

STEM PROJECT SAFETY HELMET

BY CLASS VIII

TEACHER: MS. PUNAM NARDIYA



Group Members

8 CANARIES– ARYAN, AVYUKT, DAKSH, JATIN

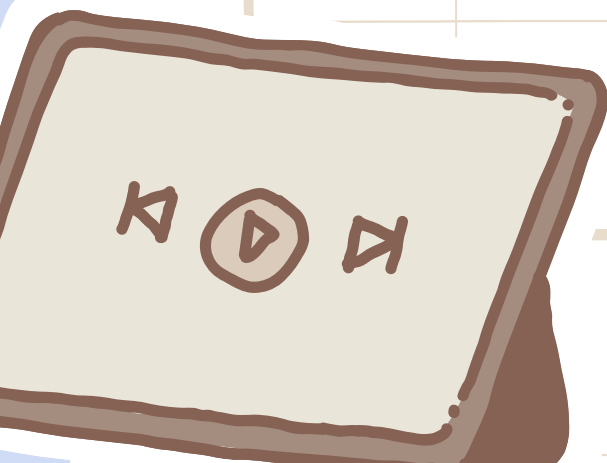
8 SWANS– PARIKET, KANISHK, ANSH

8 ROBINS– CHIRAG, YASHNEEL

8 DOVES– AAYUSH, MANSHIKA, RUPIKA, JIVIKA, RIYA

Safety Helmet Using MQ-7 Sensor and Arduino

An intelligent breathalyzer system that detects alcohol concentration using gas sensing technology and microcontroller programming.



INTRODUCTION

1

*As part of the STEM learning initiative at Scholars Global School, students of Class VII successfully designed and developed an *Safety Helmet* using an *MQ-7 sensor* and *Arduino*. The project aimed to integrate scientific concepts with hands-on technological application, encouraging problem-solving, logical thinking, and teamwork among students.*

2



GOALS

1

*To understand the working principle of gas sensors, especially the MQ-7 sensor
To learn basic Arduino programming and circuit connections*



2

*To apply STEM concepts in solving a real-world problem
To promote experiential and inquiry-based learning*



PROJECT METHODOLOGY

01

UNDERSTANDING THE CONCEPT

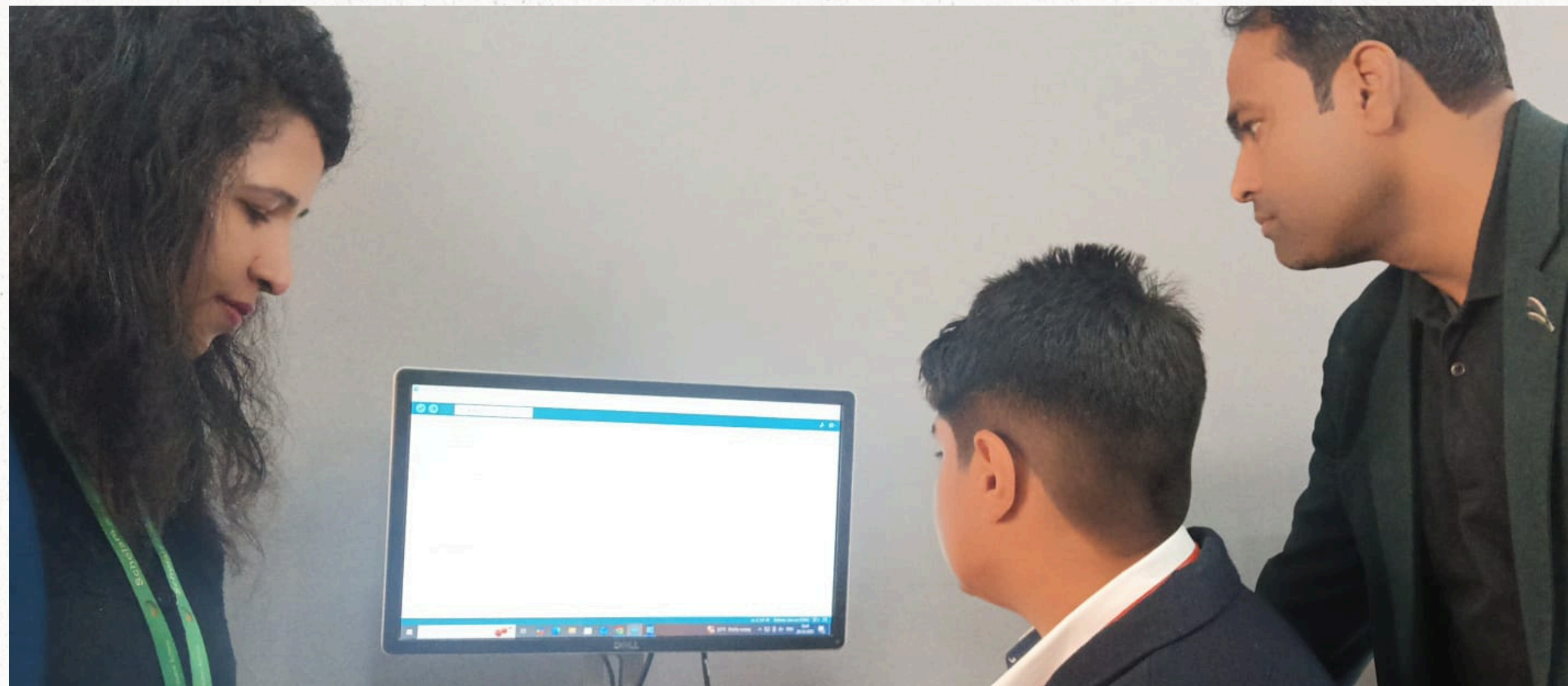
Students were introduced to the concept of alcohol detection, the working of the MQ-7 sensor, and the role of Arduino as a microcontroller. Safety aspects and real-life applications were also discussed.



