

# Arduino für FunkAmateure

## Arduino & graphische Programmiersprachen Vergleich der Sketche / Programme

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# Aufgabe, Arduino-Sketch, Schaltbild

Aufgabe

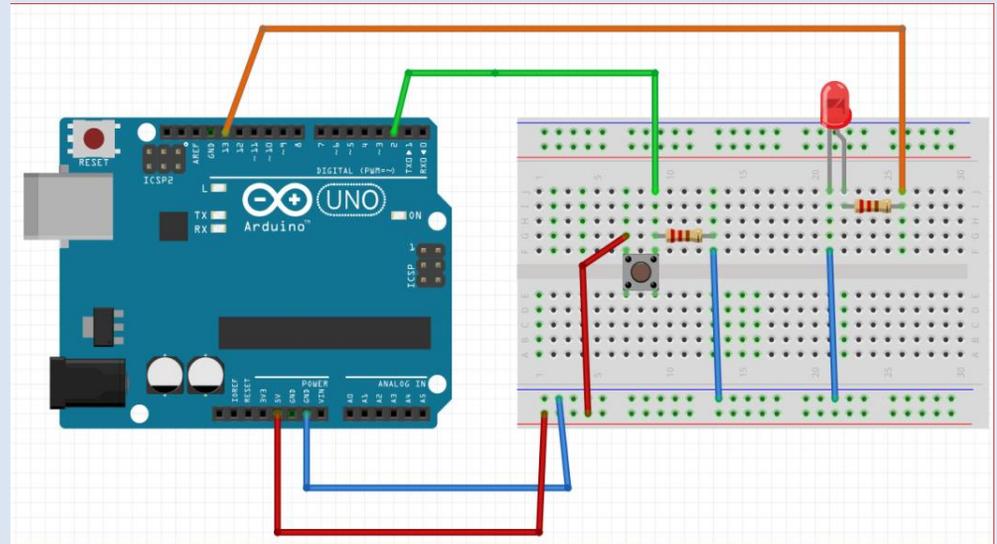
Taster gedrückt, dann LED an.

Taster gedrückt, dann LED aus.

Arduino-Sketch

Schaltung

```
1 boolean led=false;
2 void setup(){
3   pinMode( 2 , INPUT);      // DPIN 2 Taster
4   pinMode( 13 , OUTPUT);    // DPIN 13 LED
5 }
6
7 void loop(){
8   if (digitalRead(2) && (led==false)){
9     digitalWrite( 13 , HIGH );
10    led=true;
11    delay(1000);
12  }
13  if (digitalRead(2) && (led==true)){
14    digitalWrite( 13 , LOW );
15    led=false;
16    delay(1000);
17  }
18 }
```



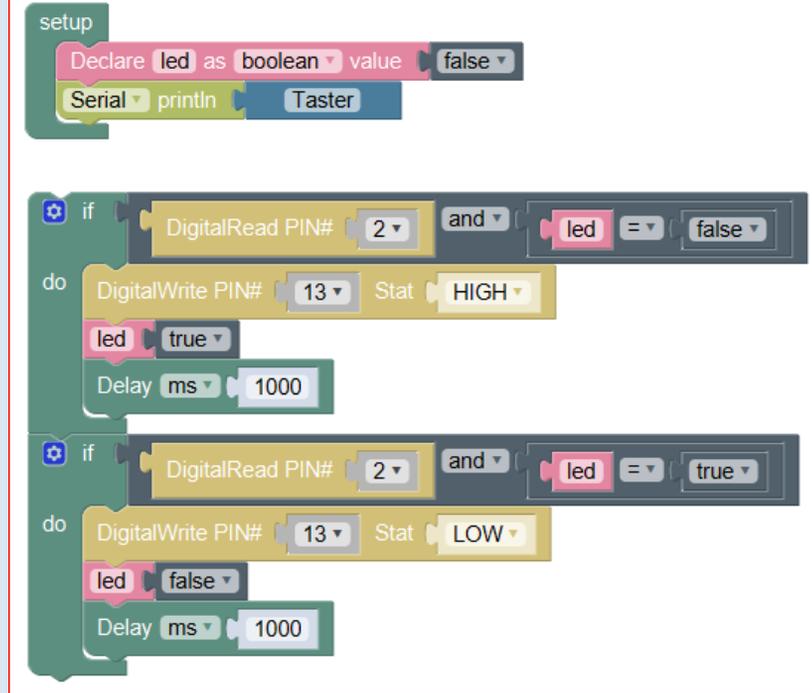
## Alternative: Ardublock-Sketch

```
1 bool _ABVAR_1_led= false ;
2
3 void setup()
4 {
5   pinMode( 2 , INPUT);
6   pinMode( 13 , OUTPUT);
7   _ABVAR_1_led = LOW ;
8 }
9
10
11 void loop()
12 {
13   if (( digitalRead(2) && ( ( _ABVAR_1_led ) == ( LOW ) ) ))
14   {
15     digitalWrite( 13 , HIGH );
16     _ABVAR_1_led = HIGH ;
17     delay( 1000 );
18   }
19   if (( digitalRead(2) && ( ( _ABVAR_1_led ) == ( HIGH ) ) ))
20   {
21     digitalWrite( 13 , LOW );
22     _ABVAR_1_led = LOW ;
23     delay( 1000 );
24   }
25 }
```



## Alternative: Mixly 0.98 von Microduino (ähnlich Scratch)

```
boolean led;  
  
void setup()  
{  
  led = false;  
  Serial.begin(9600);  
  Serial.println("Taster");  
  pinMode(2, INPUT);  
  pinMode(13, OUTPUT);  
}  
  
void loop()  
{  
  if (digitalRead(2) && led == false) {  
    digitalWrite(13,HIGH);  
    led = true;  
    delay(1000);  
  }  
  if (digitalRead(2) && led == true) {  
    digitalWrite(13,LOW);  
    led = false;  
    delay(1000);  
  }  
}
```



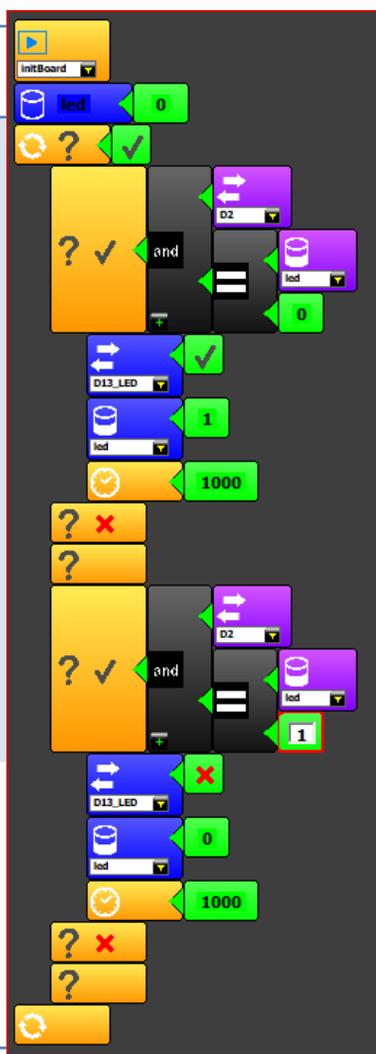
### Vorteile:

