

Übungen zur TI

5. Übung

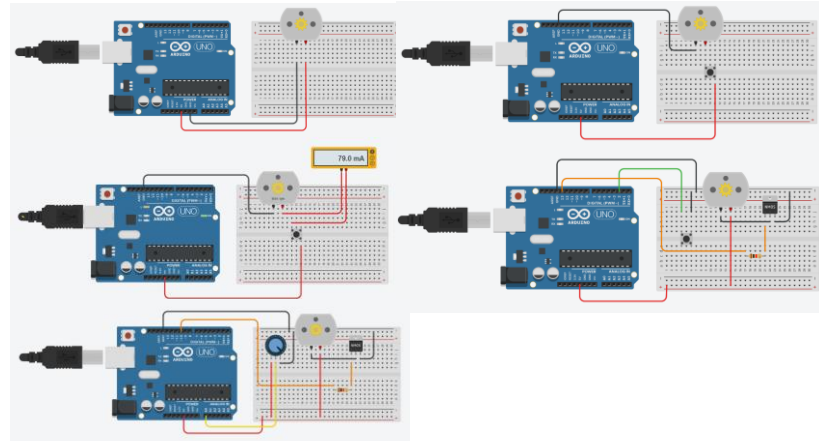
Inhalt

- Zusammenfassung der letzten Woche
- Verbesserung der Hausaufgabe
- RGB LED
 - AnalogInOutSerial
 - Common Anode / Common Cathode?
 - RGB mit drei Potis
- Neopixels

Zusammenfassung Übung 4

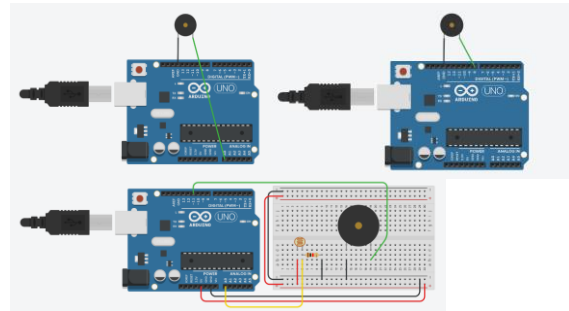
- Motor

- Motor mit Button
- Motor Strom messen
- Motor mit Transistor und Button
- Motor mit Transistor und Poti



