Wayland Girls Who Code Meeting 2

October 23, 2018

Welcome!

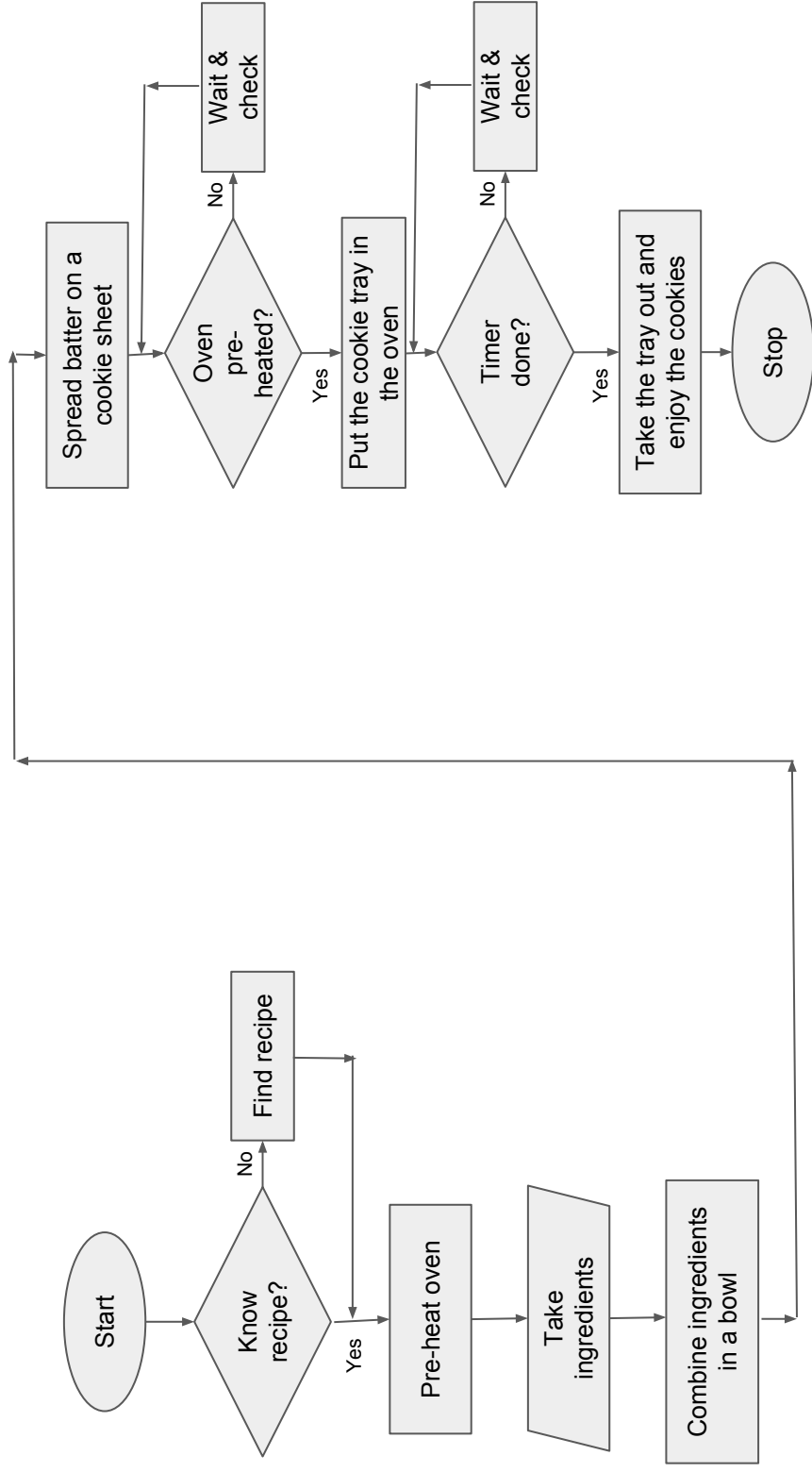Video: Made