

LOM3258 Introdução à Eletrônica e Computação Física

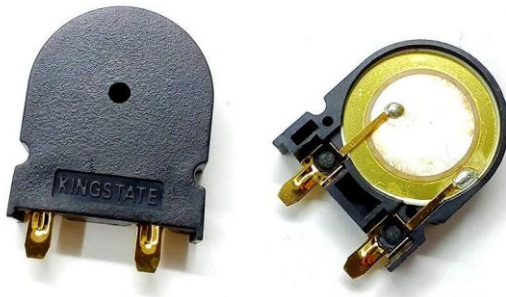
Programação do Arduino

Sirene piezelétrica

Sensor/atuador piezelétrico



Piezelétrico



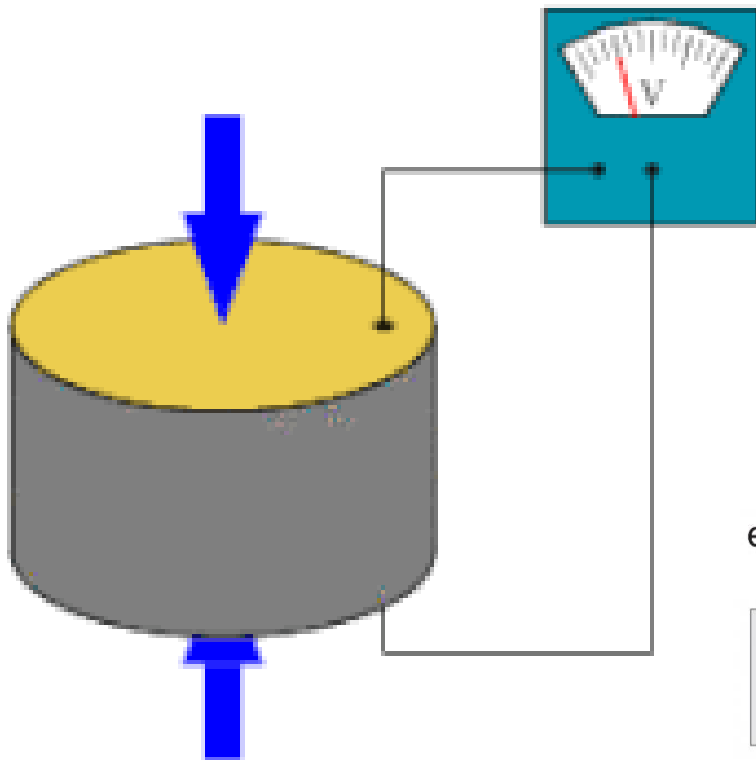
Sirene (*buzzer*)



Funcionamento do piezelétrico

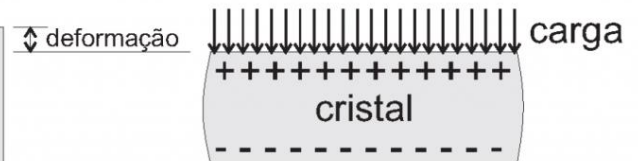
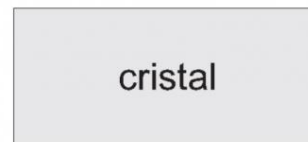
Aplicando tensão, produzindo deformação: sirene (transdutor)

Aplicando deformação, produzindo tensão: microfone (sensor)



