

Arduino



Introduction à l'utilisation
d'un arduino UNO

Session 2

ARDUINO

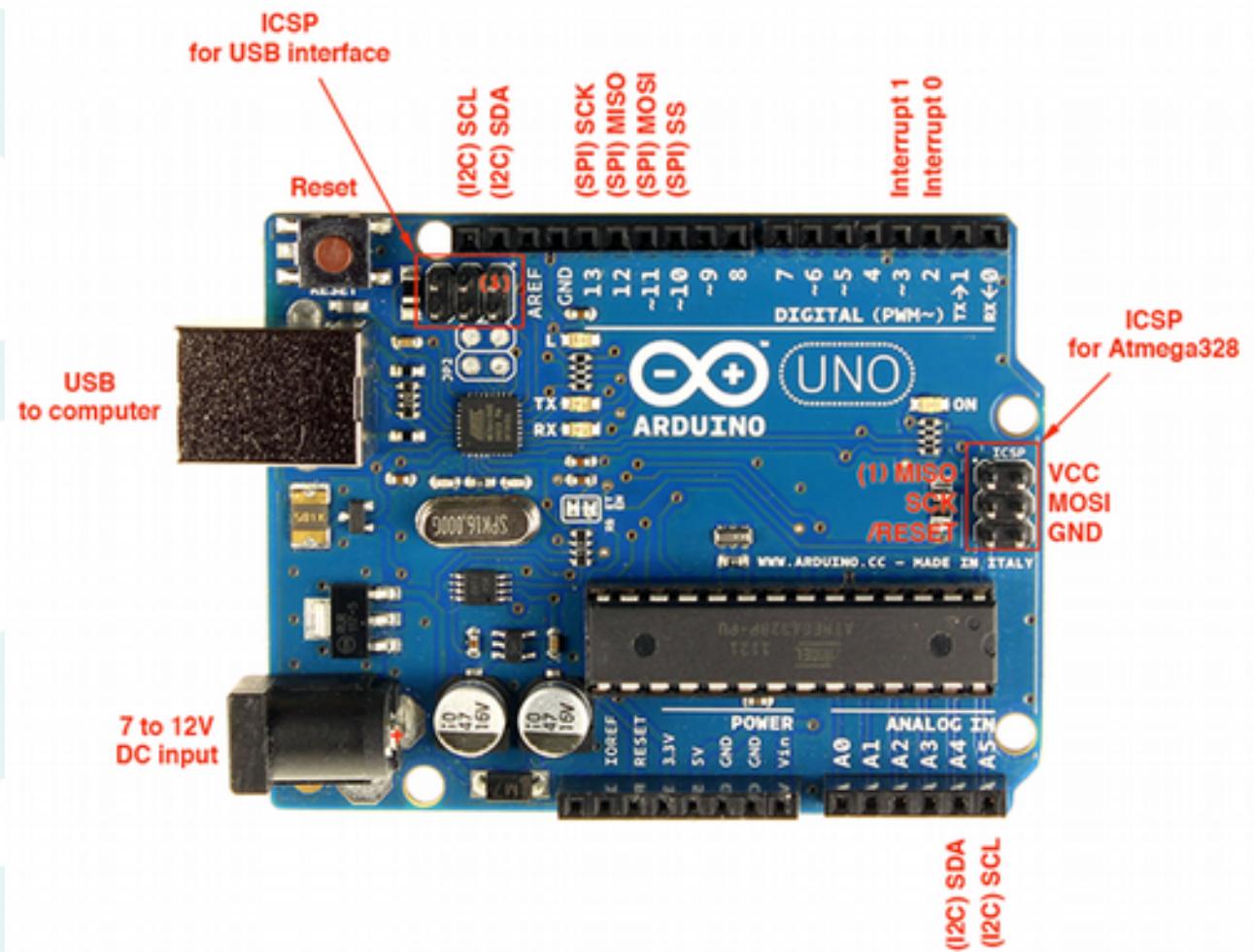
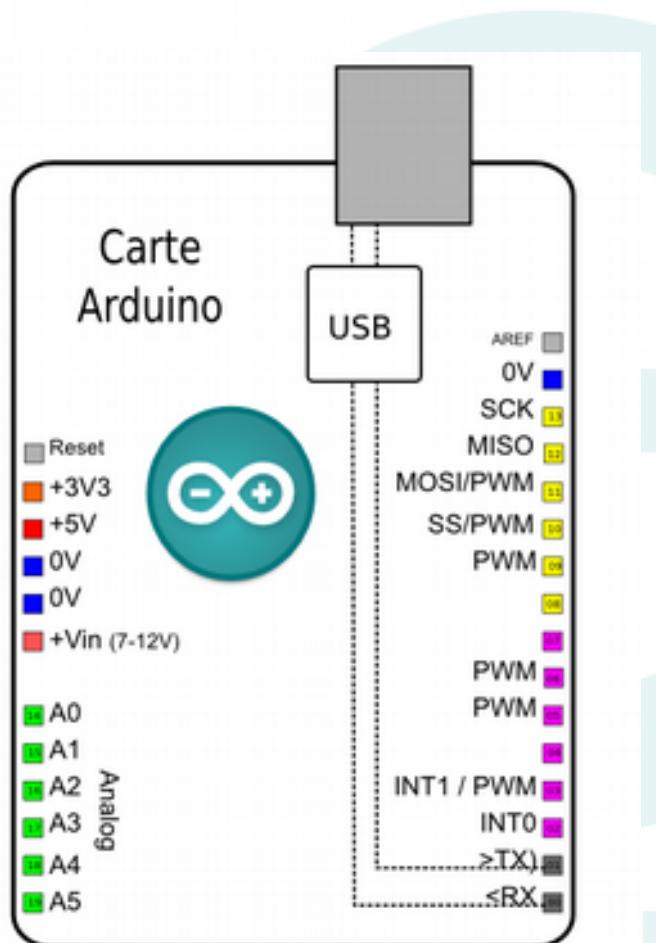