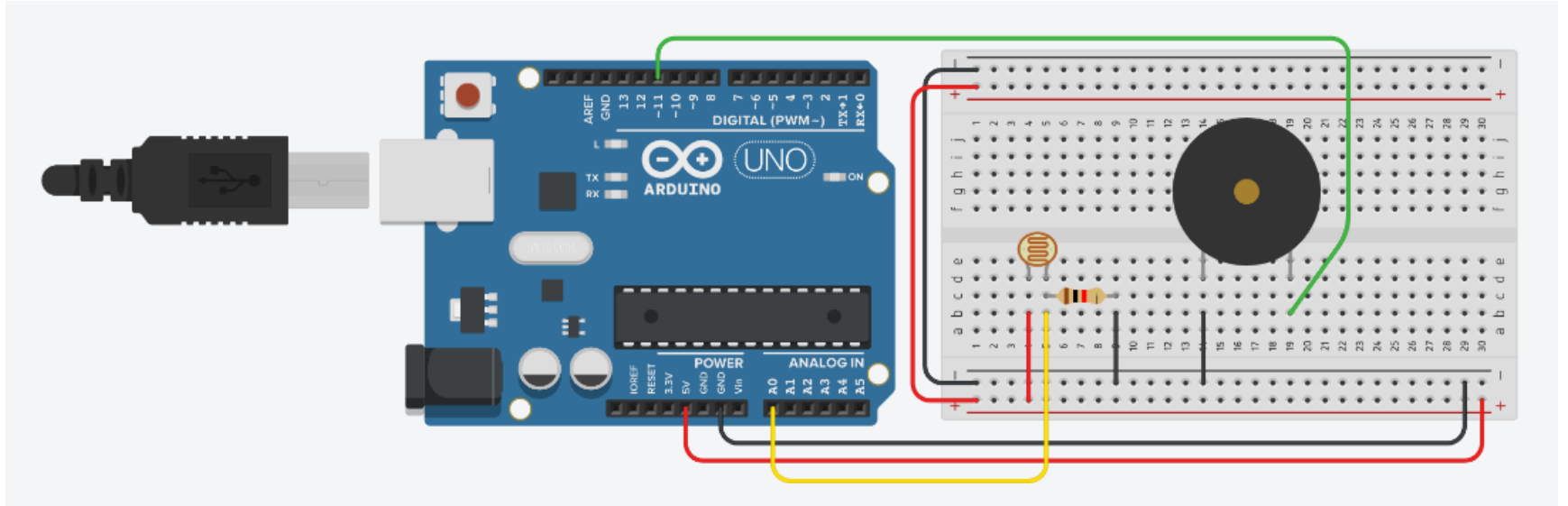
- Piezo Speaker

- Piezo input
- Piezo ToneMelody
- Piezo mit LDR



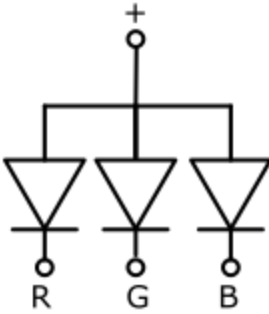
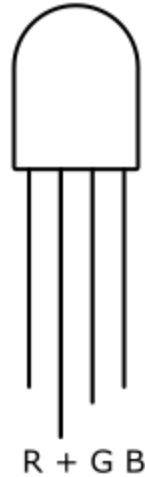
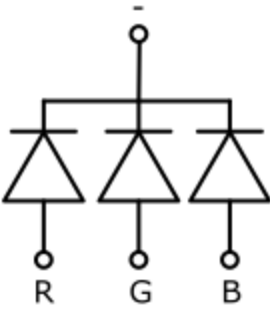
Testat Übung 4

Programmiere eine Melodie die sich wiederholt und von dem Lichtsensor beeinflusst wird.



RGB LED

“Common Cathode” vs “Common Anode”



RGB LED

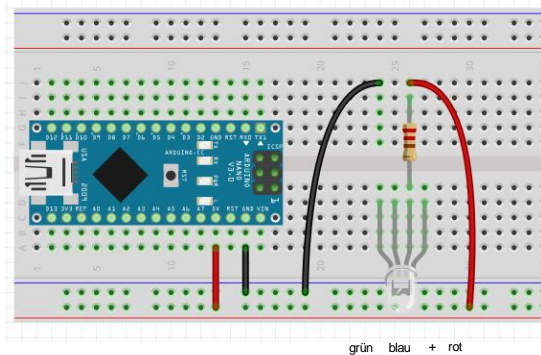
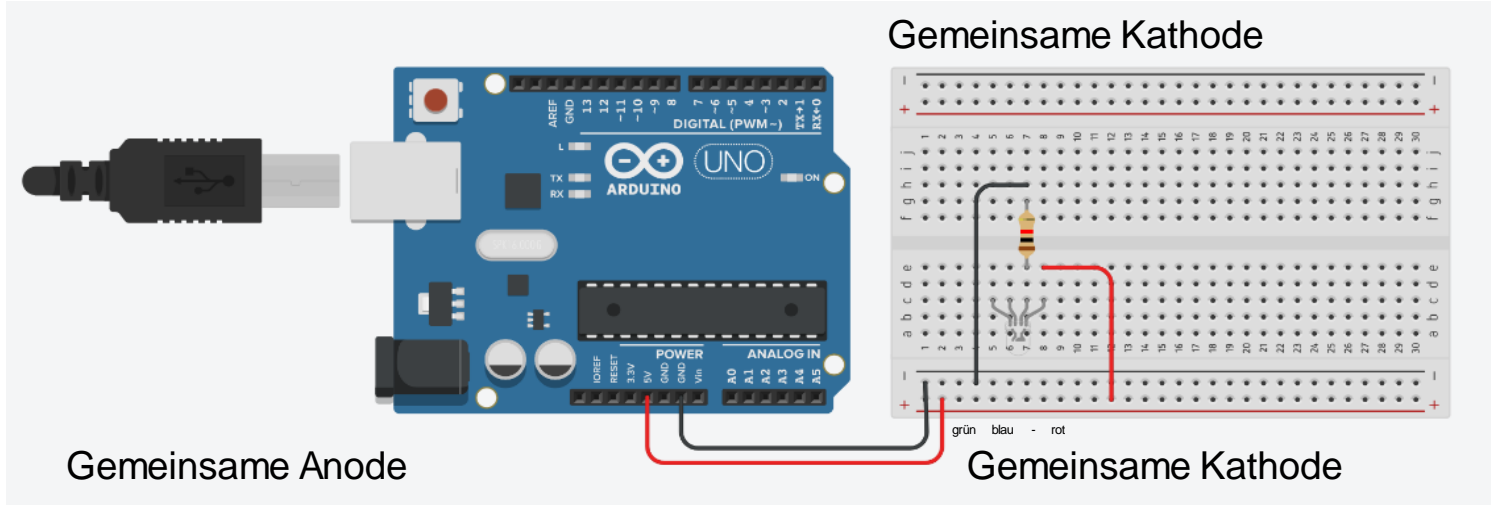
“Common Anode” vs “Common Cathode”