with Code: Miral Kotb, Founder of iLuminate
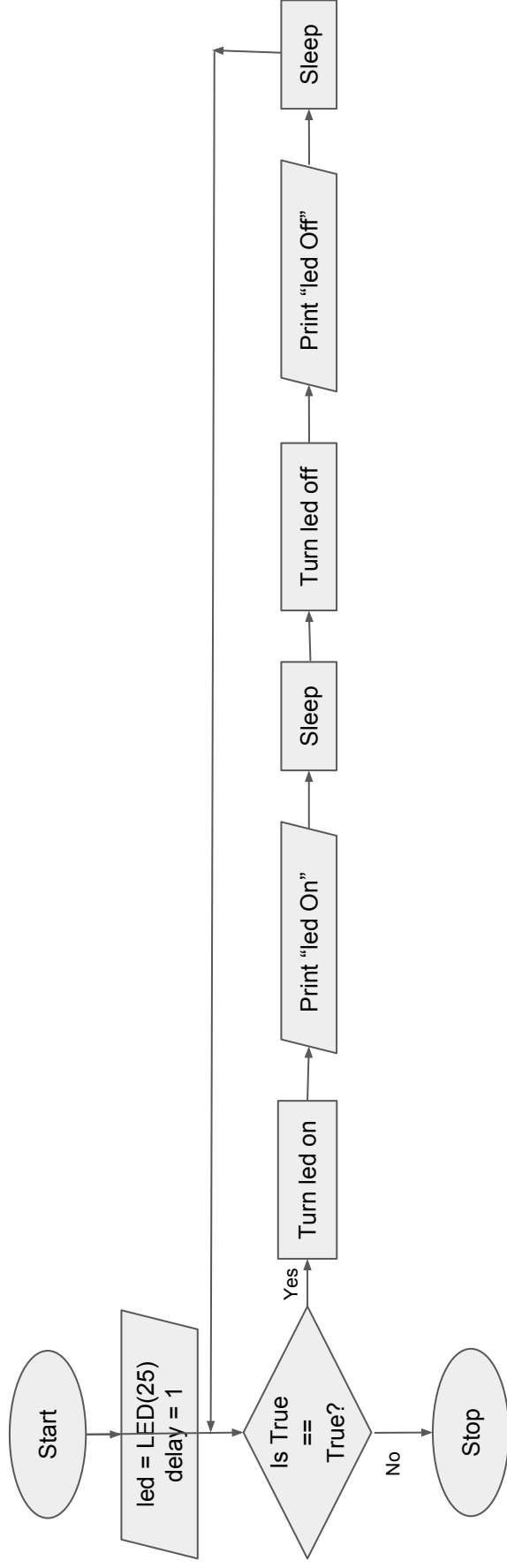
Basic ideas in programming

