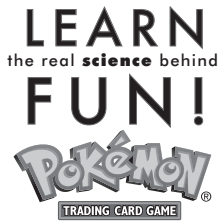


# How does NASA study water?

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## OBJECTIVE

To understand the uses of water and how to conserve it.

## BACKGROUND INFORMATION

About two-thirds of the Earth is covered with water, with the breakdown as follows:

- 97 percent oceans
- 2 percent ice caps/glaciers
- 1 percent fresh water

The average person in the U.S. uses almost 132 liters (~35 gallons) of water daily.

### Materials For the class:

- 20-liter (~5.3 gallons) container
- Measuring spoon (milliliter or tablespoon)
- Small plastic container
- Liter containers
- Sponge block pictures
- Student Sheets

Activity	Uses
Taking a bath	114 liters* (30 gallons)
Taking a shower	76 liters* (20 gallons)
Flushing a toilet	11 liters* (3 gallons)
Washing hands or face	8 liters* (2 gallons)
Brushing teeth	1 liter* ( $\frac{1}{4}$ gallon)
Drinking a glass of water	1 liter* ( $\frac{1}{4}$ gallon)

Astronauts conserve water in several ways. They don't use sinks with faucets. Instead, to wash, they wet a washcloth with a spray nozzle. Space Station showers only use 1 gallon of water. The toilet on the Space Station uses airflow to create suction to remove waste.

\* These numbers have been approximated for younger students.

## Pre-lesson Instructions

- Fill a container with 19 liters (~five gallons) of water.
- Duplicate the sponge block pictures. Each student will need 35 sponge blocks.
- The liter containers will be used to show the amount of water used by an average person on Earth. You will need 133 containers. If you do not have time to collect that amount, you may use paper representations of liter containers.
- Identify an area or container for students to return sponges blocks.
- Duplicate one Student Sheet per child.



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## PROCEDURE

1. Discuss the fact that although the Earth is called the water planet, very little of the water on Earth is usable for drinking.
2. Display the large container of water. Tell students to pretend that this is all the water found on Earth.
3. Ask a student or students to remove 517 milliliters (~35 tablespoons) of water. This will be placed in the smaller container. Tell them this represents all the water that is not in the ocean.
4. Ask another student to take out 15 milliliters (~ one tablespoon) from the small container. Tell the class that this represents all the water that is found in all the rivers in the world. Discard water after discussion.
5. Discuss the importance of not wasting the Earth's water.
6. Display 133 liter (~35 gallon) containers. (You may use paper models.) Tell students this is how much water the average person uses a day.
7. Distribute 35 duplicated sponge blocks per child. Designate a collection area for the sponge blocks as they are returned later by the students.
8. Have students put their names on their sponge blocks.
9. Tell students that each time they use water they are to write the time on their charts. Then, they are to return the appropriate number of sponge blocks to a designated area. Demonstrate how to cut sponge blocks into fourths to represent smaller amounts of water usage.
10. Demonstrate how students are to complete the chart. They will note the time they do each function listed on the student sheet. Show students where to return "used" sponges.
11. Continue the assignment for a 24-hour period.

## CONCLUSION

1. Ask students to compare their water charts. Did anyone run out of water?
2. Ask students to graph their results.
3. As a team, ask students to analyze their results. Who used the most water? The least? What were their strategies for conserving water?
4. Ask students to think of ways to conserve water. Create posters to share this information with others.

## EXTENSIONS

1. Write a story. Have students pretend that they only have three gallons of water to use. Ask them to explain how they would use it and why.



