

Learning about



**AIR QUALITY**

# **GEOGRAPHY TEACHERS GUIDE**

A guide to using the site within CfE

[www.LearnAboutAir.com](http://www.LearnAboutAir.com)

# Air Quality Learning Package

## Teacher's Notes

Welcome to this interactive learning module on air quality. The module will help your pupils learn more about the air that we breathe and its importance in our lives. The air that we breathe is something that we all take for granted as we can't see it. However air is very important to us, poor air quality can makes us feel unwell so we should take care of it.

By working their way through this module the pupils will find out:

- what the air used to be like compared to how it is now
- the main pollutants affecting air quality
- how we measure the quality of the air
- how it compares to other parts of Scotland and the world
- the impacts of poor air quality
- what we can do to ensure we have, and continue to have good quality air.

## Experiences and Outcomes

SOC 3-08a - I can identify the possible consequences of an environmental issue and make informed suggestions about ways to manage the impact.

SOC 3-14a – I can use a range of maps and geographical information systems to gather, interpret and present conclusions and can locate a range of features within Scotland, UK, Europe and the wider world.

## Class Presentation

The site is designed to be used by pupils with access to computers, as such it may not be ideal for use by a teacher using a Projector or SMART Board. With that in mind we have provided "PowerPoint" style Slideshow Presentations in the Resources section of the site. These are full screen slides which contain abridged content from the site & all the videos & illustrations.

These can be combined with PDFs of the Pupils Notes which can be printed where access to computers is limited.

## Feedback

If you wish to provide us with any feedback about the site or these notes, please do so at this page on the site: [Feedback](#)

## Geography: Section 1

# Air Pollution: Background Information

## Lesson Objectives

1. I can explain what is meant by air pollution
2. I can explain why it is important to study air pollution.
3. I can identify the possible sources of air pollution.
4. I can describe who monitors air pollution and how air pollution is monitored

## Teacher Instructions

1. Watch **History** video via the website. This will act as an introduction to the project. Pupils complete **Activity 1** on this sections **Activity Sheet**.
2. Use the website to explore 'What Causes Air Pollution?'. Pupils can use the interactive element and complete **Activity 2**.
3. Watch **History** video via the website. Pupils complete **Activity 3**. You could use questioning beforehand to identify what pupil's think may be the causes.
4. Using a show of hands to count the responses from pupils, complete the section on the website called 'How we travel to school!' This section will allow pupils to see how they, as a class, affect air quality just with their own journey to school. You will also be able to compare your classes' results with that of other schools. This data will be available the next day .
5. Pupils complete the **Homework Sheet** for this section.
6. **Extension:** You could use the homework activity as a lesson itself, depending on time, or dedicate time to completing a formative assessment activity once the homework has been completed. For example, you could ask pupils to assess each other's work based on the success criteria given and leave formative feedback on how the piece of work could be improved upon.

## Geography: Section 2

# Fieldwork: Air Pollution Around our School

## Lesson Objectives

1. I can identify and use different techniques to gather information about sources of air pollution around a school.

## Teacher Instructions

1. Please visit the **Secondary Geography start page** for further information on accessing an Air Quality Sensor from SEPA.
2. This lesson will involve fieldwork. Each school will have to consider carefully the individual factors and nature of any fieldwork that is carried out. Therefore feel free to modify the suggested activities below to suit your school.
3. Pupils should be divided up into groups of four. Some groups will complete a traffic count, others will complete a tour of the school grounds and note their observations of any possible sources of air pollution. You could **extend** this activity by giving pupils a map of your school grounds and ask them to locate their positions on the map. Google Maps, school plan or an OS map extract are possible starting points.
4. Traffic Survey - two members of each group will conduct a traffic survey – one for each direction of traffic. Download & print the **traffic count record sheet** from the website. Two sheets required per group. The count will last 20 minutes.
5. Observations - two pupils should take a camera and the observation sheet and survey the school grounds and/or local area to identify possible sources of pollution. Suggested duration 20 minutes. Download & print the **observation sheet** from the website. Use prior learning and questioning to identify the possible sources before pupils start. One sheet required per group. You could extend this activity by getting pupils to complete field sketches of different locations around the school. Pupils could then annotate their sketch to show the possible sources of pollution.
6. Pupils complete the **Homework Sheet**. Ask pupils to observe their environment as they walk home from school. Ask them to record on their homework sheet, when they get home, anything that they think could be a possible source of air pollution. When issuing the homework you may wish to refer back to the first lesson where pupils identified the sources of air pollution.

7. In preparation for the next lesson, the teacher should input the results of the traffic count into the **Traffic Survey Entry** page via the link to enter results of the **Section 2** webpage. You should select one set of results to input. If you have an air quality sensor outside your school, your traffic count and results must be entered during the two week period the sensor is at your school.
8. **Extension:** Extend this activity by asking pupils to present their results to the rest of the class and discuss whether the results are what you would have expected based each of the locations used. Pupils could process the information into graphs, annotate the photographs from their observations, describe how they carried out the surveys etc. See Section 3, Activity 1.

