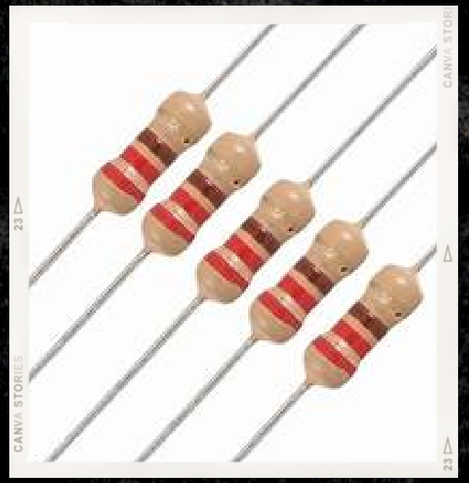
IE GROUP PROJECT

COMPONENTS

ARDUINO UNO

LED’S

MQ2 SENSOR



RESISTOR

BUZZER

PROJECT OVERVIEW

Smoke sensors work by detecting the presence of smoke particles in the air. They consist of a chamber that contains a light source and a light detector. When smoke particles enter the chamber, they scatter the light from the source, causing a decrease in the amount of light detected by the light detector. This change in the amount of light is then processed by the sensor's circuitry, which triggers an alert, such as a loud alarm or a signal to a monitoring system.

BACKGROUND

GENERAL OVERVIEW

Smoke sensors in smoke detectors work by utilizing a chamber with a light source and a light detector. In normal conditions, light travels undisturbed from the source to the detector. When smoke particles enter the chamber, they scatter the light, causing a decrease in detected light intensity. This change triggers the sensor's circuitry, which activates an alert system, such as a loud alarm, signaling the potential presence of a fire.

PROCESS

1)SENSOR IS BASED ON THE CHANGE OF THE RESISTANCE OF THE SENSING MATERIAL WHEN THE GAS COMES IN CONTACT WITH THE MATERIAL

2)GAS CONCENTRATION IS DIRECTLY PROPORTIONAL TO THE OUT VOLTAGE

3)SENSOR DETECTS THE CHANGE AND SENDS IT TO THE ARDUINO USING THE ANALOG PIN

SIMULATION

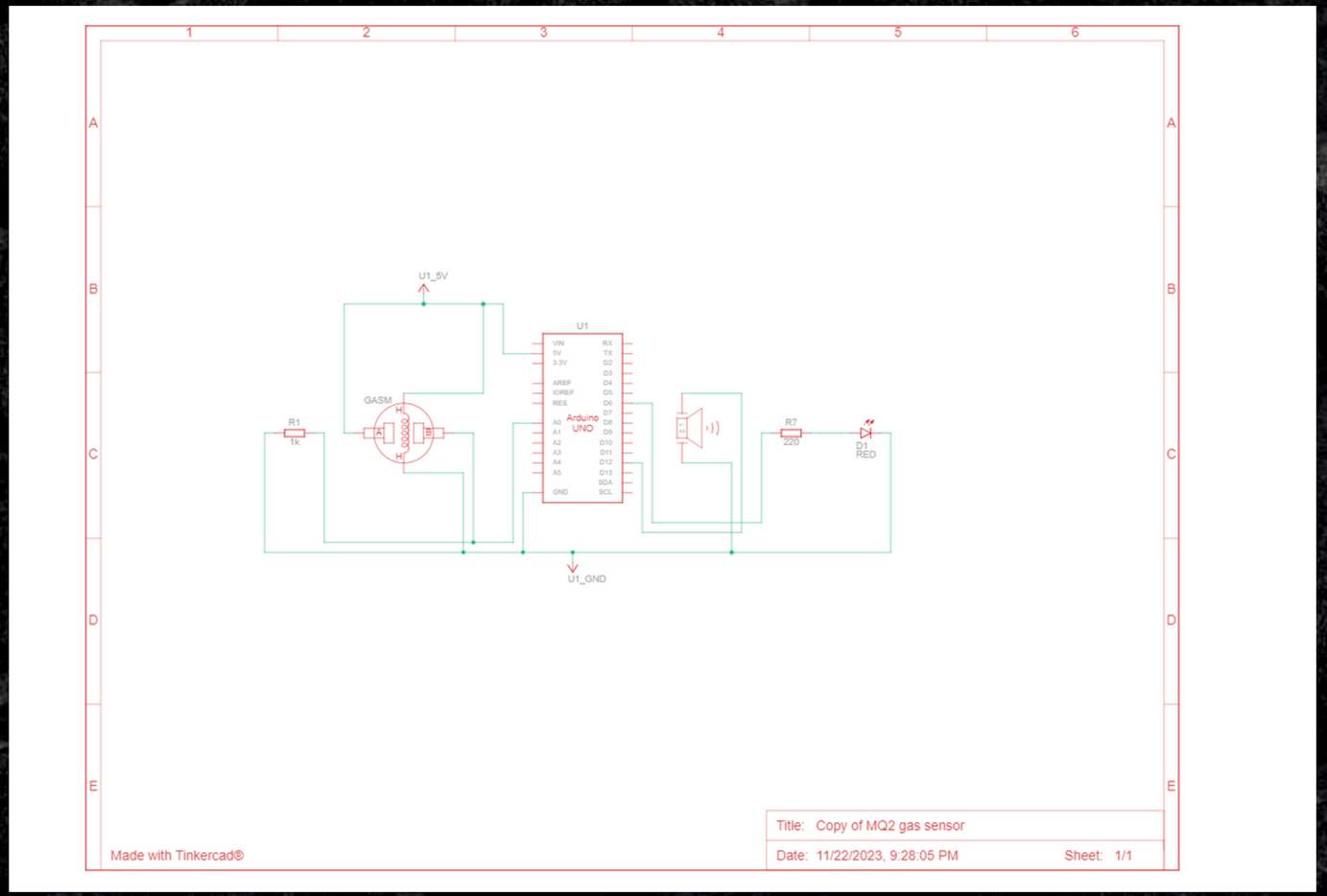
https://www.tinkercad.com/things/i6qOUneOzkv-fantabulous-fulffy/editel?sharecode=VbHe4nENMZPZzMFwxvatDQJIEmh0HuHVvouMr0hJxR4