02

CIRCUIT DESIGN AND CONNECTIONS

Students assembled the circuit by connecting the MQ-7 sensor to the Arduino board using a breadboard and jumper wires. Correct pin connections and power supply were ensured.



03

**PROGRAMMING THE
ARDUINO**

04
**TESTING AND
OBSERVATION**



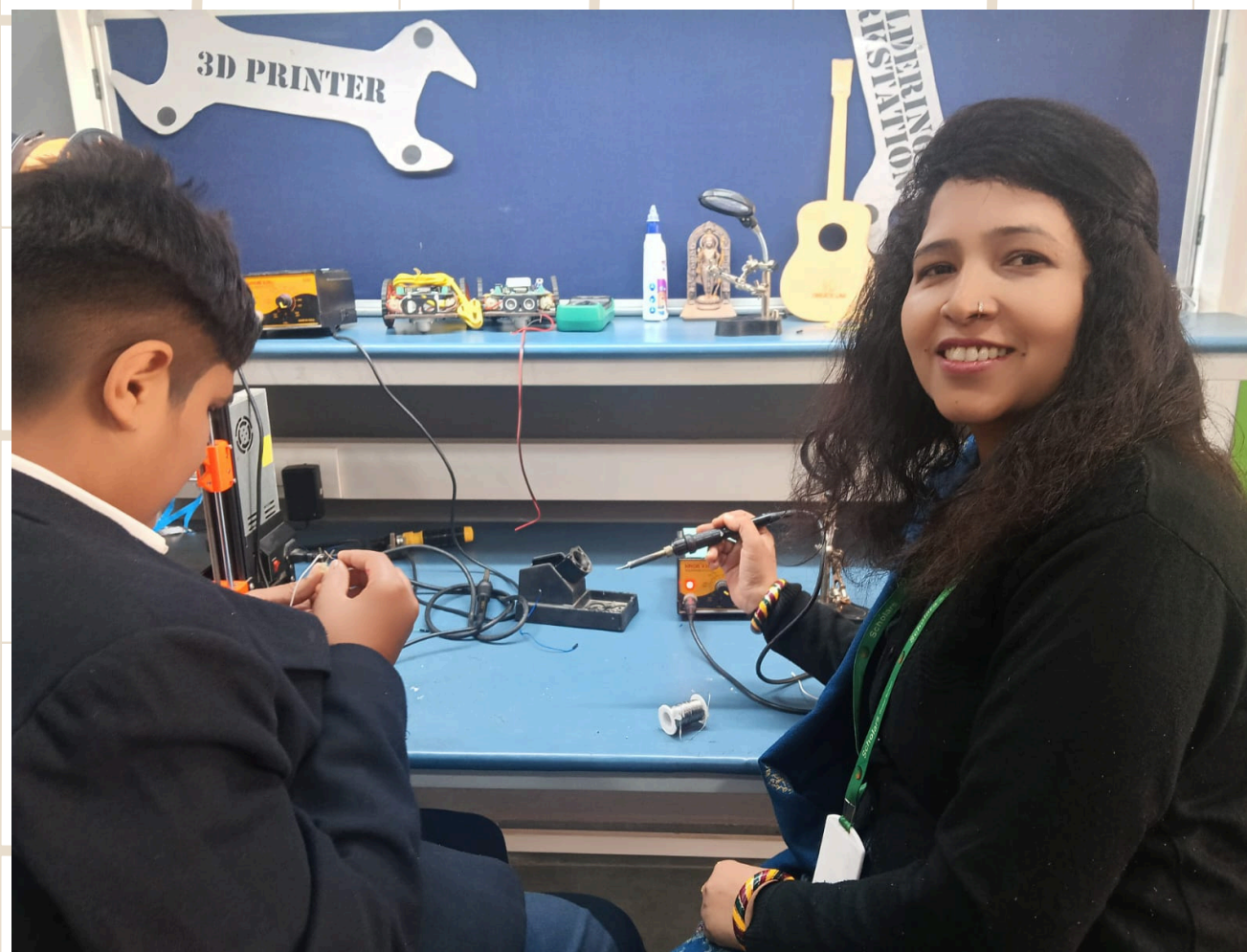
Technical Specifications

Sensor Performance

- Detection range: 20-2000 ppm CO/alcohol
- Response time: <30 seconds
- Heating voltage: 5V DC

Arduino Requirements

