

The Water Cycle

Subject Area: Science

Unit Title: Water

Grade Level: 4th & 5th grade

Objectives: Each student will show their knowledge of the water cycle.

Colorado Content Standards to be covered:

SCIENCE

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

Standard II - Physical Science: Students know and understand common properties, forms, and changes in matter and energy.

Materials:

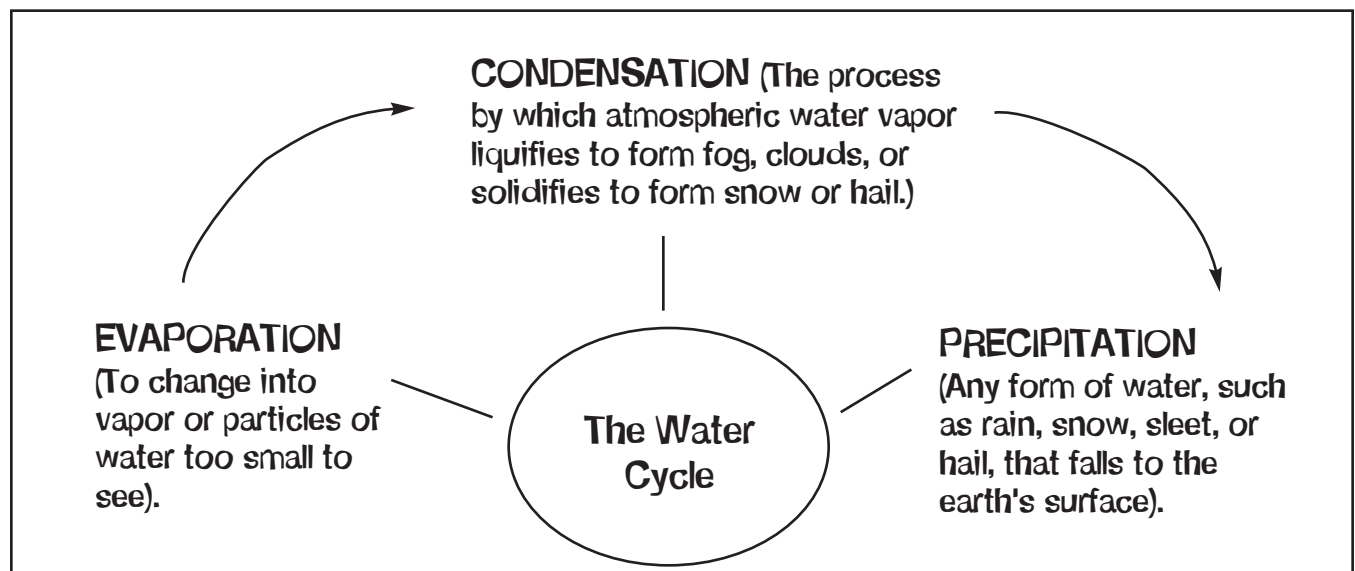
- 2 half-gallon jars
- a rock
- masking tape
- blue food coloring
- sticky notes (or scraps of paper)

Anticipatory Set: Ask the students to write “Yes” or “No” on a sticky note in response to this statement: Does the water we have on earth (from lakes, rivers, oceans) get used up?

Input:

Answer: No, it might **evaporate** or become unfit to drink, but it doesn’t get used up. It always stays in the water cycle. Heat causes water to turn to vapor. The sun heats the oceans, lakes and streams, and the vapor rises. It cools and **condenses** forming clouds, and then returns to earth as snow and rain – fresh water. The snow melts, and the water soaks into the earth or runs off into streams, rivers and lakes on its way back to the oceans. It’s a never-ending cycle!

Draw a concept map (see below) on the board to show the cycle. You could add pictures if you want.



Procedures/Activities:

Building A Model of the Water Cycle

From the Museum of Science, Boston

This simple model represents the cycle of water from the ocean to the atmosphere and down to earth again.

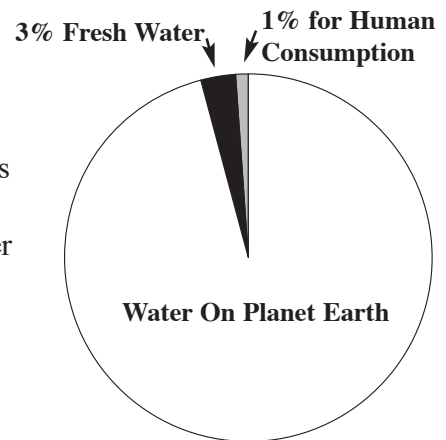
Directions:

1. Pour about 1 1/2 inches of water into one of the half-gallon jars. Add a few drops of blue food coloring. This water represents the ocean.
2. Put the rock in the middle of the jar. Some of the rock should stick up out of the water. This rock represents land.
3. Invert the second jar and place it over the first jar. Tape the two jars together.
4. Place the model on a sunny windowsill and observe.