Sommaire

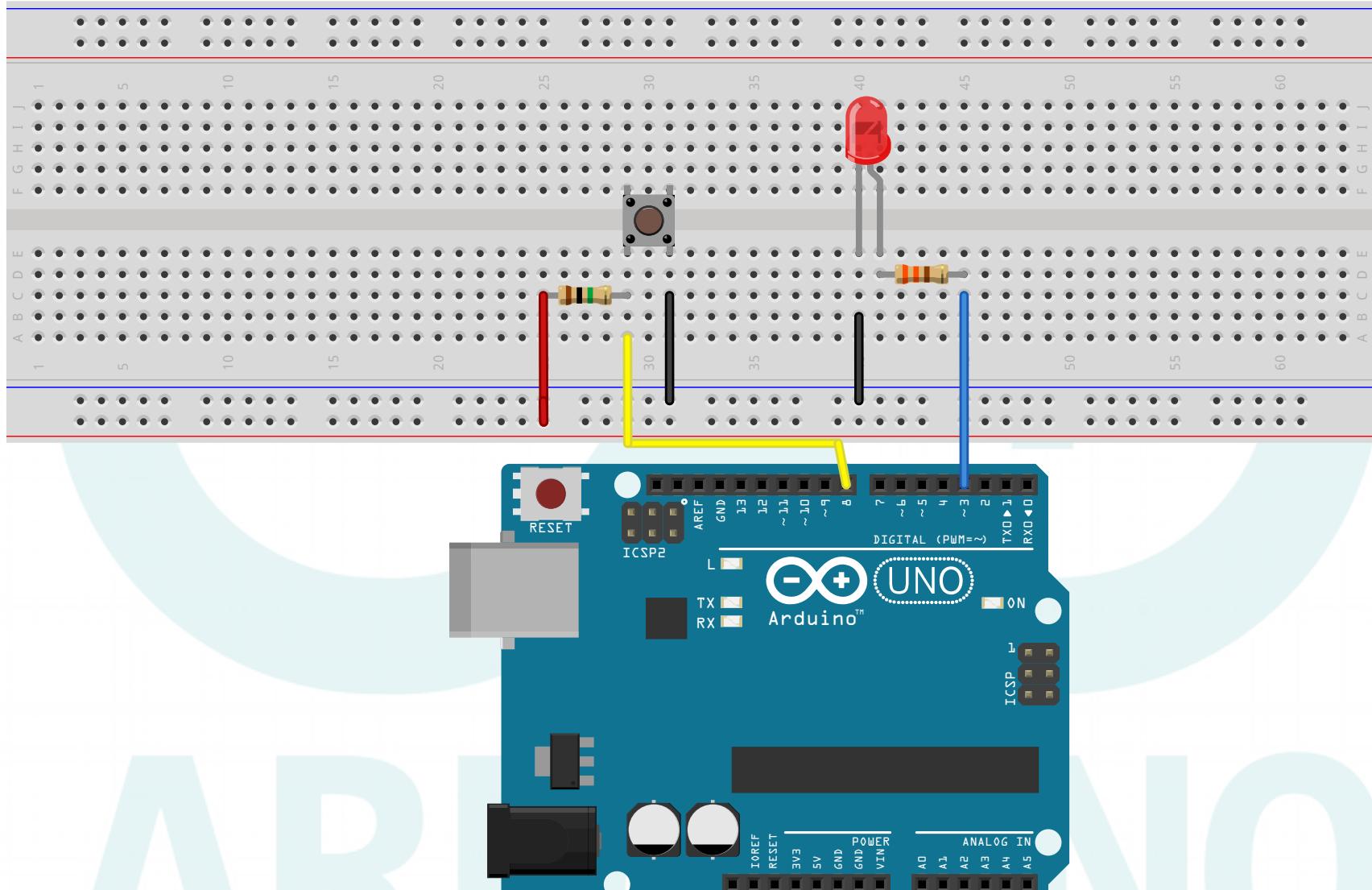
- Carte Référence
- Utilisation d'un potentiomètre
- Utilisation du capteur de lumière
- Utilisation du capteur de température

