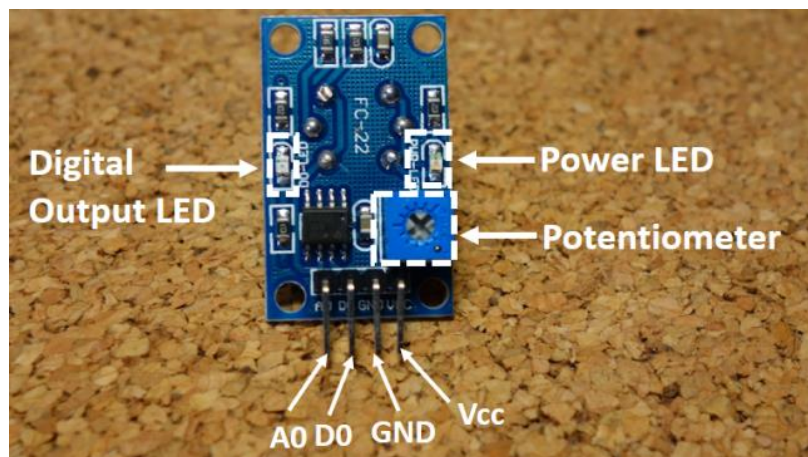


MQ-2 Gas/Smoke Sensor

This guide shows how to build a smoke detector that beeps when it detects flammable gas or smoke. The MQ-2 smoke sensor is shown in the following figure:



The MQ-2 smoke sensor is sensitive to smoke and to the following flammable gases: LPG, butane, propane, methane, alcohol and hydrogen. The resistance across the sensor is different depending on the type of the gas. The smoke sensor has a built-in potentiometer that allows you to adjust the sensor digital output (D0) threshold. This threshold sets the value above which the digital pin will output a HIGH signal.

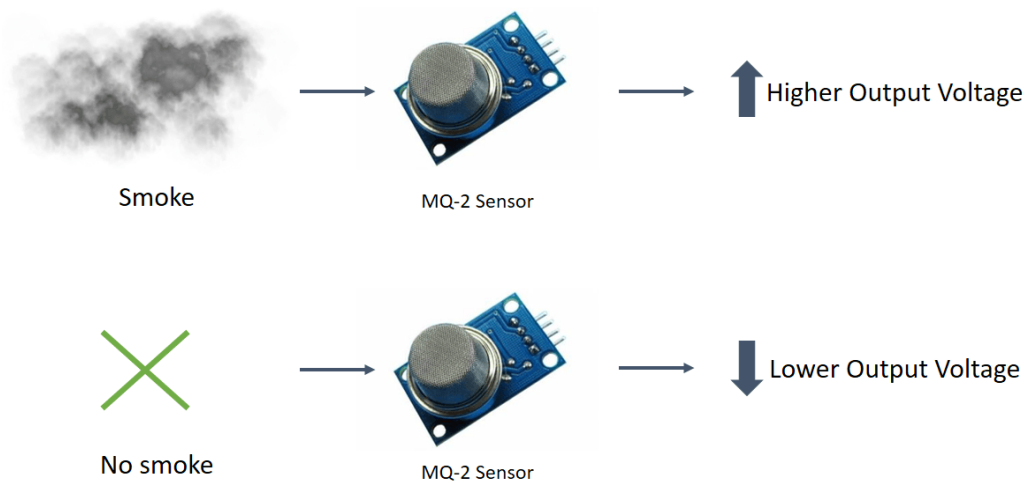


How does it work?

The voltage that the sensor outputs changes accordingly to the smoke/gas level that exists in the atmosphere. The sensor outputs a voltage that is proportional to the concentration of smoke/gas.

In other words, the relationship between voltage and gas concentration is the following:

- The greater the gas concentration, the greater the output voltage
- The lower the gas concentration, the lower the output voltage



The output can be an analog signal (A0) that can be read with an analog input of the Arduino or a digital output (D0) that can be read with a digital input of the Arduino.

Where to buy?

Click the link below to compare the sensor at different stores and find the best price:

- [MQ-2 Gas and Smoke Sensor](#)

Gas Sensor with Arduino

In this example, you will read the sensor analog output voltage. When the smoke reaches a certain level, it will make sound a buzzer and a red LED will turn on.

When the output voltage is below that level, a green LED will be on.

For this example, you'll need the following parts:

