

## RESISTORS->

10k Resistor-

Sensors/Voltage Divider

BUTTONS & FLEX SENSORS

(brown, black, orange)

330k Resistor- LEDS

(orange, orange, purple)

4.7k Resistor-

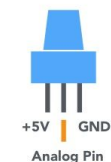
Temperature Sensor

(yellow, purple, red)

## POTENTIOMETER->

GRD and 5V can be switched.

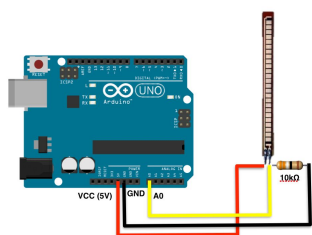
NO RESISTOR NEEDED.



```
int potPin = 2;
int ledPin = 13;
int val = 0; // variable to store the
value coming from the sensor
void setup() {
  pinMode(ledPin, OUTPUT); // declare
the ledPin as an OUTPUT
}
void loop() {
  val = analogRead(potPin);
  digitalWrite(ledPin, HIGH);
  delay(val);
  digitalWrite(ledPin, LOW);
  delay(val);
}
```

## FLEX SENSOR->

```
int flex;
void setup() {
  Serial.begin(9600);
}
void loop() {
  flex = analogRead(0);
  Serial.println(flex);
}
```



## EXAMPLE CODE FOR MAPPING->

```
// USED ON LIGHT & FLEX SENSOR
int light;
int led = 3;
void setup() {
  Serial.begin(9600);
  pinMode(led, OUTPUT);
}
void loop() {
  light = analogRead(0);
  Serial.println(light);
  int bright = map(light, 175, 319, 0,
255);
  bright = constrain(bright, 255, 0);
  analogWrite(led, bright);
}
```

## EXAMPLE CODE FOR SWITCH CASES->

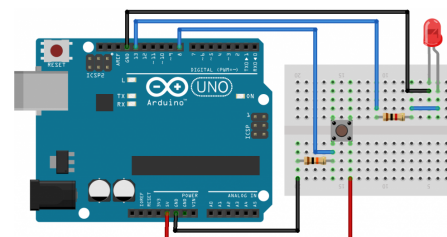
```
int mode = 0;
void loadMode(){
  switch(mode){
    case 0: img1(); break;
    case 1: img2(); break;
  }
  // Clear Screen if Mode Changes
  if (lastMode != mode){
    lastMode = mode;
    display.clearDisplay();
    display.clearDisplay();
  }
}
void homeScreen(){
  // Button Input
  int b = checkButton();
  if (b == 1) {
    mode = 1;
  }
}
```

## EXAMPLE CODE FOR SETTING UP SCREEN->

```
#include <SPI.h>
#include <Wire.h>
#include <Adafruit_GFX.h>
#include <Adafruit_SSD1306.h>
#define OLED_RESET 4
Adafruit_SSD1306 display(OLED_RESET);
void setup() {
  Serial.begin(9600);
  display.begin(SSD1306_SWITCHCAPVCC,
0x3C);
  display.clearDisplay();
  display.display();
}
void loop(){
}
```

## EXAMPLE CODE FOR BUTTON+LED->

```
const int buttonPin = 2;
const int ledPin = 13;
int buttonState = 0;
void setup() {
  Serial.begin(9600);
  pinMode(ledPin, OUTPUT);
  pinMode(buttonPin, INPUT);
}
void loop() {
  buttonState = digitalRead(buttonPin);
  if (buttonState == HIGH) {
    digitalWrite(ledPin, HIGH);
    Serial.println("HIGH");
  } else {
    digitalWrite(ledPin, LOW);
    Serial.println("LOW");
  }
}
```



fritz

## EXAMPLE CODE FOR NEOPIXELS->

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

## define PIN 6

```
int NUM_LEDS = 3;
Adafruit_NeoPixel strip =
Adafruit_NeoPixel
(NUM_LEDS, PIN, NEO_GRB + NEO_KHZ800);
void setup() {
  strip.begin();
  strip.show();
}
void loop() {
  strip.setBrightness(5);
  colorWipe(strip.Color(255, 0, 0), 250);
  colorWipe(strip.Color(0, 255, 0), 250);
  colorWipe(strip.Color(0, 0, 255), 250);
}
void colorWipe(uint32_t c, uint8_t wait)
{
  for (int i = 0; i < strip.numPixels();
i++) {
    strip.setPixelColor(i, c);
    strip.show();
    delay(wait);
  }
}
```