- Baukasten mit Bausteinen statt Schlüsselwörter
- Syntax automatisch
- Strukturen aus Bausteinen
- Parameter aus Pulldown-Listen

## Alternative: miniBlox v0.83

```
void setup()
{
  initBoard();
  float led = 0;
  while(true)
  {
    if((DigitalRead(D2)&&((int)(led)==(int)(0))))
    {
      DigitalWrite(D13_LED, true);
      led = 1;
      delay(1000);
    }
    else
    {
    }
    if((DigitalRead(D2)&&((int)(led)==(int)(1))))
    {
      DigitalWrite(D13_LED, false);
      led = 0;
      delay(1000);
    }
    else
    {
    }
  }
}

void loop()
{
}
```



### Vorteile:

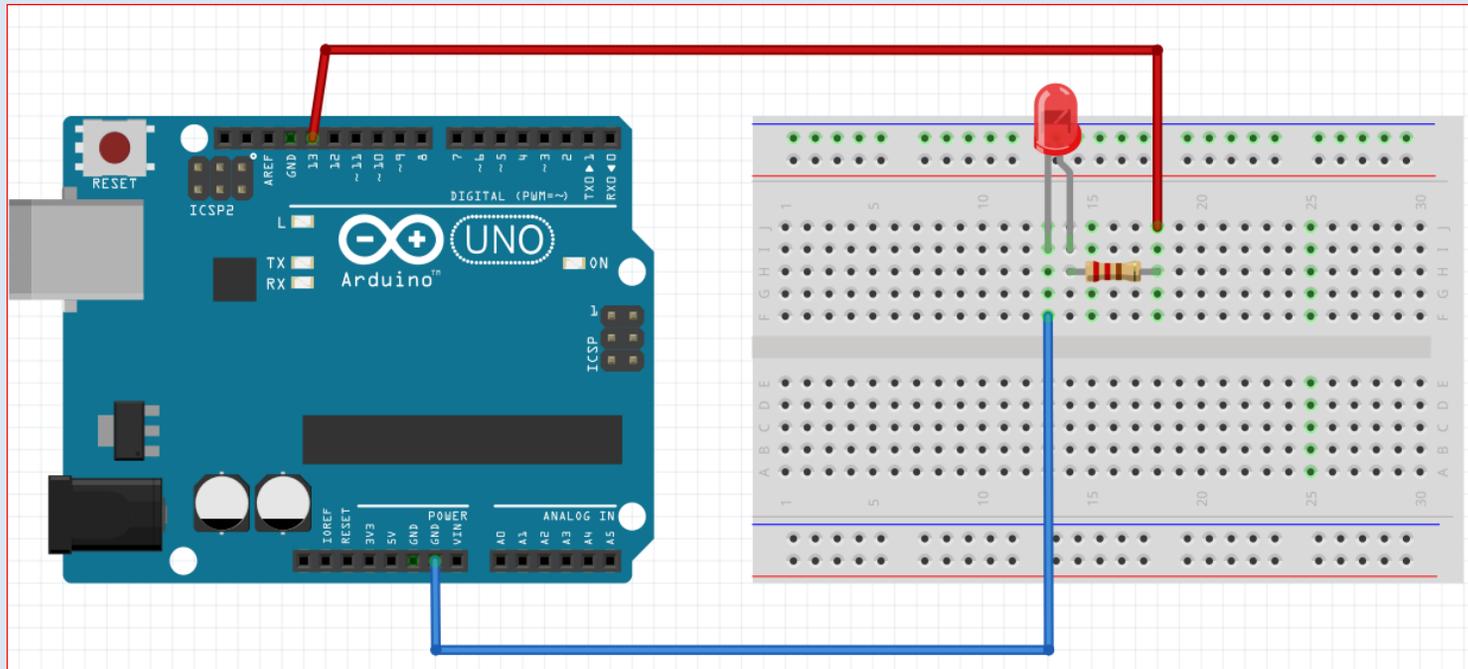
- Blöcke statt Schlüsselwörter
- Syntax automatisch
- Strukturen aus Blöcken
- Parameter aus Pickup-Listen

## Schaltung 1: Blinkende LED

Siehe <https://www.baireuther.de/page/arduino/#led>

Fritzing Schaltung

Widerstand 220  $\Omega$ ; LED



## Sketch 1: Blinkende LED mit Ardublock

Siehe <https://www.baireuther.de/page/arduino/#led>

```
1 void setup()  
2 {  
3   pinMode( 13 , OUTPUT);  
4   Serial.begin(9600);  
5   Serial.print("Blinkende LED");  
6   Serial.println();  
7  
8 }  
9  
10 void loop()  
11 {  
12   digitalWrite( 13 , HIGH );  
13   delay( 1000 );  
14   digitalWrite( 13 , LOW );  
15   delay( 1000 );  
16 }
```

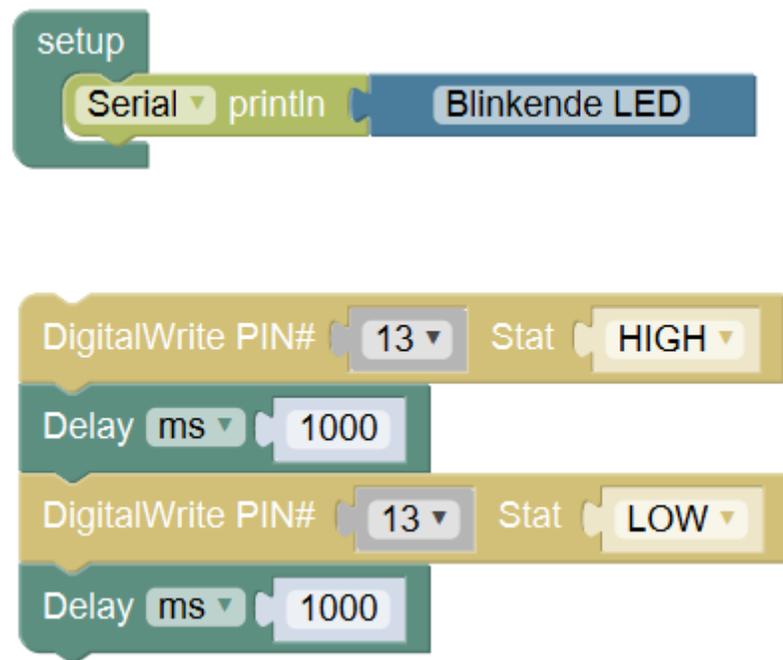


## Sketch 1: Blinkende LED mit Mixly 0.98

Siehe ...

```
void setup()
{
  Serial.begin(9600);
  Serial.println("Blinkende LED");
  pinMode(13, OUTPUT);
}

void loop()
{
  digitalWrite(13,HIGH);
  delay(1000);
  digitalWrite(13,LOW);
  delay(1000);
}
```



