Research proposal: Investigating traffic-related Nitrogen Dioxide (NO_2) levels around our school

St Clare College, Madonna tal-Mensija, San Ġwann Primary School

GLOBE Students: Year 6 Teacher: Ms Marouska Azzopardi Duca

Research Question

How do NO_2 levels measured at our school compare with those recorded at other schools in different areas of Malta and Gozo?

Hypothesis

We hypothesise that schools located near busy main roads will record higher NO_2 levels than schools in less traffic-dense areas.

Study Site

Our study site is located at Madonna tal-Mensija Primary School in San Ġwann, a town in the Northern Region of Malta (Figure 1).

Location: San Ġwann, Malta

GPS coordinates: 35.908846 N, 14.475099 E

Environment: Suburban area characterised by residential neighbourhoods, commercial zones and major roads

Climate: Mediterranean climate with mild, wet winters and hot, dry summers

Relevant features: The school is situated near a busy main road with high traffic volume, making it an ideal location to investigate traffic-related air pollutants such as nitrogen dioxide (NO_2).

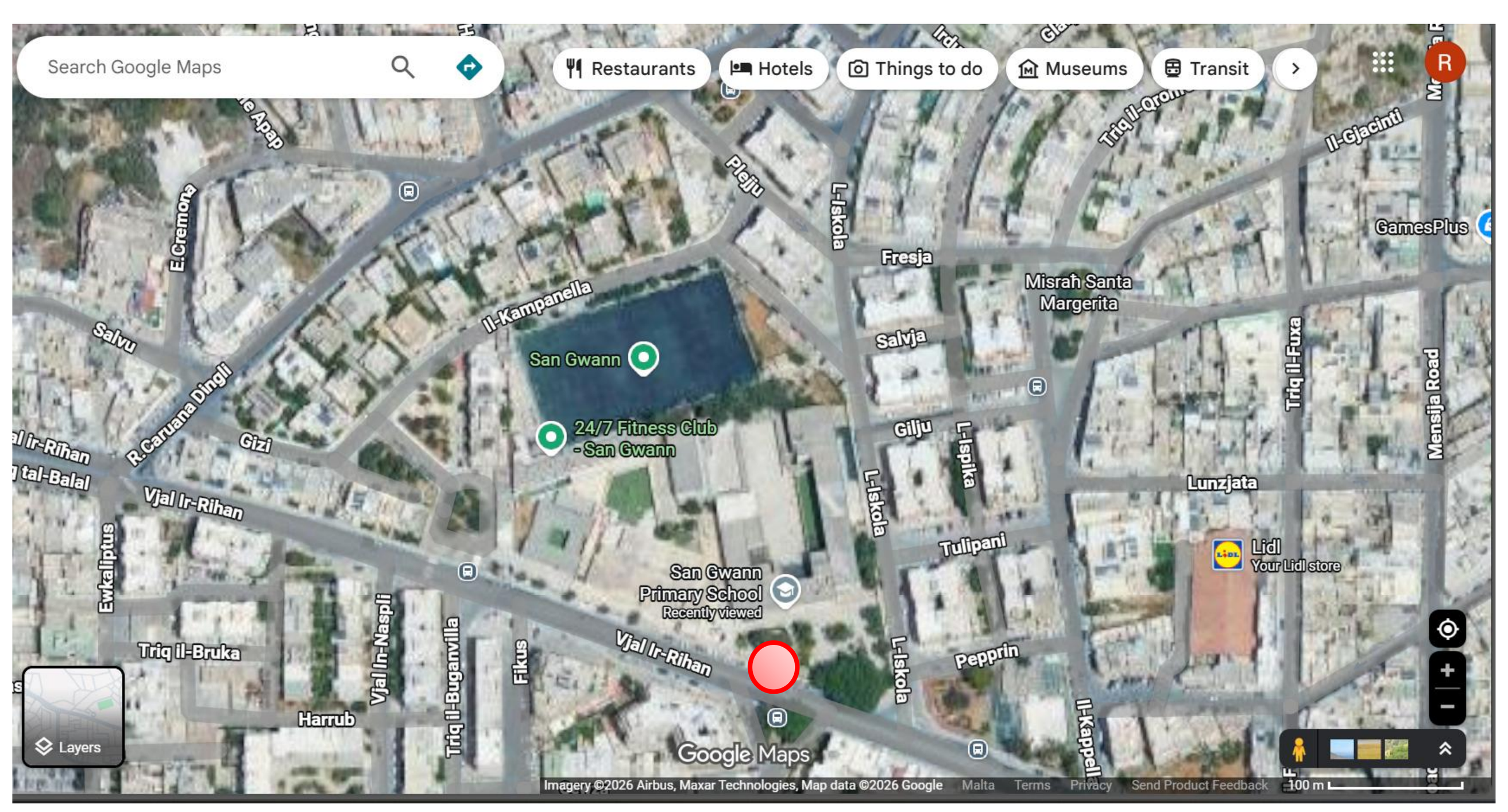

Figure 1 Aerial View of the school with study site marked in red.

Data Collection Plan

A. Data Types and Sources

- Primary data collected by students.
- Nitrogen dioxide (NO_2) levels measured using diffusion tube.
- Traffic data collected by counting vehicles passing the school entrance.
- Weather data including air temperature, humidity and cloud cover.

B. Data Collection Schedule

- Observation period: 10 November 2025 – 5 December 2025.
- Traffic counts conducted daily for 10 minutes.
- Weather observations, using GLOBE protocols, recorded daily.
- Total monitoring duration - four weeks.

