Clear into the Classroom

LESSON PLAN

The Water Cycle

OBJECTIVES:
1. Understanding of the term "cycle," and that the water cycle (also known as the hydrologic cycle) is a closed system.
2. Understanding of the stages of the water cycle and how water affects land. Water keeps moving and changing from a solid to a liquid to a gas, over and over again.

OVERVIEW:

Students will learn about the various stages of the water cycle through hands-on activities using easy-to-access materials. The unit will consist of four 40-minute lessons, plus an optional fifth lesson.

STANDARDS ADDRESSED:

NGSS K-ESS2-1: Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.
NGSS K-PS3-0: Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem.

MATERIALS:

- Multiple 1-2 liter bottles
- 60cm heavy cotton string (wick)
- Soil
- Water
- Ice
- Moss and plant seeds
- Tools to cut and convert bottles (scissors, paper punch, awl, tapered reamer, razor in a safety holder)
- Clear tape
- Copies of Zappo board (see **Appendix**)
- Cut up pieces of construction paper, beans, unpopped popcorn, etc. to use as markers
- Various worksheets that accompany the lessons (see **Appendix**)

ACTIVITY STEPS:

Lesson 1:
Review the three states of water (solid, liquid, vapor [gas]). Initiate review about the differences between weather and climate and what the climate is in students' part of the country vs. what is the weather that particular day. Students often mix up and interchange these terms. Discuss what people consider desirable

weather for various activities: a picnic, going swimming, sledding and skiing, farming, and other examples. Explain that water we drink has been around since the dinosaurs and keeps returning through a process called the water cycle. We will build a water cycle of our own.

Lesson 2:
See USGS Water Cycles (in **Appendix**). Teachers should make either a poster or a transparency or connect to internet for projection. If desired, visit http://ga.water.usgs.gov/edu/watercycle-kids-beg.html for interactive poster of the Water Cycle. This is available at three different levels: beginner, intermediate, and advanced. Use posters to discuss the water (hydrologic) cycle. Emphasize and clarify vocabulary words: water cycle, evaporation, condensation, precipitation, groundwater, runoff, seepage, snowmelt, ocean, river, stream, lake, transpiration, watershed.

Explain that when humans exhale, moisture (vapor) comes out of their mouths. An example is that when we breathe on a mirror or glass we leave some "fog" on it. Plants take in water through their roots. It passes through the plant and is given off into the atmosphere. This is called transpiration. Also discuss the fact that not all water runs off into streams, lakes, etc. but that some infiltrates the earth and forms streams and lakes below the surface called groundwater. This would be a good time to introduce the concept of a **watershed**: the area of land where all of the water that falls in it and drains off of it goes into the same place. Discuss where the water flows that lands where students live.

Students will learn either of the two versions of the "Raindrops Song" (see **Appendix**), simple or expanded, to help with terms. Possible collaboration with music teacher.

Lesson 3:
Use directions and diagram taken directly from link below to build a water bottle terrarium and show that the water cycle is a closed system (see Appendix): http://water.epa.gov/learn/kids/drinkingwater/upload/The-Water-Sourcebooks-Grade-Level-3-5.pdf Keep in classroom for observation and discussion. If possible, have the plastic bottle water cycle near a window so that students can keep track of time between initial planting of seeds, germination, and growth. Teach the "Water Cycle Song" (see **Appendix**). Use Water Cycle Word Find for further review (see **Appendix**).

Lesson 4:
Review by playing Zappo (resembles Bingo). Students will fill in vocabulary words randomly on Zappo Board (see **Appendix**). Teacher will read definitions (see **Appendix**) of the science concepts and students will mark until someone gets "Zappo." Decide in advance what will make a winner—vertical, horizontal, 4 corners, etc. Be sure to mix them up and keep track of what you read first, second, etc. Teacher circulates around the room while reading the definitions to help determine how easily the concepts come to the students.

ASSESSMENT:

"The Returning Raindrop" (see **Appendix**), from http://water.epa.gov/learn/kids/drinkingwater/upload/The-Water-Sourcebooks-Grade-Level-3-5.pdf

Lesson 5 (Optional):
Water Filtration Demonstration (see **Appendix**)

EXTENSION (OPTIONAL):

Work in small groups to make up new lyrics for common songs about water in their lives.
(*Jingle Bells, I've Been Working on the Railroad,* etc.)

APPENDIX:

USGS Water Cycle (elementary)
USGS Water Cycle (advanced)
Raindrops to Clouds Song
Bottle Terrarium and Directions
Water Cycle Song
Water Cycle Word Find
Zappo Board
Zappo Teacher Definitions
The Returning Raindrop (optional assessment)
Water Filtration Demonstration