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Arduino UNO



LED + Poussoir





LED_Poussoir01

```
#define pinLed 3  
  
#define pinBouton 8
```

```
void setup() {  
    pinMode(pinLed, OUTPUT);  
    digitalWrite(pinLed, LOW);  
    pinMode(pinBouton, INPUT);  
}  
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```

```
void loop() {  
    int etat = digitalRead(pinBouton);  
    if (etat == LOW) {  
        digitalWrite(pinLed, HIGH);  
    }  
    else {  
        digitalWrite(pinLed, LOW);  
    }  
}
```



LED_Poussoir02

```
#define pinLed 3  
  
#define pinBouton 8
```

```
void setup() {  
    pinMode(pinLed, OUTPUT);  
    digitalWrite(pinLed, LOW);  
    pinMode(pinLed, OUTPUT);  
}  
  
```

```
void loop() {  
    int etat = digitalRead(pinBouton);  
    digitalWrite(pinLed, !etatBouton);  
}
```

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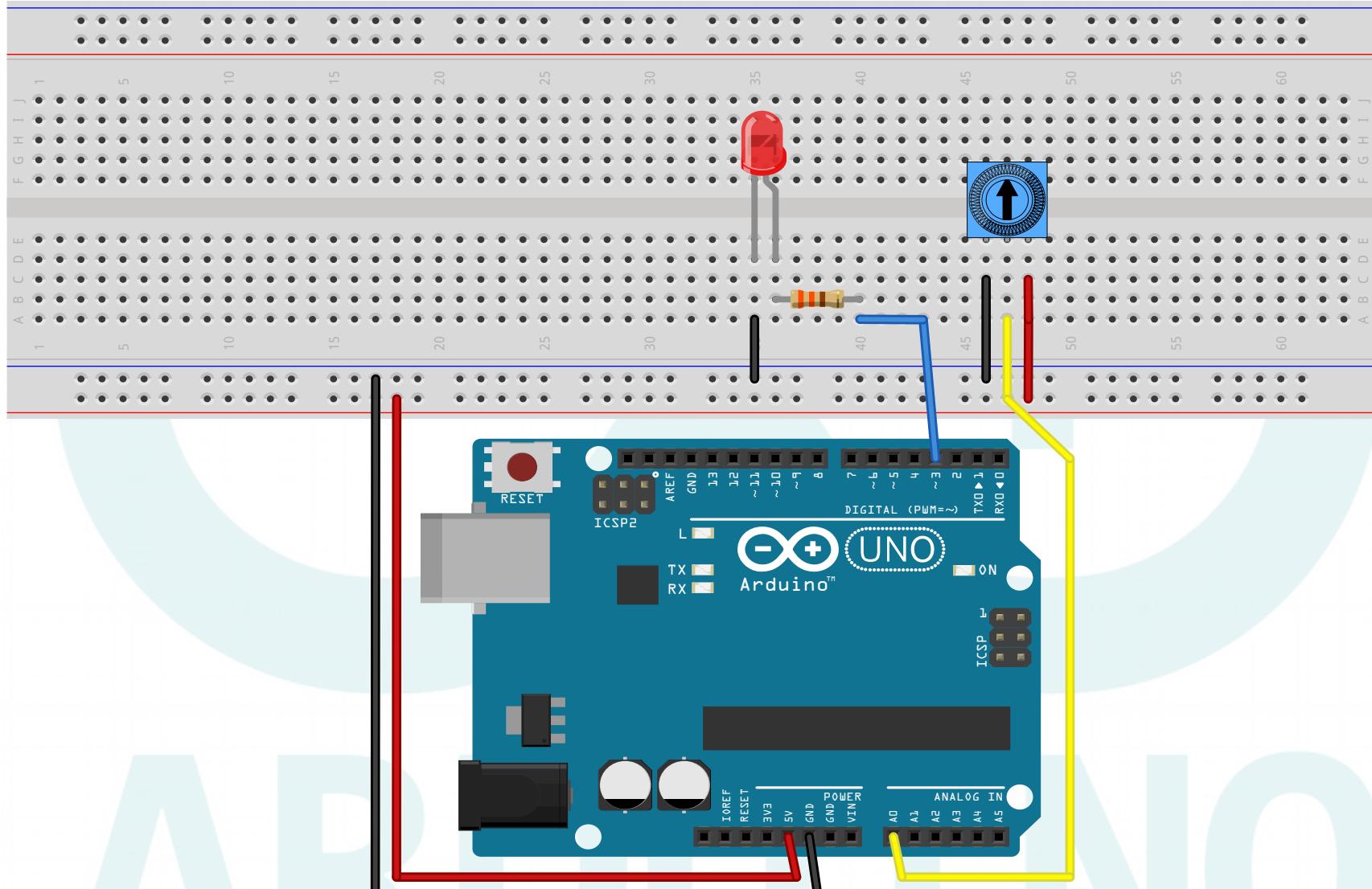
LED_Poussoir03

