




# LEDs

kleben

löten

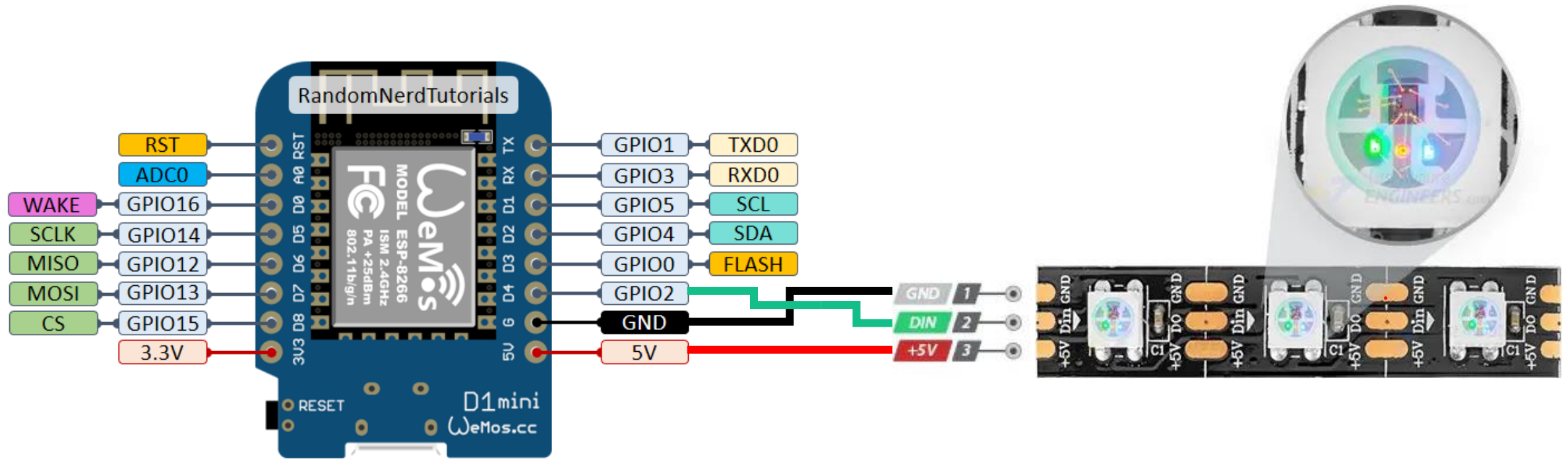
programmieren



# Hardware 1 - Papier



# Hardware 2 - Strom



# Software

choose your enemy

ARDUINO IDE

C

<https://www.arduino.cc/>



MICROPYTHON

Python

<https://micropython.org/>



WLED

Ready to use

<https://kno.wled.ge/>



# Software Arduino

- Arduino IDE kann auch für ESPs genutzt werden
- <https://arduino-esp8266.readthedocs.io/en/latest/installing.html>
- Libraries:
  - FastLED  
<http://fastled.io/>

```
#include <FastLED.h>

#define LED_PIN      4
#define NUM_LEDS     16
#define BRIGHTNESS   5 // 0-255
#define LED_TYPE     WS2812B
#define COLOR_ORDER   GRB

CRGB leds[NUM_LEDS];

void setup() {
  FastLED.addLeds
    <LED_TYPE, LED_PIN,
    COLOR_ORDER>
    (leds, NUM_LEDS)
  .setCorrection( TypicalLEDStrip );

  FastLED.setBrightness(BRIGHTNESS);
}
```

```
int i = 0;
bool b = false;
CRGB color = CRGB::Red;

void loop() {
  leds[i] = color;
  FastLED.show();
  i++;

  if (i == NUM_LEDS) {
    if (b) {
      color = CRGB::Black;
    } else {
      color = CRGB::Green;
    }
    i=0;
    b=!b;
  }

  delay(200);
}
```

# Software

- MicroPython Image auf den ESP flashen
  - [https://micropython.org/download/ESP8266\\_GENERIC/](https://micropython.org/download/ESP8266_GENERIC/)
- Code live bearbeiten
  - main.py
  - z.B. Visual Studio Code mit Pymakr (Preview)
- direkt ausführen

