

WithOnePlanet

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Introduce carbon

Lesson 1
Teacher notes
Carbon confidential

Years
3 to 4



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Open education
An xpend Foundation initiative

Carbon confidential

Lesson 1: Teacher notes

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

At a glance

To capture students' interest and find out what they think they know about carbon as a substance.

Students:

- > use a graphic organiser, (such as the *Carbon confidential – Group worksheet*), to record what they think they know about carbon
- > discuss as a class the key knowledge and understandings from this activity, including the reasons they have for these understandings.

INQuIRY focus: **Introduce**

The focus of the *Introduce* phase is to spark students' interest and engagement, stimulate their curiosity, and elicit their existing beliefs about the topic. Students' existing ideas and questions can then be taken into account in future lessons.

Assessment guide

Diagnostic assessment is an important aspect of the *Introduce* phase. In this lesson you will elicit what students already know and understand about:

- > carbon as a substance, a part of other substances (i.e. as a molecule, such as carbon dioxide)
- > where carbon can be found on the Earth.

Key lesson objectives

Science

Students will be able to represent their current understanding as they:

- > summarise their understanding of carbon as a substance, a part of other substances, and the places it can be found on Earth.

Literacy

Students will be able to:

- > contribute to discussions about carbon, its appearance, and the places it can be found on Earth
 - > record, sort and summarise their descriptions, explanations and ideas using words, drawings and graphic organisers.
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Teacher background information

Carbon is the key element that makes up everything on Earth. All life on Earth depends on carbon. Carbon is in nearly every substance that makes up all living things, and in many non-living things.

Carbon is the sixth element of the Periodic Table, located between boron and nitrogen. Its chemical symbol is C. Carbon is a very stable element and, as a result, it can exist in its elemental form, or as a compound with lots of other naturally occurring elements, including oxygen (e.g. carbon dioxide, carbon monoxide) and hydrogen (e.g. sugars, fats, oils, plastics).

In its elemental form, carbon has a number of different structures, or allotropes. These include an amorphous black granular powder, diamond, graphite and carbon nanotubes.

Carbon can be found in many objects that are used in daily life, including all plastic materials, petrol and gas, all living things, the carbon in your pencil and charcoal for the barbeque. Carbon is also able to be stored by the earth, as coal, oil and natural gas. Atmospheric carbon typically takes the form of carbon dioxide – a greenhouse gas.

Equipment

For the Class

- > Group worksheets:
 - *Carbon confidential – Group worksheet*
 - *Suspect No. 1 - Carbon – Group worksheet*
 - *Top secret carbon file – Group worksheet.*

For each Student

- > Approximately 3-5 sticky notes per student with more available if a student requires them.
- > Pencils/textas.

Preparation

- > Print out/redraw all Group worksheets to place up in the classroom.
- > Gather enough sticky notes to give each member of the group between 3 and 5.

Lesson steps

1. Explain to students that they are a team of detectives on the trail to find a criminal element called **carbon!** Place a picture of Suspect #1 – Carbon up in the room (see *Suspect #1 – Carbon – Group worksheet*).
2. Explain to students that to help them capture carbon, they first need to find out what they already know about carbon.
3. Tell students that a top secret confidential file (see *Top secret carbon file – Group worksheet*) has just been anonymously delivered that contains some information that could be helpful in the carbon case. Show students the confidential file and place an electronic copy on a screen so that students can read it. Help students to understand what the information in the file means (i.e. explain any new scientific terms etc.)
4. Place a large copy of the graphic organiser from the *Carbon confidential – Group worksheet* up in the classroom, (or redraw to the desired size). Explain each section of the graphic organiser to students using the following clarifying questions:

- **What personalities does carbon have?** - What does carbon look like? Can it change its appearance/ shape/colour? Can it combine with other substances to change its appearance?
 - **What tricks does carbon get up to?** Can it hide or become invisible? Can it combine with other substances? Can it keep out of our way somewhere where we can't touch it?
 - **Where does carbon hide?** Can it hide in the air/atmosphere? Can it hide in the ground? Can it hide inside things that are alive? Can it hide in things that are dead?
 - **How can we capture carbon?** Do we need to lure it in with other substances it likes to combine with? Can we mine it from the ground? Can we remove it from the atmosphere?
5. Provide students with sticky notes and pencils/texts. Ask students to write on a sticky note each piece of information that they already know or just found out about carbon and place it in the correct section of the graphic organiser.
 6. Use the sticky notes on the graphic organiser to facilitate a discussion about students' prior knowledge, understandings and misconceptions.