How Does Border Traffic Affect Local Air Quality?

A Science Research Project presented to

SARSEF Regional Fair 2026

Plants and the Environment Category

Abstract

This science investigation studied how border traffic affects local air quality. Air samples were collected near the border and near a school using paper and Vaseline to trap dust from the air. The purpose of this experiment was to compare air quality in two different locations over two days. The results showed that the air near the border was dirtier than the air near the school, especially on the second day. This experiment shows that traffic and car fumes can affect air quality.

Introduction

Air quality is important because it affects human health and the environment. Areas near busy roads and borders often have more cars, which release fumes and chemicals into the air. The question for this investigation was: *How does border traffic affect local air quality?* This project focused on comparing air quality near the border and near a school to see which area had more pollution.

Background Research

Many cars and trucks travel through border areas every day. These vehicles release pollutants such as dust, fumes, and gases into the air. According to the World Health Organization (2012), air pollution can cause serious health problems, including respiratory illnesses. High vehicle traffic increases carbon monoxide and other harmful pollutants in the air. Clean air is important for staying healthy, especially for children who spend time outdoors.

Variables

- **Independent Variable:** Location of air sample (border area and school area)
- **Dependent Variable:** Quality of air (amount of dust collected)
- **Constants:** Time exposed (10 minutes), paper plates, Vaseline, and containers

Materials

- Paper
- Vaseline
- Container

Procedure

1. Gather all supplies.
2. Spread Vaseline on two pieces of paper.
3. Place one paper near the border and one near the school.
4. Leave the papers outside for 10 minutes.
5. Observe which paper collected more dust.
6. Repeat the steps on a second day.

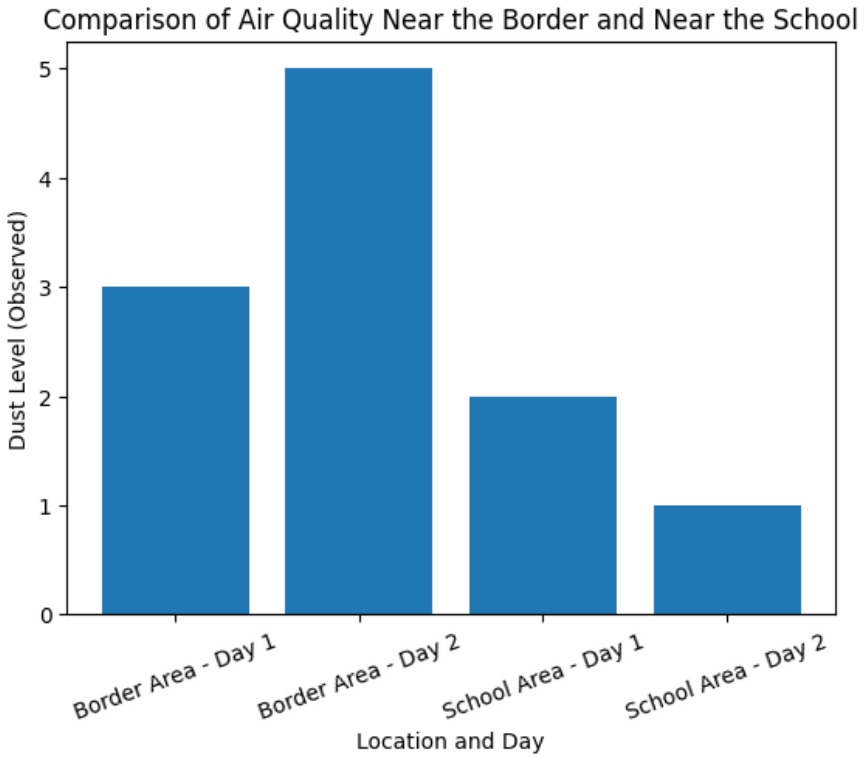
Results

**Table 1

Observed Air Quality Results**

Location	Day 1 Observation	Day 2 Observation
Border Area	Dirty but not completely	Dirty and dusty
School Area	Dirty but cleaner than border	Stayed clean

Graph



The graph above shows that the border area had higher dust levels than the school area. On Day 2, the border air was much dirtier, while the school air stayed clean.

Discussion

Both locations showed some dust on the first day. However, the air near the border became much dirtier on the second day. The school area stayed almost the same and remained cleaner. This difference is likely caused by the large number of cars and trucks near the border releasing fumes and dust into the air.

Conclusion

In conclusion, the air near the border was dirtier than the air near the school. The hypothesis was supported because border traffic produced more pollution. This experiment shows that car fumes and heavy traffic can lower air quality and make the air less healthy to breathe.

References

- American Geosciences Institute. (n.d.). *Air pollution*. https://www.americangeosciences.org/georef
- National Center for Biotechnology Information. (2019). *Air pollution and human health*. https://pmc.ncbi.nlm.nih.gov/articles/PMC5455606/
- ResearchGate. (n.d.). *Studies on air quality and pollution*. https://www.researchgate.net
- World Health Organization. (2012). *Health effects of air pollution*. https://www.who.int