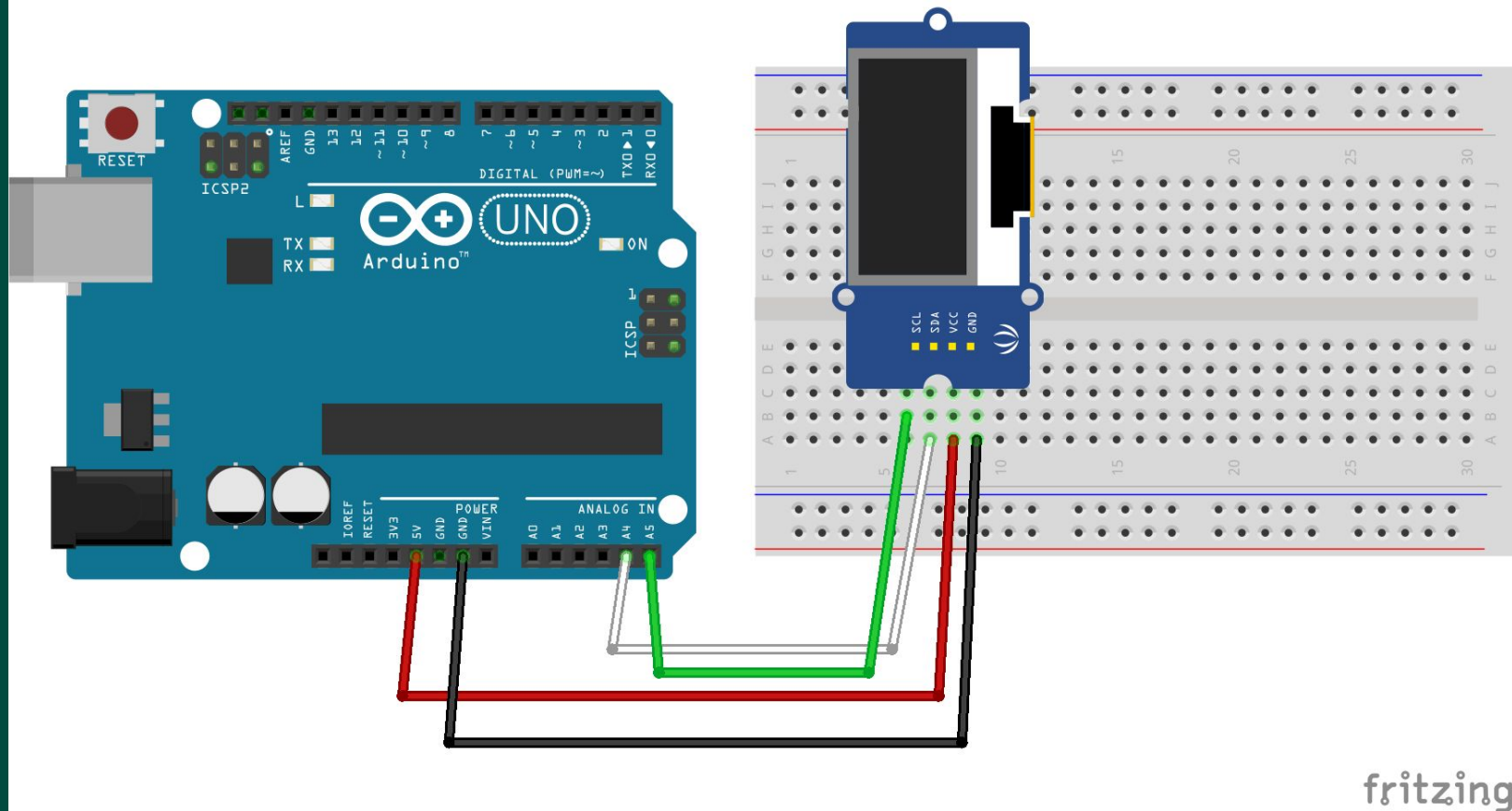
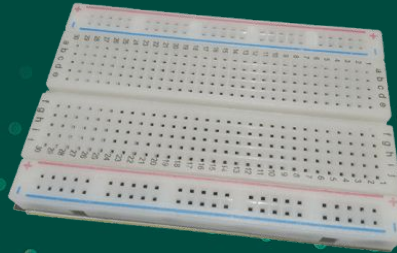# What We Need

