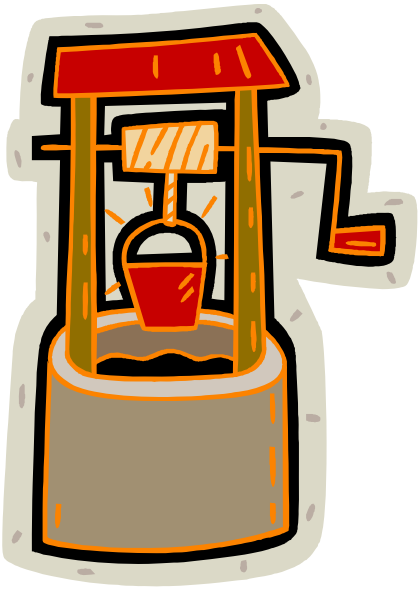
Water from the Well

Grades 4-5

Lesson Summary

Students learn how modern conveniences have greatly increased our water use from 150 years ago.



Overview

In this lesson, students will:

- Re-enact living as a 49er pioneer when water was limited
- Experience the weight of water
- Spend one day using a ration of water
- Learn about water conservation

Time

45 minutes for in-class lesson
1 hour of homework

Background

We all need water to survive. Human beings can go weeks without food but only days without water. Although we use water for many different reasons, the most important uses for water are for drinking and growing food. Without these things we wouldn't be able to live. Other uses for water include cleaning and cooling machines in factories, growing crops to feed cattle and other livestock, growing cotton and flax for fabric and clothing, watering the lawn and garden, washing the car, taking a bath or shower, brushing teeth, doing dishes, cleaning the house, washing clothes, filling swimming pools and artificial lakes, watering golf courses, making ice, and making ice skating rinks.

Up until the recent advent of modern **plumbing**, people around the world had to gather their water from wells or other natural water sources. Although modern plumbing now makes access to water very easy, there are still many people around the world that do not have modern plumbing and must rely on well water or gathering water manually from other sources like rivers or streams. **Pioneers**, like the California Gold-Rush 49ers that lived in the United States over 150 years ago, also relied on wells and similar water sources for their water needs.

Even though it seems like we have an endless supply of fresh, clean water, we don't. At this point in history, human beings are using up fresh water faster than it is being replenished naturally through the water cycle. Not only has modern plumbing allowed for greater availability, modern industry and agriculture have also vastly increased our demand and use of freshwater. It's possible that we could run out of fresh, clean water in the future if we don't get smart about how we use this precious resource.

Vocabulary

- Pioneer
- Plumbing
- Ration
- Conservation

Materials

Each student will need:

- *River of Life* Student Fact Sheet and Comprehension Question Sheet
- *Water from the Well* student handout
- 1 empty one-gallon plastic jug (could be re-used from juice or water jugs. Milk jugs are not recommended; they are harder to clean and could be unsanitary for the intended use.)
- One 8 oz. non-breakable cup or yogurt container

Preparation

- Have students read *Water - River of Life* Student Fact Sheet and answer the Comprehension Questions. This can be homework.

