

# Lesson Plan

## Air Pollution Explorers

Suitable for upper KS2 and lower KS3 pupils



### Aim

To discover where Air Pollution comes from, what are the main sources? Why each source is so polluting and what can be done to reduce each of these to improve air quality and the environment.

### National Curriculum Relevance (Suitable for Year 5 to year 9 pupils)

Main Activity: English En1, En3.1, En3.2, En3.3, Science: Sc2.1, Sc2.2, PSHE: Citizenship

Additional Activities: En1, En2.1, En3.1, En3.2, En3.3, En3.4, PSHE,

### Key Words

Air Quality, Pollution, Nitrogen, Nitrogen Dioxide, Air, Fumes, Idling, Exhaust, Health, Breathing, Lungs.

### Lesson time

A half hour to 45 minute workshop (maximum 1 hour).

### Resources

Blank or lined paper (or can be written on a PC or tablet using word processing software such as MSWord)

Pens/Pencils

Computer for research may be useful

### Lesson Activities

#### Introduction

This lesson aims to help children discover where Air Pollution come from and why it is a problem in certain areas. The children will work in groups of 4, 5 or 6 to facilitate discussion groups and sharing of ideas.

- Where does air pollution come from?
- Why is it an issue around their school?
- What can be done to address the issue, what is the solution?
- Who can make this happen?
- Who might not like these changes and what can we do to help them?
- It may be worth having a class discussion before starting the lesson.

#### Main Activity

The main part of the lesson involves the accompanying slide show which should be displayed for the class on the whiteboard or using a projector. It could be displayed on a computer screen but the class may struggle to see it. Each group needs to be provided with a piece of paper (A4 or preferably A3) and pens/pencils. If using tablet writers instead then they will need 1 per group.

The paper should be divided up as shown in the diagram to the right.

**Top Tip:** You could pre-prepare these to save time (attached)

The following headings need to be written across the top :

Source Of Pollution, Percentage, Solution

Down The side; number 1-6 (Highest—Lowest)

A hand-drawn table on a piece of paper. The table has three columns and six rows. The columns are headed 'Source of Pollution', '%', and 'Solution'. The rows are numbered 1 to 6 on the left side. The table is drawn with blue ink on a white background.

	Source of Pollution	%	Solution
1			
2			
3			
4			
5			
6			

## Lesson walk through (in order of slides).

**Slide 1, What is Air Quality** — Ask pupils what they know about Air Quality, how they think it might affect their health?

**Slide 2, What is Air Quality 2**— Explain to the pupils that Air Pollution can affect people's health, especially children who are still growing and developing as well as people with existing health issues and the elderly.

**Slide 3, Sources of Air Pollution**—Explain that these are the 6 main sources of Air Pollution in the UK and that almost all the air pollution comes from these.

Tell the pupils that they need to use their sheet to list the sources in order that they think produce the most pollution, down to the least numbered 1—6 and 1 is the highest. In addition to that they can also attempt to guess what percentage of the total amount of pollution they contribute (See example right).

Explain to the children they need to make a group decision and they need to discuss why they think certain ones will be higher than others.

**Slide 4, Time up**—Tell the children to finish what they are doing as we will look through the correct order. The next 6 slides reveal the answers.

	Source of Pollution	%	Solution
1	Energy Production and Distribution	30%	
2	Car	20%	
3	Factories	15%	
4	Non Road Transport	10%	
5	Agriculture	10%	
6	Houses	10%	

**Slide 5, car**—The top polluter is cars and road vehicles. Explain that the reason for this is purely the amount of cars on the road. Also explain that most car journeys in the UK are less than 5 miles and 1/3 of all these journeys are less than 2 miles and often only have 1 person in the car. Look at the facts in the clouds too.

**Slide 6, Energy Production**— Almost half of what the car is at 21% (and falling). Check out the fact in the cloud, the UK is slowly starting to produce green energy and now we are producing slightly more than is created by fossil fuels (gas, oil and coal).

**Slide 7, The Home**—At 14% it is the third highest source of air pollution in the UK. Again, like the car it is purely a numbers game with millions of homes across the UK having gas fired central heating and wood burning stoves.

**Slide 8, factories**—Manufacturing accounts for around 12% of Air Pollution in the UK. Explain that if we reused and recycled more we could reduce that figure as we wouldn't need as much new stuff.

**Slide 9, Non-Road Transport**—This includes ships, planes and trains, and is only 9% as there are far fewer of them. Planes in the sky do not affect air quality in and around where we live, but when taking off and landing do contribute to air pollution at ground level. They are though burning huge amounts of fossil fuel which is affecting climate change. Diesel Trains are probably the worst offenders at local level.

**Slide 10, Agriculture**—At 4% this is the lowest of the main 6 polluters in terms of pollution, but one of the highest globally when it comes to climate change and land and river pollution.

**Slide 11, How did you get on?** - Ask the children if they more or less got them in the correct order or if there were any great surprises. Also ask if they thought the car would be as high as it is at 40%.

Explain that you would like them to now use the final column on their page to try and think of some ways we could reduce each of these sources of pollution. Tel them to be creative and use their imaginations and that there are no right and wrong answers to this one.

...cont. over....

...cont.

**Slide 12, Solutions**—Give the groups 5—10 minutes (depending on time) to come up with inventive and practical solutions.

**Slide 13, Let's Hear it**—Time to ask the groups to share an idea on how they might improve the air quality for each one. Rather than asking pupils to share all of their ideas, you can ask them to pick one that no-one else has said so far. (see examples right).

**Slide 14, Think about your journey**—Ask the children to think about their journey to school. Maybe they are already doing something to benefit the environment around the school and reduce pollution. If they come in the car, ask how they may be able to change their journey. Could they park further away from school and cause less congestion and pollution, could they walk, cycle or scoot?

**Slide 15 We can all make a difference**—Explain to the children that they have the power to change things and that their actions no matter how small can collectively make a very big difference.

### Plenary activities (some ideas for extensions)

You could do some of the following after the main activity:

- Get the children to come up with imaginative design solutions to help clean up the air, new inventions, etc.
- Have a group discussion to weigh up the pros and cons of fossil fuels and less polluting alternatives.

	Source of Pollution	%	Solution
1	Energy <sup>②</sup> Production and Distribution	21% 30%	• Use Green energy • Wind, Solar, wave • Trap the smoke
2	Car <sup>①</sup>	20% 40%	• Use Active Travel • Take Public Transport • Use Electric Cars
3	Factories <sup>④</sup>	15% 12%	• Trap the smoke • Use less stuff • Recycle more
4	NON ROAD <sup>⑤</sup> TRANSPORT	10% 7%	• Use Electric Buses + Trains • Fly less
5	AGRICULTURE <sup>⑥</sup>	10% 4%	• Eat less meat • Use less tractors • Don't use chemicals
6	Houses <sup>③</sup>	10% 14%	• Turn lights off • Turn heating lower • Try not to use as much gas (fossil fuel)

## Further Reading

For further information on air pollution and air quality around schools please look at the following websites which will help pupils to add some facts and statistics to their letters.

**Staffordshire County Council Air Aware Pages for schools:**

[www.staffordshire.gov.uk/Transport/Air-quality/Schools.aspx](http://www.staffordshire.gov.uk/Transport/Air-quality/Schools.aspx)



SCAN ME

**Children Campaign to cut Air Pollution outside their school:**

[www.stokesentinel.co.uk/news/local-news/we-want-stop-pollution-getting-3761309](http://www.stokesentinel.co.uk/news/local-news/we-want-stop-pollution-getting-3761309)

For support, advice or assistance with this lesson plan please contact your School Travel Advisor at

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