



The Blue Planet

Why do we call our planet Earth when its surface is mostly water?

GRADE LEVEL

- 3-6

SUBJECT AREAS

- Earth Science, Geography, Math

SKILLS

- Gather, Analyze, Interpret, Present, Technology

VOCABULARY

Attitude, climate, equator, fresh water, latitude, percent, probability, random sample, salt water, watershed

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- Additional Educator Resources

MEASURABLE OBJECTIVES

The learner will:

- Estimate the percentage of Earth's surface that is covered with water.
- Explain differences between salt water and fresh water.
- Discuss the percentage of fresh water available for humans to use in relation to all water on Earth.

BACKGROUND AND TEXT OVERVIEW

INTRODUCTION

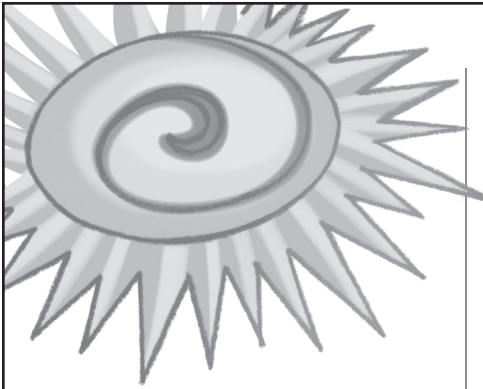
From space, our planet appears mostly blue due to the great amount of water found at its surface. About three-fourths of Earth's surface is covered with water. Relatively little of this large amount of water is usable fresh water. The rest is salt water in the ocean or is frozen as ice at the North and South Poles. Think of it this way: If all the water in the world fit into a bathtub (about 30 gallons or 114 liters), fresh usable water would fill slightly more than a teaspoon.

OUR BLUE PLANET

The majority of Earth's surface is covered by water. The percentage of Earth's surface that is covered by water is about 71 percent, or almost three-fourths. From space, our planet appears mostly blue due to the great amount of water found at its surface. Why blue? For our planet's beautiful blue color, we can thank the sun and the amazing ways of light. All colors are mixed within sunlight. When sunlight falls on the ocean, most of the colors are absorbed completely. However, the color blue is absorbed the least, so the planet looks blue.

SALT WATER AND FRESH WATER ON EARTH

Most of the water on the surface of the Earth is contained in the ocean and seas where it is salt



water. Salt water is water containing about 3.5 percent salts, or minerals. Minerals from gases that enter the ocean through cracks in the ocean floor and rocks and soils that wash from the continents give the ocean its salty taste. About 97 percent of the Earth's water is salt water, 2 percent is locked in the glaciers and polar ice caps, 0.5 percent is too polluted to use unless it's purified and 0.5 percent is usable fresh water (or water that doesn't contain a large percentage of salts). This fresh water must be shared among all people, plants and animals on Earth. People

use water not only for drinking but for bathing, washing clothes, flushing the toilet, to generate electricity, run factories, etc. It's very important to conserve as much fresh water as possible.

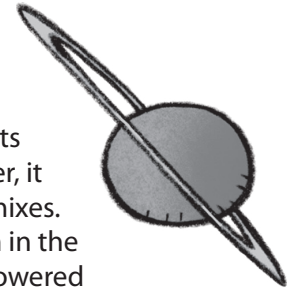


WATER AND LIFE

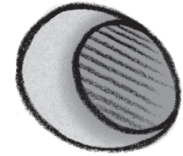
There are many things we need, such as shelter and clothing, but at the core there are four factors necessary for life to exist: soil, air, sunlight and water.

WEATHER AND CLIMATE

Climates and weather patterns around the entire planet are largely caused by the ocean, because it plays such a large role in the circulation of energy, water and carbon. The ocean absorbs, stores and moves heat, energy and carbon. Surface currents carry warm water toward the poles from the equator. Deeper currents carry cold water toward the equator from the poles.



When cold water meets warm water, it rises and mixes. Circulation in the ocean is powered by wind and tides, the sun, Earth's rotation and water density.



ATTITUDE IS EVERYTHING

Is it hot or dry where you live? Or do you have lots of rainy or misty days? How about deep snows and freezing temperatures? Your attitude (thoughts and feelings) about saving water and using it wisely depends on where you live in the world. For example, if you live in the mountains of Western Montana, where there's lots of snow and rain, your attitude about saving water is probably quite different from a kid living



SOIL

Soil is the result of rock that has been broken down by physical and/or chemical processes called weathering. Soil contains decomposed (decayed) plants and animals. Soil provides plants with minerals and nutrients and helps transport water to plants' roots.