Classroom Activity

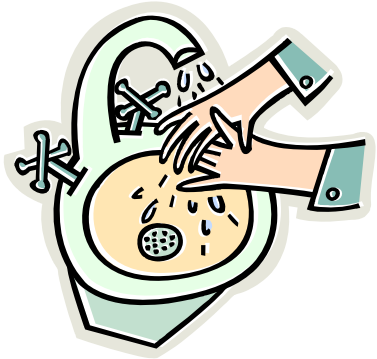
1. Tell students they are going to pretend to enter a time machine that will take them back over 150 years so that they can be 49ers who lived in the hills of California during the Gold Rush of 1849. Ask them the following questions:
   - Where did the 49ers get their water 150 years ago? (*wells, rivers, streams, capturing rainfall in cisterns*)
   - How did the 49ers get their water home? (*They used buckets, water bags, and other containers filled at the water source and carried home*.)
   - How many gallons of water might one person use each day at home for their water needs 150 years ago? *Note: Hold up the gallon container.* (*About 2 gallons per person*)
   - What would the 49ers use this water for? (*drinking, eating, washing*)
2. Tell students that they are going to go back into the time machine and speed up 150 years to be who they are today. Ask the following questions:
   - How do we get water in our home today? (*Modern plumbing and pipes bring water to our faucets and directly into our homes*.)
   - Where does our water come from today? (*reservoirs like Hetch Hetchy in Yosemite, aquifers, wells, rivers*)
   - How does nature continue to provide water in aquifers, wells and rivers over and over again? (*Nature constantly recycles water through the water cycle.*)
   - Can you guess how much water the average American uses daily at home? (*Approximately 135 gallons)*
   - What daily activities do we use water for that 49ers didn't do daily, if at all? (*We take daily showers and baths—they bathed much less frequently and often shared the bathwater; we flush toilets throughout the day—they used outhouses that didn't require water; we water our lawns and gardens—they would water their herbs and crops, but not ornamental landscaping like lawns; we use water to clean our floors, windows, kitchens and bathrooms—49er homes were very simple and required little water for cleaning; we do laundry with washing machines—49ers washed everything by hand and used much less water; we boil water for foods like pasta—they boiled water for food too, but instead of throwing it out, they'd pour it into another pot for use in another dish; we wash our cars, fill swimming pools and water golf courses—49ers didn't have any of these luxury items (some of them weren't invented yet!) so they didn't use water for them like we do today.)*

3. Tell students that it's time to hop back into the time machine and return to the 49er days again. As 49ers living over 150 years ago, they are going to experience what it's like to use only two gallons of water a day for their daily needs.
4. Hold up 2 one-gallon jugs of water. Explain that each jug holds one gallon of water and that they will only get to use two gallons as their daily allotment or ***ration*** of water. Remind them that in comparison, today the average American uses approximately 135 gallons of water a day.
5. Tell students that as 49ers, they will be "gathering water from the well" by filling up the jugs with water from the tap and then taking turns carrying these jugs around the schoolyard, pretending they are bringing water home from the local well. If the water is too heavy for them (one gallon weighs eight pounds), then have them carry only one jug for their walk around the yard. If the one jug is still too heavy, have them walk a shorter distance. The goal isn't to create difficulty; it's to simulate reality and give students a direct experience with water they don't normally have.
6. Tell students that as 49ers they will use a 2-gallon ration of water for all their personal use including drinking, eating, and washing. They will be doing this at home during a weekend day and will need to take home an empty one-gallon jug and fill it with water once they are home. When that jug gets used, they will refill the jug once more to give them two gallons total.
7. Students should use an 8 oz. plastic cup to measure out water from the jug. This lets them track how much water they are using each time. To the best of their ability, students must use only their water in the jugs and record on the handout each time they use water and for what purpose. They must also record amounts used and tally them at the end of the day. (*Note: Most kids should be able to do this activity at home during either a Saturday or Sunday. If their lifestyle is not conducive to this type of homework assignment, the activity can be modified to be done at school.*)
8. Spend ten minutes discussing as a group what the 49ers (students) think their priority of needs will be and why. Ask if they can predict certain lifestyle habits that use a lot of water that might be put on hold for the day and if there are any alternatives they can think of doing in order to save or conserve water *(Example: using a washcloth for bathing instead of taking a bath; reusing a cup or spoon instead of washing it.*)
9. Distribute the student handout and go over it with them. Explain the *Laws of the Land*:
    - Students must use their water to wash any plates, cups and forks they use.

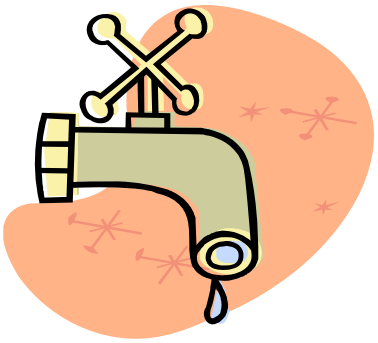
- Disposable items like paper towels, paper plates, etc. are not allowed since the goal here is to simulate life 150 years ago and these things did not exist at the time.
- Students are allowed to eat food that their parents have prepared for them but wherever possible, they are to add some of their water to the pot to best represent their portion of water used for meals.
- Flushing the toilet is the one exception where they are allowed to use modern plumbing, though they might want to consider if flushing each time is necessary since sometimes it isn't.

