

Water Works!
Our Local Water Source and the Benefits of Tap Water

Grade Level: 3rd Grade

Subject Area: Science and Computer Technology

Short Description:

Students will develop a better understanding of where their local tap water comes from and the processes that it undergoes to become clean drinking water. Students will make a homemade water filter, so that they will have a better understanding of how the system works. They will learn the advantages of using tap water instead of bottled water, and how our environment benefits from this.

Standards

State Curriculum Standards met in this lesson:

SCIENCE SOLS

Patterns, Cycles, and Change

3.9 The student will investigate and understand the water cycle and its relationship to life on Earth. Key concepts include

- a) water is essential for living things; and
- b) water supply and water conservation.

Resources

3.10 The student will investigate and understand that natural events and human influences can affect the survival of species. Key concepts include

- a) the effects of human activity on the quality of air, water, and habitat;
- b) conservation and resource renewal.

Scientific Investigation, Reasoning, and Logic

3.1 The student will plan and conduct investigations in which

- a) predictions and observations are made
- b) inferences are made and conclusions are drawn

Computer/Technology SOLS

Technology Research Tools:

3-5.6 The student will use technology to locate, evaluate, and collect information from a variety of sources.

- a) Collect information from a variety of sources.
- b) Evaluate the accuracy of electronic information sources.

Instructional Outcomes:

Students will know:

- Where our local water source is located
- The process of how water becomes tap water
- The benefits of using tap water instead of bottled water
- How re-using water can benefit our environment

Enduring Understandings/Essential Knowledge:

Goals:

-How water filtration works, and how it benefits the environment.
-Understanding the concept of how consuming tap water is the same concept as recycling water, which greatly benefits our planet.

Essential Questions:

Do you know where tap water comes from?

What are the processes that water has to go through in order to become tap water?
What are the benefits/negatives of using tap water?
What are the benefits/negatives of using bottled water?
How can we prove that drinking more tap water can benefit our environment?

Procedures

Lesson Set:

The anticipatory lesson includes a basic class discussion of tap water vs. bottled water with a mini activity. First, take a class poll. Ask students what they think about tap water and bottled water, what they prefer to drink, and why. The activity includes a blind taste test for each student: one cup will have tap water in it, and the other cup will have bottled water in it. After each student drinks both cups of water, they will state whether they noticed a difference in the taste of the water or not, and if so, choose which one they thought tasted better. After everyone goes, the outcome will show that water all taste the same, even water that comes from the kitchen faucet.

Rationale:

Researching will be involved: Students will be conducting research of water local tap water sources and how the water becomes “clean” for people to drink.

Real-life experiences: People drink water every day; humans cannot live without water, so it is important to understand where it comes from.

Going Green: Learning how plastic water bottles are bad for the environment and drinking tap water will solve this problem.

Techniques and Activities:

1. The teacher will introduce the research and the project to the class. Students will be partnered up to do research on the internet to find out more about our local water source and how it works. There will be a worksheet to go along with this research activity with web links and questions so their findings will be organized. The teacher will then explain the project that will follow the research activity. Each pair of students will be making their own homemade water filtration system to understand how our local water system filters our water to make it into drinkable water.

2. *Partner research:* Students will be placed in pairs and research where our local water comes from, the process the water has to go through to become clean, and then how the water gets to our faucet. The students can break up the information in between them so that the research can be easier and faster. A worksheet will go along with this research activity, so each group can write down their findings. The class will have to go to the computer lab to complete this activity. After the research is complete, each group will share their information to the class to see if everyone came up with similar answers. The teacher should also collect the worksheets to assess the students’ progress. The students can now make their own mini water filtration system to have an even better understanding of how the process works.

3. *Partner project:* Each group will get the project handout, which will have instructions on it. The teacher will be making her own water filtration system along with the class, so the groups will be observing what the teacher is doing, while making their own at the same time. The teacher will hand out the materials, which should be already measured out in plastic bags: a 2 liter soda bottle cut in half, 1 cup of gravel, 1 cup of sand, a handful of cotton balls, and some dirty water (regular water with pieces of paper, food coloring, or styrofoam pieces mixed into it). [SIDE NOTE- The teacher can ask the parents of the students in advance to save these items for this project.]

The following steps will be done by the teacher first, then the students will do it to their own water filter. Once all the students completed the step, the teacher will then move on to the next step and so forth.

STEP 1: Put the top half of the bottle upside down into the bottom half so that it looks like a funnel. The top half of the bottle is where the filter will be, and the bottom half is where the filtered water will end up.

STEP 2: Layer the filter materials in the top half, which would be the gravel, sand, and cotton balls. The students can choose any layer pattern they want. Some patterns will work better than others, so the students can actually go back and re-arrange their layer pattern until it works.

STEP 3: Pour the “dirty” water through the filter.

STEP 4: Once the water filters through each groups’ mini filters, the teacher should ask questions like: What does the filtered water look like? Can you see which layer removed certain “dirty” materials? Which layer pattern worked best to filter the “dirty” materials out? How is this filtration system like the bigger version of our local water source?

This completes the project. The teacher should go around to each group to assess the students’ work, and to make sure they followed directions. The students can take their mini filtration system home with them.

3. *“Going Green” Class discussion:* As a wrap up to the lesson the class as a whole will come up with the pros and cons of using bottled water vs. tap water. The teacher needs to make a point of environmental factors that would be affected. Using an overhead projector would be ideal to complete this so that each student can see.

Lesson Closure:

For the lesson closure, a “make your own” water bottle activity will be completed by each student. Each student will get a plain re-usable water bottle. They can write their names on it and decorate it however they want by drawing on it, placing stickers on it, or gluing decorations on. This will encourage students to use of the re-usable water bottle instead of plastic water bottles.

Assessment/Evaluation:

Assessing the students’ activities and worksheets throughout the lesson will allow the teacher to monitor each student’s progress. At the end of the lesson, a quiz will be given to assess all the knowledge they have learned about their local water source and how a filtration system works and how the environment benefits from people using tap water.

Student Products:

Students will produce:

- Research on our local water source system
- A mini homemade water filtration system
- A decorated re-usable Nalgene water bottle

Supplemental Activities:

If students finish their research early, they can play the “What’s Wrong With This Picture?” online game. Students will click on the picture of items or scenes that pollute the waterways and runoffs. The link for this online activity is here:

<http://www.epa.gov/owow/NPS/kids/whatwrng.html>

Adaptations for Special Learners:

Disabilities, ESL students:

Writing questions/statements on the board.

Providing visual aid.

Provide written directions.

One on one or peer guidance.

Extended time on assignments.

Provide more internet guidance during the research portion of the lesson.

Completing work in different positions such as sitting, standing, floor work.

Differentiated Instruction:

The groups that the students are placed into should be chosen by the teacher, so that the groups will be flexible. For

example, a quick learner should be placed with a student who is on a lower level so it will be a mixed group and the students will be able to support each other.

For the lower level students, the teacher will be observing and helping students if necessary.

Resources

Materials and resources needed for this lesson:

1. Water-bottles, tap water, cups
2. Computers for research
3. Worksheets
4. 2 liter empty soda bottles
5. Gravel, sand, cotton balls
6. Re-usable water bottles for “make your own” activity

Web Addresses needed for this lesson:

1. <http://www.epa.gov/owow/NPS/kids/whatwrng.html>
2. <http://pbskids.org/zoom/activities/sci/waterfilter.html>