

Don't Be Such a Drip: Water Conservation

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Grade Level 2-3
Duration 2 class periods

National Standards

GEOGRAPHY

Element 1: The World in Spatial Terms

1. How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information

Element 4: Environment and Society

16. The changes that occur in the meaning, use, distribution, and importance of resources.

Element 6: The Uses of Geography

18. How to apply geography to interpret the present and plan for the future

AZ Standards

MATHEMATICS

Number and Operations in Base Ten

2.NBT.B.5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

3.NBT.B.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Measurement and Data

2.MD.D.10. Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.

3.MD.B.3. Create a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.

Standards for Mathematical Practice

2.MP.2. and 3.MP.2. Reason abstractly and quantitatively.

2.MP.4. and 3.MP.4. Model with mathematics.

Arizona Social Science Standards

GEOGRAPHY

Human-environment interactions are essential aspects of human life in all societies.

2.G2.2 Describe how human activities affect the communities and the environment of places or regions.

2.G2.3 Describe the positive and negative effects of using natural resources.

Human-environment interactions are essential aspects of human life in all societies.

3.G2.1 Explain how people modify and adapt to the Arizona environment.

Overview

Realizing how important water is to Arizona is the key to this lesson on water conservation. After experimenting with how much water is "wasted" from a dripping faucet and from allowing water to flow

while brushing their teeth, students will analyze data and be encouraged to conserve this precious resource.

Purpose

Don't Be Such a Drip: Water Conservation

In this lesson, students will gain a better understanding of how to help conserve water through creating a graph using water data.

Materials

- Sink with faucet and water
- Large container (bucket or dishpan) to collect water
- Timer or clock to measure minutes
- Measuring cups and/or quart jars
- Student Activity Sheet (2 pages) and Answer Key
- Student Assessment (2 pages) and Answer Key

Objectives

The student will be able to:

1. Gather data about the amount of water lost while brushing teeth or from a leaky faucet.
2. Create graphs reflecting data.
3. Draw conclusions about water conservation.

Procedures

Students should have experience in creating and interpreting graphs to gain information.

SESSION ONE

1. Ask students about ways they can conserve water at home. Display student ideas. Distribute Student Activity Sheet and have students copy student ideas into the first section.
2. Explain that one area where we often lose water is allowing the faucet to flow while brushing our teeth. Ask students to predict how much water goes down the drain while brushing teeth for one minute. Write this prediction down in section two of the worksheet.
3. Get a pan/bucket and place it under the faucet. Turn on the water slowly and allow it to run for one minute. Measure the water collected and then have students complete the third section. (Round to nearest cup or quart.) Determine the quantity (quarts or cups) for the graph and mark it on the left side of the graph.
4. Complete the graph using bars to indicate the amounts for each number of family members.
5. Next discuss the graph and complete the second page of the worksheet describing any conclusions from interpreting the graph.

6. Decide how to best use the water that was collected – water indoor plants, water outdoor plants, clean paint brushes, etc.)

SESSION TWO

1. Explain that there is another common water loss besides water wasted when brushing teeth. This is through leaky faucets.
2. Set a pan in the sink to collect the drips from a simulated leaky faucet. Turn the water on a slow drip and allow it to continue dripping for one hour. (Remedial option: Allow water to collect until it fills an even cup, so students do not work with half cup amounts.) Measure the amount of water collected and record the result. Decide what value of measurement to use (cups, quarts, gallons or liters and milliliters).
3. Have students complete the Student Assessment with the information provided from the experiment. Once again decide a wise use for this collected water.

Assessment

Mathematics

The graph on the Student Assessment can be scored for accuracy and completeness. Mastery will be considered 80% or higher on the points assigned.

Questions 3 and 4 on the Student Assessment can be graded for accuracy in calculations. Mastery will be considered 80% or higher on the points assigned.

Geography

Questions 1 on the Student Assessment can be graded for comprehension on the ways to conserve water. Mastery will be considered 100% or all three answers must be valid.

Extensions

Have students retrieve statistics from <https://waterdata.usgs.gov/nwis/wu> for Arizona.

Have students look at the Arizona's Watersheds map found at https://geoalliance.asu.edu/sites/default/files/maps/AZ_Watersheds_COLOR.pdf and see in what watershed their community resides.