Starting a Water Conservation Project

Our local leaders are facing the pressing question of how to ensure a clean, reliable water supply with stresses from population growth, booming development, and global warming. Many communities are already enforcing water restrictions. There are a few simple things students can do at school to ease the burden on your local water supply and save money in the process.

1. Turn off the faucet while soaping hands.
2. Notify maintenance of faucet leaks immediately.
3. Install a rain barrel for outdoor watering.
4. Plant a rain garden for catching stormwater runoff from the school's roof, driveway, and other hard surfaces.
5. Monitor the school's water usage.
6. Share knowledge about saving water through conservation and efficiency with friends.

These water saving measures can have a big impact on water demand in local communities. Saving money, student engagement and the protection of local waterways are just a few of the benefits.

Did you know?

30 to 60% of domestic drinking water is used to water yards and gardens, and often large portions are wasted by over-watering, evaporation, and misdirected sprinklers that water sidewalks and driveways.

The average U.S. per capita water use is 170 gallons per day (gpd). In Australia it is 36 gpd. Thanks to water efficiency, Australia uses far less water, but still enjoys the same high quality of life.

If a city of one million people (roughly the population of the Dan River watershed) embraced water efficiency solutions they could save up to $700 million and between 130 and 210 million gallons a day – that's up to one-third of our current water supply.

The following activities can be done in every classroom, every grade level, throughout the school to get students excited about a campus water conservation campaign.

Where did the water go?

Get two dishes. Put about 10 ml (two teaspoons) of water in each dish. Place one dish in the sunlight, or if the sun isn't shining, place the dish under and close to a light source. Place the other dish in the shade. Observe each dish every 4 hours and also overnight and then record what happens to the water. Provide a sample table and/or chart for the kids to follow.

On the same sheet of paper as above, answer these questions with a classmate.

- Where did the water go?
- From which dish did the water disappear faster?
- What caused the water to disappear?

The process of water "going" into the air is called evaporation. On your paper list some other examples of evaporation. Discuss with your classmate what happens to water after it evaporates. Write down what you think.

Precipitation "The Rainmaker":

- 2-liter clear plastic pop bottle
- matches
- warm water

Process:

1) Fill the clear plastic 2-liter bottle one-third full of warm water and place the cap on. As warm water evaporates, it adds water vapor to the air inside the bottle. This is the first ingredient to make a cloud.
2) Squeeze and release the bottle and observe what happens. You'll notice that nothing happens. Why? The squeeze represents the warming that occurs in the atmosphere. The release represents the cooling that occurs in the atmosphere. If the inside of the bottle becomes covered with condensation or water droplets, just shake the bottle to get rid of them.
3) Take the cap off the bottle. Carefully light a match and hold the match near the opening of the bottle to capture the smoke (this should only be done by an adult).
4) Then drop the match in the bottle and quickly put on the cap, trapping the smoke inside. Dust, smoke or other particles in the air is the second ingredient to create a cloud.
5) Once again, slowly squeeze the bottle hard and release. What happens? A cloud appears when you release and disappears when you squeeze. The third ingredient in creating clouds is a drop in air pressure.

Explanation:

Water vapor, water in its invisible gaseous state, can be made to condense into the form of small cloud droplets. By adding particles such as the smoke, enhances the process of water condensation and by squeezing the bottle causes the air pressure to drop. This creates a cloud!

Water is a big part of weather and climate—it starts in the atmosphere and works its way down to the earth's surface through rain, snow, hail, and fog. Students can make observations about when each of these conveyances from the atmosphere to the earth's surface might occur—i.e. there will be rain when they see storm clouds in the sky, or there'll be fog when you're near the ocean and it's early in the cooler mornings. Students can learn what a drought is and the cause-and-effect connection can be made right now since we've been in a drought with warm dry weather, therefore, fewer storm clouds and less rain.

Waters of the Earth

Earth, as seen from space, is clearly a water planet. About 71% of the surface of the planet is covered by water. Water is found in the oceans, rivers, ponds, lakes, groundwater, ice caps, glaciers, and in the atmosphere as water vapor and clouds. Water changes state and moves from place to place through the water cycle of evaporation, condensation, and precipitation. Although earth's water supplies seem almost limitless when viewed from an ocean beach, water forms only a thin film on the surface of the planet. The average depth of the oceans is about 3.5 - 4.0 km, while the average radius of earth is 6371 km.

