Lesson 3: Detecting Air Pollution

This lesson is designed to last 1 hour and will explore ideas about air pollution and what affects types and levels of pollution.

Air Quality Wigan Borough

As a result of participating in this session, students will be able to:

- **RECALL** information about the factors affecting air pollution.
- **INTERPRET** data relating to local levels of air pollution.
- **SUGGEST** how the residents of their locality are affected by air pollution.

Curriculum Links

Geography Programme of Study: Key Stage 3

- Human and Physical Geography
    - Understand how human and physical processes interact to influence, and change landscapes, environment and the climate; and how human activity relies on the effective functioning of natural resources.

- Geographical Skills and Fieldwork
    - Use Geographical Information Systems (GIS) to view, analyse and interpret places and data.
    - Use fieldwork in contrasting locations to college, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information.

Science Programme of Study for Key Stage 3

- Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions.
- Identify further questions arising from their results.

Resources needed to deliver this Lesson

- Live data from AQ Monitors –https://www.wigan.gov.uk/air-quality/

10 mins	**Introduction/Do Now Task:** Remind students that in the previous lesson they looked at ideas about particulates and some simple ways of gathering data about where they exist. Point out also that in Lesson 1 they looked at different forms of pollution and that as well as particulates there are also, in air pollution, other substances such as gases. Ask students to suggest how scientists might be able to detect air pollution. Take feedback on ideas and draw out that there are various ways such as using gas detectors, studying tiny particles that have settled out and looking for patterns in the incidence of respiratory diseases.
10 mins	**Starter Task:** Remind students that one of the forms of air pollution is particulates, which are tiny particles released from the burning of hydrocarbons, such as in petrol and diesel engines. Show graphic of particulates and explain the units that are used to measure these. Then explain that particulates can cause respiratory problems, such as irritation of the lungs and reduced effectiveness of gaseous exchange. Ask students to recall and share ideas about where particulates seemed to be more present, e.g. in relation to distance from a road and height above ground. Now display a map of the area and ask students to suggest whereabouts they think that the incidence of particulates would be lower and where it would be higher.
30 mins	**Main Task 1:** Show students sample data and explain how it is presented. Explain that it is historical data and ask for suggestions about what it shows and why the data might vary according to the collection point. Draw out key points about what the data shows. **Main Task 2:** Now show students the live data from Wigan and Leigh and also provide them with a map to show the geographical location of the data collection points. Ask students to work in small groups to analyse the data, compare it with the locations and to suggest what the data shows. Each group should make a list of the conclusions that can be drawn from the data. Go round the room asking each group to offer one key point, trying to avoid any repetition from previous groups.
10 mins	**Plenary:** Ask students what the data shows about where in Wigan and Leigh is healthier to live, with respect to air pollution levels.

Thank you for incorporating our resources into your teaching. Your feedback is valuable to us as we strive to improve and enhance our materials. We kindly ask that you take a few moments to complete the online feedback questionnaire. Your insights and suggestions will help us better support you and your students in the future.

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