

## ENVIRONMENTAL MONITORING –INNOVATION

### Design steps for environmental monitoring

#### 1. Define the Monitoring System:

Clearly define what environmental parameters you want to monitor (e.g., temperature, humidity, air quality).

2. Select Sensors: Choose appropriate sensors for each parameter. Ensure they are compatible with Tinkercad's available components.

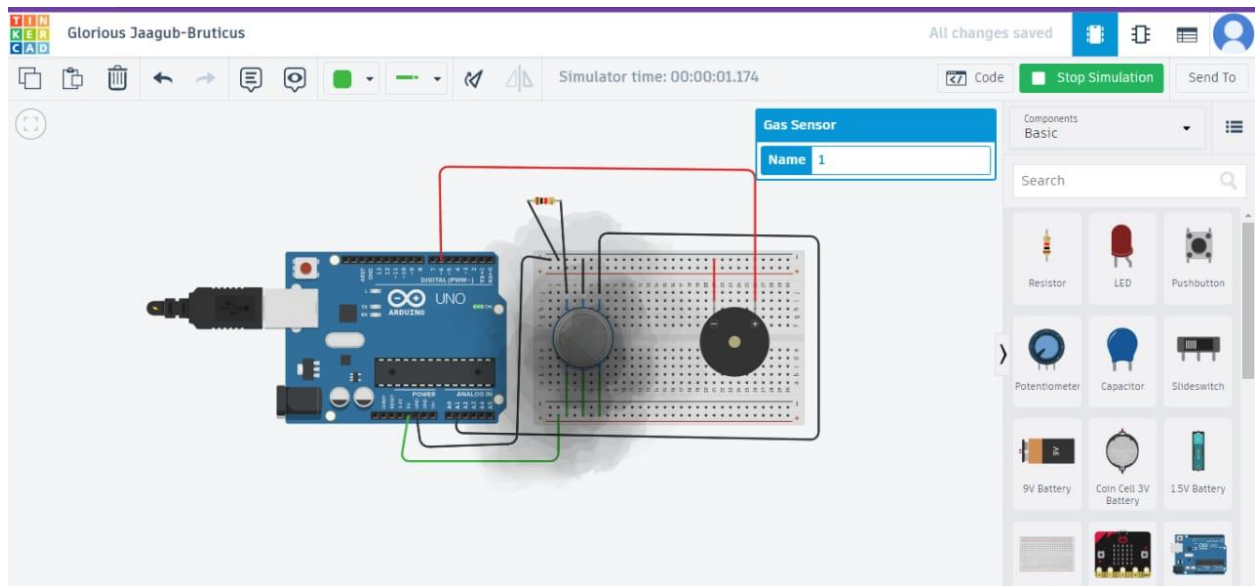
3. Design the Circuit: Use Tinkercad's Circuit Editor to design the electronic circuit. Connect sensors to microcontrollers (e.g., Arduino) and add any additional components needed (resistors, capacitors, etc.

#### 4. Programming Microcontrollers:

Write the code to read data from sensors and transmit it to a data storage system. Use Arduino programming language or other compatible languages.

5. Simulate the Circuit: Use Tinkercad's simulation tools to test the circuit virtually. This allows you to identify and fix any potential issues before building the physical prototype.

6. 3D Design and Printing (Optional): If needed, design and 3D print an enclosure for your monitoring system to protect the components.



```
// C++ code
```

```
//
```

```
/*
```

Envirnoment monitor

```
*/
```

```
int valueofgassensor = 0;
```

```
void setup()
```

```
pinMode(A1, INPUT);
```

```
Serial.begin(9600);
```

```
pinMode(6, OUTPUT);
```

```
}
```

```
void loop()
```

```
{
```

```
  // Gas sensor with buzzer
```

```
  valueofgassensor = analogRead(A1);
```

```
  Serial.println(valueofgassensor);
```

```
  if (valueofgassensor > 200) {
```

```
    tone(6, 523, 1000); // play tone 60 (C5 = 523 Hz)
```

```
  }
```

```
  delay(10); // Delay a little bit to improve simulation performance
```

```
}
```

7. Assemble the Prototype: Connect the actual sensors, microcontroller, and any other components according to the design.

8. Upload Code to Microcontroller: Upload the code you wrote to the microcontroller using Tinkercad's programming interface.

9. Test the Prototype: Ensure that the sensors are providing accurate data and that the microcontroller is transmitting it correctly.

10. Data Visualization (Optional):

Integrate a display or connect the prototype to a computer for real- time data visualization.