

Details



Completion Time: About 1 period

Permission: Download, Share, and Remix

Ecological Cycles Part 2 – Draw the Carbon Cycle

Overview

In this activity, students diagram the carbon cycle. A lot of the concepts presented here are necessary in order to fully understand the greenhouse effect and global warming. This lesson is presented as an activity to do before embarking on a study of the greenhouse effect and global warming.

Objectives

- Students understand that the total amount of carbon on Earth is constant.
- Students understand that limestone rock is by far the most important reservoir of carbon on Earth.
- Students understand that CO₂ in the atmosphere is one of the smallest reservoirs of carbon on earth, and that even small changes to the carbon cycle can have big impacts on atmospheric CO₂ concentrations.
- Students understand that burning fossil fuels releases carbon into the atmosphere that has been sequestered for millions of years.

Lesson Preparation

Since the carbon cycle is so complicated, it is a good idea for students to have previously studied the much simpler water cycle.

Procedure

- Show the Power Point
- Pass around hand samples of limestone, coal, peat, crude oil, gasoline.
- Have students build ball-and-stick models of elemental carbon (C), carbon dioxide (CO₂), carbonic acid (H₂CO₃), bicarbonate (HCO₃⁻), carbonate (CO₃⁻²), calcium carbonate (CaCO₃), and methane (CH₄) while chanting the chemical names out loud.
- Discuss
- Read through the handout

Materials

- Handouts
- Hand samples of limestone, coal, peat, crude oil, gasoline.
- Wooden ball-and-stick molecular model kits
- Power Point Presentation
- Examples of student work
- 11" x 17" sheets of paper
- Colored pencils, pens, crayons

- Show student work
- Turn students loose to complete the diagram

Extension

This assignment together with the energy non-cycle diagram are good ways to lead into a study of the greenhouse effect and global warming.

Resources

http://drake.marin.k12.ca.us/academics/rock/ROCK_Documents.htm

Assessment

The diagram is graded holistically. Emphasis is given to the clarity with which the concept of "cycle" is graphically expressed. Questions on a unit exam test specific content knowledge. For instance "Where is most of the Earth's carbon stored?"

Credits

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National Science Education Standards (NSES):

Content Standards, Grades 9-12

Content Standard C: Life Science

e. Matter, energy, and organization in living systems

Content Standard D: Earth and Space Science

b. Geochemical cycles

Content Standard F: Science In Personal and Social Perspectives

c. Natural resources

Other Standards:

N/A