C. Equipment and Tools

- Nitrogen dioxide diffusion tube (Figure 2).
- Datalogger to measure weather parameters.
- GLOBE Observer App for cloud cover observations.
- Datasheets to record atmospheric conditions, NO2 diffusion tube parameters and traffic count (Figure 3).

D. Who Will Collect the Data?

- Students will work in groups to count traffic, record weather conditions and log observations.
- The teacher will oversee the installation of equipment and ensure accurate and consistent data collection.

Figure 2 NO2 diffusion tube

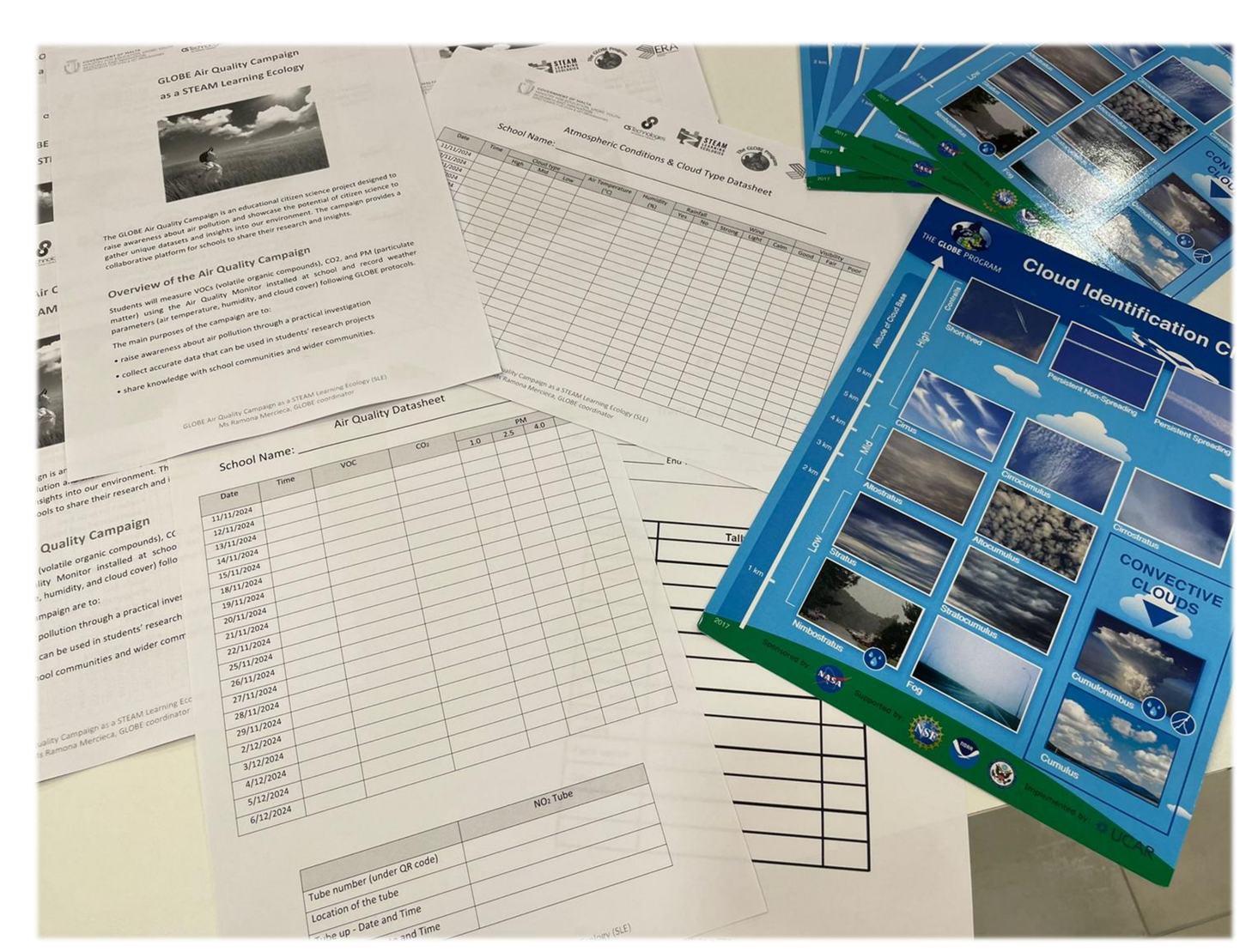

Figure 3 Datasheets and Cloud Identification chart

Background Information

Nitrogen dioxide (NO_2) is a common air pollutant produced mainly by vehicle emissions. High NO_2 levels can negatively affect human health, particularly respiratory health. This study was chosen to help students understand how everyday activities such as road traffic influence air quality and to develop skills in scientific investigation using real-world environmental data.

Expected Outcomes

- To understand the relationship between traffic volume and NO_2 levels
- To compare air quality data between schools in different locations
- To raise awareness about air pollution and its health impacts
- To empower students to propose actions that reduce air pollution around their school.

Links to the SDGs)

This investigation contributes to the following SDGs:

- SDG 3 – Good Health and Well-being
- SDG 4 – Quality Education
- SDG 11 – Sustainable Cities and Communities
- SDG 13 – Climate Action

References

Google. (2026). *San Gwann Primary School, aerial view* [Map]. Google Maps. https://www.google.com/maps

GLOBE teacher guide https://www.globe.gov/ (Accessed October 2025)