Field work test

Group 3

Definition of air pollution

- the presence of chemicals or compounds in the air
- lower the quality of the air or cause detrimental changes to the quality of life
- **Human activities:**mining, transportation, agriculture,etc.
- —>ubiquitous causes of air pollution and contribute to the global pollution of the air every single day
- **natural processes:**volcanic eruptions and wildfires
- —>occurrence is rare and they usually have a local effect

Pollutants

- Carbon Monoxide (CO)
- Nitrogen Dioxide (NO2)
- Sulphur Dioxide (SO2)
- Ozone (O3)
- particulate matter 2.5 micrometers(PM2.5)
- particulate matter 10 micrometers(PM 10)

Hypothesis

The major sources of air pollution in school come from Tseung Kwan O Road.

Experiment set up

Target location: TKO tunnel

Collection site: roof top of school

Collection time: around 5 pm

Methodology

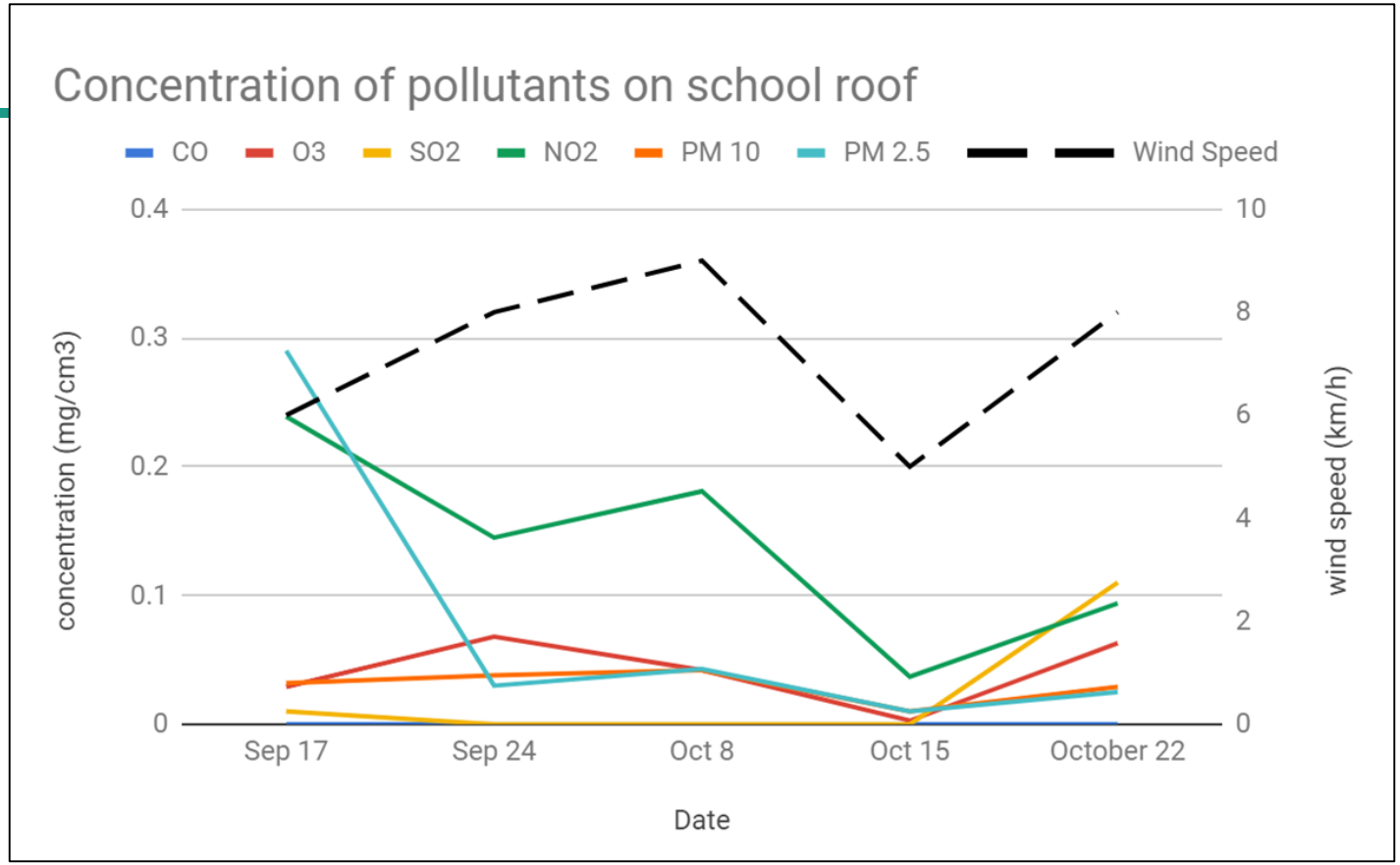
- Collect data of concentration of various green house gases. And wind speed on school roof top
- Using air quality monitors
- Data collected around 5pm
- Analyse the collected data
- See if major source of air pollution comes from TKO tunnel

Measurement apparatus

Portable Outdoor Air Quality Monitors

Source of air pollutants

NO_x	combustion, especially combustion at high temperatures. They are mainly produced by combustion processes in power plants and vehicular engines.
O_3	Reaction between oxygen molecules with high energy
SO_2	1 . combustion of sulphur containing fuel 2 . industrial processes involving the use of sulphur containing materials.
CO	Road transport and navigation sectors
PM 2.5 PM 10	combustion processes, vehicles and industrial sources.


Concentration of pollutants on school roof
CO
O3
SO2
NO2
PM 10
PM 2.5
Wind Speed
0.4
0.3
0.2
0.1
0
concentration (mg/cm3)
10
8
6
4
2
0
wind speed (km/h)
Sep 17
Sep 24
Oct 8
Oct 15
October 22
Date

Reasons for using the graph

- Can track changes of data within short periods of time
- Compare changes of data over the same period of time
- See the rise and fall of data clearly

Data analysis

- Relatively high concentration of No2
- Faster the wind speed, higher the concentration of gases
- Wind speed is SE

result of gas concentration

- CO concentration maintained below at 0
- O3 concentration had small amount increase around 0.034mg/m3 from 17/9 to 24/9,. But later it decreased around 0.039mg/m3 from 8/10 to 15/10. At last it raised to 0.063mg/m3.
- SO2 concentration had little at day 1 (0.01mg/m3). After few days (2-4) it remains 0. On 22/10 it rises suddenly

Result of gas concentration

- NO2 concentration Plummet around 0.145 mg/m3
- PM2.5 concentration from the highest point 0.32mg/m3 drop to 0.038mg/m3 on 24/9.
- PM10 concentration still maintain a low pollution, not over 0.01

Objective

- To see if the major source of air pollution in school comes from TKO tunnel
- Investigate the air quality in school

Limitation

- Frequency (only once a week)
- weather conditions (sunny and cloudy weather)
- Duration (5 minutes)
- precision of instruments (Portable Outdoor Air Quality Monitors VS Monitoring Stations)

Improvements on data sampling

- Increase the frequency
- Increase the duration

Improvement on air pollution

1. Promote electric vehicles
2. Encourage people to take public transport vehicles
3. Promote renewable energy

Conclusion

The hypothesis should be accepted!

The end