## Sketch 1: Blinkende LED mit miniBq v0.83

Siehe ...

```
#include <mbq.h>
#include <PingIRReceiver.h>

void setup()
{
  initBoard();
  serial0.println("Blinkende LED");
  while(true)
  {
    DigitalWrite(D13_LED, true);
    delay(1000);
    DigitalWrite(D13_LED, false);
    delay(1000);
  }
}

void loop()
{
}
```

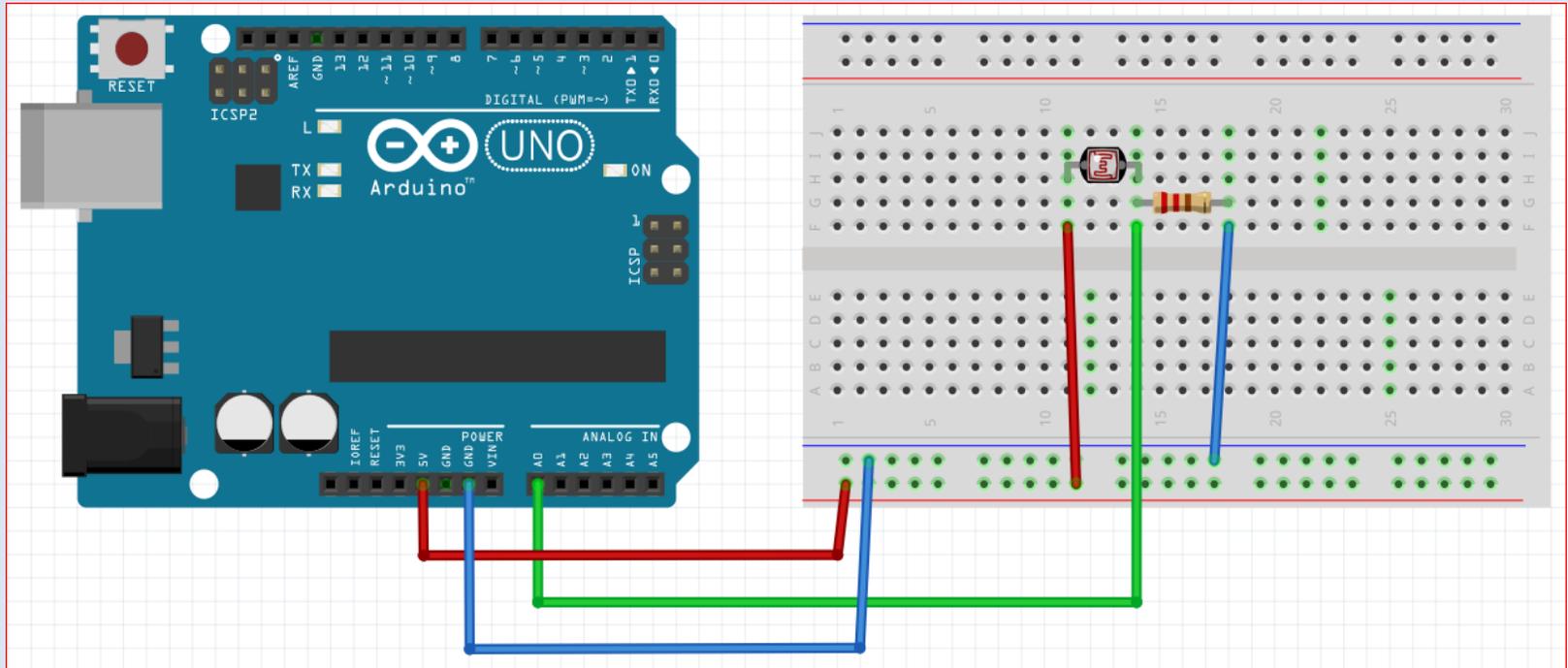


## Schaltung 2: LDR

Siehe <https://www.baireuther.de/page/arduino/#ldr>

Fritzing Schaltung

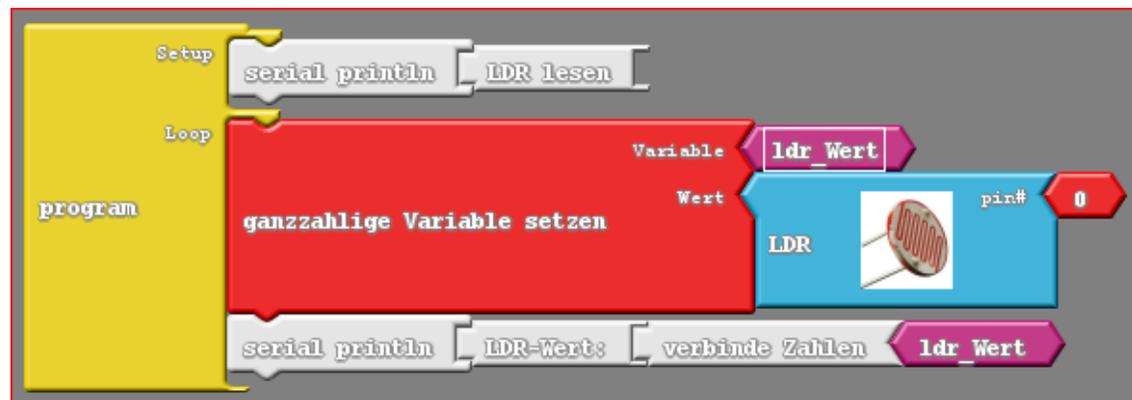
LDR; Widerstand 10 k $\Omega$



## Sketch 2: LDR mit Ardublock

Siehe <https://www.baireuther.de/page/arduino/#ldr>

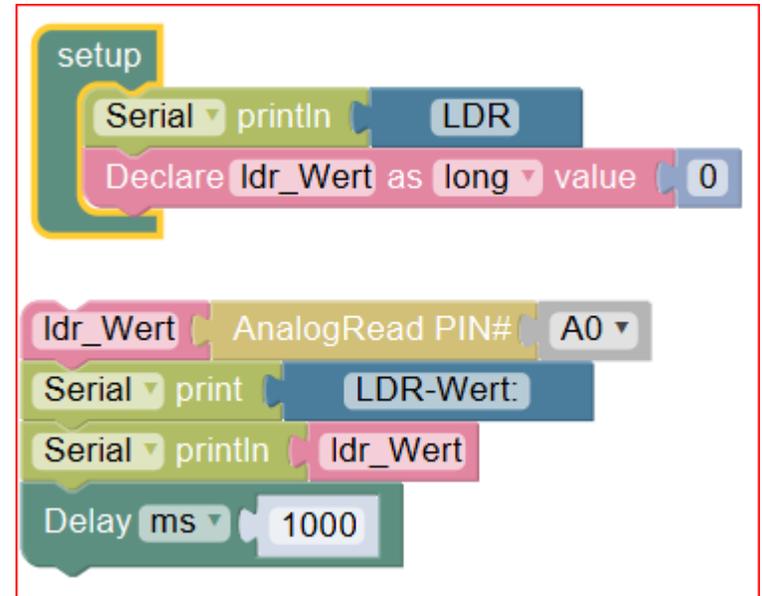
```
1 int _ABVAR_1_ldr_Wert = 0 ;
2
3 void setup()
4 {
5   Serial.begin(9600);
6   Serial.print("LDR lesen");
7   Serial.println();
8
9 }
10
11 void loop()
12 {