```
#define pinLed 3  
  
#define pinBouton 8  
  
void setup() {  
    pinMode(pinLed, OUTPUT);  
    digitalWrite(pinLed, LOW);  
    pinMode(pinBouton, INPUT);  
}  
}
```

```
void loop() {  
    int val_btn=digitalRead(pinBouton);  
    int val_led=digitalRead(pinLed) ;  
    if (val_btn == LOW) {  
        digitalWrite(pinLed, !val_led);  
    }  
}
```

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LED + Potentiomètre





LED_Pot01

```
#define pinLed 3  
  
#define pinPotentiometre A0
```

```
void setup() {  
    pinMode(pinLed, OUTPUT);  
    digitalWrite(pinLed, LOW);  
}  
  
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```

```
void loop() {  
    int valeurPotentiometre;  
    valeurPotentiometre =  
        analogRead(pinPotentiometre);  
    digitalWrite(pinLed, HIGH);  
    delay(valeurPotentiometre);  
    digitalWrite(pinLed, LOW);  
    delay(valeurPotentiometre);  
}
```



LED_Pot02

```
#define pinLed 3  
  
#define pinPotentiometre A0
```

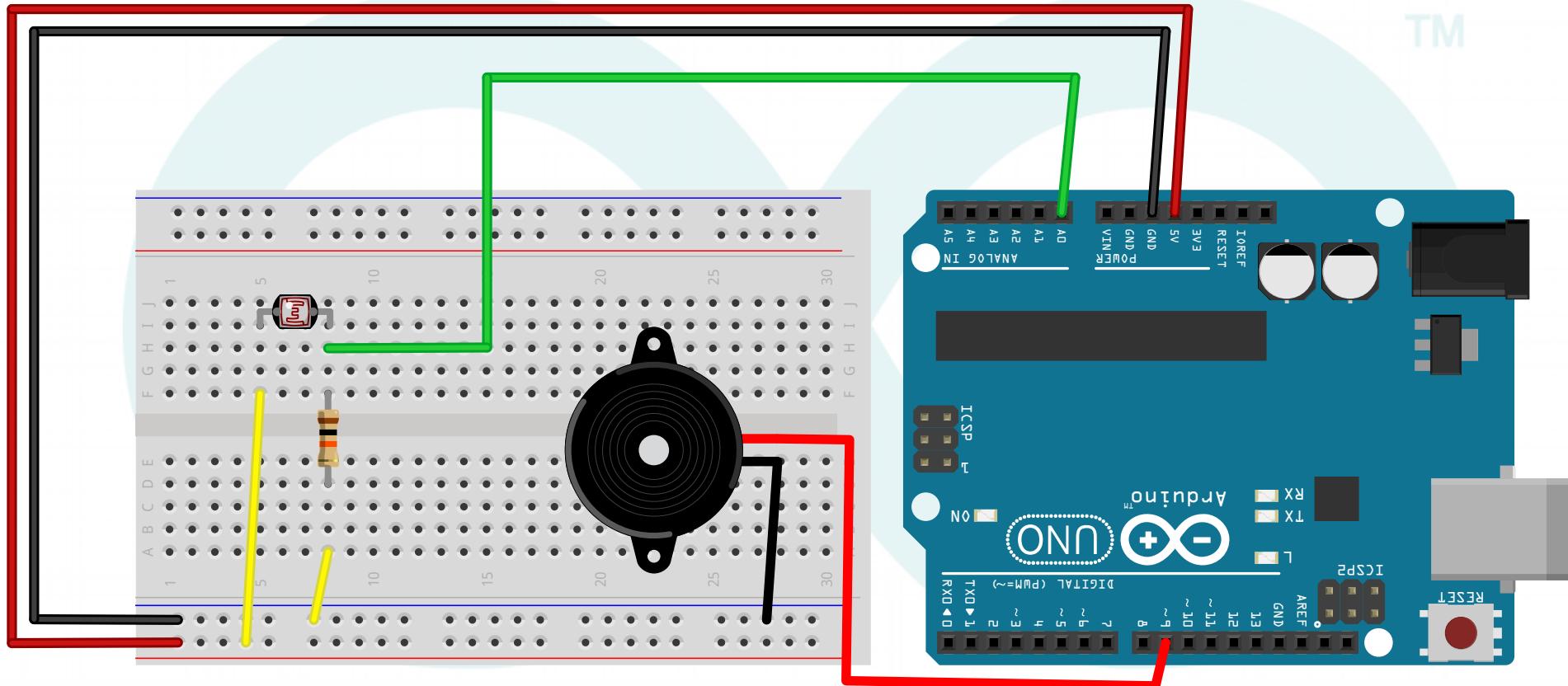
```
void setup() {  
    pinMode(pinLed, OUTPUT);  
    digitalWrite(pinLed, LOW);  
}  
  
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```

```
void loop() {  
    int valeurPotentiometre;  
    valeurPotentiometre =  
        analogRead(pinPotentiometre);  
    int brightness;  
    brightness = map(valeurPotentiometre,  
        0, 1023, 0, 255);  
    analogWrite(pinLed, brightness);  
}
```

Photoresist / buzzer



TM



- 1 résistance de 10 kΩ
- 1 photo-résistance
- 1 Buzzer



Photoresist / buzzer

```
#define capteurPin A0  
#define buzzerPin 9
```

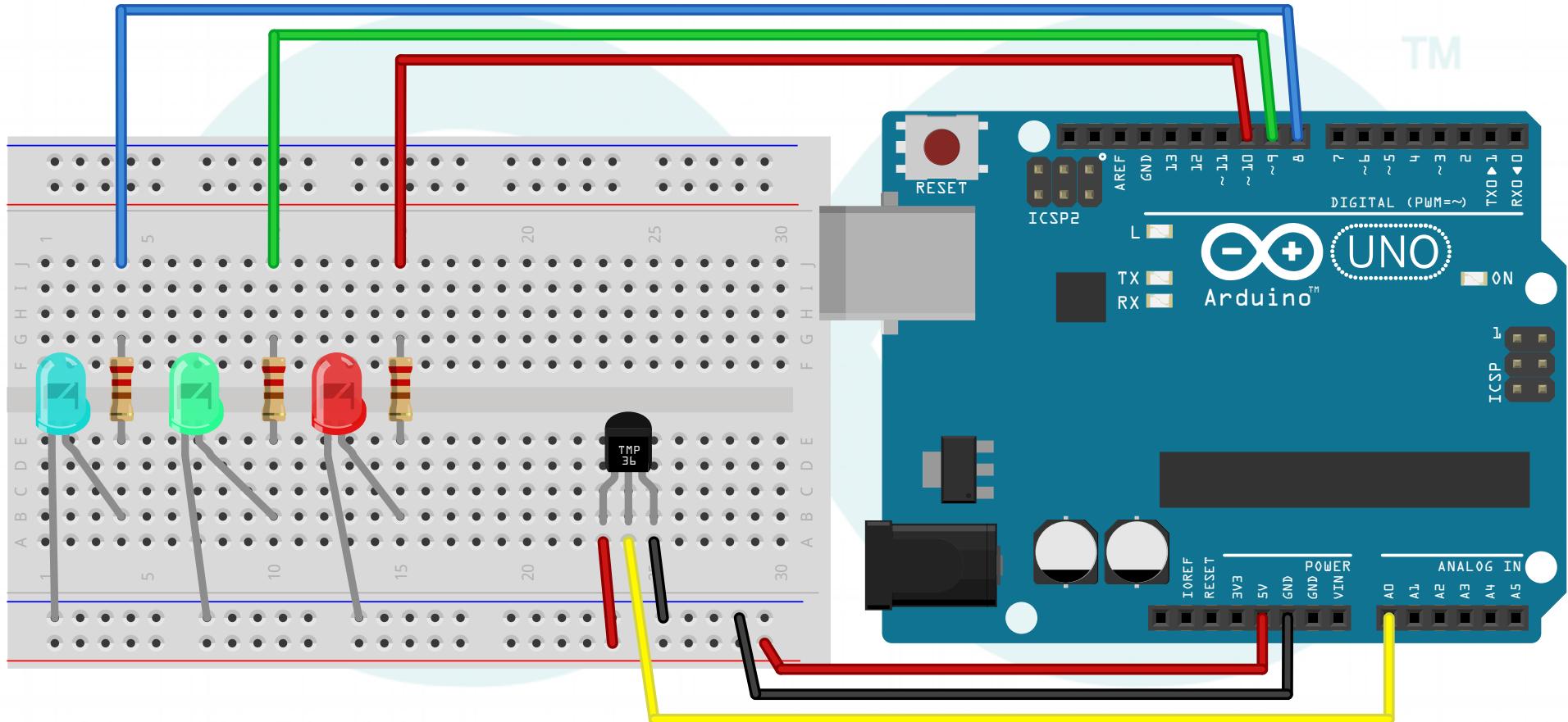
```
int capteurValue = 0;  
int buzzerValue = 0;
```

