

WithOnePlanet

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Carbon hides
in the air
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Investigate carbon

Lesson 5

Teacher notes

Carbon hides in the air

Years
3 to 4



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INQuIRY



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Carbon hides in the air

Lesson 5: Teacher notes

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This document provides the teacher with the details of the lesson.

At a glance

To provide students with hands-on, investigation experiences of:

- > the connection between the carbon in the air, the enhanced greenhouse effect and the Earth's temperature.

INQuIRY focus: **Investigate**

The *Investigate* phase is designed to provide students with hands-on experiences of the science phenomenon. Students explore ideas, collect evidence, discuss their observations and keep records, such as science journal entries. The *Investigate* phase ensures all students have a shared experience that can be discussed and explained.

In the *Investigate* phase students develop a literacy product to represent their developing understanding. They discuss and identify patterns and relationships within their observations. Students consider the current views of scientists and deepen their own understanding.

Assessment guide

This assessment guide supports teachers in identifying the types of assessment that are appropriate for this lesson.

Formative assessment is an important aspect of the *Investigate* phase. It involves monitoring students' developing understanding and giving feedback that extends their learning. It involves monitoring students' developing understanding of:

- > the connection between the carbon in the air (as carbon dioxide), the enhanced greenhouse effect and rising global temperatures.

You will also monitor their developing science inquiry skills.

Summative assessment of the science inquiry skills is another important focus of the *Investigate* phase. Rubrics can be used to gauge the level of student achievement on performance tasks.

Key lesson objectives

Science

Students will be able to:

- > develop a basic understanding of the greenhouse effect and the part carbon dioxide plays in it
- > understand how increasing carbon dioxide levels contribute to an enhanced greenhouse effect
- > understand the link between the enhanced greenhouse effect and rising global temperatures.

Literacy

Students will be able to:

- > contribute to discussions about the enhanced greenhouse effect, the role carbon dioxide plays in it and how it contributes to rising global temperatures
- > record their observations, ideas and descriptions in drawings and words.

This lesson also provides opportunities to monitor the development of students' general capabilities.

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Teacher background information

Carbon is an element that forms many of the living and non-living structures on the Earth. There are many other elements that make up these structures, including hydrogen and oxygen. Together, in an endless variety of combinations, carbon and all the other elements on the Earth make up every single living and non-living thing on the planet.

Equipment

For each Student

- > Students will each require a copy of the following two worksheets:
 - *Carbon hides in the air - Student worksheet*
 - *Make your own greenhouse - Student worksheet.*

Preparation

- > For the *Carbon hides in the air - Student worksheet*, check that the web animation is working.
- > For the *Make your own greenhouse - Student worksheet*:
 - Identify a suitable location for the activity in your classroom.
 - Source and prepare all the required equipment.
 - Organise the different groups.

Lesson steps

1. Explain to students that one of the best places to catch carbon is in the air. Read through the introduction to the *Carbon hides in the air – Student worksheet*.
2. Facilitate a preliminary discussion about carbon dioxide and the greenhouse effect using the following prompt questions:
 - i. What is the greenhouse effect?
 - ii. How is the greenhouse effect like putting the Earth into a huge greenhouse?
3. Students to watch the video: <http://vimeo.com/19797487>.
4. Return to the prompt questions from Step 2 and ask students whether they would like to add any extra information to their answers based on the information contained in the video.
5. Students to complete the *Make your own greenhouse activity* using the instructions from the *Make your own greenhouse - Student worksheet*.
6. Using a large piece of graph paper (or an electronic alternative) use one group's data set to plot a temperature versus time graph for each model. Use different colours and label each model so that the students can tell them apart. Use this graph and the students' answers to the questions on the worksheet to discuss the greenhouse effect in a greenhouse and for the Earth.
7. Students to watch *Greenhouse Animations* from the Australian Greenhouse Calculator website (<http://www.epa.vic.gov.au/agc/animations.html>) and answer the questions on the *Carbon hides in the air – Student worksheet*.

Source:

Planet Nutshell 2011, *Climate Science in a Nutshell #4: Too Much Carbon Dioxide*, 10 February, viewed 1 January 2014, <http://vimeo.com/19797487>.