

Activities suitable for KS3 (11-14 Year olds)



Activity one

Fieldwork to measure local air quality

Once pupils have an understanding of air pollution and its primary causes, encourage them to take part in a field experiment to monitor, record and analyse air quality levels in the area around the school.

Pupils can draw on knowledge already gained about air pollution locally via the factsheet and quiz. This activity will also help them to develop analytical skills, recognise patterns in data and learn how to interpret and communicate results.

To support this activity, Colchester City Council has a supply of portable air quality monitors available for schools to borrow free of charge.

Firstly, ask pupils to formulate a hypothesis as a starting point for further investigation, for example, 'Air quality in the area around the school is worse at drop off and pick up'.

Next, pupils can use the portable air monitors to gather their evidence. We suggest the activity is undertaken at morning drop off, afternoon pick up and mid-morning/lunchtime when traffic should be lighter over a two week period. This will provide three distinct times to compare.

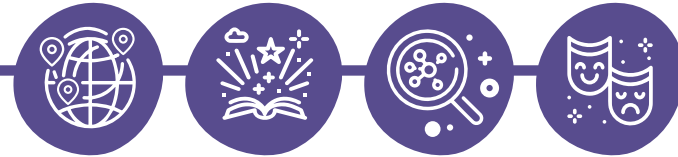
Pupils can also record the number of cars they can see sitting stationary with their engines running. An air quality monitoring data sheet is provided on page 32 to record the information.

Air pollution monitoring data collection sheet

Use this sheet to record findings from your air quality monitoring. Make sure you record the time of day you make your observations and collect data. It can be interesting to compare results at the start of the school day, with lunchtime and then at the end of the school day.

Date	Time	Location	Weather	Pollution reading*	How many vehicles can you see sitting with their engines running	Use this column to record anything else you notice (think about what you can hear, see and smell)

Activities suitable for KS3 (11-14 Year olds)



Activity one

Fieldwork to measure local air quality

Back in the classroom, pupils can discuss their results:

- What did you notice about the results?
- Was there a variation in the quality of air at different times of the day?
- Was there a variation in the quality of air depending on the weather?
- Why do you think any variations occurred?
- Was there anything surprising about the results?
- Did the results prove or disprove your hypothesis?

This can lead to a discussion about what could be done to improve air quality during the times when pollution is highest. This could include:

- Asking drivers to switch off their engines while stationary
- Encouraging people they know to walk, cycle or scoot to school

Set up a class or smaller group discussion about how the results can be presented, who you are going to present them to and what your recommendations will be.

As an extension activity, pupils can draft a persuasive letter including the results of their investigation and recommendations for how we can all work together to improve air quality in our city.

Recipients of the letter could include:

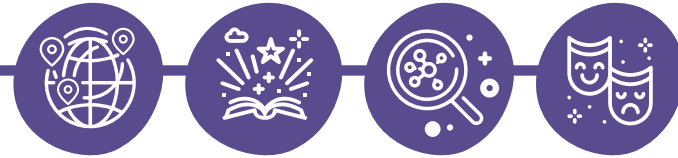
- Your local MP – you can search for your local MP: <https://members.parliament.uk/FindYourMP>
- Your local Councillor – find yours: www.colchester.gov.uk/elections/councillors
- The Head Teacher of your school
- Your school Governors
- Your school PTA
- Car manufacturers

Recommendations could include:

- Promoting the use of alternative fuel vehicles e.g. electric (see supplementary activity below)
- Asking parents to switch off car engines while they are stationary outside school*
- Encouraging parents and pupils to use a different mode of transport to get to school e.g. bicycle or walking. Could you ask pupils to submit the number of steps they take when walking to school and set up inter-class, year group or school competitions?

* Visit www.cleanaircolchester.org for more information about the Careless Pollution campaign

Activities suitable for KS3 (11-14 Year olds)



Activity one

Fieldwork to measure local air quality

Supplementary activity 1 – Drama

Work in pairs or small groups to develop a role play activity, persuading car drivers to switch off their engines. How would you start a conversation? What important messages would you need to include? How would you respond if the driver said no?