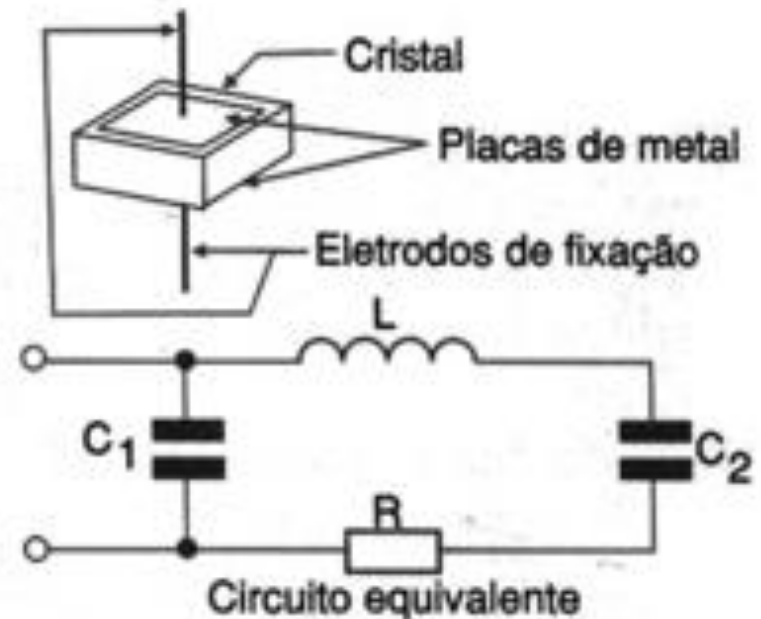
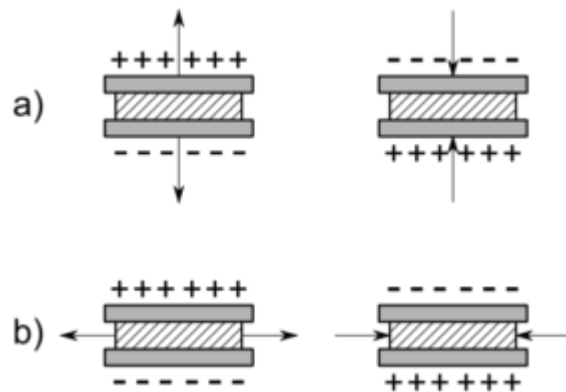
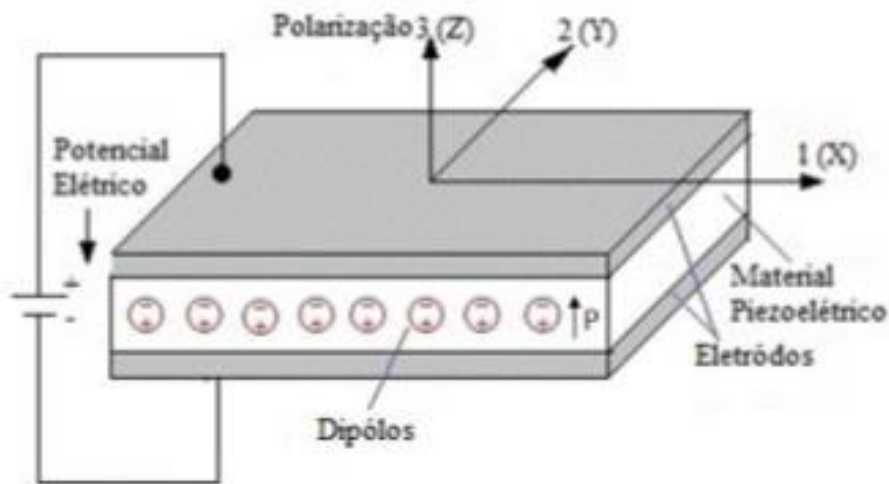
estado 1: repouso