WATER

Water is the combination of two colorless and odorless gases—hydrogen and oxygen. It is needed to dissolve and carry food and waste within organisms.

AIR

Air is a mixture of numerous gases including nitrogen, oxygen, hydrogen, carbon dioxide, neon, helium and others. During plant photosynthesis, carbon dioxide is used to build sugar. Respiration (oxygen intake and carbon dioxide release) helps many plants and animals metabolize (convert into energy) sugar in their cells. This burning of sugar supplies energy to living things.

SUNLIGHT

The sun illuminates and warms Earth's surface. Plants use the sun's energy to make sugar from carbon dioxide and water—a process called photosynthesis. Sunlight and soil are used directly by plants and indirectly by animals. Animals get their nutrients and energy from plants or from animals that eat plants.

in the Gobi Desert. A young person in the Brazilian rain forest probably thinks differently about water than a young native of the Kalahari Desert.

ACTIVITIES

BLUE PLANET ACTIVITY

Please see *Blue Planet Activity* student copy page.

ANSWER KEY

Answers will vary

TAKE ACTION!

POSTER ITEMS

1. I will shop smart by taking my own reusable bags and recycling plastic shopping bags.
2. I will recycle and reuse glass, plastics and cardboard.
3. Turn off the water while brushing your teeth, washing your hands and shampooing.

ACTIVITIES

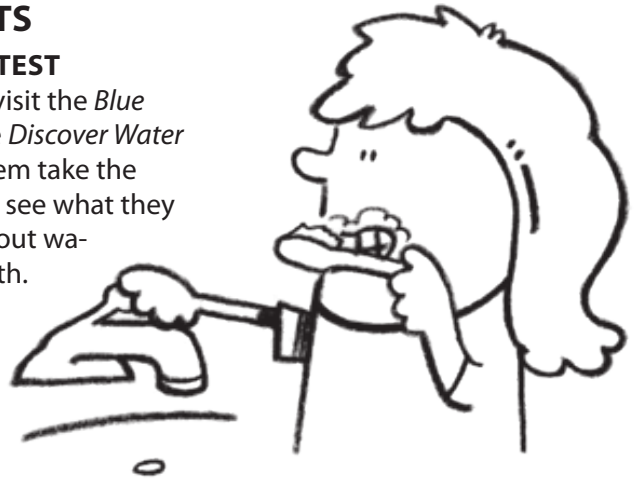


ASSESSMENTS

PRETEST/POSTTEST

Before students visit the *Blue Planet Unit* of the *Discover Water* website, have them take the following quiz to see what they already know about water on planet Earth.

Have students take the same quiz again as a posttest to measure learning.



Please see Blue Planet Pretest/ Posttest Student Copy Page.

PRETEST/POSTTEST ANSWER KEY

1. True
2. True
3. True
4. All of the above
5. Hydrogen and oxygen
6. True
7. True

CRITICAL THINKING QUESTIONS

LEVEL 1

If there is so much water on Earth, why is only a small portion of it drinkable?

Answer should include discussion about how much—3/4 or about 75%—of the water on Earth is salt water and that humans can't drink salt water.

LEVEL 2

Why do we call our planet Earth when its surface is mostly water?

Answer should include discussion about how much of the water on Earth is salt water, and therefore not necessarily usable for humans, also that humans live on land and are focused on our lives on land and the fresh water we use.

LEVEL 3

What is your attitude about water? How is it influenced by where you live? Compare your attitude with the ideas about water in other areas.

Answer should be an opinion piece with reasoning to explain the student's attitude about water and include discussion of the local climate, ways water is used in your area and how that affects local people's attitudes. Discussion should also include mention of different climates and how that might affect attitude about water.

WHAT DID I LEARN? ONLINE QUIZ ANSWER KEY

Q. How much of Earth's surface is covered with water?

A. Three-fourths

Q. Earth is called the Blue Planet because there is so much water at its surface?

A. True

Q. If all the water on Earth fit into a 30 gallon (114 liter) tub, the amount that is fresh water would fill slightly more than a:

A. Teaspoon

Q. The difference between salt water and fresh water is that salt water contains more natural dissolved salts.

A. True

Q. There are actions one person can take to make a difference in the health of the Blue Planet.

A. True

EXTENSIONS

Ideas for ways to support and expand lesson plans about this topic or provide additional activities for advanced learners.