1 x Arduino Uno
(Elegoo brand)

1 x USB Type B to
USB Type A Cable

1 x OLED Display
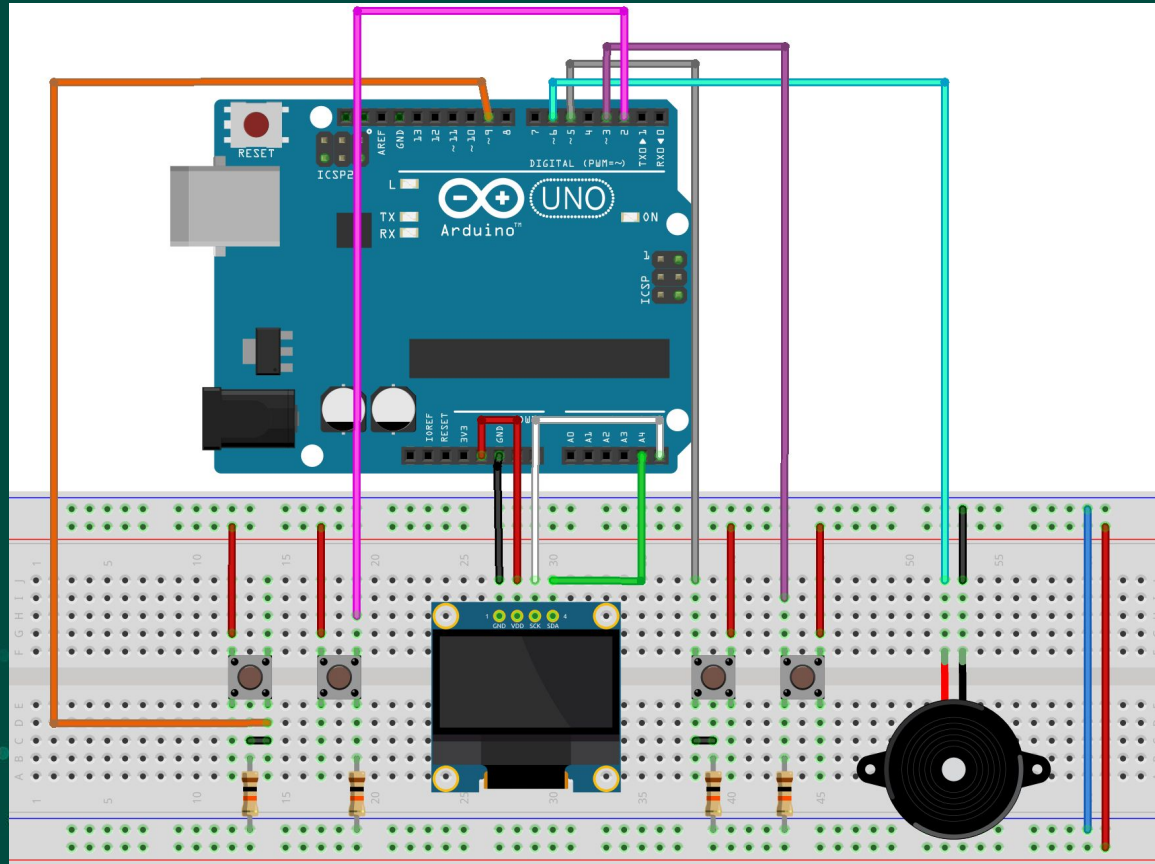
1 x Breadboard

4 x Male-Male
Wires

# Testing the Circuit

**To test the circuit, follow these steps:**

1. Connect your Arduino to your Chromebook

2. Go to the library manager portion of the editor, and install the libraries called "Adafruit SSD1306" and "Adafruit GFX"

3. Double and triple check your connections

4. Upload the code to the board, located under lesson 3 titled "Display_Demo" and the other titled "Display_Fun"

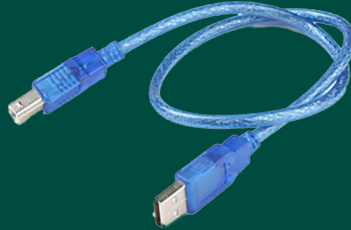5. Watch the display light up!