```
void setup() {  
  Serial.begin(9600);  
  pinMode(buzzerPin, OUTPUT);  
  pinMode(capteurPin, INPUT);  
}
```

```
void loop() {  
  capteurValue=analogRead(capteurPin);  
  
  buzzerValue = map(capteurValue, 0,  
 1023, 16, 16000);  
  tone(buzzerPin, buzzerValue);  
  
  Serial.print("Niv. de luminosité = ");  
  Serial.print(capteurValue);  
  Serial.print("\t Fréquence buzzer = ");  
  Serial.println(buzzerValue);  
}
```

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Capteur de température



- 3 résistance de $330\ \Omega$
- 3 Leds
- 1 sonde de température LM35

Déclaration et setup



```
#define capteur A0  
#define ledRouge 10  
#define ledVerte 9  
#define ledBleue 8
```

```
const char temp_max=26;  
const char temp_min=19;
```

```
void setup() {  
    Serial.begin(9600);  
  
    pinMode(capteur,INPUT);  
  
    pinMode(ledRouge,OUTPUT);  
    pinMode(ledVerte,OUTPUT);  
    pinMode(ledBleue,OUTPUT);  
  
    digitalWrite(ledRouge, LOW);  
    digitalWrite(ledVerte, LOW);  
    digitalWrite(ledBleue, LOW);  
}
```

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loop()

```
void loop() {  
    float temperature = lectureTemp(capteur);  
  
    digitalWrite(ledRouge, LOW);  
    digitalWrite(ledVerte, LOW);  
    digitalWrite(ledBleue, LOW);  
  
    if (temperature < temp_min) digitalWrite(ledBleue, HIGH);  
    else {  
        if (temperature > temp_max) digitalWrite(ledRouge, HIGH);  
        else digitalWrite(ledVerte, HIGH);  
    }  
  
    Serial.print("La temperature est de : ");  
    Serial.println(temperature , 2);  
  
    delay(5000);  
}
```



lectureTemp()

```
float lectureTemp(int pin) {  
    int valeur = analogRead(pin);  
  
    float tension = 5000;  
    int resolution = 1024;  
    float coeff = 10 ;  
    float offset = 0 ;  
  
    float temperature = (((tension / resolution) * valeur) - offset) / coeff;  
  
    return temperature;  
}
```

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Sources

- <http://www.arduino.cc/>
- <http://www.mon-club-elec.fr/>
- <http://www.flossmanualsfr.net/arduino/>
- <http://eskimon.fr/ebook-tutoriel-arduino>
- <http://www.didel.com/>
- Les schémas sont réalisés grâce à
<http://fritzing.org/home/>