estado 2: submetido a uma carga

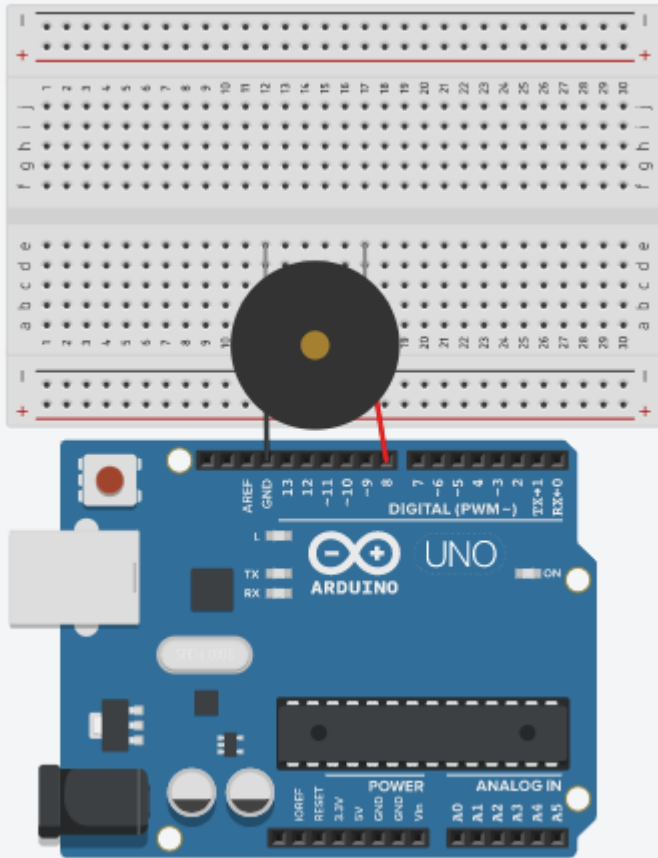


a carga mecânica faz surgir uma diferença de potencial elétrico

Funcionamento do piezelétrico



Sirene piezelétrica



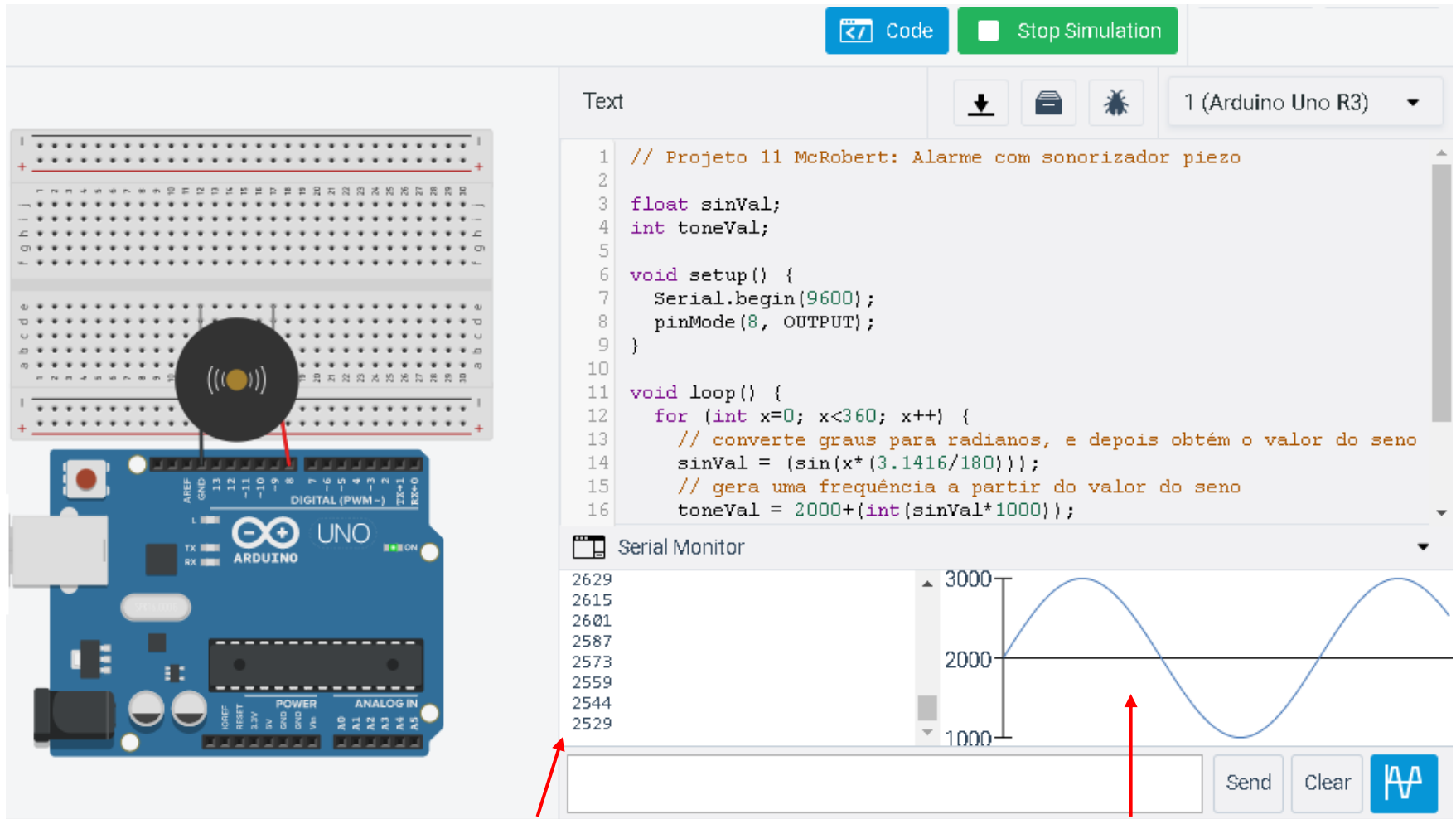
```
// Projeto 11 McRobert: Alarme com  
sonorizador piezo
```

```
float sinVal;  
int toneVal;
```

```
void setup() {  
    Serial.begin(9600);  
    pinMode(8, OUTPUT);  
}
```

```
void loop() {  
    for (int x=0; x<360; x++) {  
        // converte graus para radianos  
        sinVal = (sin(x*(3.1416/180)));  
        // gera frequência do valor do seno  
        toneVal = 2000+(int(sinVal*1000));  
        Serial.println(toneVal);  
        tone(8, toneVal);  
        delay(20);  
    }  
}
```

Simulação do circuito no Tinkercad



The screenshot displays the Tinkercad simulation environment. On the left, an Arduino Uno R3 is connected to a breadboard. A piezo buzzer is connected to digital pin 8 and ground. The code editor on the right contains the following C++ code:

```
// Projeto 11 McRobert: Alarme com sonarizador piezo
float sinVal;
int toneVal;

void setup() {
  Serial.begin(9600);
  pinMode(8, OUTPUT);
}

void loop() {
  for (int x=0; x<360; x++) {
    // converte graus para radianos, e depois obtém o valor do seno
    sinVal = (sin(x*(3.1416/180)));
    // gera uma frequência a partir do valor do seno
    toneVal = 2000+(int(sinVal*1000));
  }
}
```

Below the code editor, the Serial Monitor shows a list of values: 2629, 2615, 2601, 2587, 2573, 2559, 2544, 2529. To the right, the Serial Plotter displays a sine wave graph with a y-axis ranging from 1000 to 3000. Red arrows point from the Serial Monitor and the Serial Plotter to their respective labels at the bottom.

**Valores da função seno no
Monitor Serial**

**Gráfico da função seno no
Plotter Serial**