Recap from last week

- What is a computer?
- What are instructions?
- What is a program?
- How do you instruct the computer?
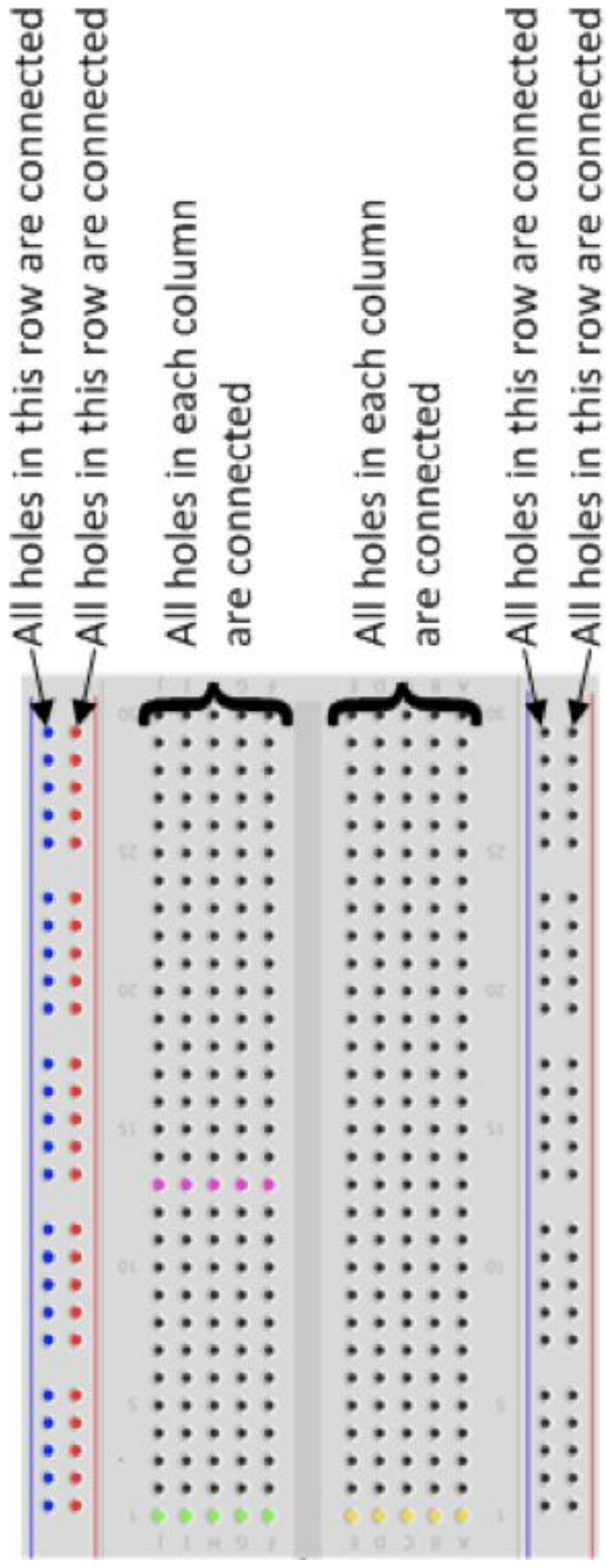
How to bake cookies?

```
Start → Know recipe?
  Know recipe? --No--> Find recipe → (loops back)
  Know recipe? --Yes--> Pre-heat oven → Take ingredients → Combine ingredients in a bowl → Spread batter on a cookie sheet

Spread batter on a cookie sheet → Oven pre-heated?
  Oven pre-heated? --No--> Wait & check → (loops back)
  Oven pre-heated? --Yes--> Put the cookie tray in the oven → Timer done?
  Timer done? --No--> Wait & check → (loops back)
  Timer done? --Yes--> Take the tray out and enjoy the cookies → Stop
```