13   _ABVAR_1_ldr_Wert = analogRead(0) ;
14   Serial.print("LDR-Wert:");
15   Serial.print(_ABVAR_1_ldr_Wert);
16   Serial.println();
17 }
```



## Sketch 2: LDR mit Mixly 0.98

Siehe ...

```
long ldr_Wert;  
  
void setup()  
{  
  Serial.begin(9600);  
  ldr_Wert = 0;  
  Serial.println("LDR");  
}  
  
void loop()  
{  
  ldr_Wert = analogRead(A0);  
  Serial.print("LDR-Wert: ");  
  Serial.println(ldr_Wert);  
  delay(1000);  
}
```



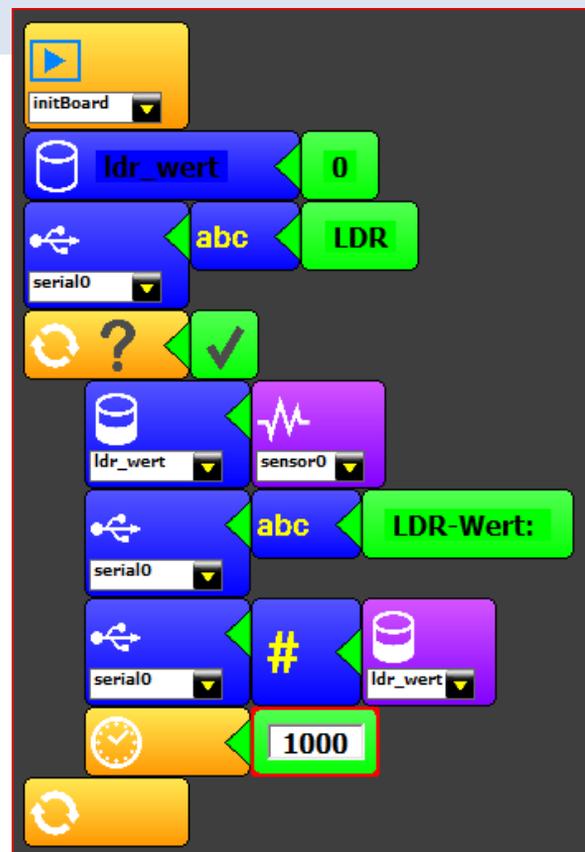
## Sketch 2: LDR mit miniBloq v0.83

Siehe ...

```
#include <mbq.h>
#include <PingIRReceiver.h>

void setup()
{
  initBoard();
  float ldr_wert = 0;
  serial0.println("LDR");
  while(true)
  {
    ldr_wert = AnalogRead(sensor0);
    serial0.println("LDR-Wert: ");
    serial0.println(ldr_wert);
    delay(1000);
  }
}

void loop()
{
}
```