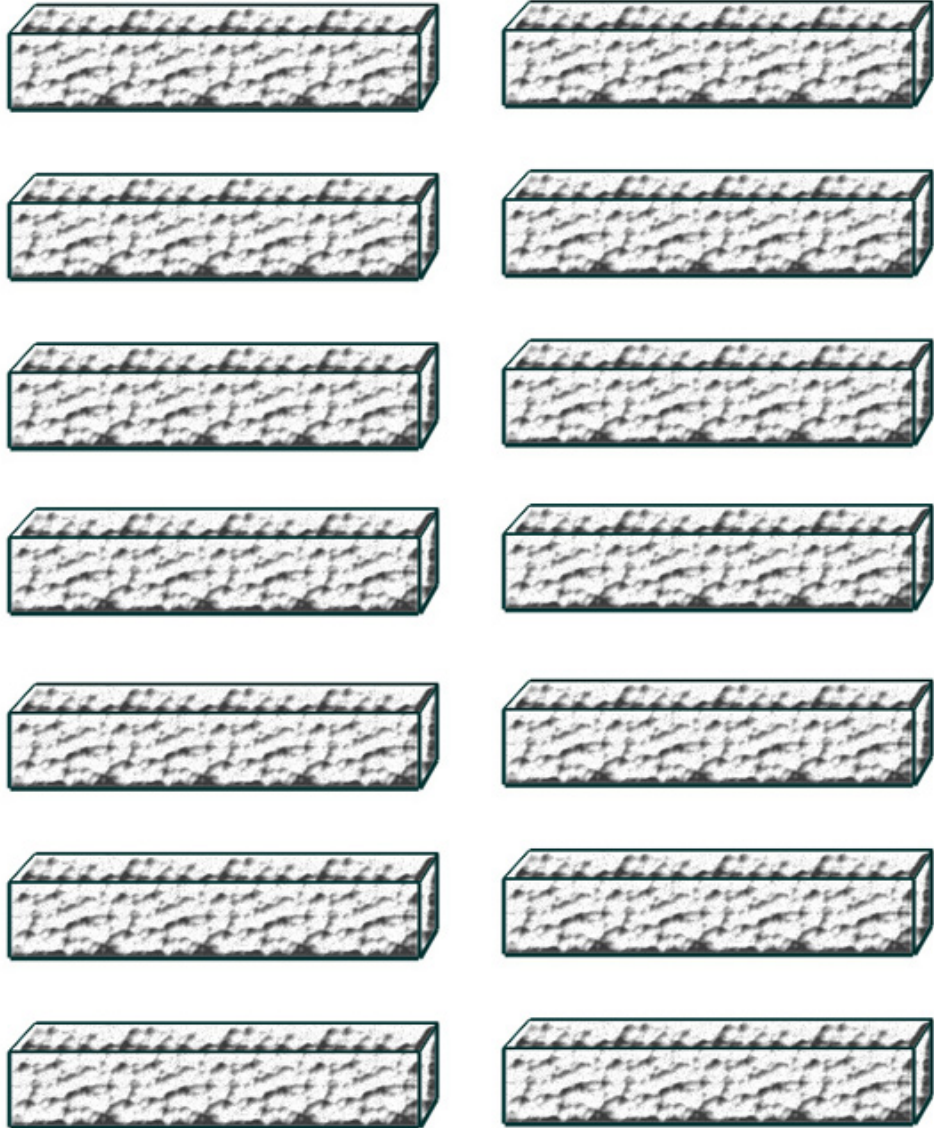
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**Sponge blocks: Duplicate 35 blocks per student**



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*Keep a record of the water that you use.  
 Refer to this chart for amounts.*

<b>Water Use</b>	<b>Time you used the sponge:</b>
<b>Example:</b> <b>Taking a bath/shower</b> <b>Return 30 sponge blocks for a bath or 20 sponge blocks for a shower.</b>	<b>Shower</b> <b>7:00 P. M.</b> <b>20 sponge blocks used</b>
Taking a bath/shower  Return 30 <b>sponge blocks</b> for a bath or 20 sponges for a shower.	
Flushing toilet Return three <b>sponge blocks.</b>	
Washing hands/face Return two <b>sponge blocks.</b>	
Drinking a glass of water Return $\frac{1}{4}$ of a <b>sponge blocks.</b>	
Brushing teeth Return $\frac{1}{4}$ of a <b>sponge blocks.</b>	
Total <b>sponge blocks</b> returned:	