Don't PANIC

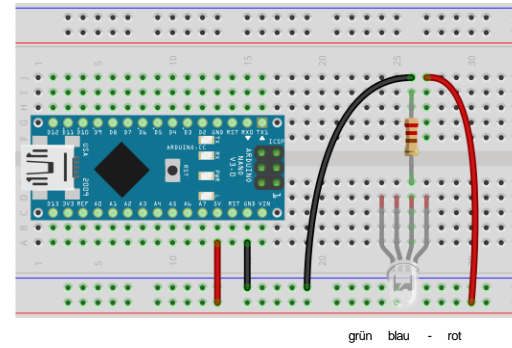
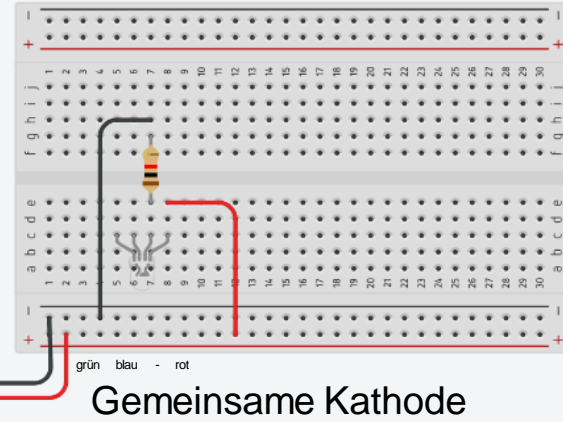
Positive is Anode, Negative is Cathode

RGB LED

“Common Anode” vs “Common Cathode”



Gemeinsame Kathode



RGB LED

<https://cree-led.com/media/documents/ds-CLV1A-FKB.pdf>

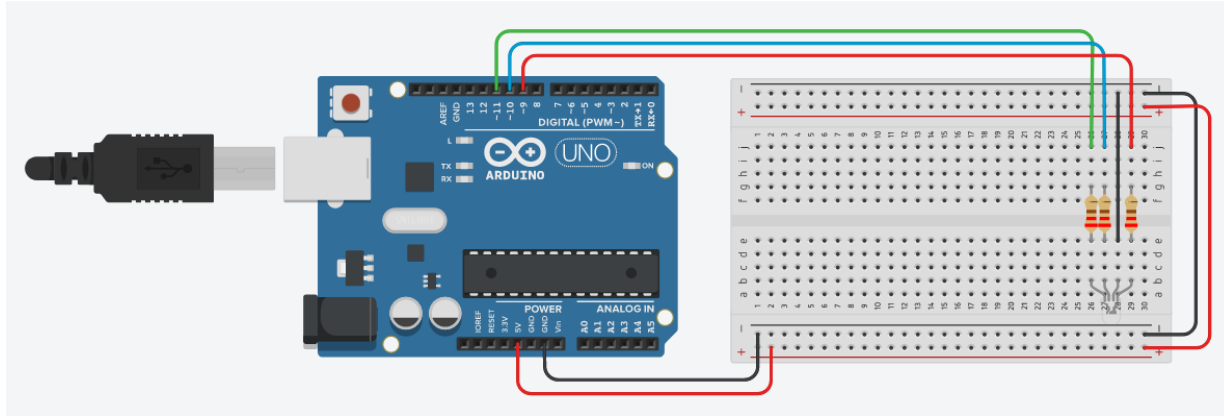
ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

