Introduction

Although it is hard to see, air pollution is around us and responsible for serious diseases and even death. According to the World Health Organisation it is the ‘single biggest environmental health risk’. In Ireland over 1,510 premature deaths each year are attributable to air pollution. This is 10 times more than road deaths!

Air pollution can worsen symptoms for sufferers of asthma, lung disease, cardiovascular (heart) disease. Everyone is affected by air pollution but some are at risk than others: Unborn babies, pregnant women and older adults. Children in particular are more likely to be more vulnerable to exposure as their lungs are still growing and developing, their immune and metabolic systems are still developing, they suffer from frequent respiratory infections and they are more active outdoors than adults and therefore breathe in higher doses of outdoor pollutant.

Many of the sources of air pollution are also strongly linked to environmental damage and climate change. We need to raise awareness about this very serious health and environmental problem.

Research Methods

The levels of NO2 were measured by diffusion tubes over the measurement period of 1st February to 1st March and sent to the laboratory for analysis

- The grey cap contains the material that absorbs NO2 over the measurement period.
- The plastic tube channels the air and the white cap was removed during the measurement period and put back on at the end of it before posting.

We undertook Traffic Surveys at Tube #1 and Tube #2. 2nd Class took turns in 15min slots to count the traffic.

Weather Measurements: 1st Class recorded the weather over the month of February. A rain gauge was used to record the amount of rainfall on a daily basis. Measurements of wind speed and wind direction were recorded using the Met Eireann website.

Results

**NO2 Concentration Results:**

The laboratory measured accumulated NO2 level in the diffusion tubes and applied a calculation to find out what this means for the air near the tube. This is expressed in micrograms per cubic meter of air (µg/m3). The results are ranked by the Curieuzene scale:

- Tube #1 Side Gate #2 in Situ
- Tube #2 Side Gate #1

<table>
<thead>
<tr>
<th>Location</th>
<th>NO2 Concentration (µg/m3)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main road (Main gate)</td>
<td>33.77</td>
<td>Mediocre</td>
</tr>
<tr>
<td>Near moving traffic (Side gate)</td>
<td>19.3</td>
<td>Good</td>
</tr>
<tr>
<td>sheltered area (back courtyard)</td>
<td>13.66</td>
<td>Very Good</td>
</tr>
</tbody>
</table>

Discussion

The quality of air collected from #1 tube located at the main gate has been described as ‘mediocre’ – 33.77µg/m3. It is exposed to one of the main roads through the town and the traffic surveys shows high level of traffic at this location. #2 tube located on the Hospital Hill entrance had a lower level of 19.3µg/m3 rated as ‘good’. This is reflected in the traffic surveys that showed lower traffic levels here compared to the front gate. #3 tube at 13.66µg/m3 was rated as ‘very good’. This is not unexpected as it was placed in the back courtyard which is sheltered from traffic.

Weather impacts air pollution in different manners and the weather over the study period could have impacted the results. Rain clears the air by washing pollutants down to the ground, however rainfall levels were quite low over the month of February (0-10mm).

Conclusions

Our study shows very clearly the effects of traffic pollution on the quality of air around our school. Nitrogen Dioxide was detected in all three areas of the school that we investigated. This is air that we are breathing in on a daily basis. Long term exposure to concentrations over 40 (µg/m3) are believed to have adverse health impacts it is now considered that any level of air pollution is not acceptable and poses a risk.

Other factors that may have effected the results include:  
Mid-term break occurred during the test period. Secondary schools were closed from 18th - 22nd February, and all primary schools were closed on 21st and 22nd February which meant that the volume of traffic passing our school and parked at the entrance would have been significantly lower for that period.

Researchers Resources

- Cars: 44  
- Van: 11  
- Bike: 1  
- Walker: 10  

We were unable to obtain sunshine hours for the period but overall the weather was settled and bright.

Bibliography

- www.postersession.com