

Gimme a Gallon

Science Enhanced Lesson – Grade 3



TOPIC

Water Conservation

SCIENTIFIC AND ENGINEERING PRACTICES

3.1

The student will demonstrate an understanding of scientific and engineering practices by (b.) planning and carrying out investigations.

- Estimate length, mass, volume, and temperature
 - Measure length, mass, volume and temperature in metric and U.S. Customary units using proper tools
-

EARTH RESOURCES

3.8

The student will investigate and understand that natural events and humans influence ecosystems. Key ideas include (a.) human activity affects the quality of air, water, and habitat; (b.) water is limited and needs to be conserved.

BACKGROUND INFORMATION

Planet Earth is covered in water. In fact, about 70 percent of Earth's surface is covered in water. However, only 2.5 percent of this water is freshwater. Out of the 2.5 percent of freshwater, much of it is trapped in glaciers and snowfields. As a result, only one percent of Earth's freshwater is accessible for use.

Though we have limited access to fresh water, every person uses about 80-100 gallons of water per day. We rely on local companies like Virginia American Water to distribute water to our homes, businesses and schools for safe use. After we use this clean water

for things like bathing, cleaning and cooking, we send our dirty water to wastewater utilities like AlexRenew. Wastewater utilities clean our dirty water before releasing it back into the environment.

Because we rely on water to live, and we only have access to a limited amount, it is important to conserve and protect our water resources.

MATERIALS FOR TEACHER

- 1 globe (or world map)

The following materials can be provided to the teacher or the number of groups a teacher has designated for this activity in his/her class.

- 1 one-gallon jug (empty and clean)
- 1 two-cup measuring cup
- 1/8 measuring spoon
- 1 clear plastic cup or glass
- Clean water (approximately 11.2 cups of clean water)
- Tape

MATERIALS FOR STUDENTS

- 100 copies of the one-gallon jug handout
- Access to a large wall or space for displaying handouts

VOCABULARY

- Glacier, fresh water, salt water, snowfields, gallon

AVAILABLE HANDOUTS

- Water Cycle Graphic
- Water Cycle Labels

STUDENT/TEACHER ACTIONS

OPTION 1: TEACHER LEADS

OPTION 2: BREAK STUDENTS UP INTO GROUPS AND PROVIDE THE MATERIALS LISTED ABOVE TO EACH GROUP.

TEACHER LESSON INTRODUCTION:

1. Hold up a globe and let students observe Earth's surface. Pass the globe around to each student.
2. Ask the students to pay attention to where their hands are on the globe. Tell them to observe whether or not any part of their hands are touching water when holding the globe.
3. After everyone holds the globe, ask the students to raise their hand if they were touching water when holding the globe. A majority of students should raise their hands.
4. Share that a lot of the Earth's surface is covered in water.
5. Ask the students, "How much of Earth's surface do you think is covered in water?"
6. After taking some guesses from students, turn their attention to an empty one-gallon jug.
7. Tell the students the jug is going to represent planet Earth. Tell the students you are going to fill the jug with water. The amount of water poured into the jug will represent the amount of water found on planet Earth.
8. Gradually pour, or have a student gradually pour, approximately 11 and 1/4 cups of water into the empty jug. As you, or the student, fill the empty jug, occasionally pause and ask the class if they think you have poured enough water to represent all the water found on Earth.
9. After you fill the jug with approximately 11 and 1/4 cups of water, tell the students that you have just filled 70 percent of the jug with water. Share that approximately 70 percent of Earth's surface is covered in water.
10. Hold up the filled gallon jug and ask students, "If this jug represents the water we can find on Earth, how much of it do you think we have access to and can use?"
11. Take some guesses from the students.
12. Share that much of Earth's water is salt water found in oceans and cannot be used for life. Point to some oceans on the globe.
13. Share that we can only use fresh water. But even some of the freshwater is trapped in glaciers and snowfields.
14. Share with students the only amount of fresh water we can use is about 1 percent of Earth's fresh water.
15. Pour, or have a student pour, approximately an 1/8 teaspoon of water from the jug into a clear glass or cup.
16. Hold up the cup so all the students can see. Share with the students the amount in the cup represents the approximate amount of Earth's fresh water we can use.

TEACHER ACTIVITY INSTRUCTION:

1. After pointing out we have limited fresh water available, ask the students “How many gallons of water do you think every person uses in a day?”
2. Take some guesses from the room.
3. Share with the students that you are going to do an activity that shows how many gallons of water we use.
4. Pass out all 100 gallon-jug handouts to the students. Each student will receive 3-5 handouts.
5. Tell the students to brainstorm ways they use water every day and write it on their gallon jug handouts.
6. After they’ve had time to brainstorm and document ways they use water, share that you are going to review some tasks that are part of a daily routine and the amount of water used for each task.
7. As you share the amount of water used for each task listed below, have students hang the noted amount of gallon jug pictures in an allocated space. Multiple students will have to hang their pictures to add up to some volumes.
 - Hand-washing dishes – approximately 20 gallons
 - Running dishwasher – approximately 15 gallons per load
 - Using garbage disposal – approximately 3 gallons per day
 - Washing clothes – approximately 35 gallons for a full load
 - Shaving – approximately 3-5 gallons each shave with water running (have students hang 3 gallons)
 - Bathing in tub – approximately 15 gallons when bathtub is full
 - Brushing teeth – approximately 2 gallons each time with water running
 - Washing hands – approximately 2 gallons per wash
 - Flushing toilet – approximately 5 gallons per flush, low-flow toilet is 2 gallons (have students hang 5 gallons)
8. All 100 copies will be distributed and displayed when finished with activity.
9. Share with the students that on average every person uses 80-100 gallons of water per day.
10. Share that Virginia American Water distributes about 14 million gallons of water per day to people in Virginia. That means, every day they distribute enough clean water to fill over 21 Olympic-sized swimming pools!

TEACHER ACTIVITY CONCLUSION:

- Share with the students that in today’s lesson you learned how much of Earth’s surface is covered in water (hold up gallon jug).
- You also learned how much fresh water we have access to (hold up clear cup).
- But if you look around the room, you’ll see how much fresh water we use every single day.
- Have the students brainstorm ways to conserve water. Write ideas on the board. Some ideas may include:
 - o Turn off water when brushing teeth or shaving
 - o Only run dishwasher and washing machine when full
 - o Take a quick shower
 - o Don’t fill the bathtub – only use water needed
 - o Install low-flow faucets or toilets
- Encourage kids to conserve water at school and at home.

ASSESSMENT

QUESTIONS

- Why is it important to conserve water?
- What is one change you can make at home/school to help conserve water?

JOURNAL/WRITING PROMPT

- Imagine a day without water. What would the day be like for you?
- Imagine Virginia American Water can only deliver 10 gallons of water to your house per day. How would you change your daily routine?

EXTENSIONS AND CONNECTIONS

- Hang one-gallon jug handouts in the hallway or other public display area to bring awareness to the amount of water used per day.
- Have students agree on one or two actions the class can take to conserve water at school. Students can sign a classroom pledge.
- Have students reach out to the entire school or other classes to sign a water conservation pledge.

STRATEGIES FOR DIFFERENTIATION

- Build a model using 100 empty one-gallon milk/water jugs. Display in a central location for school-wide education.
- Have students tally water usage at school for one day.