- 5V power supply
- 1 analog input pin
- 1-2 digital output pins
- 1KB program memory



Result

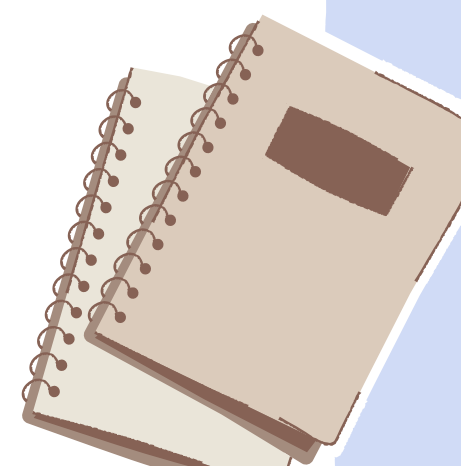
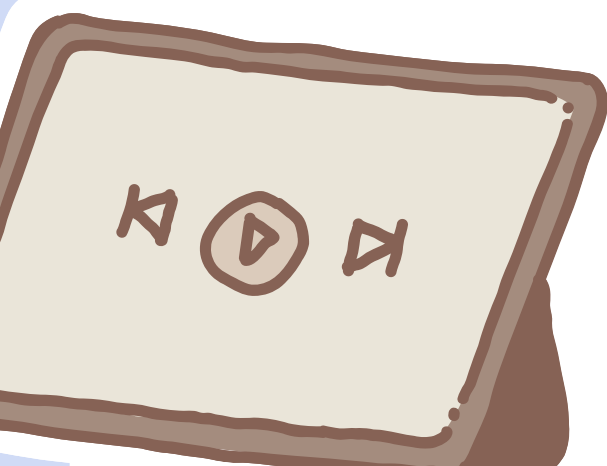
The system successfully detected alcohol using the MQ-7 sensor.

Sensor readings increased with alcohol presence.

Buzzer/LED alert activated when alcohol exceeded the set limit.

No alert was triggered in normal (alcohol-free) conditions.

The project proved to be accurate, reliable, and cost-effective for safety use.