## EXAMPLE CODE FOR TEMP. SENSOR->

```
/******
**** 4.7K between + and pin ****
*****/
#include <OneWire.h>
#include <DallasTemperature.h>
#define ONE_WIRE_BUS 2
OneWire oneWire(ONE_WIRE_BUS);
DallasTemperature sensors(&oneWire);
void setup(){
  Serial.begin(9600);
  sensors.begin();
}
void loop() {
  sensors.requestTemperatures();
  float c = sensors.getTempCByIndex(0);
  float f = (c * (9.0/5.0)) + 32;
  Serial.println(f);
  delay(1000);
}
```

## EXAMPLE CODE FOR PIEZO->

```
// NO RESISTOR
const int buttonPin = 2;
const int piezoPin = 13;
int buttonState = 0;
void setup() {
  Serial.begin(9600);
  pinMode(piezoPin, OUTPUT);
  pinMode(buttonPin, INPUT);
}
void loop() {
  buttonState = digitalRead(buttonPin);
  if (buttonState == HIGH) {
    tone(piezoPin, 1000);
    Serial.println("HIGH");
  } else {
    noTone(piezoPin);
    Serial.println("LOW");
  }
}
```

## SSD1306\_128x64\_i2c EXAMPLE CODE->

```
display.drawPixel(10, 10, WHITE);
display.setTextSize(1);
display.setCursor(0,0);
display.setTextColor(WHITE, BLACK);
display.setTextWrap(true);
```

```

display.println("Hello, world!");
display.drawBitmap(0, 0, ???, 128, 64,
WHITE);
display.drawRect(x, y, w, h, color);
display.fillRect(x, y, w, h, color);
display.drawLine(x, y, x1, y1, color);
display.drawCircle(x, y, r, color);
display.fillCircle(x, y, r, color);
display.drawTriangle(x, y, x1, y1, x2,
y2, color);
display.fillTriangle(x, y, x1, y1, x2,
y2, color);
EXAMPLE FOR SERVO->
#include <Servo.h>
Servo myservo; // create servo object to
control a servo
// twelve servo objects can be created on
most boards

```

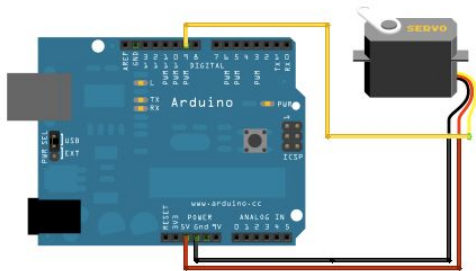
```

int pos = 0; // variable to store the
servo position

void setup() {
  myservo.attach(9); // attaches the
servo on pin 9 to the servo object
}

void loop() {
  for (pos = 0; pos <= 180; pos += 1) {
    // goes from 0 degrees to 180 degrees
    // in steps of 1 degree
    myservo.write(pos); //
tell servo to go to position in variable
'pos'
    delay(15); //
waits 15ms for the servo to reach the
position
  }
  for (pos = 180; pos >= 0; pos -= 1) {
    // goes from 180 degrees to 0 degrees
    myservo.write(pos); //
tell servo to go to position in variable
'pos'
    delay(15); //
waits 15ms for the servo to reach the
position
  }
}

```



#### **EXAMPLE CODE FOR MILLIS->**

```

unsigned long time;

void setup(){
  Serial.begin(9600);
}

void loop(){
  Serial.print("Time: ");
  time = millis();

  Serial.println(time); //prints time
since program started

```

```

    delay(1000); // wait a
second so as not to send massive amounts
of data
}
EXAMPLE CODE FOR BOOLEAN->
int LEDpin = 5; // LED on pin 5
int switchPin = 13; // momentary switch
on 13, other side connected to ground

bool running = false;

void setup()
{
  pinMode(LEDpin, OUTPUT);
  pinMode(switchPin, INPUT);
  digitalWrite(switchPin, HIGH); //
turn on pullup resistor
}

void loop()
{
  if (digitalRead(switchPin) == LOW)
  { // switch is pressed - pullup keeps
pin high normally
    delay(100); //
delay to debounce switch
    running = !running; //
toggle running variable
    digitalWrite(LEDpin, running); //
indicate via LED
  }
}

```

**THE HORRIBLE NOTES FOR CRT 420 ADVANCED  
PROTOTYPING  
BY: SIDNEY MCADAMS  
4/30/18**