- Become pen pals with someone from a different climate and compare your attitudes about water
- Research major bodies of water on each continent
- Have students make salt water using the same proportions as sea water

RESOURCES

PROJECT WET RESOURCES

Project WET KIDS (Kids in Discovery Series) Booklets

- [Discover Floods](#)
- [Discover Marine Mammals](#)
- [Discover Ports and Harbors](#)
- [Discover Recycling, Take Action!](#)
- [Discover Sea Turtles](#)
- [Discover Drought](#)
- [Explore Oceans](#)
- [The Water Story](#)

- [Water, Every Drop Counts](#)

Project WET Curriculum and Activity Guide 2.0 Activities

- [A Drop in the Bucket](#)
- [Blue Planet](#)
- [Common Water](#)

ADDITIONAL STUDENT RESOURCES

Eales, Philip. 2007. *Map: Satellite*. New York, NY: Dorling Kindersley, Inc.

Hooper, Meredith. 2008. *A Drop in My Drink: A Story of Water on Our Planet*. London, UK: Francis Lincoln Children's Books.

ADDITIONAL EDUCATOR RESOURCES

Strahler and Strahler. 2010. *Introducing Physical Geography*, Fifth Edition. New York: John Wiley and Sons, Inc. Publishing Company.

Vowell, Julie and Marianne Phillips. 2007. A Drop through Time. *Science and Children*, 44 (9), 30-34.



Blue Planet Activity

For the Blue Planet Activity online, you will use the power of probability and will sample random points on the surface of a globe to determine if your results coincide with what you know about the proportion of land and water on Earth's surface.

In theory, a random sampling of 100 points on an accurate globe would yield 71 points on water and 29 points on land. The number of samples, or the sample size, is important. The larger the sample size, the more accurate the results obtained. In the online activity, the sample size is 25 points. To get a more accurate result, use the chart below to keep track of your classmates' results, or multiple turns of your own. You can then use the formula below to see if a larger sample size gave more accurate results.

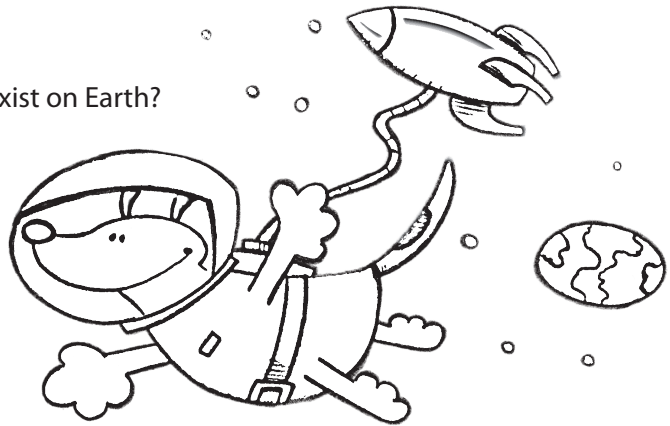


| | | | | | | | | | | | | | | | |
|------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Number of turns | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| Clicks in water | | | | | | | | | | | | | | | |
| Total number of clicks | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |

$$\frac{\text{TOTAL \# OF CLICKS IN WATER}}{\text{TOTAL \# OF CLICKS}} \times 100 = \text{PERCENTAGE OF WATER ON EARTH} \%$$

Blue Planet Unit Pretest/Posttest

1. True or false, there is more water than land at Earth's surface?
2. True or false, Earth appears mostly blue because most of all the other colors are absorbed completely and blue is absorbed the least.
3. True or false, salt water contains at least 3.5 percent salts or minerals.
4. Which of the following is necessary for life to exist on Earth?
 - a. Air
 - b. Sunlight and soil
 - c. Water
 - d. All of the above
5. Water is a combination of which two gases?
 - e. Hydrogen and oxygen
 - f. Oxygen and nitrogen
 - g. Hydrogen and nitrogen
 - h. Neon and helium
6. True or false, global climates and weather patterns are affected by currents in the ocean?
7. True or false, your attitude about water is affected by where you live?



Score: ____/7