

Protecting Our Water

Subject Area: Natural Resources

Unit Title: Source Water Protection

Grade Level: 4th & 5th grade

Objectives: To help students understand the importance of protecting our valuable water resources.

Colorado Content Standards to be covered:

ECONOMICS

Standard II - Students understand how different economic systems impact decisions about the use of resources and the production and distribution of goods and services.

GEOGRAPHY

Standard V- Students understand the effects of interactions between human and physical systems and changes in meaning, use, distribution, and importance of resources.

SCIENCE

Standard I - Students understand the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations.

Standard III - Life Science: Students know and understand the characteristics and structure of living things, the processes of life and how living things interact with each other and their environment.

Standard V- Students know and understand interrelationships among science, technology and human activity, and how they can affect the world.

Materials:

- paper
- red, green and blue crayons, markers or colored pencils for each student
- an apple
- a knife
- copy of the Vocabulary Knowledge Rating sheet (see last page)

Anticipatory Set:

Have students predict 3 different things by writing down percentages using different colors on the blank piechart (last page).

- What percent of the world is water? *Use a red crayon, marker or colored pencil*
- What percent of fresh water is in glaciers in the ice caps? *Use a green crayon, marker or colored pencil*
- How much fresh water is left to drink in the world? *Use a blue crayon, marker or colored pencil*

Then, ask the students to fill in the first column of the included Vocabulary Knowledge Rating Chart, (toward end of document) indicating how well they know each vocabulary word before the lesson.

Input:

Water: Life depends on it!

What do you need to live? Everyone needs air to breathe, water to drink, food to eat and shelter from the weather. These are our basic needs. It's up to you and me to help make sure our air, water and food are safe.

We can't live without safe water. All life on our planet is dependent on water. It's one of our most important resources. Most of us take clean drinking water for granted. That means we assume it will be safe and don't think about it. We can turn on the faucet whenever we want and enjoy clean water. In many parts of the world, this isn't possible. The fact that population and pollution are increasing threatens limited water supplies.

WHAT IS SOURCE WATER?

When you hear about protecting **source water** it means water in the environment that can be used for drinking water after it is treated to be safe. There are two kinds of source water: surface water and ground water. Water that is found on the earth's surface is called surface water. This would be oceans, lakes, rivers and streams. Most surface water is in the ocean and is salt water. Less than 1% of the earth's water is fresh water or usable for drinking.

Ground water is water that collects below the surface. Precipitation (rain and snow) soaks into the ground and is stored there. Soil and rocks that hold enough water in spaces between the particles for us to recover are called aquifers. Scientists estimate that most of the earth's fresh water is found in aquifers.

Most ground water is naturally cleaner than surface water. It's harder for pollutants to get underground. Also, by moving through layers of rock and soil, many pollutants are filtered out. When ground water does get polluted though, it is much harder to clean it up.

Water is all around us. In fact, it covers 75% of the earth. It's found in the atmosphere, ground, in rivers, lakes, polar ice caps, glaciers, and oceans.

Checking for Understanding: At the end of this section choose one of the following for a quick check: ask the students to partner share and think, pair and share, do a quick 3 word write up as an exit slip, do a quick sketch or give each other a quick thumbs up or down to check for understanding. Determine the level of mastery for each student and provide individual remediation as needed.

Demonstration or Student Activity

Water Availability

1. Introduce topic by having students brainstorm global water sources:
Go over this fact:
 - Global water distribution: 75% of the earth is made of water, so where is all this water found?
Student responses should include: groundwater, snow, ice, permafrost, oceans, seas, lakes, rivers, streams, polar ice caps, glaciers, snowy mountain ranges, aquifers, etc.
2. Demonstrate availability of potable freshwater by cutting 1/4 out of the apple. This represents land on earth (set aside), while the remaining 3/4 represents water on earth.
3. Remove peel from the 3/4 portion. This represents the 3% of water on earth as fresh water (the remainder is salt water in oceans, set it aside).
4. Split the peel into 3 parts. This represents the 1/3 of freshwater not frozen in polar ice caps. Set remaining 2/3 of peel aside.
5. Examine the "freshwater peel." Not even all of this 1% of the earth's water is potable (safe for drinking). Some is contaminated by pollution.
6. Pose this question: What can we do to conserve the precious fresh water we can access? (responses should include: water conservation, pollution controls, water treatment/purification).

Closure:

Go over what you demonstrated with the apple and review the answers compared to the predictions the students made. Discuss how valuable fresh water is and how careful we need to be that it doesn't get polluted. Have the students return to the Vocabulary Knowledge Rating Chart and rate their understanding of each vocabulary word after the lesson. Then have them write down the definition and use the word in a sentence or give an example. See key for definitions.

Vocabulary Knowledge Rating Chart

Before the Lesson:

In the first column, indicate how well you know each vocabulary word by using "1" to represent "I know what it means," "2" "I sort of know what it means," or "3" for "I don't know what it means."

After the Lesson:

In the second column, indicate how well you know each vocabulary word after the lesson, by using "1" I know what it means, "2" I sort of know what it means, or "3" I don't know what it means. Next, write down the definition and use the word in a sentence or give an example.

Vocabulary Word	Before Lesson	After Lesson	Definition	Use the word in a sentence or give an example
source water				
surface water				
ground water				
aquifers				
pollutant				

Vocabulary Knowledge Rating Chart KEY

Before the Lesson:

In the first column indicate how well you know each vocabulary word by using “1” to represent “I know what it means,” “2” “I sort of know what it means,” or “3” for “I don’t know what it means.”

After the Lesson:

In the second column, indicate how well you know each vocabulary word after the lesson, by using “1” I know what it means, “2” I sort of know what it means, or “3” I don’t know what it means. Next, write down the definition and use the word in a sentence or give an example.

Vocabulary Word	Before Lesson	After Lesson	Definition	Use the word in a sentence or give an example
source water			water in the environment that can be used for drinking water after it is treated to be safe	Answers will vary.
surface water			water that is found on the earth’s surface,	rivers, lakes and oceans
ground water			water that collects below the surface	rain and snow
aquifers			soil and rocks that hold enough water in spaces between the particles for us to recover	Answers will vary.
pollutant			something that pollutes and has the potential to be harmful	Answers will vary.

Percentage Pie-Chart for Anticipatory Set