# MicroPython

```
from machine import Pin, freq
from neopixel import NeoPixel
from sys import platform

import time
import math
import gc

numberOfLeds = 16

# pin 4 is also called D2
ledPin = Pin(4, Pin.OUT)

leds = NeoPixel(ledPin,
                numberOfLeds)
```

```
def setAllTo(rgb):
    for i in range(numberOfLeds):
        leds[i] = (rgb)
        leds.write()

setAllTo(255,0,0)

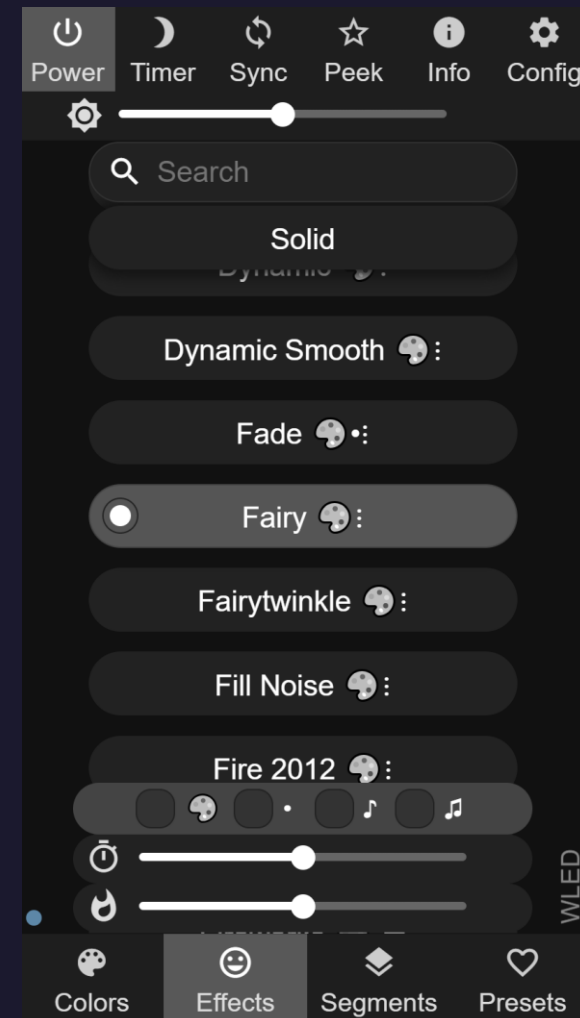
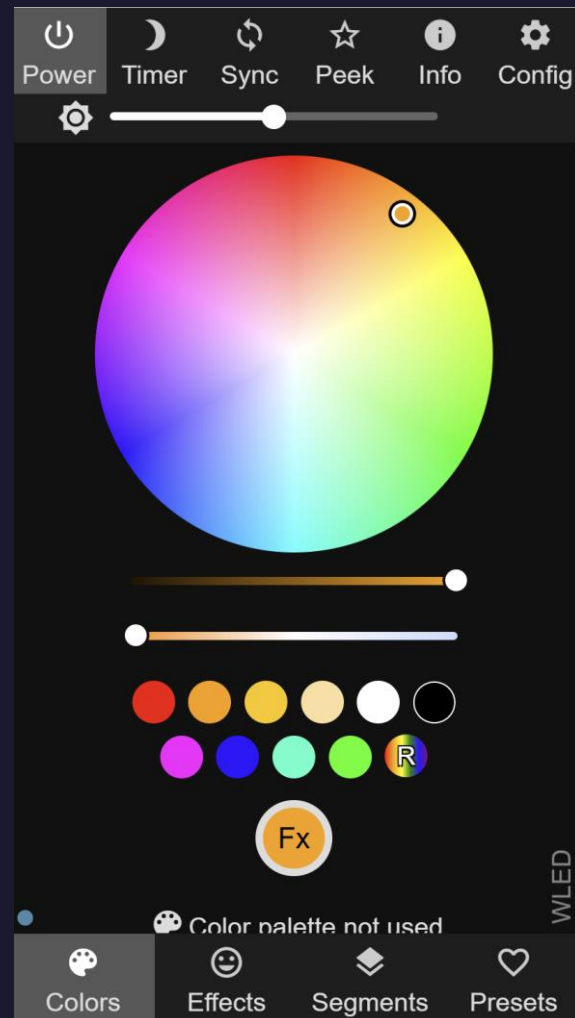
setAllTo(toRgb(h, s, v))
```