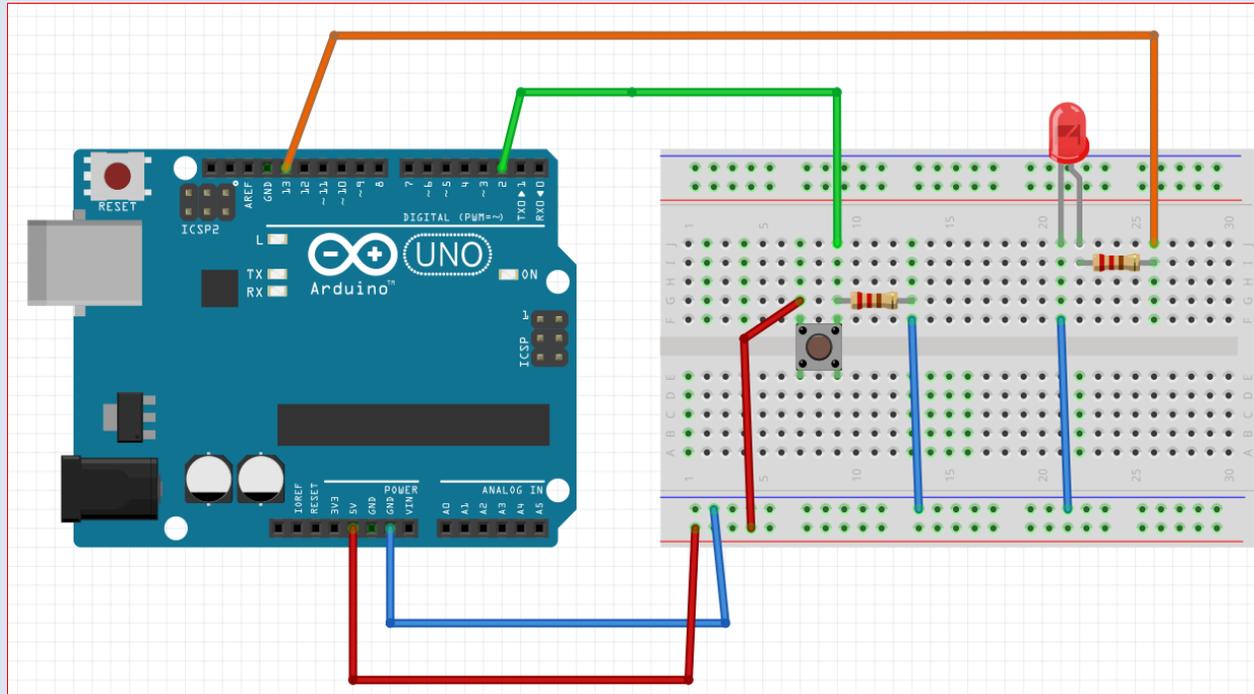


## Schaltung 3: Taster

Siehe <https://www.baireuther.de/page/arduino/#taster>

Fritzing Schaltung

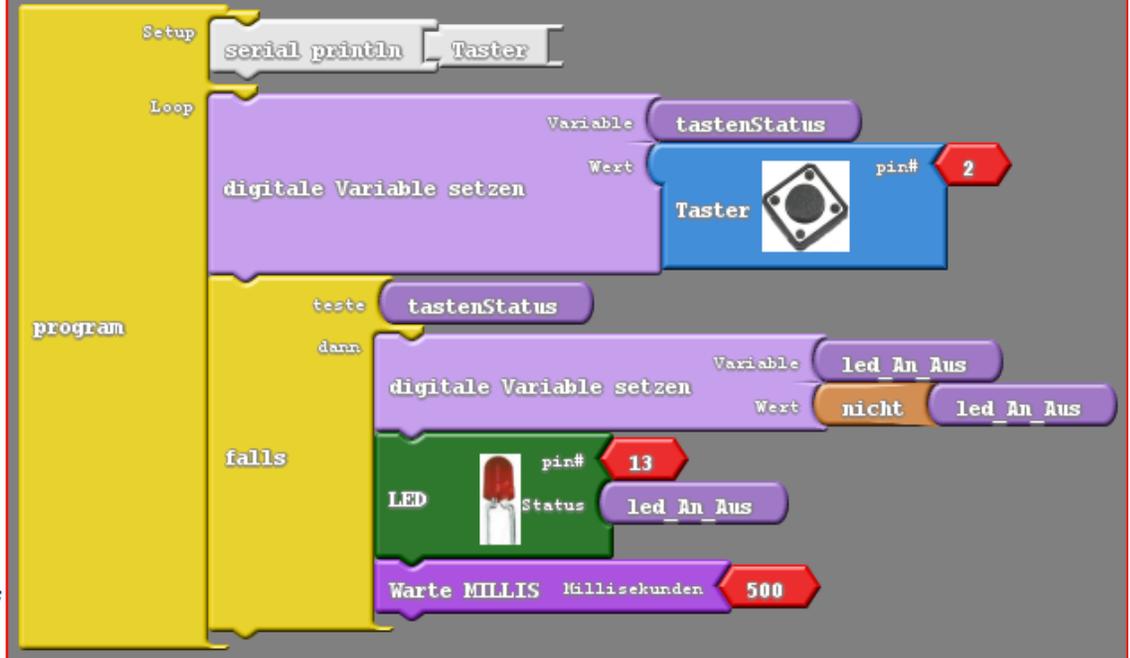
Taster; Pulldown-Widerstand 10 k $\Omega$



### Sketch 3: Taster mit Ardublock

Siehe <https://www.baireuther.de/page/arduino/#taster> (abgewandelt)

```
1 bool _ABVAR_1_tastenStatus= false ;
2 bool _ABVAR_2_led_An_Aus= false ;
3
4 void setup()
5 {
6   pinMode( 2 , INPUT);
7   pinMode( 13 , OUTPUT);
8   Serial.begin(9600);
9   Serial.print("Taster");
10  Serial.println();
11 }
12 }
13
14 void loop()
15 {
16   _ABVAR_1_tastenStatus = digitalRead(2) ;
17   if ( _ABVAR_1_tastenStatus)
18   {
19     _ABVAR_2_led_An_Aus = !( _ABVAR_2_led_An_Aus ) ;
20     digitalWrite( 13 , _ABVAR_2_led_An_Aus );
21     delay( 500 );
22   }
23 }
```



