



Water, Water Everywhere

OBJECTIVES: Water is a resource that is necessary for life and is limited. What is water, what are its states and properties, why is it important, and how do we use it?

OVERVIEW:

Students will discuss properties, states, types and forms, and uses of water. The unit will take place over 5-6 days' time. It's recommended that children know how to work in small groups and that adult volunteers are available for assistance during investigations.

STANDARDS ADDRESSED:

NGSS K-ESS3-3: Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment; ask questions, plan and carry out investigations; use observations to describe patterns of what plants and animals (including humans) need to survive; analyzing and interpreting data; make observations (firsthand or from media) to collect data that can be used to make comparisons; construct explanations.

MATERIALS:

- Chart/butcher paper (option to use chalkboard)
- Markers
- Gallon bottles of water and various transparent containers for water: vase, pitcher, drinking glasses of various sizes
- Graduated measures, one with lid
- A large collection of magazines with a variety of photos/pictures that can be used at the end of this unit
- Construction paper
- Seven attachments (see **Appendix** at the end of this lesson)

ACTIVITY STEPS:

Lesson 1:

Play "I'm Thinking of Something" (see attachment) with the class. This should be brief, no more than 5-10 minutes. Teacher elicits the simple answer of "water." Then do K-W-L with class (see attachment). K-W-L should be done on the board or, even better, on large sheet(s) of chart paper that can be saved for Lesson 2. K-W-L should last for 20 or so minutes. As class discussion progresses, many of the terms found in Lesson 2 will appear. Children know quite a bit about water!

Lessons 2 (10-15 minute discussion; 25 minute activity):

Addresses the three states of water: solid, liquid, and vapor (gas).

Discussion: Ask students to name the various forms they know that water appears. Refer to “K” column on K-W-L list. (Look for or “hint” about familiar forms such as snow/ice/ice cubes, rain, sleet, hail; puddles, ponds, lakes, streams/rivers, oceans if they haven’t appeared on the list.) Depending on age and abilities of students, discussion can include questions about where water comes from and where it goes once it comes to earth including how humans use water.

Activity (if you can begin in the morning, lesson activities are more meaningful if continued to next day): Have on hand two or more gallon bottles of water. Pour water into various clear containers so students may observe the “shape” of the water and how it retains that of the container. Important properties of water are that it is colorless, sticks to itself, may be poured, and will retain the shape of the container. We call this a **liquid**.

Continue with two graduated measures full of the same amount of water. (This part of the lesson will continue to next day). Place one in a sunny window if available and mark the water level as it goes down during the day; this observation will continue to the next day. If possible, make a graph showing time and amount of water, and mark it every several hours during the day. (See graph comment under Extension). The greatest change will be seen on the next day. During or just after, place the second cup with lid into a freezer, noting the date and time.

Lesson 3 (40 minutes):

Examine the evaporating cup of water to determine the change in water level. Ask: Where is the water now? Discuss possibilities that might include suspicion that someone poured it out during the night. If doubt still remains, draw a circle on the chalkboard, wet inside of the circle with a sponge, and observe what quickly happens. Where did the water go? It is in the air around us but has turned into something we can’t see called a vapor (gas). You can give another example of a vapor (**gas**) by having students breathe on their hands. They can’t see what comes from their mouths but can feel it, including its warmth.

Bring frozen cup of water from previous lesson to the classroom and observe the change in the water as it has expanded to (possibly) pop the cover off the cup, depending on how full you have made it. What do you call this? (Ice.) What did it use to be? This state of water is called a solid. What examples of **solid** water can you think of?

Lesson 3 Extension: If available, bring in enough measuring cups of snow (chipped ice is an alternative) for each team of 4-5 students. Complete Snow Graph (see attachment) that shows the change in amount of snow as it melts into water. Note the time that you bring into the classroom, then observe and record the changes from snow/ice to water. Review the states of matter students are working with.

Note: For a great website on making graphs for children, see <http://nces.ed.gov/nceskids/createagraph/default.aspx>

Lesson 4:

Students will work in small groups/teams finding photos/pictures showing examples of water uses. Cut out and attach to poster paper, including labels.

Lesson 5 (Assessment):

Each student will draw three cartoon panels showing him/herself using water in three different ways: indoors, outdoors, and self-choice. Each should be labeled. See attachment: "Using Water (cartoon template)."

Extension:

Students will take a "field trip" within the school to determine how water is used there and discuss how to cut down on its use within the school. See attachment: "Ways We Use Water at School." After that, send a letter (see attachment: "Parent Water Letter") home telling parents that students will take a "field trip" around the residence with a parent or caregiver looking for and recording ways water is used and discussing how they can reduce water usage. See attachment: "Ways We Use Water at Home."

Upon return to school, discuss with students the results of their surveys and focus on ways to reduce the use of water in the home. Compare usage of water and which activities beyond the home (e.g., farming, street cleaners, electrical production) would use more water.

APPENDIX:

I'm Thinking of Something...

K-W-L

Snow Graph

Using Water (cartoon template)

Ways We Use Water at School

Parent Water Letter

Ways We Use Water at Home