# What we can also build!
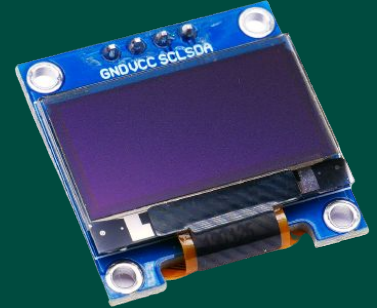
# What We Need

1 x Arduino Uno (Elegoo brand)
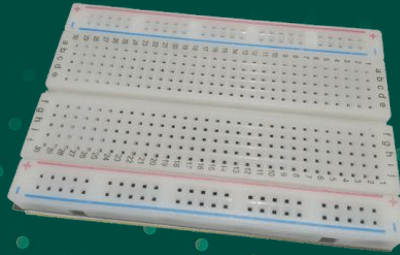
1 x USB Type B to USB Type A Cable

1 x Push Button w/ Cap
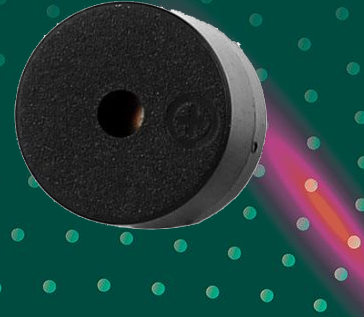
1 x OLED Display

4 x 10kΩ Resistor
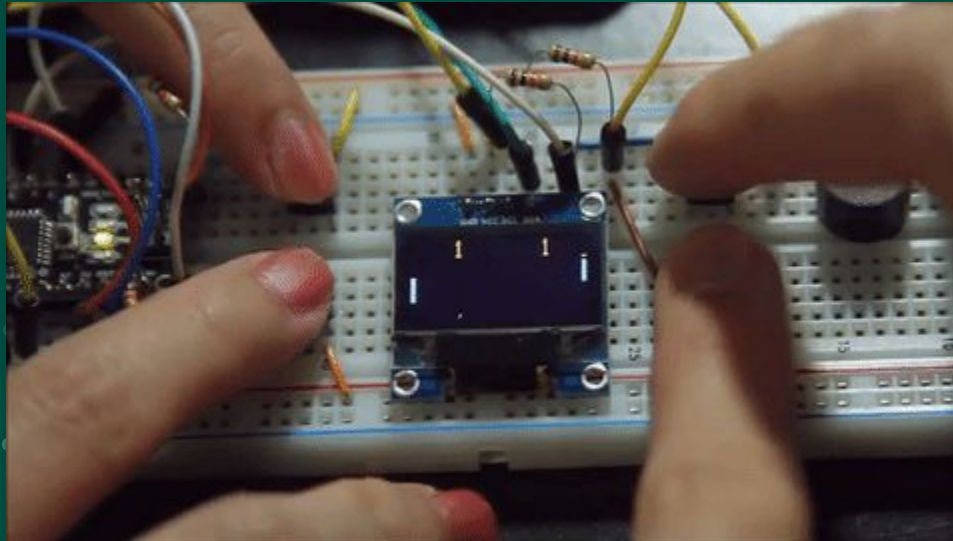
1 x Breadboard

16 x Male-Male Wires

1 x Buzzer

# Testing the game

**To test the circuit, follow these steps:**
1. Connect your Arduino to your Chromebook
2. Make sure the libraries are installed from the previous project
3. Double check your connections
4. Go to the lesson 3 folder and take the code from the Arduino_Pong.ino file
5. Upload it and an enjoy playing Pong!

**Congratulations, you're now an electrical engineer!**

# Thank you for coming to this lesson, and I hope you learned something!

*Come back next week for more!*