1. Watch Video and Read about how humans see color.
   1. <https://askabiologist.asu.edu/rods-and-cones>
2. Read watch what are neopixils a.k.a. RGB LEDs
   1. <https://randomnerdtutorials.com/electronics-basics-how-do-rgb-leds-work/> Do not read past ***Example – Control an RGB LED with the Arduino.***
   2. https://www.youtube.com/watch?v=HO6xQMR8naw

Libraries in python and in most programming languages, are a collection of already written programs that allow you to save time and simplify your programs. Someone AdaFruit Company wrote a libraries to use all of the gadgets on our CPE.

# This line imports libraries that allows access to the neopixels on our board

**import** board

# This line imports libraries that are used to simply show any color on our neopixils, we have 10!

**import** neopixel

# This line imports everything to do with time. We will use it to control how much time to light up the neopixils.

time.**sleep**(*secs*)[¶](https://docs.python.org/2/library/time.html#time.sleep)

Suspend execution of the current thread for the given number of seconds. The argument may be a floating point number to indicate a more precise sleep time. The actual suspension time may be less than that requested because any caught signal will terminate the [**sleep()**](https://docs.python.org/2/library/time.html#time.sleep) following execution of that signal’s catching routine. Also, the suspension time may be longer than requested by an arbitrary amount because of the scheduling of other activity in the system. <https://docs.python.org/2/library/time.html>

**import** time

# this line creates an object called pixels. You could have named the object whatever you wanted like “rainbow\_lites” but we used pixels. Here is where we use previously written code we imported above. “neopixel” is the library name and the specific program we want to use is called “NeoPixel” confusing? This program needs additional configuration or settings to make it work properly. First setting is the where the neopixels are found, which we reference another library “board.NEOPIXEL”. The second arguement is “10” which tell how many neopixls there are. The last argument is how bright 1 being brightest and 0 being off.

pixels = neopixel.NeoPixel(board.NEOPIXEL, 10, brightness=.2)

# This line sets the color to 0,0,0 which is black or off

pixels.fill((0,0,0))

# This line tell the board to show the colors.

pixels.show()

Step one write down your plan or your goals!

1. What colors do you want to make each of the 10 neopixils
2. Do you want them to blink? bright?

Calculate the color using 3 bytes:

1. Define a byte.
2. Use Website and note down values for your color:
   1. http://htmlcolorcodes.com/

Program the following:

Red, Green, Blue

Purple, Pink, Yellow

White, Orange…

How about the rainbow?

References:  
 http://circuitpython.readthedocs.io/projects/neopixel/en/latest/\_modules/neopixel.html

<http://circuitpython.readthedocs.io/projects/neopixel/en/latest/README.html>

<https://learn.adafruit.com/adafruit-circuit-playground-express/circuitpython-neopixel>

EXTRA Reference for Buttons/Switches:

<https://learn.adafruit.com/adafruit-circuit-playground-express/circuitpython-digital-in-out>

# Setup button A

button\_a = DigitalInOut(board.BUTTON\_A)

button\_a.direction = Direction.INPUT

button\_a.pull = Pull.DOWN