

How does using electricity affect our environment?



Age Range: Primary and Lower Secondary

Curriculum Links

Learning Outcome: Science - Living things and their habitats

to recognise that environments can change and that this can sometimes pose dangers to living things

Main concepts points to be learnt

Explore pupil's understanding about how gases are produced by coal fuelled power stations, transport and household fires. If fuels are not burned efficiently then particles of soot (carbon) enter the air around us which can irritate our lungs and impact on plants and animals, e.g. lichen. We cannot easily see the particles. There is a trade-off between making electricity using these methods and looking after the environment. Humans are responsible for causing much of this pollution so we have a responsibility to learn about the effects and to try to mitigate them.

Step by step guide

In this activity we're going to investigate the air pollution around their school or home.

- Watch** the video of Jules telling the story.
- Demonstrate** using a tealight how burning wax (the fuel) creates soot. Place a glass jar over the tealight flame (6 inches above). Lower it until the glass is touching the flame. As the sides of the tealight's metal container and the glass begin to restrict the amount of oxygen reaching the flame, it will be less efficient at burning. Soot particles will start to deposit on the base of the glass. (You may also notice the flame is more orange in colour as it burns less efficiently.)
- Elicit** pupil's questions about what they've observed. Guide them to make their own soot (particulate matter) traps using Vaseline, paper, plastic wallet (See video) etc.
- Encourage** them to discuss:
 - How large the traps should be
 - How long to leave the traps out
 - Where they are expecting to find most pollution
 - Where will they place the traps
 - What they will count when they collect the traps – e.g. most vs least (5-7 years) or particles per cm squared (7+ years)
 - How they will use the information they collect – e.g. promote a walk to school week to lower pollution around the school gates
 - If the weather forecast might affect their investigation
- Explore** pupil's questions to investigate the particulate matter in their school or home space.
- Pupils can **compare** how air pollution varies in different parts of the country and in other countries using <https://uk-air.defra.gov.uk/data/gis-mapping/>

Equipment

Teacher only - Matches, glass jar, tealight candle; **Pupils** - A4 plastic wallets, graph paper, Vaseline, hand lenses, string / pegs to affix particle traps

Health & Safety should be addressed in line with your normal practices.



Watch the story video:

<https://youtu.be/acJ62tHpV7s>



Watch the lesson to investigate air pollution

<https://youtu.be/Ne2HSJ9>

[GWYg](#)

Questions to ask 4 - 7 year olds

How many particles can you see?

Where do you think the air is cleanest/dirtiest?

What makes you cough?

Questions to ask 7 - 14 year olds

Where does our electricity come from?

What is a lichen? Can you find out?

Why are lichens so sensitive to air pollution?

Links

<https://www.nhm.ac.uk/discover/nature-and-pollution-what-lichens-tell-us-about-toxic-air.html>

<https://www.eea.europa.eu/themes/air/intro>

Doffa's Reindeer book will be available soon through artfulfoxcreatives.com



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