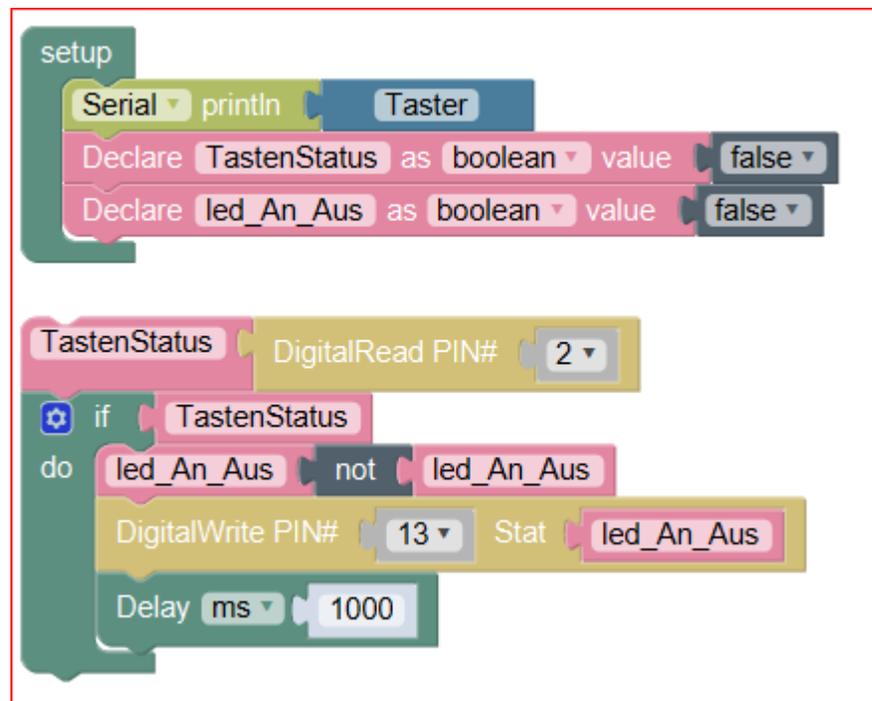
### Sketch 3: Taster mit Mixly 0.98

Siehe ...

```
boolean TastenStatus;
boolean led_An_Aus;

void setup()
{
  Serial.begin(9600);
  TastenStatus = false;
  led_An_Aus = false;
  Serial.println("Taster");
  pinMode(2, INPUT);
  pinMode(13, OUTPUT);
}

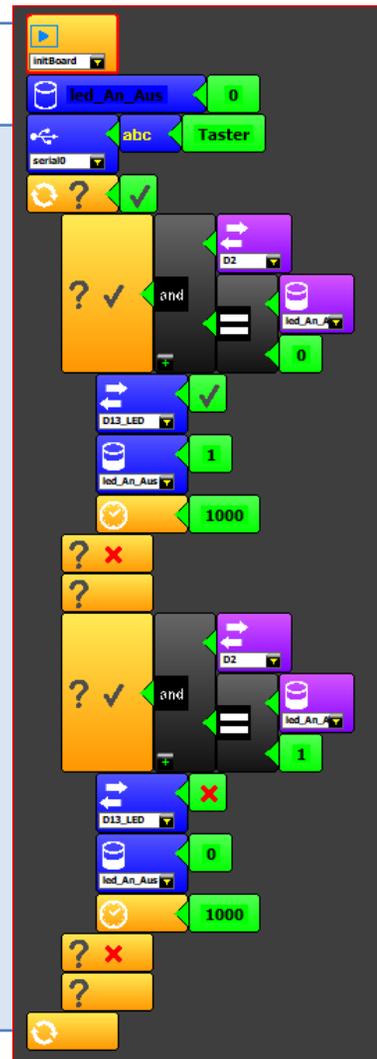
void loop()
{
  TastenStatus = digitalRead(2);
  if (TastenStatus) {
    led_An_Aus = !led_An_Aus;
    digitalWrite(13, led_An_Aus);
    delay(1000);
  }
}
```



### Sketch 3: Taster mit miniBLoq v0.83

```
#include <mbq.h>
#include <PingIRReceiver.h>

void setup()
{
  initBoard();
  float led_An_Aus = 0;
  serial0.println("Taster");
  while(true)
  {
    if((DigitalRead(D2)&&((int)(led_An_Aus)==(int)(0))))
    {
      DigitalWrite(D13_LED, true);
      led_An_Aus = 1;
      delay(1000);
    }
    else
    {
    }
    if((DigitalRead(D2)&&((int)(led_An_Aus)==(int)(1))))
    {
      DigitalWrite(D13_LED, false);
      led_An_Aus = 0;
      delay(1000);
    }
    else
    {
    }
  }
}
```



## Schaltung 4: Temperatur

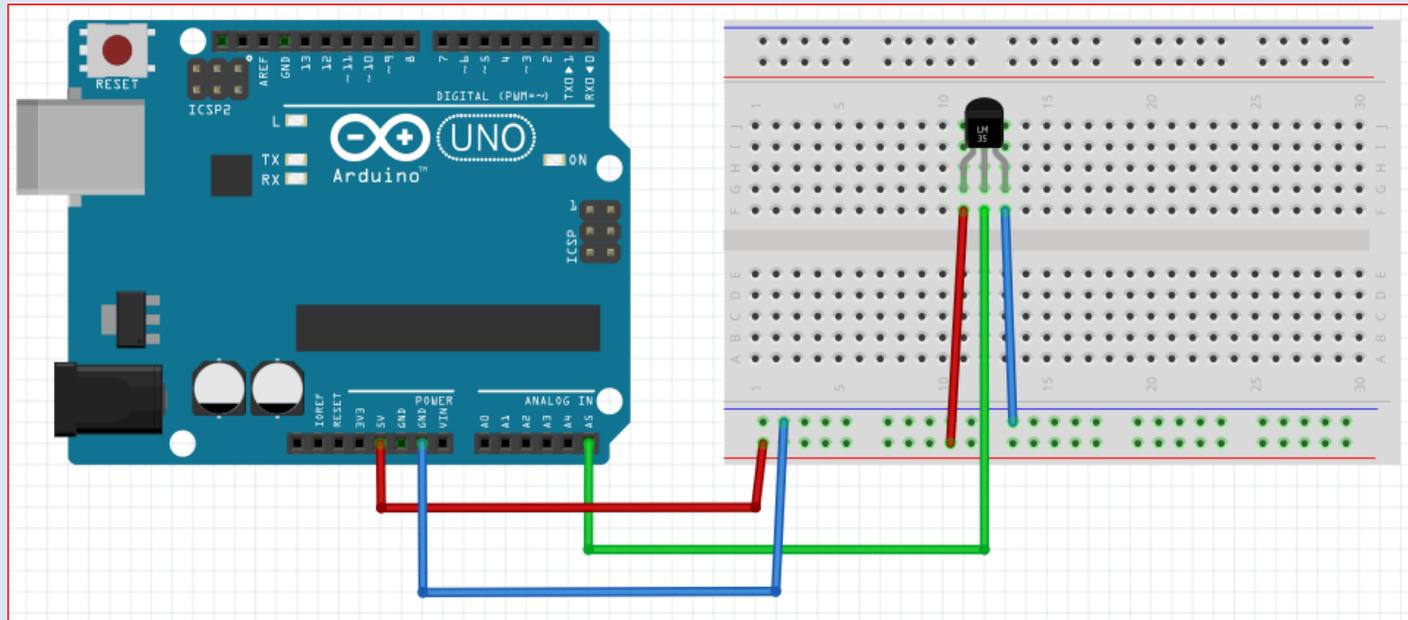
Siehe [https://wiki.arduino-hannover.de/wiki/LM35\\_Temperatursensor\\_Analog](https://wiki.arduino-hannover.de/wiki/LM35_Temperatursensor_Analog)

Fritzing Schaltung

LM35; -55 °C bis +150 °C; 5000 mV entsprechen 1024 Schritten (Analogdigitalwandler)

