



UNIVERSITY OF SCIENCE - VNUHCM
Faculty of Information Technology

INTERNET OF THINGS

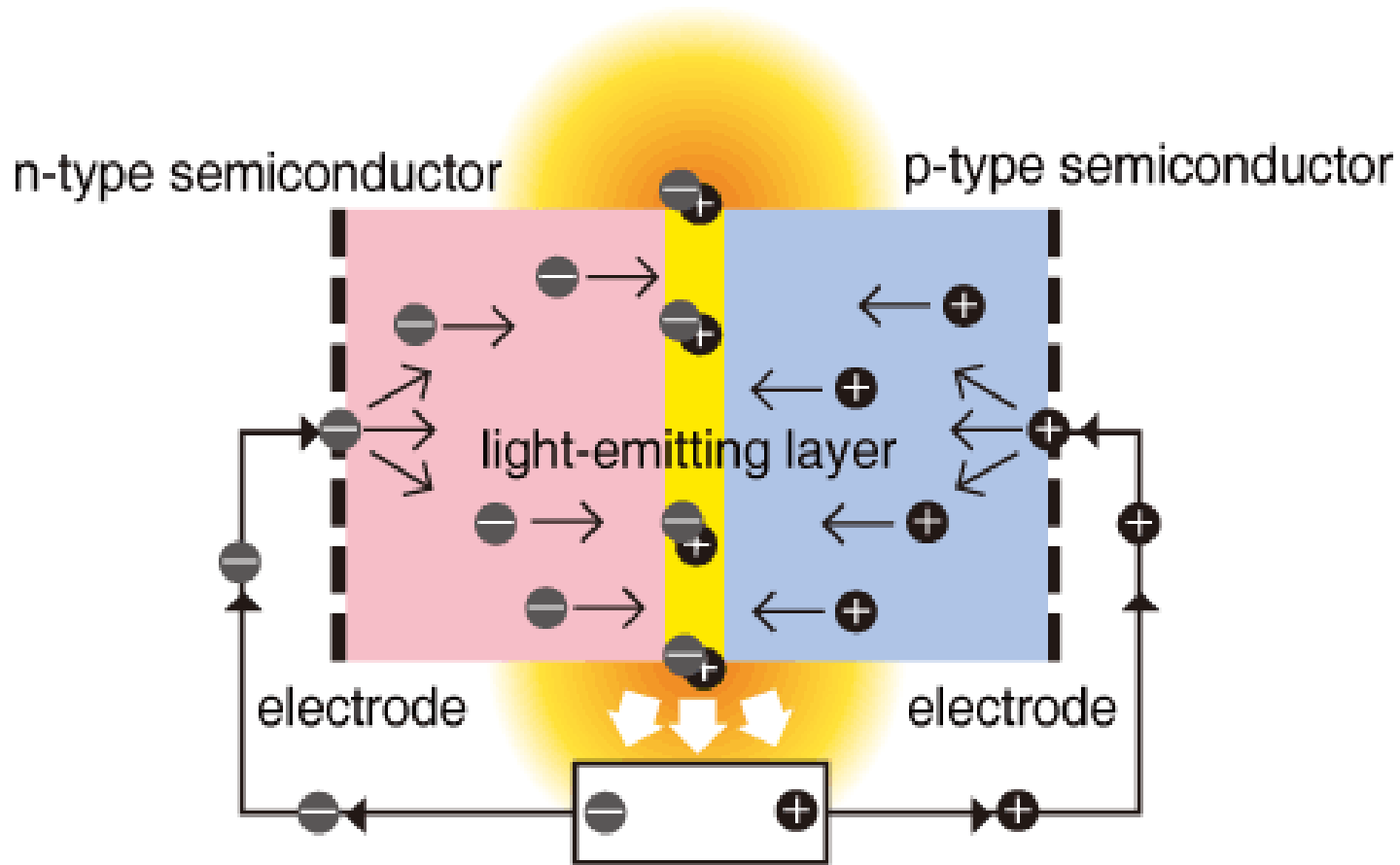
1.2

LED

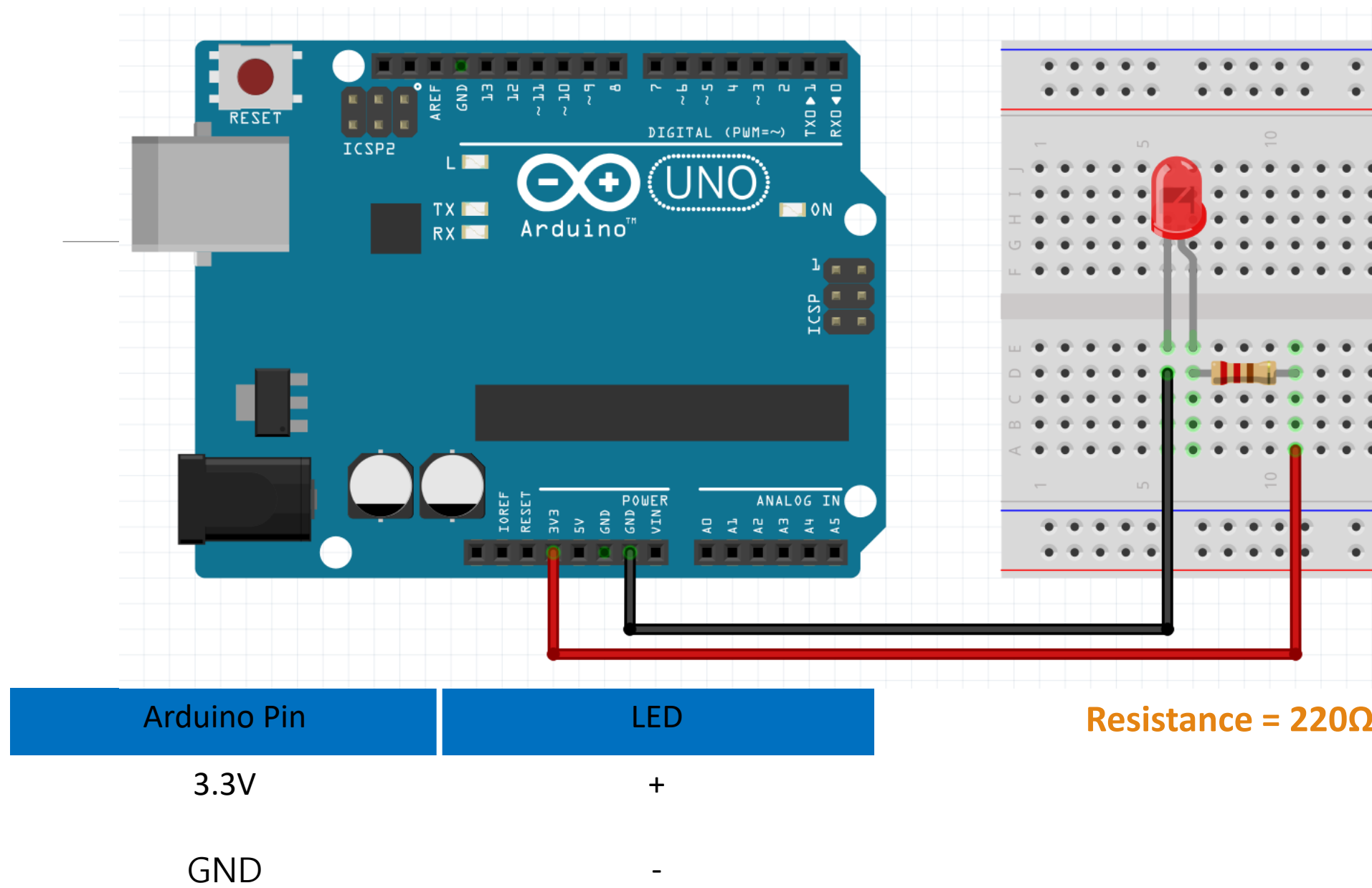


LED (Light Emitting Diode)