What to Expect:

Some of these volumes are so small the class will need to gather around the display to see the water being added. The clear bottles with blue colored water in them clearly labeled, make a dramatic display for the school or community.

Materials:

- Seven two-liter bottles
- Food coloring
- Water
- Labels for bottles
- Graduated cylinders
- Calibrated droppers for 1 ml.

Procedure:

1) Color about 2 liters of water blue with food coloring.

2) For younger students: have students measure out the volumes, add each amount to a separate bottle. (For older students: have students use these figures to calculate volumes. Students can fill the bottles and set up a display for the school in a prominent place.)

Type of Water	**Percentage of Earth's Water Supply**	
Volume of Water to Use in Bottle		
All of the earth's water	100 %	2,000 ml
All earth's salt water (oceans)	97.2 %	1,944 ml
All earth's fresh water	2.8 %	56 ml
Fresh water locked up as ice	2.3 %	46 ml
Underground fresh water	0.4 %	8 ml
Surface fresh water	~ 0.05 %	1 ml
Water in soil and air	~ 0.01%	0.2 ml

Discussion:

Have students discuss what they observed in the demonstration and how it relates to the current usage of water in our local watershed. Then, have students form into groups to create their own public service announcement posters on saving water.

Water Weather Words

To get students used to certain weather vocabulary, an easy level word cross puzzle is a fun option to let them work independently but work their spelling skills.

Activity Sources:

- http://www.sea.edu/academics/k-12_detail/waters_of_the_earth
- http://www.edupics.com/wordsearch/eng/wordsearch.php
- Full sized word cross puzzle:

Other water conservation campus campaign ideas:

Encourage students to take the Clean Water Pledge: https://www.danriver.org/form/clean-water-pledge

Recruit a Water Conservation Task Force with students from every grade. This Task Force can come up with creative ideas to get students thinking about water conservation. They could organize a Water Festival, have games and demonstrations in the library or cafeteria and/or create signs near faucets and water fountains to remind students about how to conserve water. The Task Force could also raise funding to purchase students reusable water bottles.

If you would like someone from DRBA to help you with your Water Conservation Campaign, please contact Krista Hodges, Environmental Education Manager at khodges@danriver.org.

Additional Water Conservation Guides and Curricula

World Water Day

Teacher Planet – lesson plans, activities, webquests, and more!

4-H There's No New Water This water conservation and water quality curriculum is grounded in a simple yet powerful concept that water is a finite natural resource whose quantity and quality must be responsibly preserved, protected, used, and reused.

Water.org Lesson Plans – Aligned with national standards, the lesson plans and mini-units include elementary, middle and high school levels.

A Teacher's Guide to Water Related Lessons and Curricula – these lesson plans, web quests, activities, and handouts will all add to instructors' efforts to teach their students all about water.

The Water Crisis – Lesson Plans for all grades

Project WET Resources

Marine Activities, Resources and Education

PBS Water Conservation Lesson with videos

Green Schools Water Conservation Action Project

Water Conservation Guide

Apps

Rain Garden – The University of Connecticut Center for Land Use Education and Research developed this App as a resource for homeowners, landscapers, contractors, and others.

Virtual Water – The vast amount of water consumed and polluted in the making of products has an enormous impact on the ecological footprint of human civilization. Carry the Virtual Water digital companion anywhere and grow more conscious about how much water our everyday food and beverages really consume.

Dropcountr – Dropcountr connects people and their utilities on the mobile devices they use every day. Our unique mobile and web applications help water utilities and their customers save water, save money and save time.

Games

Water Games for outdoors

More Water Games for Outdoors

What's Your Water Footprint? Water Calculator

Videos

Brainpop Water Supply

Howdini/Ntl Geographic Water Conservation Tips

World Fresh Water Resources– Interesting Asia-centric view

Penn State Water Conservation Videos

Watch, Know, Learn Water Conservation videos

Rain Barrels from Upcycled Syrup Drums

Other Useful Links

USGS Water Cycle for Kids

Freshwater 101 Quiz