Supplementary activity 2 – English

Encourage the class to set up a debate, for example 'This house believes that all private and commercial road use vehicles should be electric'. Would it make a difference to local air pollution? If yes, why? If no, why not?



Colchester Prep and High School

Pupils at Colchester Prep and High School have been monitoring air pollution in the streets surrounding the school and creating different solutions, notably planting urban vegetation, to help improve air quality. Year 9 pupils have been working on a Clean Air project with the University of Essex to deepen their understanding of air pollutants. Outdoor signs have been placed at both entrances to remind visitors to the school to switch off their engines and the school has been awarded the Eco Schools Green Flag for their efforts.



Activity two

I need clean air because...

Drawing on the information pupils have learnt from the fact sheet and quiz, ask them to consider why having clean air is important. This can be in the form of a leading statement such as ‘I need clean air because....’

Ask them to draft their own action plan for improving air quality to achieve their aim of clean air. Points to consider include:

- The impact of poor quality air on our own health
- What happens to our lungs when we breathe in polluted air
- What measures could be taken in Colchester to improve our air quality
- Who is responsible for cleaning up our air - the Council? Local businesses? Parents? All of us?

Write a persuasive letter to the Mayor of Colchester, or the Leader of the Council, setting out your action plan.

Alternatively, turn the activity in to a role play exercise for two people where one person is the Mayor and the other has to develop a convincing argument about how pollution in Colchester is a problem and how they would like the Mayor to take action. Use ambitious, persuasive language. Then switch roles.



Activity three

Health consequences of air pollution for children

Children are one of the vulnerable groups who are at risk from breathing in poor quality air, because it can affect their lung development. Ask pupils to think about the health consequences of air pollution (there is information in the fact sheet to help with this). They could consider the following questions:

- How could poor quality air make you feel physically and mentally?
- Do they know anyone who has asthma or another lung condition? How could air pollution affect them?
- How could air pollution affect you and your family? What impact does poor quality air have on our health care services?
- Apart from children, who else is vulnerable to air pollution in the community and how could you help them?
- What measures could be taken to reduce air pollution locally?

Discuss different modes of transport that you could use to travel to school that help reduce air pollution – this links with activity two about developing ‘clean’ routes to school.



Activity four

Studying exhaust fumes

The main source of air pollution in Colchester is exhaust fumes from cars, vans and other vehicles on the road. By switching off a car engine while stationary, air pollution in Colchester could be cut by up to 30%.

The main components of exhaust fumes are sulphur dioxide, nitrogen oxide, carbon dioxide, carbon monoxide and particulate matter.

Ask pupils to undertake some desk research about these air pollutants, considering some of the following questions:

- How are the gases formed?
- What is particulate matter and how is it created?
- How can these air pollutants damage our health when breathed in?
- List some additional sources of these pollutants apart from exhaust fumes
- What measures can be taken to reduce levels of these gases in the air?

If you want to find out more about air pollutants and how they affect our health then the following websites might be useful:

- World Health Organisation – www.who.int
- Emissions Analytics – www.emissionsanalytics.com
- Plume Labs – www.plumelabs.com



Please refer to the separate worksheet named 'Toolkit for schools: Monitoring specific pollutants' for details of a supporting activity using air quality monitors to observe specific pollutants. The worksheet can be downloaded from www.cleanaircolchester.org/schools



Activity five

Design a poster

Ask pupils to visually represent what air pollution means to them or create an image of what air pollution does to their health and incorporate their designs in to a poster encouraging people in the city to switch off their engines every time they wait.

Alternatively, using the colouring-in poster included as part of this toolkit as inspiration, design a picture incorporating six major sources of air pollution alongside your choice of iconic Colchester landmarks. You could incorporate some fun 'hide and seek' elements with hidden cars or gases. Create a class display with all the completed posters or share your work with younger year groups and ask them to complete the activities.

Feedback

We would love to know how you get on with these activities and to see any results you achieve. If you are happy to share then please email your work to cleanair@colchester.gov.uk

For more information about the CAREless pollution campaign please visit www.cleanaircolchester.org