As the colored water in the bottom of the jar is heated by the sun some of it receives enough energy to evaporate into water vapor (particles of pure water too small to be seen). The water vapor rises up in the warm air. When the water vapor comes close to the cooler sides of the jar it cools and condenses onto the jar. As more water vapor condenses onto the jar, droplets form and eventually grow big enough to **precipitate** down to the bottom. The droplets that condense out onto the sides of the jar are not colored like the water in the bottom of the jar. The larger food coloring particles are left behind just as salt and pollutants are left behind when water evaporates from oceans.

More Input:

There is the same amount of water on earth now as there was two billion years ago. It's the most common substance on the surface of the planet, but there's a catch. Less than 3% of the total water is fresh water, and less than 1% of the total is available for human consumption. Put another way, if all the water in the world were fit into a gallon jug, the fresh water would be less than a tablespoon. We put water to work in many ways. For example, it takes approximately 39,000 gallons of water to manufacture the average automobile. What are some other things we do with water? To name just a few, we grow food, produce energy, swim, fish, and enjoy recreation.

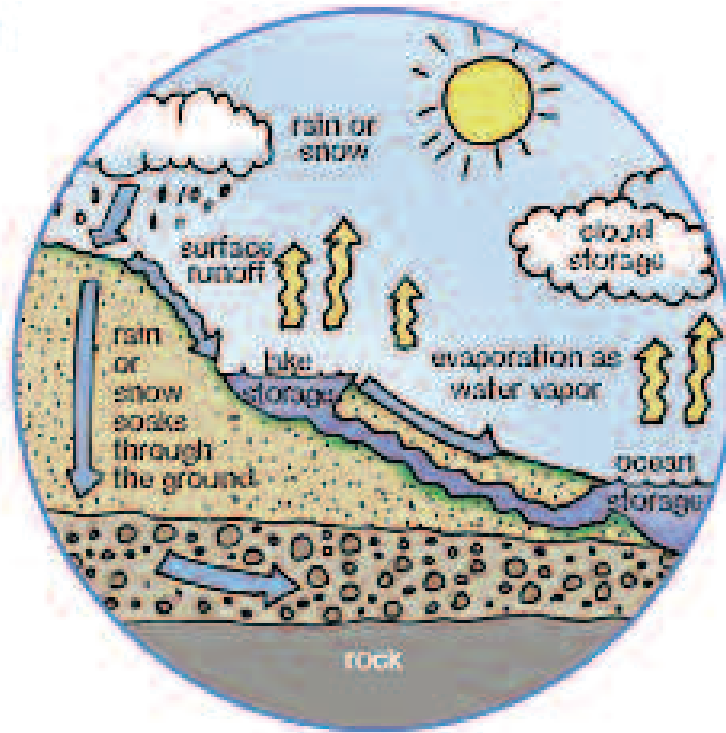


For survival, we need about two quarts of water a day to drink. A ten-minute shower uses up to 55 gallons of water. The average person uses about two gallons of water every day just for brushing teeth.

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. Provide individual remediation as needed.

Closure:

After the class has had a chance to observe the model, each student should write a paragraph explaining what they observed and what happened during the experiment. Review and clarify the key points of the lesson including the new vocabulary words (in bold in lesson). For additional review, photocopy and pass out the attached handout with the water cycle and fun facts on it.



Fun Water Facts

Do you think the following statements are true or false?

- A tree is 75% water. _____
- More than 1/2 the world's animal and plant species live in water. _____
- 3/4 of the earth's surface is covered with water. _____
- 2/3 of the world's fresh water is groundwater. _____
- The Great Lakes represent 18% of the earth's fresh surface water. _____
- 66% of the human body is water. _____
- All living things, from the tiniest insect to the tallest tree, need water to survive. _____
- 83% of human blood is water. _____



Fun Water Facts Answer Key

Do you think the following statements are true or false?

- A tree is 75% water. TRUE
- More than 1/2 the world's animal and plant species live in water. TRUE
- 3/4 of the earth's surface is covered with water. TRUE
- 2/3 of the world's fresh water is groundwater. TRUE
- The Great Lakes represent 18% of the earth's fresh surface water. TRUE
- 66% of the human body is water. TRUE
- All living things, from the tiniest insect to the tallest tree, need water to survive. TRUE
- 83% of human blood is water. TRUE