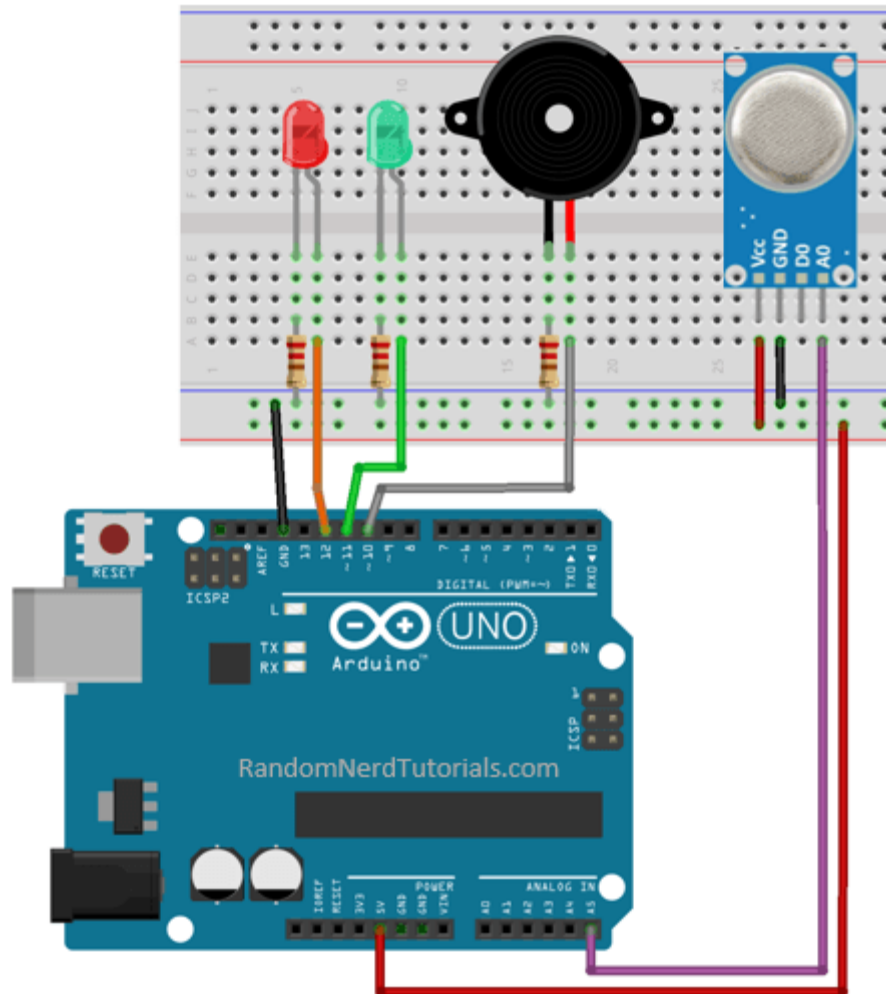
Figure	Name	Check Price
	Arduino UNO	Find best price on Maker Advisor
	MQ-2 gas/smoke sensor	Find best price on Maker Advisor
	Breadboard	Find best price on Maker Advisor
	2 x LEDs	Find best price on Maker Advisor
	3 x 220kΩ Resistor	Find best price on Maker Advisor
	Piezo buzzer	Find best price on Maker Advisor
	Jumper Wires	Find best price on Maker Advisor

Pin wiring

Sensor Pin	Wiring to Arduino Uno
A0	Analog pins
D0	Digital pins
GND	GND
VCC	5V

Schematic

Follow the next schematic diagram to complete the project:



Code

Upload the following sketch to your Arduino board (feel free to adjust the variable **sensorThres** with a different threshold value):

```
/*  
All the resources for this project:  
http://randomnerdtutorials.com/  
*/  
  
int redLed = 12;  
int greenLed = 11;  
int buzzer = 10;  
int smokeA0 = A5;  
// Your threshold value  
int sensorThres = 400;
```

```

void setup() {
  pinMode(redLed, OUTPUT);
  pinMode(greenLed, OUTPUT);
  pinMode(buzzer, OUTPUT);
  pinMode(smokeA0, INPUT);
  Serial.begin(9600);
}

void loop() {
  int analogSensor = analogRead(smokeA0);

  Serial.print("Pin A0: ");
  Serial.println(analogSensor);
  // Checks if it has reached the threshold value
  if (analogSensor > sensorThres)
  {
    digitalWrite(redLed, HIGH);
    digitalWrite(greenLed, LOW);
    tone(buzzer, 1000, 200);
  }
  else
  {
    digitalWrite(redLed, LOW);
    digitalWrite(greenLed, HIGH);
    noTone(buzzer);
  }
  delay(100);
}

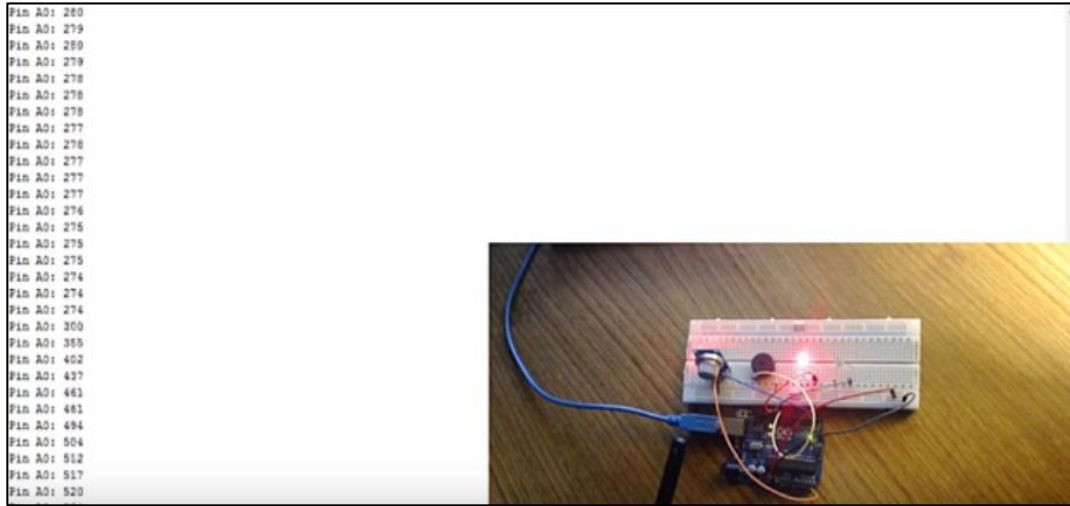
```

{:} SOURCE CODE

https://github.com/RuiSantosdotme/Random-Nerd-Tutorials/blob/master/Projects/smoke_detector.ino

Demonstration

When you press a lighter next to the sensor, the red LED lights up and the buzzer beeps. You can also see at the serial monitor, the values changing and surpassing the threshold value.



Wrapping up

The MQ-2 gas sensor allows you to detect a wide variety of gases in the environment. It is very useful to build a smoke detector at home.