AIR QUALITY MONITORING USING TINKERCAD

PHASE 3 : PROJECT DEVELOPMENT

Developing an air quality monitoring project using Tinkercad is a great way to learn about environmental monitoring and IoT (Internet of Things) applications.. Here's a step-by-step guide to creating an air quality monitoring project using Tinkercad:

COMPONENTS :

1. Arduino board (e.g., Arduino Uno)
2. Gas sensors (e.g., MQ series for CO2, CO, or other gases)
3. DHT22 or DHT11 temperature and humidity sensor
4. Breadboard and jumper wires
5. Display (LCD or LED) or a computer screen for data visualization
6. A Wi-Fi module (e.g., ESP8266) for wireless data transmission (optional)

PROCEDURE :

1. Set up Tinkercad :
    - Create an account on Tinkercad if you don't have one.
    - Start a new circuit project.
2. Design the Circuit :
    - Add the Arduino board to your circuit.
    - Connect the gas sensors and DHT22/DHT11 sensor to the Arduino using jumper wires.
    - If you're using a display, add it to the circuit and connect it to the Arduino as well.
    - If you want to implement wireless data transmission, add an ESP8266 module and connect it to the Arduino.

3. Write the Arduino Code :

- Develop an Arduino sketch (code) that reads data from the gas sensors and the temperature/humidity sensor.
- Calculate air quality index based on the sensor readings.

4. Simulate the Circuit :

- Use Tinkercad's simulation feature to test your circuit and code. Make sure the sensor readings and displays work as expected.

5. Calibration :

- Calibrate your gas sensors if needed to ensure accurate air quality measurements. This often involves exposing the sensors to known gas concentrations.

6. Data Visualization :

- If you are transmitting data to a server, set up a way to visualize the data using a web interface or dashboard.

7. Testing :

- Test your project thoroughly in the simulation environment to ensure it's functioning correctly.

8. Real-world Implementation :

- Once your project works in the Tinkercad simulation, build the physical circuit using real components.
- Upload the code to your Arduino board.
- Install the sensors in the desired location to monitor air quality.

9. Monitoring and Maintenance :

- Regularly monitor and maintain your air quality monitoring system.
- Address any issues or recalibrate sensors if necessary.