

Water Woes

Lesson Focus: Water Conservation and Non-renewable Resources

Learning Objectives:

- Students will examine the state of the Earth's natural fresh water resources.
- Students will define conservation and discuss why it is essential to protect the Earth's natural resources.

Enduring Understandings for the Lesson:

- Every person, animal and plant on Earth needs water to survive. Every species on this planet is impacted by the way in which we manage the Earth's water supply.
- There is a fixed amount of water on Earth, therefore it is essential for each of us to conserve and protect the Earth's water supply.

Georgia Performance Standards Addressed:

- **S3L2. Students will recognize the effects of pollution and humans on the environment**
 - a. Explain the effects of pollution (such as littering) to the habitats of plants and animals.
 - b. Identify ways to protect the environment.
 - c. Conservation of resources
 - d. Recycling of materials
- **S3CS5. Students will communicate scientific ideas and activities clearly.**
 - c. Use numerical data in describing and comparing objects and events.
 - d. Locate scientific information in reference books, back issues of newspapers and magazines, CD-ROMs, and computer databases.
- **SS2E1. Student will explain that because of scarcity, people must make choices and incur opportunity costs.**

Grade Level: 2nd- 3rd

Materials:

- Strass, Rochelle. One Well: The Story of Water on Earth. Publisher. Kids Can Press, 2007. ISBN: 1553379543
- Empty, gallon milk jug
- 1 or 2- tablespoon and 1- teaspoon measuring spoons
- One jug of water or flavored punch

- 1- package of 10z. or higher plastic cups (enough for whole class)
- Access to a library
- Get Water Wise worksheet from <http://www.timeforkids.com/TFK/media/teachers/pdfs/2002F/020913WR1.pdf>

Time Needed: 1-2 class periods

Background Information:

Although, over 70% of the Earth's surface is water, 97% of that water is salt water and it is not suitable for drinking. Only three percent of all the water on Earth is fresh water, and only 0.3% percent is available for people to use for drinking water. Every person, animal and plant on Earth needs water to survive. With all the people on Earth relying on such a small percentage of all the water on Earth, it only makes sense that we must preserve and conserve our water. We must not pollute our water because we cannot replenish it. The amount of water today is the same as it was when the dinosaurs roamed. We do not have an endless supply of water. We must preserve its quality. Water is the foundation of food and life. Second to air, water is our most precious resource. We cannot live without water. Saving water helps to preserve our environment and humankind.

Some people do not realize the importance of water, and they are continually polluting it. Only about ten percent of wastewater is disposed of properly. The average Georgia uses 100 gallons of water each day. However, the average number of gallons actually needed to sustain life is only about 13 gallons. Since we all enjoy the benefits of having pure, clean water, we must help conserve water so that we may continue to enjoy these benefits. More than 1.2 billion people do not have access to a safe and adequate water supply. It is our responsibility to learn more about water conservation. In addition, we need to help keep our water pure and safe for generations to come so that we may continue to enjoy these benefits years from now.

Learning Procedure:

Day One: Engagement:

1. Have students brainstorm ways in which they use water every day whether for home, school, recreation etc. List ideas on the board and discuss different uses of water.
2. Ask the students where they think the water comes from and to consider how they would function and complete their daily tasks if there was a shortage of water. Discuss and list ideas on the board.
3. Read, **One Well: The Story of Water on Earth** to the class and share reactions.

Exploration: *modified from Project Wet: Drop in a Bucket*

4. Ask students if they know how much available fresh water there is on the Earth.
5. Next fill a milk jug to show a gallon of water. Explain that this gallon represents all of the water in the world.
6. Call on volunteers to scoop out 3 tablespoons and 1 teaspoon full of water. The students will place the water in a clear container. This amount represents the amount of fresh water on Earth. The rest of the water left in the gallon jug is salt water.
7. Next, ask another student to remove 2 tablespoons from the smaller container to represent the amount of water trapped in glaciers or that is too deep in the ground for recovery.
8. The remaining water in the second container represents the amount of water that is fresh and available for use. This fresh water, which is less than 2% of all water globally, is available to support human needs for agriculture, drinking, and washing. It also fills lakes, rivers, and fresh water ecosystems.
9. Close the exploration activity by asking students to define the word, conservation: *protecting and managing our natural resources and environment so that they are here for future generations*. Briefly discuss what might be ways to conserve fresh water since there is so little. Students should jot down their thoughts in a journal.

Day Two: Explanation

10. Remind the students that every person, animal and plant on Earth needs water to survive. Since the Earth's water supply cannot be replenished, it is important for us to be considerate and to manage water usage to ensure that everyone has an ample supply of water for his or her needs.
11. Present to the students a candy brainteaser scenario. *Imagine you have just a bag of candy and have six friends who want some. How are you going to divide it up? Do you give everyone an equal amount, do you give some to the first person who asks, or do you give your best friend more?* Students share their solutions with the class.
12. Arrange students in small groups around tables in the classroom. Starting at one end of the table, have the students pour out as much water as needed, and then pass the jug to the next student at the table.
13. Teacher should explain that they should not drink the water until each student has water in their cup. (Because of the limited amount of water in the jug, there might not be enough water in the jug to go around the group.) Teachers should monitor and observe to assess the reactions of the students who did and did not receive water to drink and record.
14. Ask students what they should do to make sure they all get water. Students should attempt to self-correct passing out the water.

15. Homework: Have students independently complete the worksheet, GET WATER WISE

Evaluation:

Use the attached rubric to score students based on their response to discussion/dialogues, written reflections to daily questions, participation and completion of activities.

Extensions:

1. Have students put together a booklet of ways to conserve water. Give each group a specific area to investigate, such as water conservation at home, outside, in the garden and/or at school. Students can then organize a campaign for the school community on ways to manage and conserve water. Have them create poster displays, PowerPoint and/or pod cast describing the benefits and human responsibilities to conserve water. Students will use the library and the Internet to gather research and facts.
2. Have students research and write journal entries as if they were a person living with water scare issues. The student will describe how having little available water impacts his or her daily living. The student should include in the entry reflections about how they get their water, what they use the water for, and choose one reason why they wish they had more water to complete the daily task.
3. Ask students to determine how much water is wasted from a slowly dripping faucet during a 24-hour period by doing the math on how much water is collected in 10 minutes.

Resources:

Conserve Water Georgia - <http://www.conservewatergeorgia.net/>

- Local resources for the public to use to conserve water.

Georgia EPD – Drought and Water Use Information -

<http://www.gaepd.org/Documents/outdoorwater.html>

- Local state information on the current availability of water.

University of Georgia: Every Drop Counts - http://www.uga.edu/aboutUGA/water_tips.html

- A source for comprehensive water litigation as well as local tips and hints for saving water in Georgia.

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This activity is a product of the Rivers to Reef Educators Workshop sponsored by the Georgia Aquarium and Gray's Reef National Marine Sanctuary in which the author participated. For more information about this workshop, Georgia Aquarium, or NOAA Gray's Reef National



Marine Sanctuary, please visit our websites at www.georgiaaquarium.org or <http://graysreef.noaa.gov/>



Water Woes - Grading Rubric

Student Name _____

	0-4 Points	Comments
Participation in activities		
Evidence of problem solving with candy/water sharing activity		
Completion of homework assignment		
Thought used to answer questions asked by teacher		

Total Score:

Total Points	Final Grade
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