

WithOnePlanet

- > Module 1:
Carbon
- > Level:
Years 1 to 2
- > INQuIRY:
Investigate
- > Lesson 5:
Sharing our carbon
- > Teacher notes



Investigate

Lesson 5

Teacher notes

Sharing our carbon

Years

1 to 2



WithOnePlanet

Open education
An xpend Foundation initiative

WithOnePlanet.org.au

INQuIRY



Sharing our carbon

Lesson 5: Teacher notes

.....

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

At a glance

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

- > how the amount of carbon in the air and extreme weather events can be influenced by their decisions and actions.

Lesson focus

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 amount of carbon in the air (as carbon dioxide), extreme weather events and students' own decisions and actions.

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 how humans can influence the amount of carbon in the air (as carbon dioxide)
- > make decisions and take actions to reduce the amount of carbon in the air.

Literacy

Students will be able to:

- > contribute to discussions about carbon dioxide in the air, how it can affect the weather, and how it can be reduced through human intervention
- > record their observations, ideas and descriptions in drawings and words.

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

Teacher background information

Carbon dioxide emissions are a result of many of Earth's natural and man-made processes. Some of these emissions result directly from human activities. While some human activities are essential for survival, others have simply increased the convenience of our daily lives. These types of activities can be considered and modified in order to reduce emissions on a personal scale. Many of these activities are energy-intensive, where most of this energy ultimately comes from emissions-intensive actions such as the burning of fossil fuels. Reducing the frequency of these activities or sourcing alternative non-emitting sources of energy for these activities is one way that an individual can contribute positively to reducing global greenhouse gas emissions.

Equipment

For the Class

- > A large-format copy of the *Ways we can stop carbon from entering the air – Group worksheet*.

For each Student

Students will each require a copy of the following two worksheets:

- > *Ways carbon enters the air – Student worksheet*.
- > *Three ways I can stop carbon from entering the air – Student worksheet*

Preparation

- > Check that the two online animations are working. Ree-Lindstad 2010, <http://youtu.be/wa58h4IJ6Hk>
Robinlittlewood, 2010, http://youtu.be/bn8R_XqjiI0
- > Make a large-format copy of the *Ways we can stop carbon from entering the air - Group worksheet*.

Lesson steps

1. Explain to students that they are about to watch an animation about the ways that carbon gets into the air. Explain that you will stop the animation at certain stages to ask the students what they think is happening.

The animation can be found here: Ree-Lindstad 2010, <http://youtu.be/wa58h4IJ6Hk>

Stop the animation at the following times and use the prompt questions to facilitate a discussion about what is happening in the animation.

Stop 1 – approx. 30 seconds

- > Ask students what they think is happening so far.
- > Ask students to keep watch on the thermometer. While normal thermometers tell us about temperature, this thermometer tells us how much carbon is in the air. Explain that if the liquid in the thermometer increases or changes colour, this means that the amount of carbon in the air has increased.

Stop 2 – approx. 50 seconds

- > Ask students what they think is happening now. (There are more factories being built and there is more pollution in the atmosphere.)
- > Why has the music changed? (To indicate an increase in human carbon dioxide emissions.)
- > Has the thermometer changed? (Not yet.)

Stop 3 – approx. 1 minute

- > Ask students what they think is happening now. (Black bags with skulls and crossbones are coming out of the factories.)
- > Why is this happening? (The factories are putting more carbon into the air.)
- > Has the thermometer changed? (Not yet.)

Stop 4 – approx. 1 min 30 sec

- > Ask students what they think is happening now. (Cars have appeared and the number of carbon dioxide bags has increased.)
- > Why has the number of carbon dioxide bags increased? (The factories and the cars are putting more carbon into the air.)
- > Has the thermometer changed? (Yes. It has increased and also changed colour.)

Stop 5 – approx. 2 minutes

- > Ask students what they think is happening now. (The sky has grown darker; there is more pollution; the sunlight that was once bouncing off the earth and going back into space is now unable to get through the smog and is bouncing back to earth.)
- > Has the thermometer changed? (Not yet.)