Items	Symbol	Absolute Maximum Rating			Unit
		R	G	B	
Forward Current <small>Note 1</small>	I_F	50	25	25	mA
Peak Forward Current <small>Note 2</small>	I_{FP}	200	100	100	mA
Reverse Voltage	V_R	5	5	5	V
Power Dissipation	P_D	130	100	100	mW
Operation Temperature	T_{OP}	-40 ~ +85			$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 ~ +100			$^\circ\text{C}$
Junction Temperature	T_J	110	110	110	$^\circ\text{C}$
Junction/ambient 1 chip on	R_{THJA}	450	400	450	$^\circ\text{C}/\text{W}$
Junction/ambient 3 chips on	R_{THJA}	650	580	680	$^\circ\text{C}/\text{W}$
Junction/solder point 1 chip on	R_{THJS}	300	280	300	$^\circ\text{C}/\text{W}$
Junction/solder point 3 chips on	R_{THJS}	450	430	480	$^\circ\text{C}/\text{W}$



RGB LED

mit drei 220Ω Widerständen

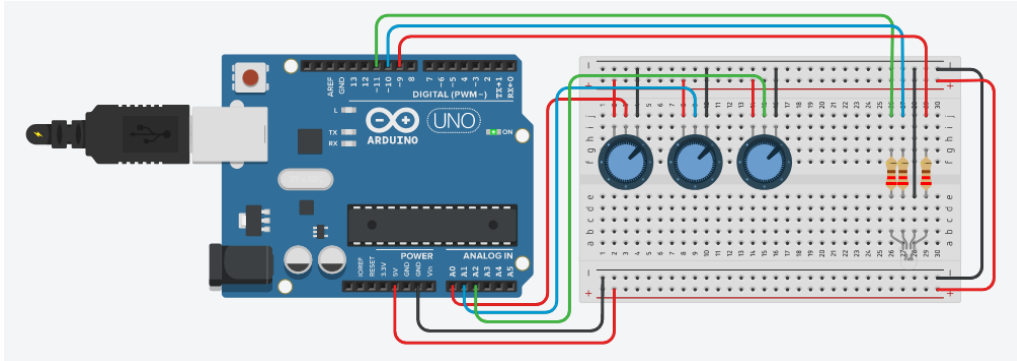


```
void setup()
{
  pinMode(9, OUTPUT);
}

void loop()
{
  digitalWrite(9, HIGH);
  delay(1000);
  digitalWrite(9, LOW);
  delay(1000);
}
```

