



Fontenelle Forest Nature Center
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*Welcome to the natural world of Fontenelle Forest and Neale Woods Nature Centers!
Below is a guide to pre and post field trip activities that you can do with your students either indoors or on your school grounds. These fun activities will greatly enhance your students' field trip experience. We look forward to your students' arrival and are excited to provide them with a fun and educational experience. If you have any questions, please call us at 731-3140.*

Cool It

**The following activities meet Nebraska state standards
8.1.1, 8.1.2, 8.1.3, 8.1.4, 8.2.1, 8.3.3, 8.5.1 & 8.6.1**

1) Carbon Cycle Game

Adapted from Project Learning Tree and prepared by Karen Malhiot, Fox Point, Wisconsin

Grade Level(s): Middle School

Time: 1-2 class periods

Lesson Outcomes: Students will learn about the natural process of the carbon cycle and humans' impact on this cycle.

Materials: Teacher will need to make cards for each station and a record sheet for students to record their journeys through the cycle.

Background:

Natural cycles, such as the water cycle, are often depicted as circular routes, so students often think that elements just travel in a circle through the cycle. The carbon cycle is a series of processes (photosynthesis, respiration) through which carbon atoms on the Earth move. It is interesting to note that the same carbon atoms here today were here during the time of dinosaurs (some of these became fossil fuels) and since the Earth began. The carbon cycle is a natural process that allows carbons to move and be used when in balance. This lesson starts by having the students explore a "simple natural carbon cycle." In this cycle, plants absorb carbon dioxide from the atmosphere and use water to make the substances they need for growth. This process of photosynthesis incorporates the carbon atoms from carbon dioxide into sugars. Animals eat the plants and use the energy in these sugars to live. Other animals eat these plant-eaters and then use the carbon for their own needs. These animals return carbon dioxide into the air when they breathe. When they die, the carbon is returned to the soil during decomposition. The carbon atoms in soil may then be used in a new plant or microorganism. Man has impacted this cycle in many ways from increasing the amount of carbon released from sources (fossil fuels, wood) and deforestation.

Directions:

1. Briefly give students an overview of the carbon cycle.
2. Set up one station for each location in the carbon cycle: atmosphere, plants, animals, soil/earth (if decomposers and the ocean are included). At each station, have a series of cards that explain how the carbon moves from that station. For Example:
 - a. Plants - You were eaten by a rabbit, go to animal. Or, you were released to the atmosphere when the plant respired at night, go to atmosphere.
 - b. Atmosphere - You were absorbed by a plant during photosynthesis and made into sugar, go to plant. You were lifted to the upper atmosphere, stay at atmosphere.
3. Explain to students that they will each be a “carbon atom” and will move through stations in the carbon cycle (when a signal is given). Have students record their journey as they move through several rounds of the game.
4. After 7-10 rounds of the game, have students discuss their journeys. Students will see that all journeys are different and that in the natural cycle, there are certain places that hold carbon.
5. Once the students seem comfortable with the cycle, have them think of ways that humans impact this cycle. You may want to have them try to recreate the game with stations and card changes that show how humans have impacted this cycle. Then play the game and see how it changes the journey. Assessment: You may want to have students write a story explaining the journey they made as a carbon atom. This can be used to assess their understanding of the cycle.

Literature Cited/References Websites:

- VisionLearning.com
- The Carbon Cycle Book: How We Know What We Know About Our Changing Climate
- Scientists and Kids Explore Global Warming by Lynne Cherry and Gary Braasch

2) Make a weather station at your school to track local weather patterns.

You will find lesson plans and directions at:

<http://www.ciese.org/curriculum/weatherproj2/en/lesson1.shtml>

3) A board game to play can be found at:

<http://www.eol.ucar.edu/apol/activity4.pdf>

4) Additional Resources/Activities

Wonderful activities for the classroom from the United States Environmental Protection Agency’s Climate Change, Wildlife and Wildlands Toolkit for Formal and Informal Educators: <http://www.epa.gov/climatechange/wycd/school.html>