ARDUINO CODE

```
// Defining pins for the inputs and outputs
const int gas_input = A0;  // Analog pin A0 is used to read the input from the MQ2 ga
int gas = 0;  // Variable to store the gas sensor reading
const int led = 6;  // Pin connected to the LED
const int buzzer = 12;  // Pin connected to the buzzer

void setup() {
  // Setting up the correct pin modes
  pinMode(led, OUTPUT);  // Configuring the LED pin as an output
  pinMode(buzzer, OUTPUT);  // Configuring the buzzer pin as an output

  // Initializing the serial monitor for debugging purposes
  Serial.begin(9600);
}
```

```
void loop() {
  // Read the input from the MQ2 gas sensor
  gas = analogRead(gas_input);

  // Print the input on the serial monitor
  Serial.println(gas);

  // Remapping the value of input from the MQ2 sensor to a range of 0-255
  int led_out = map(gas, 80, 400, 0, 255);
  // You might want to use the following line instead if you want to avoid exceeding
  // int led_out = min(gas, 255);

  // Send the output to the buzzer
  tone(buzzer, led_out, 100);  // The buzzer produces a tone with a frequency based o

  // Send the PWM signal to the LED
  analogWrite(led, led_out);  // Adjust the brightness of the LED based on the gas se

  // Delay of 100 milliseconds
  delay(100);
}
```

SCHEMATIC DIAGRAM



CONCLUSION

.In conclusion, the smoke sensor project successfully demonstrates the effective use of smoke detection technology. The sensor's design, featuring a chamber with a light source and detector, proves reliable in identifying the presence of smoke particles. As smoke enters the chamber, it scatters the light, leading to a measurable decrease in light intensity. The sensor's circuitry is adept at detecting this change and promptly triggering an alert system.

This project's significance lies in its contribution to fire safety, providing an early warning system that can be crucial for timely evacuation and emergency response. The simplicity and efficiency of the smoke sensor make it a valuable component in various applications, including residential smoke detectors and commercial fire alarm systems.

Moving forward, potential enhancements could include integrating the sensor with smart home technology for remote monitoring or exploring advanced algorithms to reduce false alarms. Overall, the smoke sensor project exemplifies a fundamental yet impactful application of sensor technology in ensuring the safety of individuals and property in the face of potential fire hazards.