RGB LED

mit drei Potis



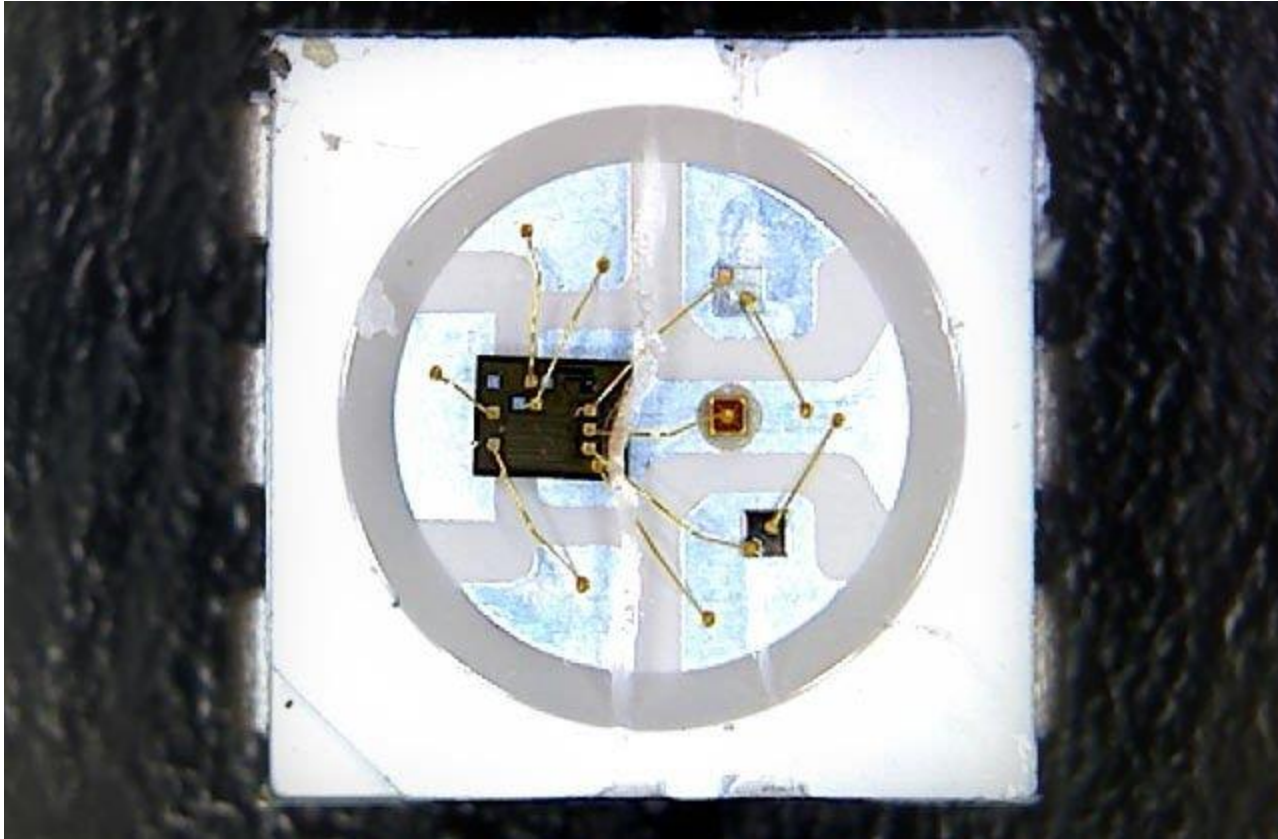
```
int redPin = 9;  
int greenPin = 10;  
int bluePin = 11;
```

```
void setup()  
{  
  pinMode(redPin, OUTPUT);  
  pinMode(greenPin, OUTPUT);  
  pinMode(bluePin, OUTPUT);  
}
```

```
void loop()  
{  
  int redvalue = analogRead(A0);  
  analogWrite(redPin, redvalue/4);  
  int bluevalue = analogRead(A1);  
  analogWrite(bluePin, bluevalue/4);  
  int greenvalue = analogRead(A2);  
  analogWrite(greenPin, greenvalue/4);  
}
```

