



The air around us

Overview

What is air quality? Why is it important to monitor? In this activity we will be answering these questions and getting you to conduct an air quality experiment from your own home or classroom.



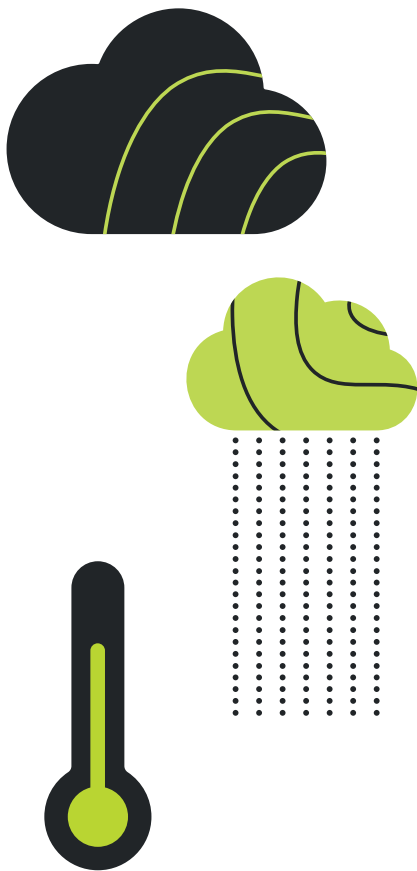
Time required

60 minutes



Materials required

- Petroleum jelly
- String
- Card or paper plates x 3
- Hole punch
- Scissors
- Magnifying lens (optional)
- Marker pen
- Digital camera (optional)



Activity Steps

01 Research - What do we mean by Air Quality?

Air quality is the term we use to describe how polluted the air we breathe is. When air quality is poor, pollutants in the air may be hazardous to people, particularly those with lung or heart conditions.

Clean air is a basic requirement of a healthy environment for us all to live in, work, and bring up families. Air quality has improved significantly in recent decades, but there are some parts of our country where there are unacceptable levels of air pollution.

The air we breathe contains small amounts of trace gases and particles which can be harmful to our health. Pollutants such as sulphur dioxide, nitrogen oxides and particulate matter are routinely released into the atmosphere as a result of the combustion of fossil fuels and industrial processes.

Chemical interactions amongst these primary pollutants, under the influence of heat and sunshine, can give rise to additional secondary pollutants, such as ozone. Individually or together, these common pollutants degrade the quality of the air we breathe, and an index has been devised to quantify the air quality and its impact on human health.

The Daily Air Quality Index (DAQI) is the standard index defined by Defra for characterising air quality.

Air quality can also be degraded by the release of other, less common pollutants, for example during an accidental release of a harmful chemical.

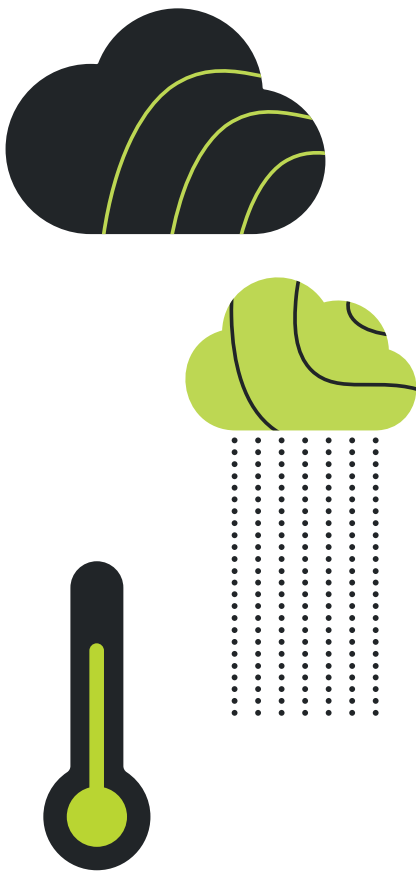
Defra and the Met Office work in partnership to measure the amount of polluting particles in the air. The Met Office supplies an air quality forecast for Defra based on five key pollutants: ozone, nitrogen dioxide, sulphur dioxide, PM2.5 and PM10 particles that can have an impact on your health.

Polluting particles in the atmosphere can be big or small, solid particles or a liquid droplet. Some you will be able to see with the naked eye but other you will need a magnifying glass. Have you got any of these particles where you live?

From the [link](#) provided could you make a report on the effects of poor air quality? Share it with your family or friends.

Tip

Attach the air quality index at the end of the activity - in document sent.



02 Experiment

Using the information you have discovered there's a simple experiment with petroleum jelly that will capture some of the particles in the air near your house or classroom.

Follow the instructions below:

- Using 3 pieces of card cut to the same size or 3 paper plates.
- Get a hole punch and punch a hole in each piece and draw a 5cm x 5cm box in the middle of the plate/card.
- Tie a piece of string through the hole to make a loop for hanging them up around your garden or out of your window.
- Decide on where you will be putting them and write their locations on them.
- Before you hang them up, smear a small amount of petroleum jelly on each piece of card/paper plate within the box you have drawn.
- Leave them in their locations over the course of a morning or afternoon, check the Met Office website or app to make sure rain is not forecast.
- After that time, remove them from each location one at a time.
- Use a magnifying glass to count the number of visible particles you see stuck in the petroleum jelly inside the boxed area. Write the number in your data table (you can take a picture if you want)
- Count how many particles were found at each location and record them in a table.
- At what location did you find the most particles? Is it what you expected to see? What does this tell you about the 3 locations?

Tip

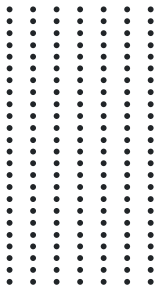
You could use 3 pieces of card for each location and work out the average.

03 Collating results

Draw a table to show your results for each location. The locations can be in the first column, the second being a picture/drawing of what was found and the last column, totals for each location.

Tip

How could you display the data you have collated? Could you make a graph with the information above? If it was a particularly windy day, does this affect your results if you were to conduct the experiment again? If you have time, try the experiment on different days and see if there's any difference and why that could be.



04 So you have collected the data, how does this link with the Met Office and Defra data?

Air quality forecasts are displayed on the UK map but are also available for 5000 specific locations over the UK. By searching for your postcode, you can see air quality forecasts for the locations of most interest to you. This can be found [here](#).

In the forecast tab you will be able to see a breakdown of your location and the air quality score it has been given.

Does this coincide with your results?

How well do they match up with your findings?