

Video Links:

[The Wonders of the Hydrological Cycle](#)

[The Story of Bottled Water](#)

[Good Water](#)

[Water Cycle \(part1\): Surface Water and Groundwater](#)

[Groundwater Animation](#)

Lesson Focus: The Importance of Water Time: 50 minutes

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**** Ground Water Institute offers paid Summer Internships for high school students. Contact Ms. Dry for more information.

Guiding Question, Course/Grade Level Expectations, and SPI's are included for Physical Science, Biology, Physics, Algebra 1, Algebra 2, and Geometry. (See the Standards Tab.)

Materials:

Handout: "How Much do You know about Water?"
(Solutions: All True, except #1)

Handout: Water Crossword Puzzle

Handout: Water-related Careers

PowerPoint

YouTube Video, "The Wonders of the Hydrological Cycle."

YouTube Video, "The Story of Bottled Water."

YouTube Video, "Good Water."

YouTube Video, "Water Cycle Part 1: Surface Water and Groundwater."

YouTube Video, with Jay Z and Unicef, "H2O FOR LIFE School to school2"

YouTube Video, "Water Changes Everything."

YouTube Video, "Engineers Without Borders."

For taste test: Small cups, 5 per student

Tap water, Jug Water, Distilled water, Smart Water, Spring Water

For Aquifer: Large clear cups, 1 per group

Play Sand

Straws/coffee stirrers (2 per group)

Modeling Clay

Food coloring

Aquarium gravel

Computer for Research questions

Preparing the lesson:

(Consider inviting Ms. Dry to visit or video chat with classes.)

1. Make copies of Handouts.

2. Prepare taste test cups. Number them 1-5 and fill with different types of waters.

3. Gather materials

Teaching the Lesson:

1. Have each student think about the role that water plays in their lives, such as bubble baths, swimming,

camping experiences, etc. and allow each to share with the group.

2. Distribute handout, "How much do you know?" Allow students to take the "quiz" and then discuss each answer and the issue(s) that surrounds the statistic.
3. Show Video, "The Wonders of the Hydrological Cycle."
4. Show PowerPoint presentation, discuss slides and encourage students to take notes so that they are prepared for the next activity.

ACTIVITY #1 (The Story of Water)

5. Have students work in groups to write a story entitled, "The Trip of a Drip," which will trace a drop of water as it moves through the water cycle in each of the following stages, but not necessarily in this order:

- Evaporation
- Condensation
- Precipitation
- Infiltration
- Transpiration
- Surface run-off

A sampling of forms students may choose from:

- Cloud

- Glacier
- Rain, Sleet, snow, hail
- Steam
- Groundwater
- Animal
- Plant

Have students present their stories, by reading them aloud or acting them out. See extension suggestion below.

Extension: For story presentations, student could use “Alice” or “Blabberize” to create an animation or create a comic book of the story with “Comic Life” software.

6. Show Video, “The Story of Bottled Water.”

ACTIVITY #2 (Taste Test) [Pictures](#)

7. Number cups, 1-5, and fill with the following types of water; jug water, tap water, spring water, Smart water, and Distilled water.

8. Have students rate each sample on a scale of 1 to 5 with 5 being the best and 1 being the worst.

	Appearance	Smell	Taste	Aftertaste	Total Score
Water 1					
Water 2					
Water 3					
Water 4					
Water 5					

10. Conduct a poll to collect the results and then reveal what each type of water is and why it may have been scored a certain way.

11. Show Video, "Good Water."

REFLECTION ACTIVITY #3

9. _____

Have students respond to the following: What did you like best about this lesson and why? What did you find most interesting about this lesson and why? What else would you like to learn about water and why?

(These responses will determine the final research project topics.)

ACTIVITY #4

13. (Formative Assessment) Distribute Water Crossword Puzzle and then discuss solutions.

14. Show YouTube Video, "Water Cycle Part 1: Surface Water and Groundwater."

15. Show Video (12min) from TDEC Website, Ground Water Institute, "Drops of Water in Oceans of Sand."

16. ♪ Groundwater Song/Video, "Groundwater Educational Flash Animation."

<http://www.leapingmedia.com/groundwater.html>

ACTIVITY #5 (Build an AQUIFER IN A CUP from the Bottom Up) See Math Variation Below.

Put $\frac{1}{2}$ cup of Sand (Play Sand from Home Depot) in clear cup.

Add thin layer of Modeling Clay on top of sand, only covering $\frac{1}{2}$ of sand surface. This provides a protective barrier similar to the clay layer in Memphis

Place rocks (aquarium gravel) over the clay and sand (Slope the rocks on the clay side of the cup forming a hill and a valley area over the sand.

Add Water to reach “saturation” zone and watch.

Add a “well,” by poking a straw through the clay side of the aquifer.

Put a few cups of food coloring on top of the rock hill as close to inside wall of cup. (This is pollution, contamination of surface water.

Now place your Auger-drill, (another straw or coffee stirrer) to one side of the cup, not the clay side. Notice the contamination of the ground water.

Note: For a more complex aquifer demonstration, use a large clear plastic container instead of cup, a hand lotion pump for “well” and even place pantyhose around “well” to act as “well screen.”

Activity #5 - Where's the Math? Form groups or partnerships and assign each group different measurements for the different layers. (Application of Ratio and Proportion.) After aquifers are built, display the models and have students record the data for each structure's measurements, as well as the observations that can be made regarding saturation. Collect and graph all data, using Excel, Geometer's Sketchpad, or other software

Activity #6- More Math....[Rainfall Roulette Activity](#)

17. Discuss clean water initiatives and how students can get involved in the solution. Show YouTube Videos with Jay Z and UNICEF, "H2O FOR LIFE School to school2" and "Water Changes Everything," and "Engineers Without Borders."

Activity #6 – Research

18. Divide students into groups or pairs. Assign each group a question derived from the earlier Reflection Activity. Allow students to time to research the answers to their question and then develop a presentation for the class. Also, suggest appropriate web sites for reliable information, such as <http://www.epa.gov>.

19. Distribute handout of water-related careers. Have students research a water-related career from the list. What does that type of professional need in terms of education, salary, and job description? Present findings.

Assessment: These activities may or may not be graded. If graded, use a rubric style assessment to help students identify strengths and weaknesses in knowledge, writing, and presentation skills.