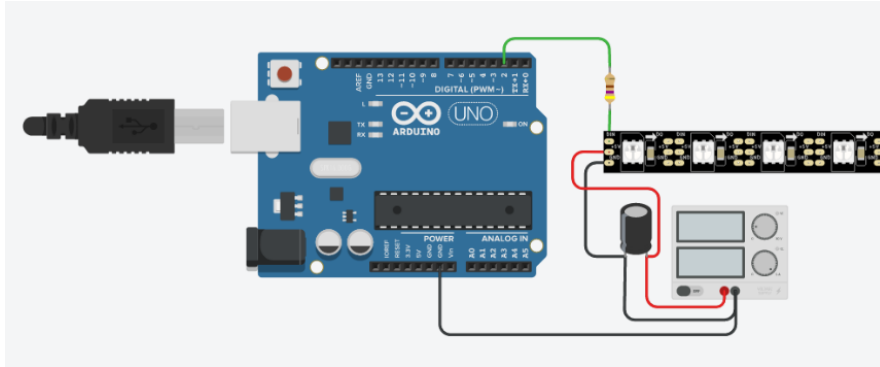
Neopixels

<https://learn.adafruit.com/adafruit-neopixel-uberguide/the-magic-of-neopixels>



Neopixels

Neopixel-Streifen 20, 470Ω Widerstand,
1000µF Kondensator



```
#include <Adafruit_NeoPixel.h>
#define PIN 2 // input pin Neopixel is attached to
#define NUMPIXELS 20 // number of neopixels in Ring

Adafruit_NeoPixel pixels = Adafruit_NeoPixel(NUMPIXELS, PIN, NEO_GRB + NEO_KHZ
800);

int redColor = 0;
int greenColor = 0;
int blueColor = 0;

void setup() {
  pixels.begin(); // Initializes the NeoPixel library.
}

void loop() {
  setColor();
  for(int i=0;i<NUMPIXELS;i++){
    // pixels.Color takes RGB values, from 0,0,0 up to 255,255,255
    pixels.setPixelColor(i, pixels.Color(redColor, greenColor, blueColor));
    pixels.show(); // This sends the updated pixel color to the hardware.
    delay(100); // Delay for a period of time (in milliseconds).

    if (i == NUMPIXELS){
      i = 0; // start all over again!
      setColor();
    }
  }
}

// setColor()
// picks random values to set for RGB
void setColor(){
  redColor = random(0, 255);
  greenColor = random(0, 255);
  blueColor = random(0, 255);
}
```

Neopixels

Beispiele

<https://www.studiodrift.com/the-tree-of-tenere>

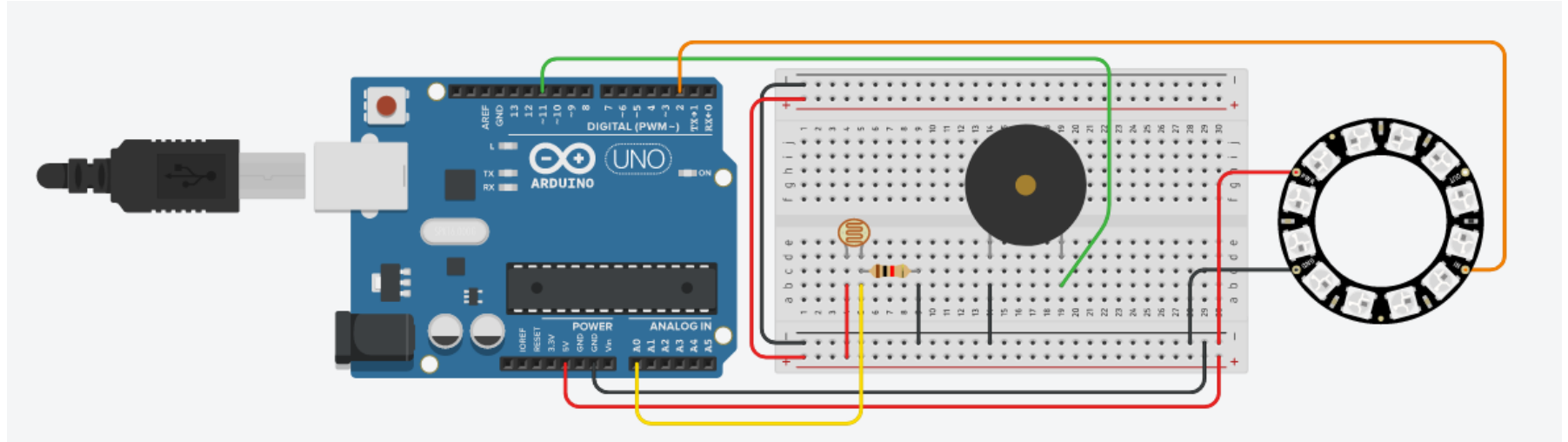
<https://www.learnrobotics.org/blog/neopixel-projects-ridiculously-cool/>

Bibliotheken

<https://github.com/kitesurfer1404/WS2812FX>

Testat

Vereine den RGB/Neopixel-Sketch mit dem Piezo-Speaker-Sketch der letzten Woche



Vielen Dank fürs Mitmachen!

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