



Science lesson 5 - Teacher notes

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Learning aim:

To describe the consequences of human activity on the Earth's atmosphere and suggest solutions to reduce the impact.

Curriculum links and Skills Builder focus skills chart:

England The national curriculum	Chemistry – Earth and atmospheric science Pupils should be taught about the potential effects of, and mitigation of, increased levels of carbon dioxide and methane on the Earth's climate.
Scotland SQA National 5 English	Biology – photosynthesis Limiting factors: carbon dioxide concentration, light intensity and temperature and their impact on photosynthesis and plant growth. Analysis of limiting factors graphs.
Wales WJEC GCSE science (double award) specification	Chemistry - The ever-changing Earth Learners should be able to demonstrate and apply their knowledge and understanding of the environmental effects and consequences of the emission of carbon dioxide and sulfur dioxide into the atmosphere through the combustion of fossil fuels.
Skills Builder Framework Focus Skills	
Staying positive – The ability to use tactics and strategies to overcome setbacks and achieve goals	Staying positive step 7 I look for opportunities in difficult situations.
Teamwork – Working cooperatively with others towards achieving a shared goal	Teamwork step 7 I contribute to group decision making, whilst recognising the value of others' ideas.

Main skills developed and how:

- Problem solving – Students will apply problem-solving skills by interpreting information from graphs.
- Analysis and evaluation – Students will analyse evidence and draw conclusions both qualitatively and quantitatively.

Equipment required:

- Calculators
- PowerPoint
- Student worksheet

Suggested layout of the session:

3 minutes – Introduce the aim and scenario. Inform students that they will be working in small groups to create Sam's 5-step plan. They will need to read the email reply, assess Sam's researched data and analyse his further findings before they begin to write notes in their 5-step plan.

15 minutes – Students need to work in their group to complete the worksheet, assisting each other through the discussion of information.

7 minutes – Facilitate a feedback session where each group describes and explains to the rest of the class one part of their 5-step sustainability plan. The remaining groups need to listen carefully to their peers' responses, adding further information to their own plans if needed. End with the silent reflection at the end of the PowerPoint.

Ways to differentiate:

- Students could describe and explain to each other graph 2 (the rate of photosynthesis at different CO₂ concentrations) including why it levels off.
- The information on the sheets regarding photosynthesis will help to support comprehension.

- Students could discuss if Sam should just grow crops, and not have cows on his farm – what would be the advantages and disadvantages of this? Write a list and then feedback to each other.

How to extend the session – if required:

- Sam is considering a greenhouse for growing crops. Students can discuss the pros and cons of this in their groups. For example, it would be warmer but might get too hot; the cost of the greenhouse and how long would it take to pay back, and it would be protected/heated in winter and could, therefore, be used to grow all year etc.