$\text{milliVolt} = \text{analogRead} / 1024 * 5000$

Umrechnung mV in °C:  $\text{celsius} = \text{milliVolt} / 10$



## Sketch 4: Temperatur mit Ardublock

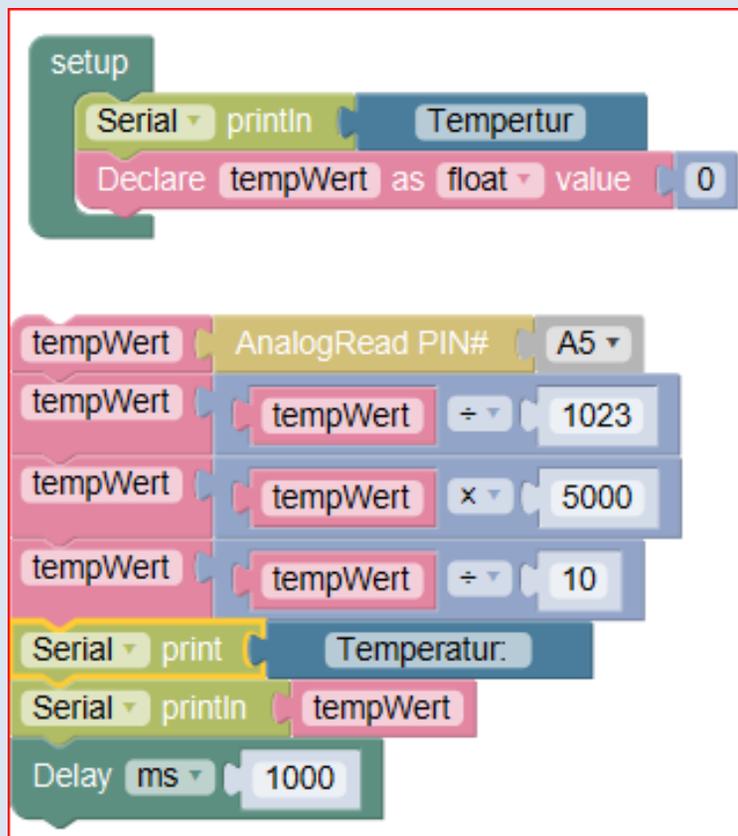
Siehe [https://wiki.arduino-hannover.de/wiki/LM35\\_Temperatursensor\\_Analog](https://wiki.arduino-hannover.de/wiki/LM35_Temperatursensor_Analog)

```
1 double _ABVAR_1_temWert = 0.0 ;
2
3 void setup()
4 {
5   Serial.begin(9600);
6   Serial.print("Temperatur");
7   Serial.println();
8
9 }
10
11 void loop()
12 {
13   _ABVAR_1_temWert = analogRead(5) ;
14   _ABVAR_1_temWert = ( _ABVAR_1_temWert / 1023 ) ;
15   _ABVAR_1_temWert = ( _ABVAR_1_temWert * 5000 ) ;
16   _ABVAR_1_temWert = ( _ABVAR_1_temWert / 10 ) ;
17   Serial.print("Temperatur=");
18   Serial.print(_ABVAR_1_temWert);
19   Serial.println();
20   delay( 500 );
```



## Sketch 4: Temperatur mit Mixly 0.098

```
float tempWert;  
  
void setup()  
{  
  Serial.begin(9600);  
  tempWert = 0;  
  Serial.println("Tempertur");  
}  
  
void loop()  
{  
  tempWert = analogRead(A5);  
  tempWert = tempWert / 1023;  
  tempWert = tempWert * 5000;  
  tempWert = tempWert / 10;  
  Serial.print("Temperatur: ");  
  Serial.println(tempWert);  
  delay(1000);  
}
```

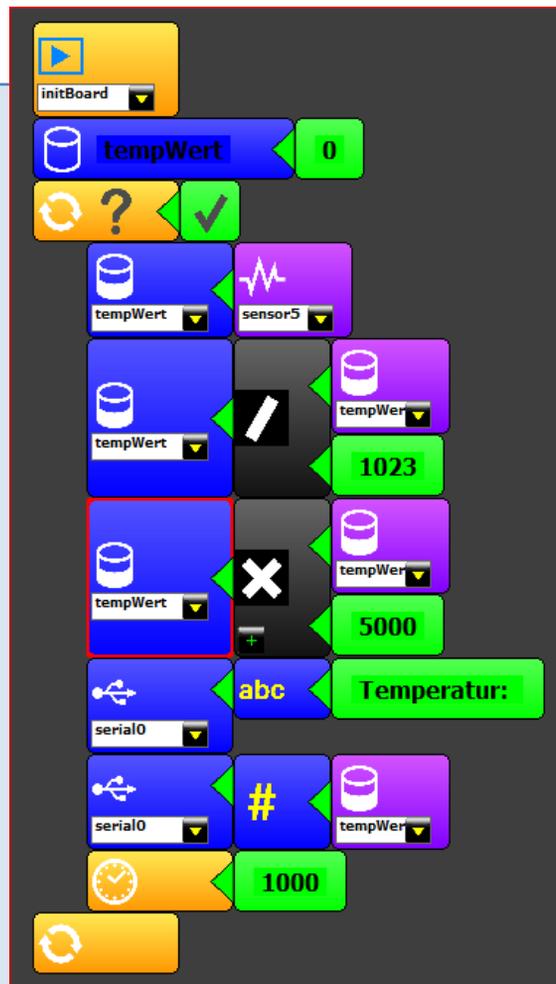


## Sketch 4: Temperatur mit miniBLoq v0.83

```
#include <mbq.h>
#include <PingIRReceiver.h>

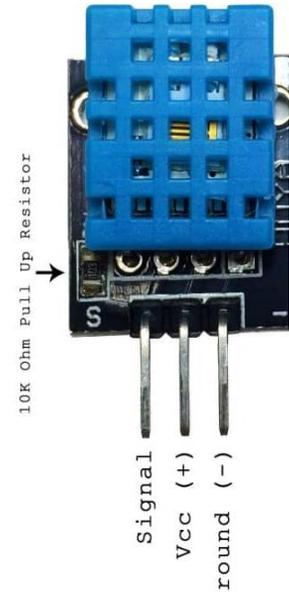
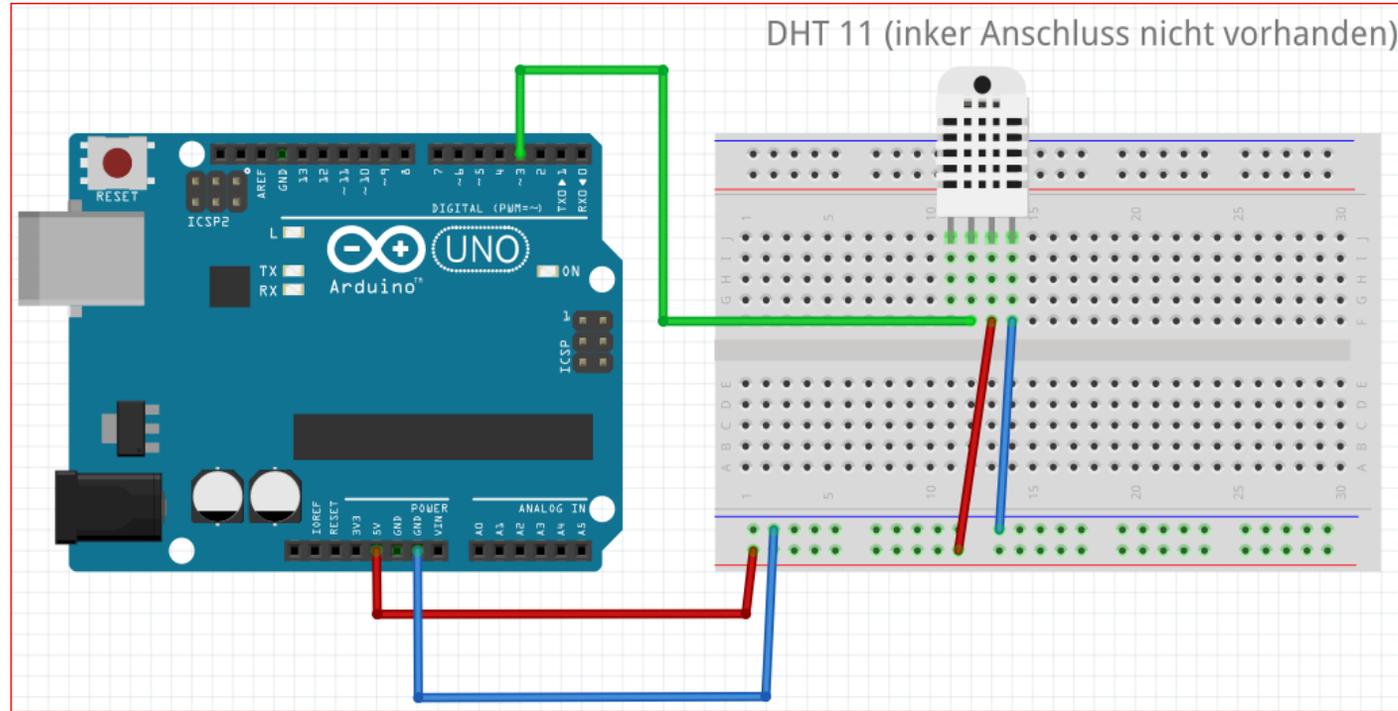
void setup()
{
  initBoard();
  float tempWert = 0;
  while(true)
  {
    tempWert = AnalogRead(sensor5);
    tempWert = (tempWert/1023);
    tempWert = (tempWert*5000);
    serial0.println("Temperatur: ");
    serial0.println(tempWert);
    delay(1000);
  }
}

void loop()
{
}
```