Stop 6 – approx. 2 mins 30 sec

- > Ask students what they think is happening now. (More of the same.)
- > Has the thermometer changed? (Yes. It has increased and also changed colour. It has almost risen to the top.)

Stop 7 – approx. 2 mins 50 sec

- > Ask students what they think is happening now. (The earth has been encased in a large glass jar!)
- > Why is this happening? (This is to show us that on earth it is like living in a giant glasshouse/greenhouse.)
- > Has the thermometer changed? (Yes. It has increased to the top and changed to red.)

Stop 8 – approx. 3 mins 30 sec

- > Ask students what they think is happening now. (The animated character has been thinking and has thought of a solution to the problem.)
- > Has the thermometer changed? (No, but it is constantly ringing like a bell.)

Stop 9 – approx. 4 minutes

- > Ask students what they think is happening now. (The animated character has decided that the factories should recycle – the green arrow triangle is shown – and carbon dioxide bags are now returning to the factories.)
- > Why is this happening? (Recycling helps to reduce the amount of carbon dioxide entering the air.)
- > Has the thermometer changed? (Not yet.)

Stop 10 – approx. 4 mins 15 sec

- > Ask students what they think is happening now. (The cars have all turned green. There are no more bags of carbon dioxide present.)

- > Why is this happening? (Driving green cars helps to reduce the amount of carbon dioxide entering the air.)
- > Has the thermometer changed? (Not yet.)

Stop 11 – approx. 4 mins 24 sec

- > Ask students what they think is happening now. (The jar has burst and more trees have grown.)
- > Why is this happening? (Planting trees helps to reduce the amount of carbon dioxide entering the air. The earth is returning to health.)
- > Has the thermometer changed? (It has changed to green and has reduced.)

Stop 12 – approx. 4 mins 40 sec

- > Ask students what they think is happening now. (The earth's clean atmosphere has returned and birds are starting to sing.)
- > Why is this happening? (The earth has returned to full health.)
- > Has the thermometer changed? (It has changed to green and has reduced back to its original temperature.)

2. Discuss the different ways that carbon gets into the air that the students saw on the animation. (Factories producing pollution, driving cars). Students to add these two ideas onto a copy of *Ways carbon enters the air – Student worksheet*, using drawings and words.

Explain to students that one example has already been completed for them – burning. Remind students about charcoal – the result of burning. Explain to students that when wood from trees burns, although some of the carbon becomes charcoal, some of the carbon becomes carbon dioxide in the air.

Ask students if they can suggest any other ways that carbon could enter the air. (Some examples include: using a lot of electricity in the home, producing lots of waste, flying in a plane, deforestation, land clearing, etc.)

Students to add two more ways to add carbon to the air to their *Ways carbon enters the air – Student worksheet*, using drawings and words.

3. Discuss different ways that we can prevent carbon from getting into the air.
Some of these ways were shown on the animation and students may already know of others.
Add any of their ideas to a large format copy of the *Ways we can stop carbon from entering the air – Group worksheet*.

4. Show the following animation to students to help them to generate more ideas: Robinlittlewood, 2010, http://youtu.be/bn8R_XqjiI0

Ask students for more of their ideas to add to the list on the *Ways we can stop carbon from entering the air – Group worksheet*.

Provide students with a copy of the *Three ways I can stop carbon from entering the air – Student worksheet*. Ask students to choose 3 of the ideas from the *Ways we can stop carbon from entering the air – Group worksheet* and write in words and draw a picture of themselves completing each action on their worksheet.

Sources:

Ree-Lindstad, Nina 2010, *Climate animation*, viewed 4 January 2014, <<http://youtu.be/wa58h4U6Hk>>
Robinlittlewood, 2010, *Save Our World*, viewed 4 January 2014, <http://youtu.be/bn8R_XqjiI0>