



KEEPIN' IT CLEAN

Pre-Visit Class Activity

Water Survey

Objectives:

- Establish understanding of how much water students consume on a daily basis
- Practice collecting and analyzing data
- Practice solving multiplication problems involving decimals and whole numbers

Duration:

Preparation: 10 minutes

Instruction: **Day 1:** about 15 – 20 minutes to explain the assignment

Day 2: about 30 – 45 minutes to organize and discuss student data

Materials List:

- Copy of the *Water Survey* for each student.
- Projector for transparency or computer.
- Pad of sticky paper.
- Students may find calculators helpful.

Getting Ready:

- Copy *Water Survey* for each student.
- Make transparency of page 2 of *Water Survey* or plan to project page 2 using a computer.

Procedure:

DAY 1

- Explain to your students that in preparation for the trip to the Roseville Utility Exploration Center, they should get an idea of how much water their families consume.
- Brainstorm with students how they've consumed water over the past day.
- Did they: get a drink of water? take a shower cook? wash dishes?
- Go over list – how many gallons do they think it takes to do each activity?
- Display page 1 of the *Water Survey* worksheet. Point out any activities on the brainstorm list and suggest that students add one or two to the "other uses" section.
- Explain assignment – tonight students will survey their water habits to determine how they've used water that day.
- Display page 2 of the *Water Survey* worksheet. Explain the difference between high flow/low efficiency and low flow/high efficiency. Point out how many gallons each activity actually takes.

DAY 2: DATA ANALYSIS

- Review student survey results. As students return, ask them to write down how much water they consumed on sticky paper.
- Ask students to collect and then organize these results on your board.
- Direct students to determine the minimum, maximum, and range (difference between the maximum and minimum numbers) for the data set.
- Direct students to determine the mode (average) and median (most frequently occurring number).
- Discuss the data. Example questions to ask:
- Why is the minimum that low?
- Is the range of numbers high or low? Is there a great or low difference between the maximum and minimum numbers? Why

- Is the medium closer to the maximum or minimum?
- Write the national water consumption average for an American, according to the
- USGS: 80 - 100 gallons.[<http://ga.water.usgs.gov/edu/qahome>]
- How does the class average (mode) compare with the national average?
- Discuss if students think they use too much water or just the right amount.

Extensions:

- Consider holding onto the collected data and repeating the survey in a few months, after the visit to the Roseville Utility Exploration Center. Did the data change dramatically? What changes do the numbers reflect?
- Display five empty, one-gallon milk jugs. Explain that it is generally acknowledged that the average person needs a daily average of 3 quarts to avoid dehydration and at least 4 to 5 gallons a day for basic hygienic and hydration needs. Have students compare their consumption with these extremely low levels of water. How would it be to live with just that much?

Correlation to California Academic Standards California Content Standards

Fourth Grade

Mathematics - Mathematical Reasoning - 1.2: *Make precise calculations and check the validity of the results from the context of the problem.*

Students determine the solutions to simple multiplication and division problems as they complete a survey of their water consumption.

Mathematics – Statistics, Data Analysis, and Probability – 1.2. *Identify the mode(s) for sets of categorical data and the mode(s), median, and any apparent outliers for numerical data sets.*

Students determine the minimum, maximum, medium, mode, and range of a student-collected data set.

Fifth Grade

Mathematics – Number Sense 2.5: *Compute and perform simple multiplication and division of fractions and apply these procedures to solving problems.*

Students determine the solutions to simple multiplication and division problems as they complete a survey of their water consumption.

Mathematics – Statistics, Data Analysis, and Probability – 1.1. *Know the concepts of mean, median, and mode; compute and compare simple examples to show that they may differ.*

Students determine the minimum, maximum, medium, mode, and range of a student-collected data set.

Sixth Grade

Mathematics – Number Sense 2.1: *Solve problems involving addition, subtraction, multiplication, and division of positive fractions and explain why a particular operation was used for a given situation.*

Students determine the solutions to simple multiplication and division problems as they complete a survey of their water consumption.

Mathematics – Statistics, Data Analysis, and Probability – 1.1. *Compute the range, mean, median, and mode of data sets.*

Students determine the minimum, maximum, medium, mode, and range of a student-collected data set.

Water Survey

Keep track of how you use water today. Be sure to note how long you keep the water running or how many times you use water to accomplish a task. For some tasks, you'll need to divide by 7. Then, copy these answers to the next page to determine how much water you consume each day.