# Software WLED

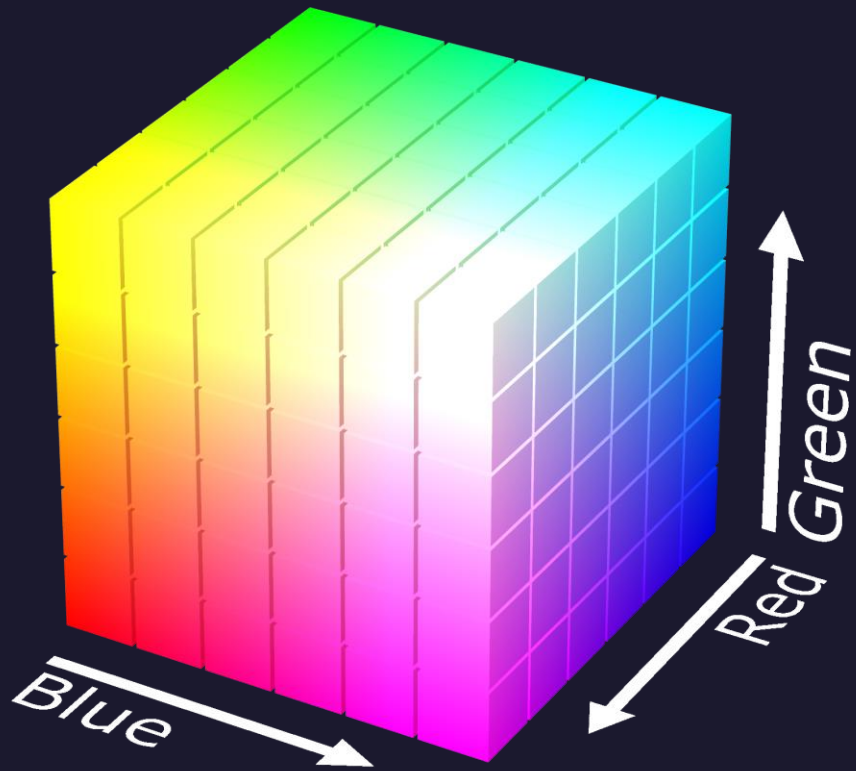


- WLED Image auf den ESP flashen
  - Web Installer  
<https://install.wled.me/>  
(z.B. Chromium)
- mit WiFi "WLED-AP" verbinden
  - pw = wled1234
- <http://4.3.2.1>

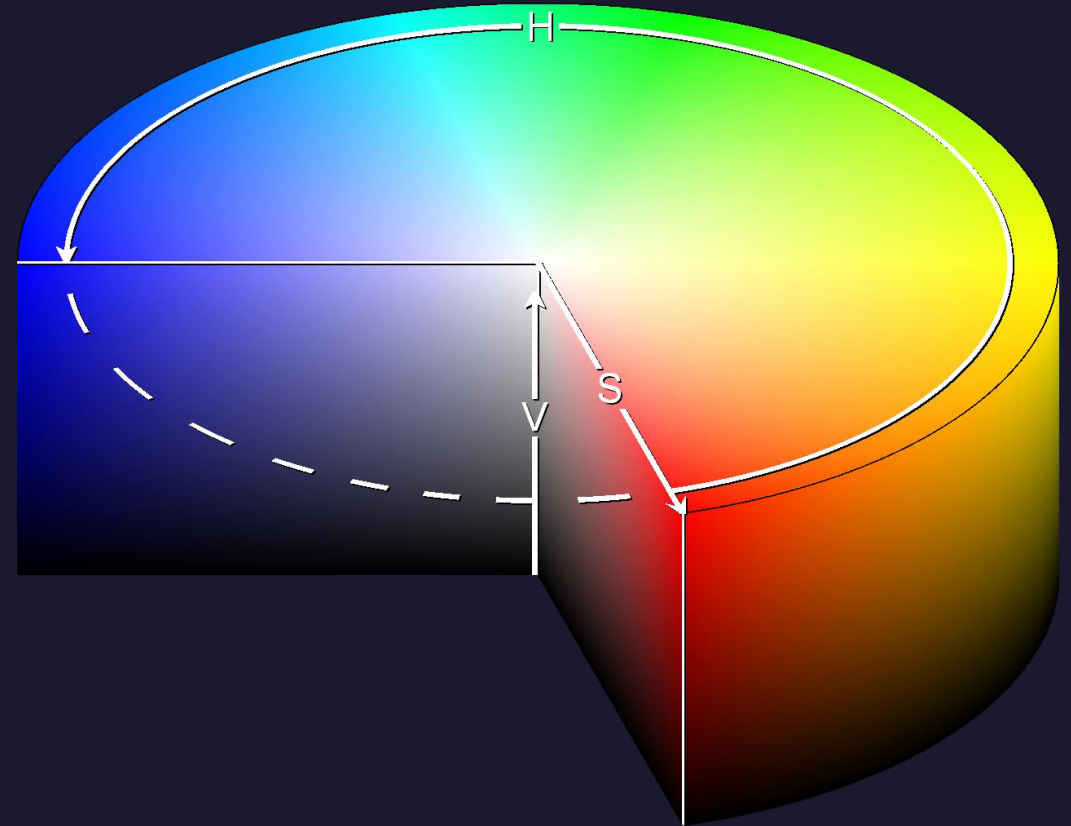


# Farbräume

RGB (rot, grün, blau)



HSV (hue, saturation, value)





# Code / Stuff

<https://github.com/irgendwienet/37c3-kidspace-leds>