## Schaltung 5: DHT11

### Fritzing Schaltung

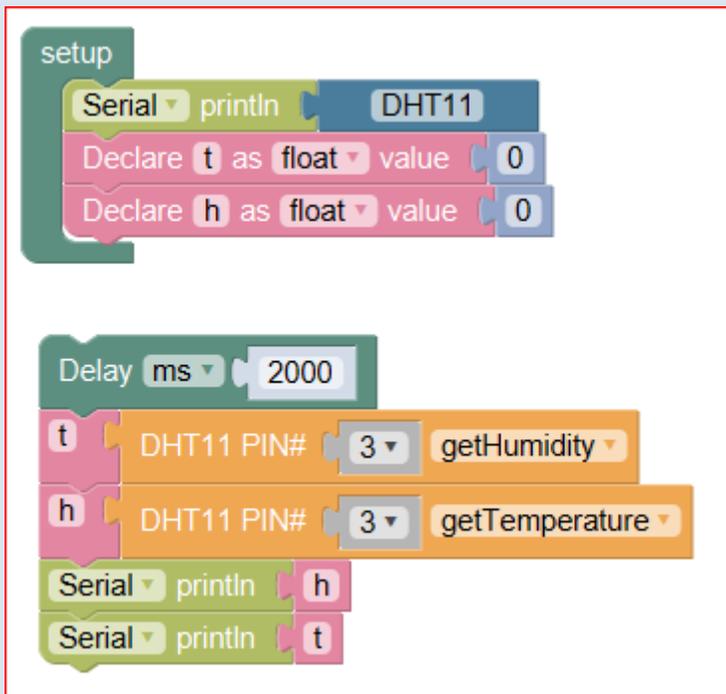


## Sketch 5: DHT11 mit Arduino-IDE

Library  
„DHT-sensor-library-master“  
nachinstallieren

```
1 // https://www.bastelgarage.ch/index.php?route=extension/d\_blog\_module/post&post\_id=1
2 #include "DHT.h"
3 #define DHTPIN 3           // Pin Nummer eintragen, wo der Sensor angeschlossen ist
4 #define DHTTYPE DHT11     // Definiert was für ein Sensor ausgelesen wird: hier DHT11
5
6 DHT dht(DHTPIN, DHTTYPE);
7
8 void setup() {
9     Serial.begin(9600);
10    Serial.println("DHT11");
11    dht.begin();
12 }
13 void loop() {
14     // Wait a few seconds between measurements.
15     delay(2000);           // Abfrage der Werte alle 2 Sekunden
16
17     float h = dht.readHumidity(); // Lesen der Luftfeuchtigkeit und speichern in die Variable h
18     float t = dht.readTemperature(); // Lesen der Temperatur in °C und speichern in die Variable t
19
20     if (isnan(h) || isnan(t)) { // Wurden Werte ausgelesen?
21         Serial.println("Fehler beim auslesen des Sensors!");
22         return;
23     }
24
25     Serial.print("Luftfeuchtigkeit: ");
26     Serial.print(h);           // Ausgeben der Luftfeuchtigkeit
27     Serial.print("  %\t");     // Tabulator
28     Serial.print("Temperatur: ");
29     Serial.print(t);           // Ausgeben der Temperatur
30     Serial.println(" °C");
31 }
```

## Sketch 5: DHT11 mit Mixly 0.098



The image shows a Mixly code editor with the following blocks:

- setup** block containing:
  - `Serial println` block with `DHT11` selected.
  - `Declare t as float` block with `value` set to `0`.
  - `Declare h as float` block with `value` set to `0`.
- Delay** block with `ms` set to `2000`.
- `t` block connected to `DHT11 PIN#` (set to `3`) and `getHumidity`.
- `h` block connected to `DHT11 PIN#` (set to `3`) and `getTemperature`.
- `Serial println` block with `h` selected.
- `Serial println` block with `t` selected.

Library „dht11-master“ nachinstallieren

```
#include <dht11.h>

float t;
float h;
dht11 myDHT_3;
int dht_3_gethumidity() {
  int chk = myDHT_3.read(3);
  int value = myDHT_3.humidity;
  return value;
}

int dht_3_gettemperature() {
  int chk = myDHT_3.read(3);
  int value = myDHT_3.temperature;
  return value;
}

void setup()
{
  Serial.begin(9600);
  t = 0;
  h = 0;
  Serial.println("DHT11");
}

void loop()
{
  delay(2000);
  t = dht_3_gethumidity();
  h = dht_3_gettemperature();
  Serial.println(h);
  Serial.println(t);
}
```