Advantages of This System

**COST-
EFFECTIVE**

**LOW
POWER**

**EASY TO
BUILD**

CUSTOMISABLE

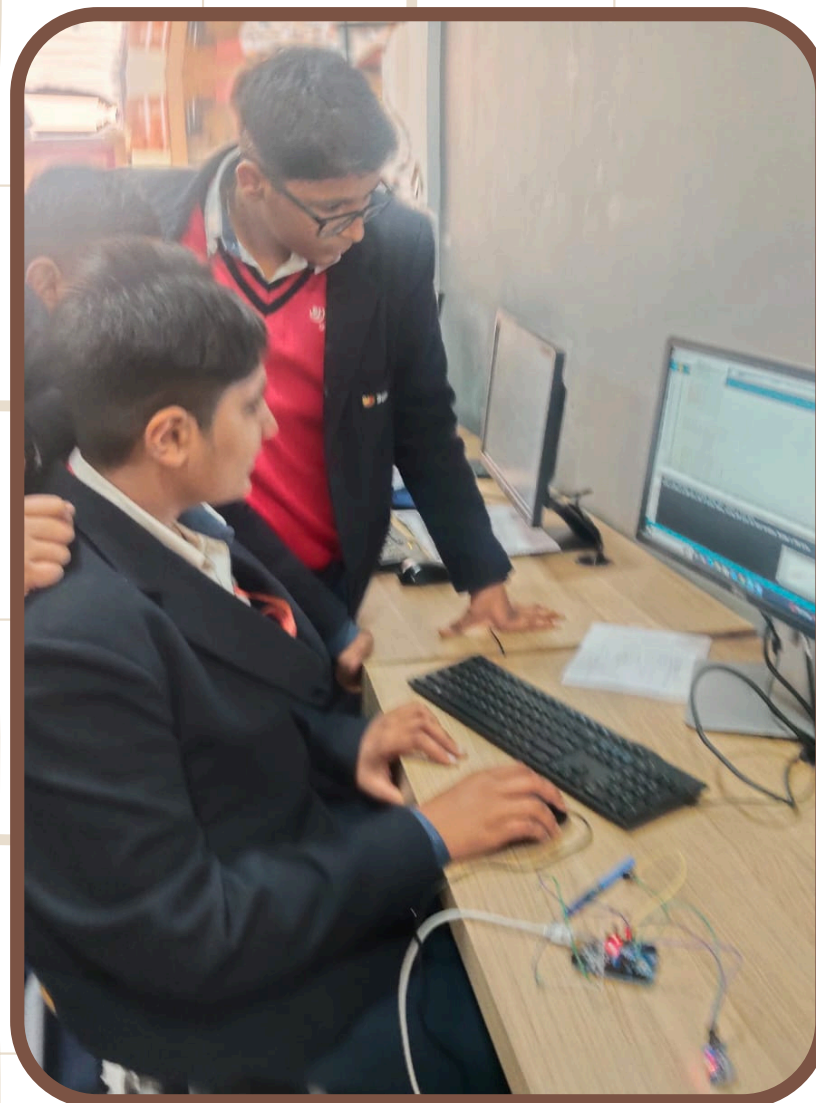


Future Enhancements

Wireless
Connectivity



Mobile App



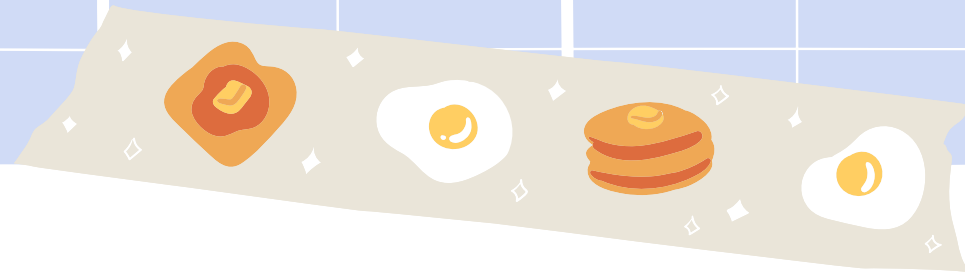
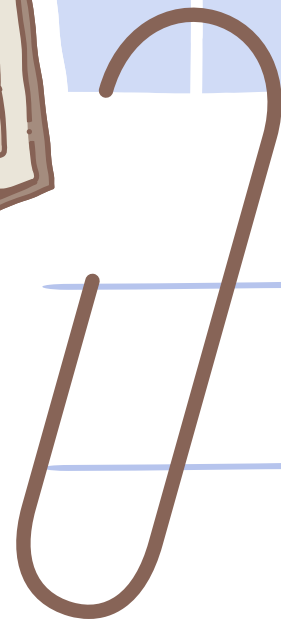
Data Analytics



Conclusion

The SAFETY HELMET project proved to be a meaningful STEM activity that successfully combined theory with practice. Students of Class V111 demonstrated enthusiasm, creativity, and technical understanding while completing the project in a systematic manner. The activity reinforced the importance of experiential learning and real-life application of STEM concepts.





Thank You!

by STEM GROUP
CLASS V1111

