

WithOnePlanet

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Investigate carbon

Lesson 3

Teacher notes

Carbon in disguise

Years

3 to 4



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INQuIRY     

Carbon in disguise

Lesson 3: 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 carbon as a substance, the different forms that carbon can take in the environment, and how they can be used based on their properties.

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:

- > carbon as a substance that can take a number of different forms
- > how these forms can be used.

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:

- > observe carbon in a variety of different forms – both as an element and a compound
- > draw and describe these different forms of carbon
- > list some of the uses of each different form of carbon.

Literacy

Students will be able to:

- > contribute to discussions about carbon's different forms and their possible uses
- > record ideas and descriptions in drawings and words.

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

Teacher background information

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

Carbon can exist either in its elemental form, most commonly as carbon black, diamond or graphite, or it can chemically combine with other elements to form carbon compounds. A compound is any substance that is made up of two or more different chemical elements.

One of the most common carbon-based chemical compounds is carbon dioxide. Carbon dioxide is made up of a single carbon atom chemically combined with two oxygen atoms. (Both of the oxygen atoms bond with carbon and not with each other in this substance.) Other examples of common carbon-based compounds include crude oil, charcoal and chalk.

The entire body of any living thing, such as a human or the tallest tree is mostly made of carbon, combining with many other different elements. For this reason, scientists sometimes call living things 'carbon-based life forms'.

Non-living things, such as rocks, and dead things, such as decaying plants and fossils, are also mostly made up of carbon.

Equipment

For each Student

- > Students will each require a copy of the *Carbon in disguise - Student fieldwork activity*.

Preparation

- > For the *Carbon in disguise - Student fieldwork activity*:
 - Find a natural setting to conduct the lesson in.
 - Read through the activity, noting the safety guidelines in particular.
 - Familiarise yourself with different forms of carbon and the carbon compounds that require preparation.
 - Prepare all the equipment and set each form of carbon up as a separate station, so that students have enough space to move around and examine each one.

Lesson steps

1. This lesson is best conducted outside in a natural setting.
2. Explain to students that carbon is a master of disguise! Not only can it exist as pure carbon in different forms, but it can also combine with other chemicals to form new substances. This makes carbon so hard to detect and capture.
3. Ask students if they know of any of the different forms that carbon can take.

4. Provide students with the *Carbon in disguise - Student fieldwork* activity and read through the introduction with them. Show the students the various stations where different forms of carbon have been placed and read through the instructions on the activity sheet explaining what students need to do.
5. Students to complete the *Carbon in disguise - Student fieldwork activity* sheet.
6. Once the activity is completed, facilitate a discussion about what the students drew, how they described each form of carbon and what uses they came up with. Suggest some additional uses for some of the forms of carbon if necessary.

