Air pollutants and the greenhouse effect

Teacher / technician

YEAR 11 / LESSON 112 / BIOLOGY + SCIENCE (DOUBLE AWARD)

Staff preparation and answer guidance. Keep separate from student sheets. Original learning tasks; no supplied numerical example represents class measurements.

Coverage and delivery

Shared Biology / Double Award: 4.12–4.15. Air pollution and climate.

Allow about 60 minutes. Follow the student sequence and use the answers to check reasoning.

Requisition • class of 30, working in 15 pairs

Item	Per pair / setup	Class total
Student booklets	1 per learner	30
Pollutant cards and infrared-energy diagram	1 set per pair	15 sets
Rulers	1 per pair	15

Immediate safety

Paper, modelling and written reasoning only. No chemicals or biological samples are handled.

Preparation and delivery

Read alongside the student method

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1. Provide 30 booklets, 15 rulers and 15 sets of pollutant cards and infrared-energy diagram.

2. Keep answers separate until learners have attempted the tasks; discuss the reasons for corrections.

3. Prepare separate CO, SO_2 and greenhouse-gas cards; provide an Earth–atmosphere diagram showing outgoing infrared radiation. Use the cited NOAA explanation for reference; do not generate gases or use flames.

Close of lesson

• Return models and keep the corrected work.

Check before teaching

Check the cards, reference data and quantities against this requisition. Keep the staff answer guide separate until the checking stage. Supplied numerical practice datasets are labelled examples; they are not class measurements.

Answers and teaching notes

Expected explanations • do not give as experimental observations

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- It reduces oxygen-carrying capacity by binding haemoglobin.
- Respiratory irritation or acid deposition.
- For example CO_2 and CH_4.
- Outgoing infrared radiation at relevant wavelengths.
- No.
- Weather varies over short periods; climate concerns longer-term patterns.

References and provenance

Pearson Biology specification

NOAA: greenhouse-gas explanation

Prepared 22 November 2026. Original wording, tables and questions. Sources inform the concepts and technique; the lesson scope and classroom quantities are explicitly described here. No laboratory trial or final school risk approval is claimed.