Discussion Questions

1. When the 49ers return to school after their homework assignment, put them into groups of five to discuss what their experiences were like. Spend 15 minutes doing this, giving each student about three minutes each to share with the group.
2. As a classroom, ask the 49ers to share some of their findings. Ask the following questions:
   - What did they find were the most important uses for water?
   - What water-use activities, if any, did they eliminate from their day?
   - What did they do or use to save water? (*i.e. re-using cups or using washcloths*)
   - Did they have water left over at the end of the day? If so, what did they use it for? Did they save it?
   - Did they learn anything new about their daily use of water that they never realized before?
   - What, if any, techniques for saving water as a 49er could students employ at home on a regular basis? Will they do this?
   - How would it feel to use water like a 49er for two days, one week, one month, or one year?
3. Tell the 49ers it's time to hop back into the time machine and return to the modern day once and for all. Discuss the benefits and drawbacks of modern plumbing. Ask the following questions:
   - What are the benefits of modern plumbing? (*easy access, plentiful supply, sanitary standards*)
   - What are the drawbacks of modern plumbing? (*Plentiful and ready supply gives false impression that there's an endless supply of water and that conservation isn't necessary*.)

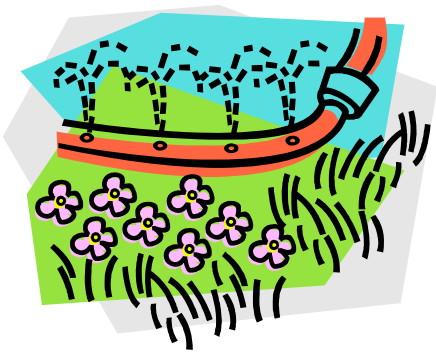


- Does modern plumbing create the idea that there's "plenty of water?" Why? Why not?
- How does modern plumbing increase our daily water use? (*Faucets increase our likelihood of running the water when we do the dishes or brush our teeth. Modern plumbing also allows us to use water for things we wouldn't have 150 years ago like washing cars, filling swimming pools, watering golf courses, making ice skating rinks, etc.*)
- Is all this water use necessary, or is water used just because it is readily available?
- Does this activity change their understanding and appreciation of water? How?



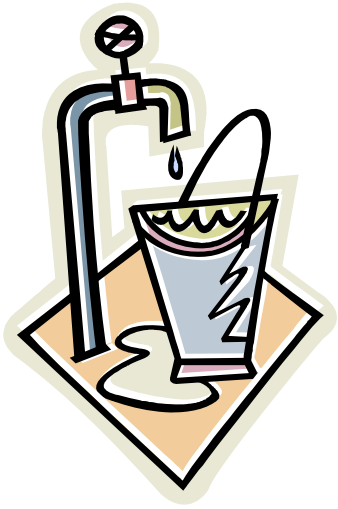
Extensions

- Ask students to research life as a 49er before or after doing this activity.
- Have students take their daily amount of water used in this experiment and ask them to calculate how much water they would use as a 49er during one week, one month, and one year.
- Ask students to illustrate and write about their experiences as a 49er.
- To learn how diet impacts water use in dramatic ways, lead a lesson on "*Wet" Your Appetite!* http://www.sfenvironment.com/aboutus/school/teacher/lesson_plans/wet_appetite.pdf
- To further learn how our consumption patterns differ from 150 years ago, teach the lesson, *I Want It! I Need It!* http://www.sfenvironment.com/aboutus/school/teacher/lesson_plans.htm



CA State Standards

Gr. 4 Language Arts LS1.2 • Science 1g, 3, 3a, 3b, 3c, 3d, 3e



Water from the Well

Pretend you are a Gold Rush 49er living in the year 1850. You can only use two gallons of water for all of your daily needs. When using water, pour it first into an 8-ounce cup. This helps you know how much water you are using. Record what you used the water for and how much you used each time you used it.

Remember the Laws of the Land!

- You must use your own water to wash any plates, cups and forks you use.
- You may not use disposable paper towels, paper plates, or plastic utensils as a way to avoid washing your dishware. Remember, these items did not exist 150 years ago!
- You may eat food your family has made but whenever possible, you must add some of your water to the pot to represent your portion of water used for cooking meals.
- Flushing the toilet is the one exception where you are allowed to use modern plumbing.

What did you use water for?	How many cups were used?