## Geography: Section 3

# Results and Assessment: Air Pollution around Our School

## Lesson Objectives

1. I can read and gather information from bar graphs, line graphs and pie charts.
2. I can use a pie chart to identify the main method of transport used by my class to travel to school.
3. I can use a bar graph to identify which method of transport contributes the most to air pollution outside my school and what contributes the least.
4. I can use bar and line graphs to identify the time of day when air pollution is at its greatest at my school.
5. I can use a map to describe the quality of the air at my school in comparison to other schools.
6. I can use the results of the observational fieldwork to identify other possible sources of air pollution that might be contributing to the levels of pollution in and around my school.

## Teacher Instructions

1. This lesson will involve pupils being able to access ICT. Pupils will be able to see, for their class/school, the results of the traffic count that was carried out and the levels of air pollution outside their school from the air quality monitors if they were requested.
2. Ask pupils to sit in the groups they were in for lesson two and ask pupils to share the results of what they discovered during their fieldwork. Pupils should complete **Activity 1** on the **Activity Sheet** for this section. Make sure pupils are aware that they will have to feedback so listening, good communication and accurate recording skills are needed. Pupils who took part in the traffic count should report back to the class or teacher what the results of the observation fieldwork was and vice versa.
3. Pupils should follow the instructions on their **Activity Sheet** to complete **Activities 2-4**. The teacher should demonstrate, step by step, what they need to do and take feedback once each activity has been completed.
4. **Extension:** There is a section for revisiting the project after a number of weeks or months, to see if pupil behaviour has been changed as a result of their participation in the project. To do this you would need to complete the 'How we travel to school' survey again at a later date and put the results into the website. You will then be able to discuss and explore with your pupils the impact of the project.

## Geography: Section 4

# Impact of Air Pollution

## Lesson Objectives

1. I can explain the impact poor air quality has on health, plants and animals, the environment and the economy.

## Teacher Instructions

1. Watch the **Impact of Air Pollution** Video. This will identify and explain the impact air pollution has on our health and the environment. Pupils complete **Activity 1** on the **Activity Sheet** as they watch the video. Notes could be key words, phrases or images that they hear or see.
2. There are four ways in which air pollution affects humans and the environment. Health, animals and plants, the wider environment and the economy. Split pupils into groups. Number pupils 1-4. Each pupil will become an expert in one area. Give each member of the group a different **Expert Factsheet** to complete. Pupils complete **Activity 2**. Give each member a jigsaw piece that he/she will use to note 5 facts. Depending on time you may wish pupils to design their jigsaw piece to include colour, a picture, keywords, and facts.
3. The information presented on the factsheets is also available on the webpage for this topic. Feel free to modify or use your own activities based on this information if group work is not possible.
4. Pupils take it in turn to report their research to the rest of their group. Use questioning of pupils to check accountability i.e. person no.1 answer a question based on what he/she has learned from person no.3.
5. Pupils complete the **Homework Sheet**. Pupils should create an acrostic poem on the impacts of air pollution using the knowledge they have learned in the lesson. You could use Air Pollution, Effects or Impact as the basis for the poem. You may need to discuss possible keywords. This could be **extended** to include a formative assessment activity or pupils could present their poem to the class. A display could be created of the different poems.

## Geography: Section 5

# Solutions: Tackling Air Pollution

## Lesson Objectives

1. I can identify strategies to improve air quality at an individual, local and national level.

## Teacher Instructions

1. Watch the '**Solutions**' video on the website and the information in this section. Pupils use this to explore in more depth a wider range of strategies that could be adopted on an individual, local and national level to help improve air quality .
2. Pupils complete **Activity 1** on the **Activity Sheet** for this section.
3. Throughout, pupils should think back to earlier in the project when they explored factors contributing to air pollution and those factors specifically that were having an impact in their school and community. Pupils should begin to consider what they as an individual and what the school could do, to help reduce air pollution.
4. Pupils complete **Activity 2** on the **Activity Sheet** for this section.
5. Ask pupils to identify the strategies they think would help to reduce air pollution in their school and local community. Pupils should refer to and think about the strategies identified and discussed in the lesson. Pupils should identify 5 strategies.
6. Pupils should make a three point pledge which identifies 3 ways in which they will help to reduce air pollution. Complete **Activity 3** on the **Activity Sheet** for this section.
7. Pupils complete the **Homework Sheet**. This homework exercise is asking pupils to think and consider the ways in which their behaviour has changed as a result of completing the project. It will also help them to think about what they can do to make a difference.
8. Click on '**Virtual City Game**' link on the website to explore further the link between traffic and air pollution and what happens when even small changes to traffic and the way we travel can affect air pollution.