Last week's code

```
Start
  ↓
led = LED(25)
delay = 1
  ↓
Is True == True?
  ├─ Yes → Turn led on → Print "led On" → Sleep → Turn led off → Print "led Off" → Sleep ─┐
  │                                                                                         │
  │←────────────────────────────────────────────────────────────────────────────────────────┘
  └─ No → Stop
```

Motion detector that lights up

Quick review: Breadboards

All holes in this row are connected

All holes in this row are connected

All holes in each column are connected

All holes in each column are connected

All holes in this row are connected

All holes in this row are connected

We need an LED again! - test with power

to GROUND (GND) - Pin 6

3.3V power (pin 1) just to test circuit

Bottom pin is long (+)

fritzing
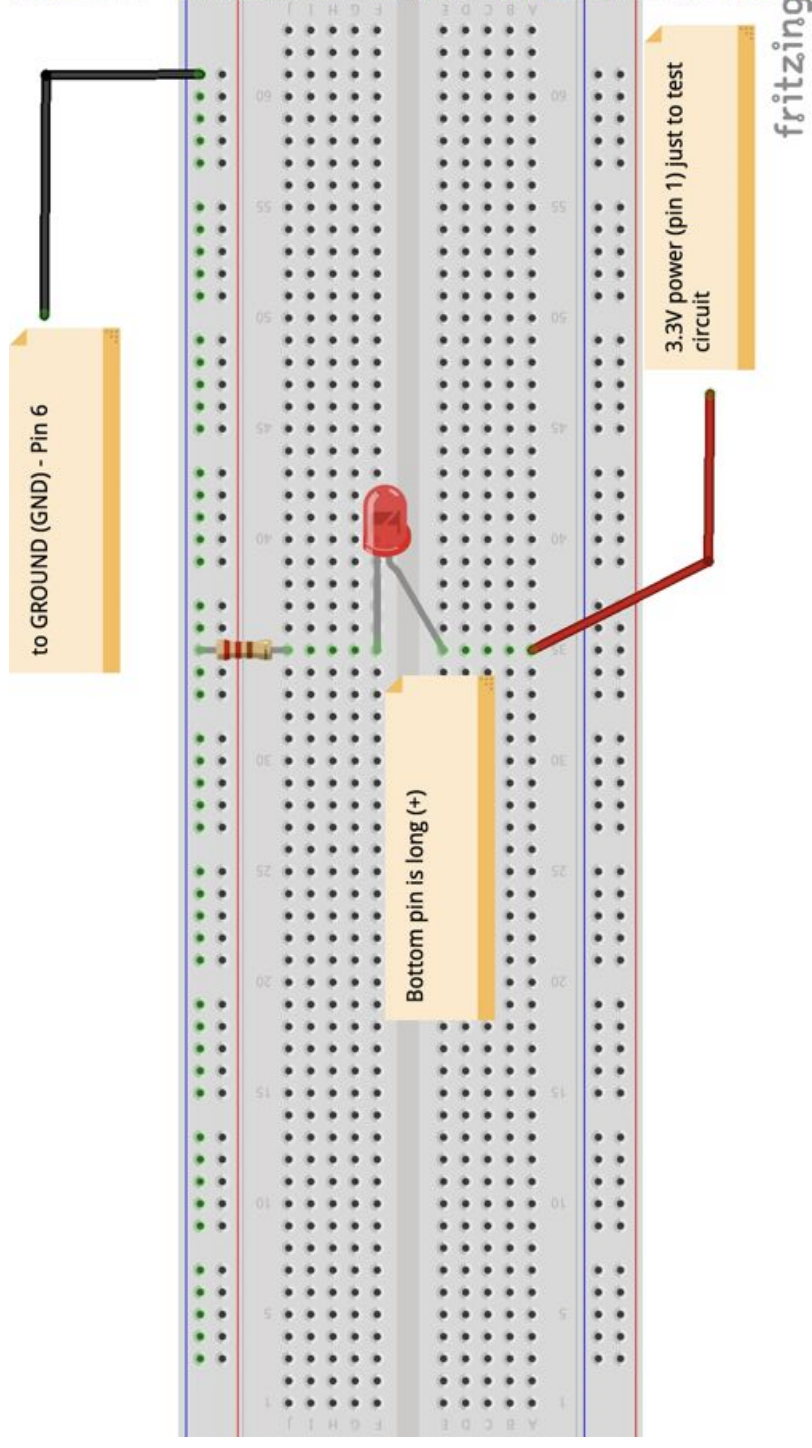
LED: connect for software

to GROUND (GND) - Pin 6

Bottom pin is long (+)

+5V to 5V power on the Pi (pin 2)

GPIO 25 (pin 22)

