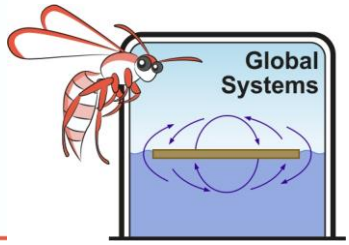


Air Quality – Student Activity

An abundance of fine particles in the air can be bad for animal (including human) health, and the environment. They can cause respiratory problems, irritation to eyes and even non-fatal heart attacks. Depending on the chemical composition of the particles they can mix with rainwater to cause acid rain and make lakes and streams acidic, they can block pores on leaves, preventing gas exchange and deplete the nutrients in soils.
Often, the pollen count is part of the daily news, especially during springtime. Although not considered a pollutant it can cause irritation to those with hay fever.

Air quality can be particularly bad in built up areas. Bushfires and drought can result in large amounts of ash and dust in the air, which also decreases air quality. Blasting from mining also cause dust to enter the air.
It is worth noting that air quality indoors can often be worse than outdoors (this often surprises people).

Activity

Aim To compare the air quality at different locations around the school.

Pre- investigation discussion:

Do you think there will be more dust lower to the ground or higher up?

Should you select surfaces at the same height?

Which areas around the school do you think will have the most fine particles, explain your answer?

Materials per group:

- 8 pieces of acetate with a 1cm x 1 cm grid marked on (around 10 x 5 cm total size)
- Petroleum jelly
- Plastic knife
- Blu tack
- Marker pen
- Microscope/magnifying glass
- (Ruler and marker pen if acetate does not already have grid marked on it)
- Map of the school

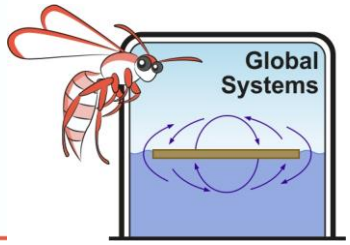
Air Quality – Student Activity

Method

1. Choose 8 locations around the school where you will test the air quality and number them 1 through to 8.
2. Use the marker pen to number each piece of acetate 1 – 8, corresponding to the locations marked on the map. If your acetate does not already have a grid marked on it, use a ruler and marker pen to draw one on each sheet.
3. Use the knife to spread a very thin layer of petroleum jelly on each acetate grid.
4. Use Blu tac to stick the pieces of acetate up at each selected (mapped) location and leave for at least 24 hours before taking them back to the classroom.

Results/observations

Use a microscope to analyse your grids. Count how many particles you can see on each grid square to calculate the total number of particles and determine the average number of particles per cm^3 for each location (record your results below). You may find it easiest to record this as a tally, or even to draw replica grids and write the number of particles found in each rid square on the replica.



Air Quality – Student Activity

Discussion

Which location had the highest number of particles per cm^3? _____

Which location had the least number of particles per cm^3?_____

Were you surprised about the locations that had the worst air quality, explain your answer?

_____

Did you notice any clear difference in size of the particles at different locations? For example, were the particles much larger near the flower beds than in the car park? (You may need to have another look at your grids)

_____

Consider what is around each location. How do activities nearby impact your results?

_____

What natural variables could impact your results? (Consider if you did this at a different time of year for example.)

_____

_____

How could you improve or extend this experiment? Justify your suggestions.

_____

_____

_____

Conclusion

Is it possible to draw any conclusions from your results?

_____

_____

_____