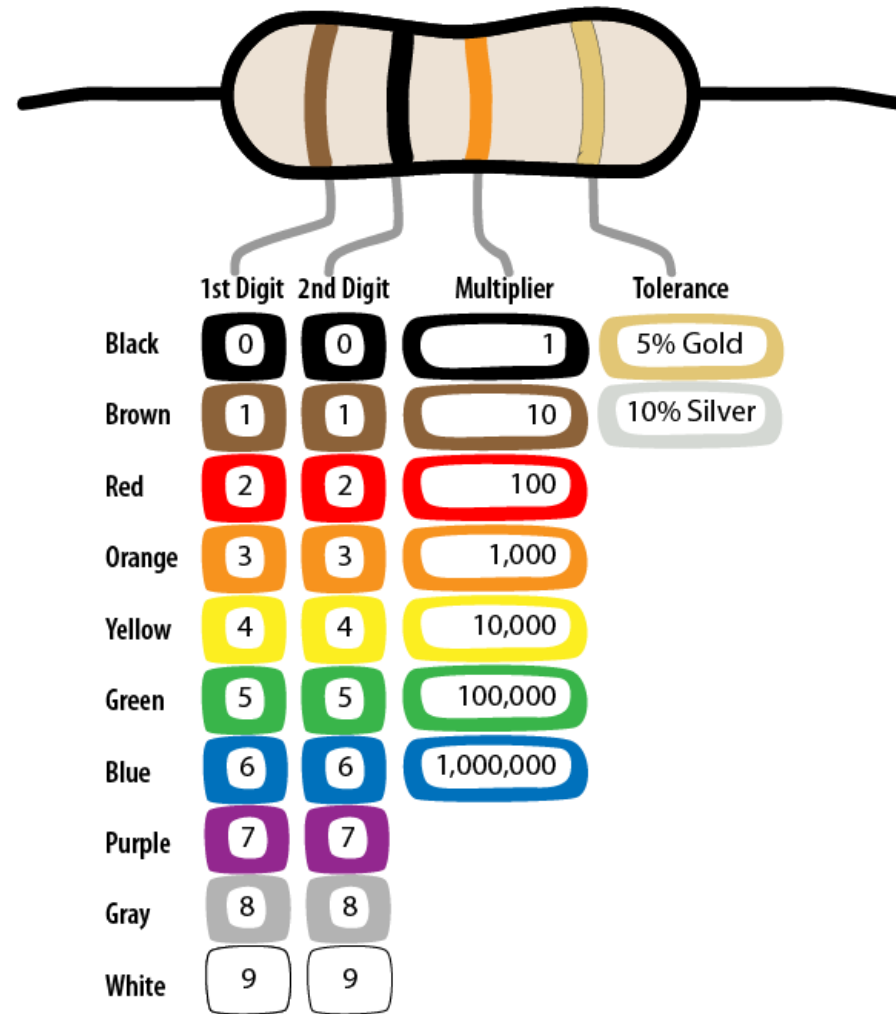


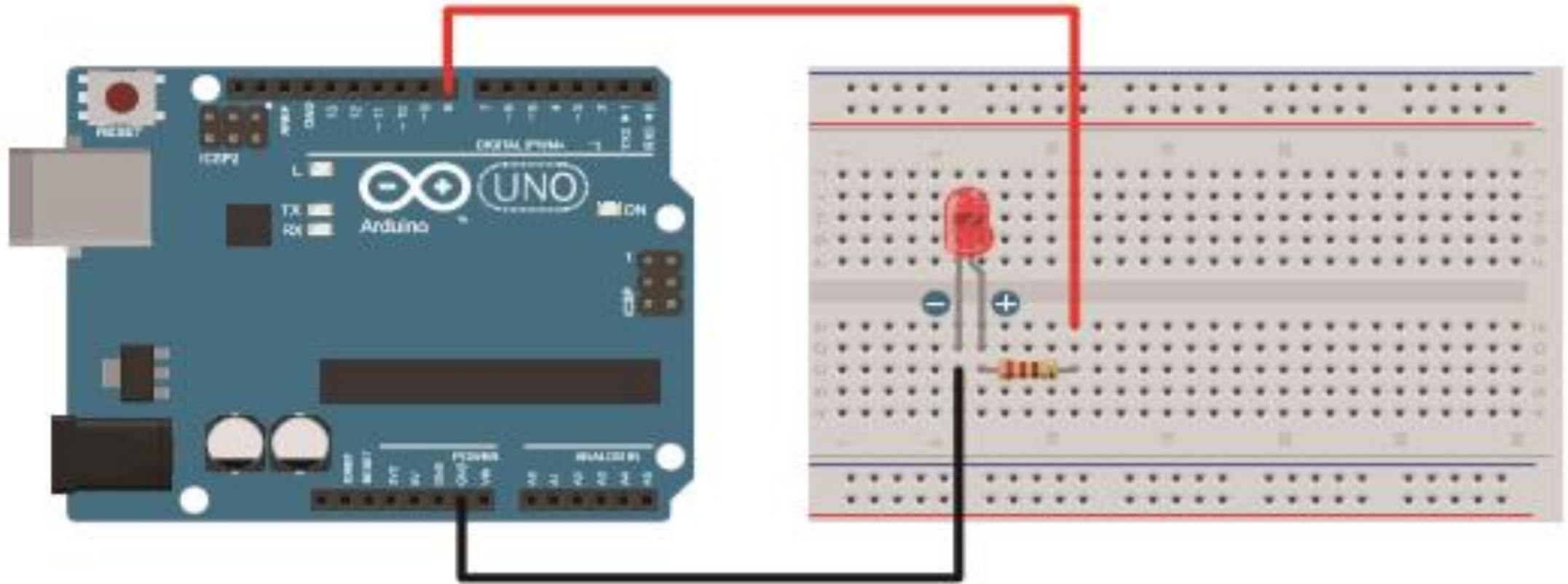
How does LED work?





Resistor

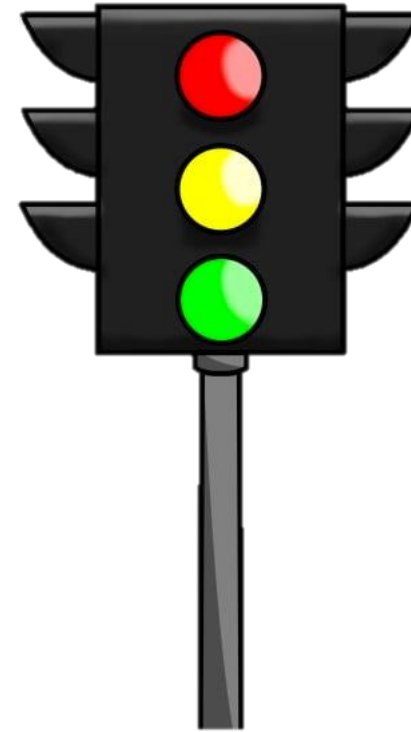




Arduino Pin	LED
Digital 8	+
GND	-

Resistance = 220Ω

```
void setup() {  
    pinMode(8, OUTPUT);    //set pin 8 as OUTPUT mode  
}  
  
void loop() {  
    digitalWrite(8, HIGH); //set HIGH signal at pin 8  
    delay(1000);  
    digitalWrite(8, LOW);  //set LOW signal at pin 8  
    delay(1000);  
}
```

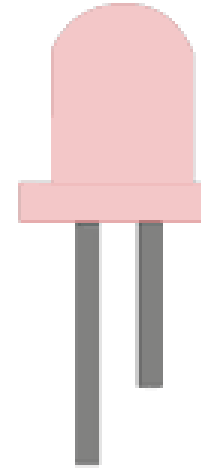
THE TRAFFIC LIGHT



Pulse Width Modulation

```
analogWrite (ledPin, value)
```

Value is in range 0 - 255



Fade-in & Fade-out

```
void fadeIn(unsigned int time,int increament){  
    for (byte value = 0 ; value < 255; value+=increament){  
        Serial.println(value);  
        analogWrite(ledPin, value);  
        delay(time/(255/5));  
    }  
}
```