fritzing
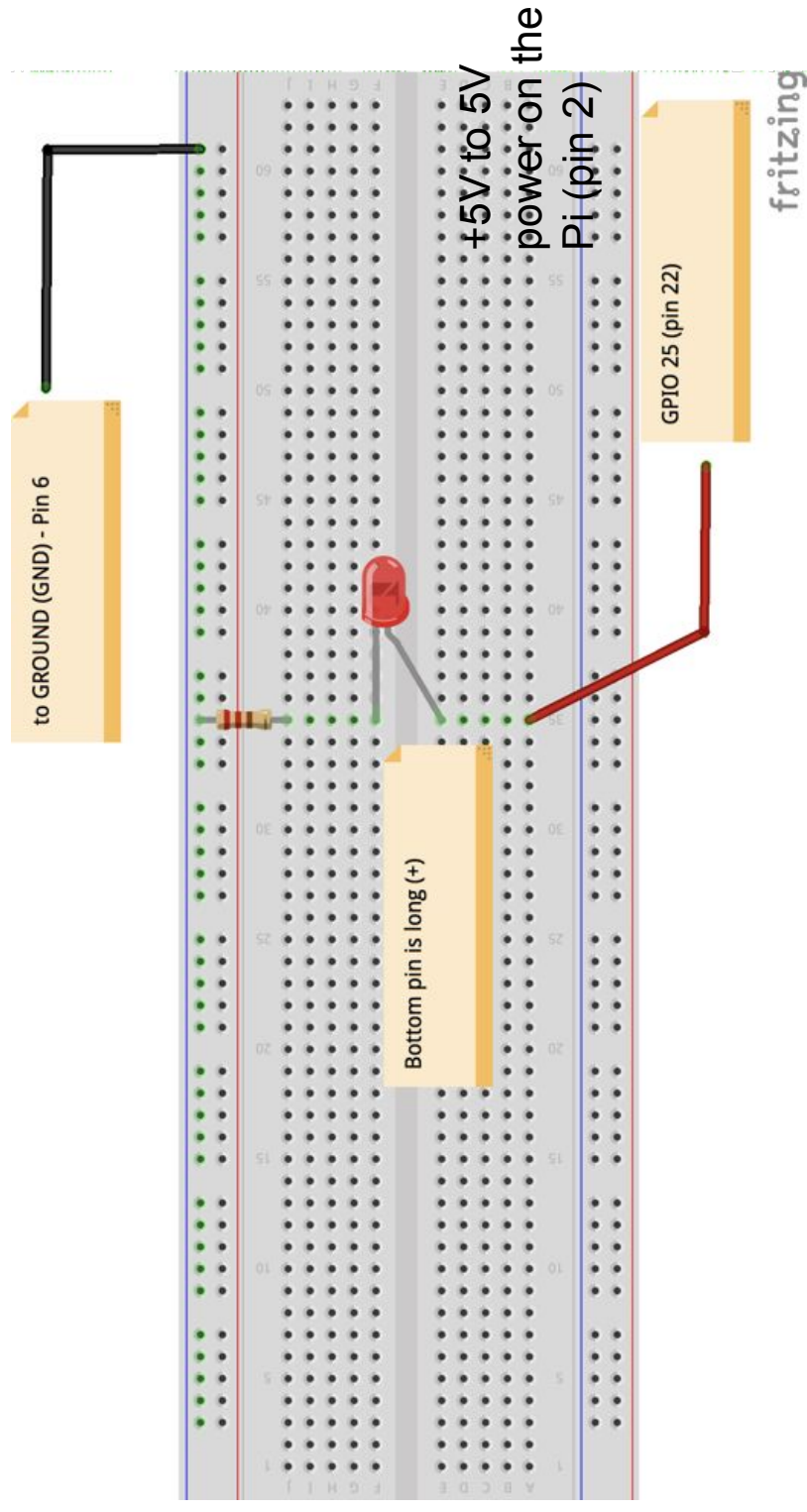
Make sure the LED code works

```
from gpiozero import LED
from time import sleep

led = LED(25)
delay = 1

while True:
    led.on()
    sleep(delay)
    led.off()
    sleep(delay)
```
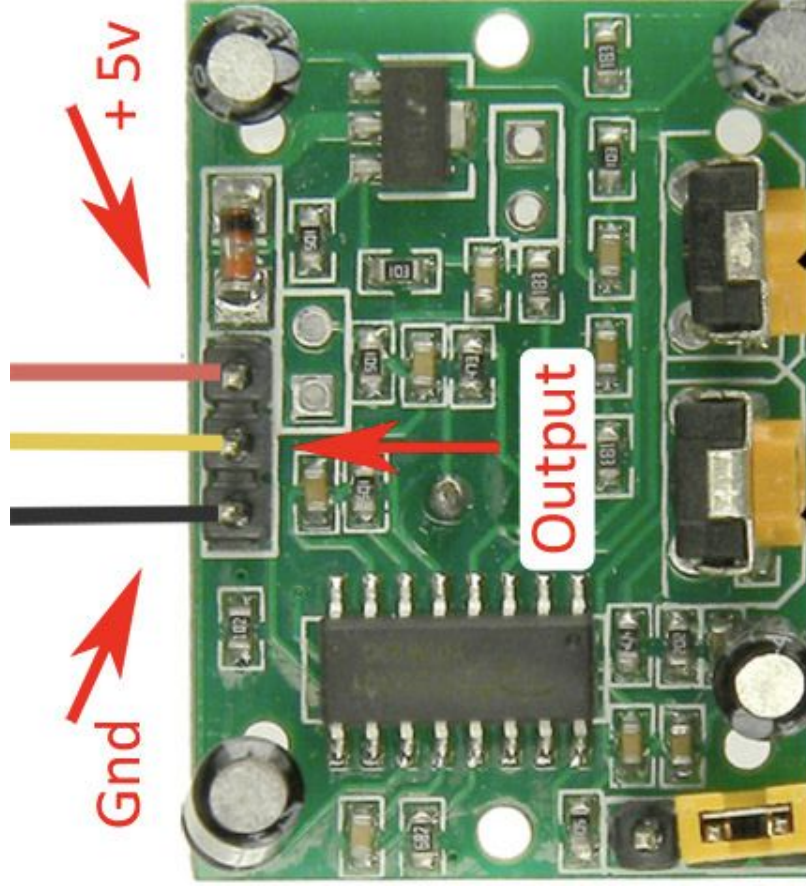
Motion detector circuits

Output to GPIO 4
(can you figure out
the pin?)

