

LESSON PLAN — CLIMATE CHANGE

This unit introduces the concept of climate change as a result of human activities. It explores the carbon cycle and the use of finite fossil fuels for plastic and energy.

Learning outcomes

Students will be able to:

- outline how carbon moves around the world and through the earth in a cycle.
- discuss how carbon dioxide and other greenhouse gases occur naturally in the atmosphere and help to keep the Earth warm.
- recount that coal, oil and gas contain carbon that was in the bodies of plants and animals that died and were buried 65 million years ago. Oil is used to make plastic as well as supplying energy.
- Explain the link between burning fossil fuels and Climate Change.
- Acknowledge that climate change has happened many times before in Earth's history and that we have to adapt to it.
- Report on predicted effects of climate change.

Resources

- *EcoLogic: creating a sustainable future*, by McEwen S, Powerhouse Publishing, 2004. Chapter 1, pp 10–22
- Worksheet — The Carbon Cycle diagram
- Worksheet — Is there a dinosaur in your pencil case?
- Poster — The Greenhouse Effect
- Poster — The Carbon Cycle
- Useful websites:
 - Australian Academy of Science — The science of climate change: Questions and answers
<http://www.science.org.au/policy/climatechange.html>
 - Australian Bureau of Meteorology
<http://www.bom.gov.au>
 - CSIRO Climate Adaptation Flagship
<http://www.csiro.au/org/ClimateAdaptationFlagshipOverview>

Starting point

You are part of the carbon cycle. It's a system that transfers energy through all living things on Earth. The carbon cycle is driven by the Sun which provides energy that allows plants to capture carbon dioxide from the air and turn it into sugars in their leaves. When we eat the plants, the sugars are transferred to our bodies and we use the stored energy to power our bodies. In the process, the sugars are turned back into carbon dioxide that we breathe out into the atmosphere. All animals do this. When a plant or animal dies and is buried, the carbon in its body is buried with it. Sixty five million years ago, enormous forests and swamps were buried. Pressure turned them into coal, oil and gas which we therefore call fossil fuels. They contain vast stores of carbon compounds that can be burned for energy or transformed into plastics.

Activities

- Discuss the poster of the Greenhouse Effect, including the fact that the concentration of carbon dioxide in the Earth's atmosphere is increasing.
- Ask students to fill in arrows on the diagram of the carbon cycle handout, showing the direction of flow of carbon.

- Ask students to identify all the plastic (ex-dinosaurs and forests) in the room. Use the handout: Is there a dinosaur in your pencil case?
- Discuss changes in local weather based on historical records. You can obtain information from www.bom.gov.au
- Ask students to form groups to use the internet to research one of the following:
 - Current and predicted impacts of climate change on Australia
 - Current and predicted impacts of climate change on Pacific Islands like Tuvalu
 - Current and predicted impacts of climate change on Greenland
 - Current and predicted impacts of climate change on Europe
 - Current and predicted impacts of climate change on Asia
 - Current and predicted impacts of climate change on South America
 - Current and predicted impacts of climate change on Africa
 - Current and predicted impacts of climate change on the Inuit people of Canada

Results can include health, biodiversity, food and water security, weather, flood and fire risk, sea level change and social impacts.

Each group will report back to the class.

Written or oral assignment

- How can Australian people prepare for and adapt to the changes in climate that are expected to occur over the next fifty years?
- How can humans reduce the size of climate change in the future?