A Story about the Carbon Cycle

Grades: 4-8

Objectives:

- Students understand the process of the carbon cycle
- Students identify different examples of biomass
- Students recognize human effects on carbon dioxide levels in the atmosphere

Summary:

Prior to their Mobile Museum visit, the students perform an activity that demonstrates the carbon cycle and how humans affect the levels of carbon dioxide entering the atmosphere. After the activity, students engage in a small and large group discussion about what the carbon cycle is, and how the carbon cycle affects the Earth's atmosphere. During their Mobile Museum visit, students read information on the carbon cycle, as well as identify and compare different forms of biomass including oat hulls, wood chips, and miscanthus. Following their visit to the Mobile Museum, students engage in an activity to solidify the concept of how carbon dioxide is added to the atmosphere by human activities, such as burning coal, and how the carbon cycle interacts with biomass to help reduce the net amount of carbon dioxide in the atmosphere.

Next Generation Science Standards:

Earth and Human Activity

- 4-ESS3-1 Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
- 5-ESS3-1 Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
- MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

- MS-ESS3-5 Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

Materials:

- 2 clear, large bowls with measurement units for fluid ounces and filled with water
    - You can mark the bowl with lines in centimeters to indicate water levels
- 1 large measuring cup
- 2 medium measuring cups
- 2 small measuring cups
- Food coloring
- Labels

Prior to Exhibit Engagement Activity:

- The activity is designed to assist students in developing a conceptual model of the carbon cycle after engaging in the mobile museum exhibit.
- This activity is designed to assist students in developing an understanding of the difference between burning coal and other materials. The activity is a story that is split up in paragraphs where students will observe the changes in the amount of carbon dioxide in the Earth's atmosphere as the story progresses.

Activity Setup

- Label the two clear, large bowls so that one bowl is known as "The carbon dioxide in the atmosphere" and the other bowl is labelled "Potential carbon dioxide to be released. Ensure the bowls are clearly marked so students can visualize the change in water depth as water enters and leaves the bowl.
- Cut the story into 6 paragraphs

Activity Procedure

- Separate students into groups of four to five.
- Distribute one paragraph to each of the groups along with the activity worksheet.
- Allow students time to read through their paragraph in their groups.
- One group at a time, students come to the front of the room and read their paragraph in the correct order of the story. As the paragraph is read by one student in the group, the other students in the group will perform the action indicated after the paragraph.
- Before each paragraph is read, allow groups time to take notes on the actions that are occurring in the story, make a prediction on what will happen along with their reasoning, and how the water level of the carbon dioxide in the Earth's atmosphere is changing.
- After each paragraph is read, allow the students to write the results about how the level of carbon dioxide has changed and why.