+5V to 5V
power on the
Pi (pin 2)

+ 5v

Output

Gnd

GND to GND
on the Pi (pin
14)

Let's code a motion detector light!

```python
from gpiozero import MotionSensor, LED
import time

led = LED(25)
pir = MotionSensor(4)

for i in range(1, 4):
    pir.wait_for_motion()
    led.on()
    print("Something moved" , i, "times" )
    pir.wait_for_no_motion()
    led.off()
    print('everything is still')
```
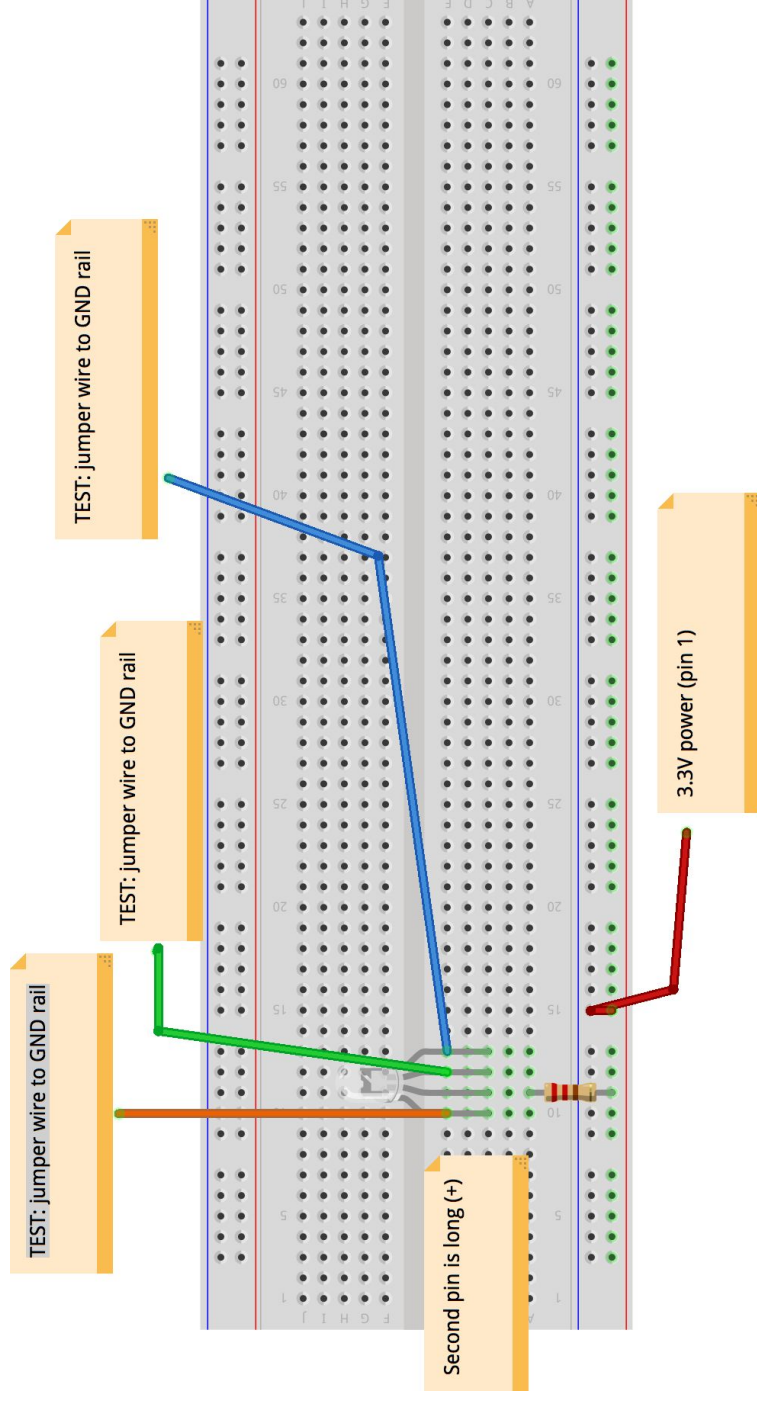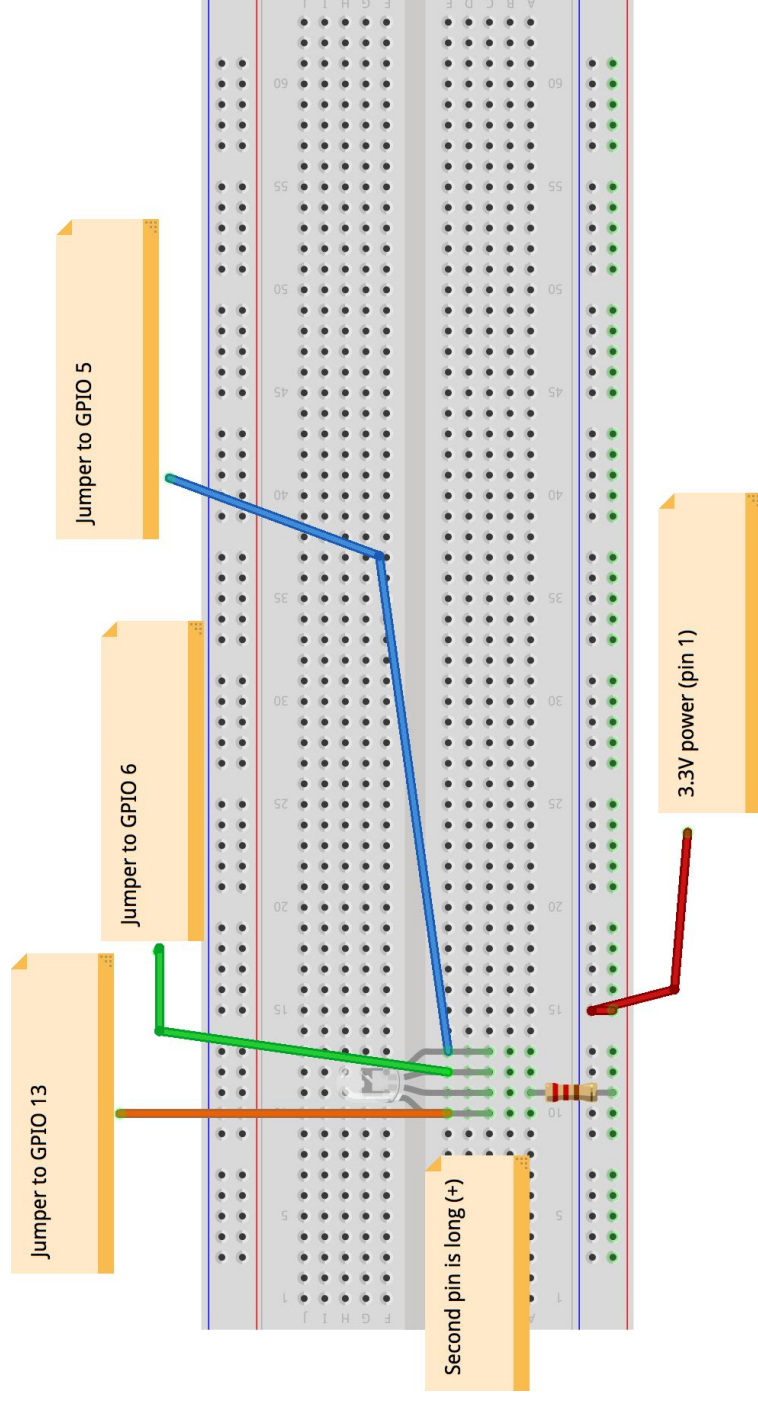
What else could we do?

RGB LED

RGB LED breadboard layout

TEST: jumper wire to GND rail

TEST: jumper wire to GND rail

TEST: jumper wire to GND rail

3.3V power (pin 1)

Second pin is long (+)

fritzing

Connect RGB LED to the Raspberry Pi

Jumper to GPIO 5

Jumper to GPIO 6

Jumper to GPIO 13

3.3V power (pin 1)

Second pin is long (+)

fritzing

RGB LED code

```
from gpiozero import RGBLED
from time import sleep

rgb = RGBLED(red=13, green=6, blue=5, active_high = False)
```

Now let's play with it a bit!

Cool things to do with LEDs and Raspberry Pi

[Light Rail](#)

Cleanup checklist

1. sudo shutdown -h now
2. Unplug everything. Put parts in their bags.
3. Wrap up the power cord and twist-tie it
4. Put the cover on
5. Put everything except your USB key back in the box.

Write in your notebook:

- What you learned
- Ideas for things you could build
- Questions you have