

WATER WONDERS

LESSON 1

GOALS

- Students will have an understanding of the origin of the water used by Sonoma Valley
- Students will know that the amount of fresh water located in rivers, lakes, under-ground sources, and glaciers is limited and that its availability can be extended by recycling and decreasing the use of water
- Students will know and understand the water cycle
- Students will learn the terms evaporation, condensation, precipitation, and transportation

BEFORE CLASS PREP – On board write SEC, instructor name, presentation overview, hang Sonoma Creek watershed map

MATERIALS – Student work packets, pre-assessment, clear gallon jug, eye dropper, measuring cup, plastic cups, gallon of water, index cards for student names, Incredible Journey Dice and Posters

PART 1: INTRODUCTION (15 minutes)

- Sonoma Ecology Center
- Personal Introduction(s), “What is your name and favorite place with water?”
- Brief Program Overview

PART 2: Pre-Assessments (10 Minutes)

PART 3: DROP IN A BUCKET (10 minutes)

- Reference globe, have students guess how much water is available on Earth
- Show water available on Earth with gallon of water
- Pour ½ cup water into a plastic cup; this is all the freshwater on Earth’s surface (3% of all earth’s water). Is all of this freshwater available to use?
- From this cup, pour one third of the cup into another plastic cup. This water represents freshwater that is frozen (70% of the Earth’s freshwater is frozen). This water is not available for us to use, so set aside.
- With the water remaining in the first cup, use the eyedropper to remove one drop. The water left in the cup (.6% of the Earth’s water) represents water that is not available for use (in the air, underground) or water that is too polluted to consume.
- The remaining one drop in the eyedropper represents the readily available freshwater supply on Earth (.003%)
- Ask students if they are surprised to find out how little potable water is available to them.

PART 4: INTRODUCE THE WATER CYCLE- If Time allows (5 minutes)

- Pour a cup of water and ask if anyone wants to guess how old the water is. 10 minutes? 10 days? 10 years? Where does water come from? Where do we find water? Water doesn’t start or stop anywhere – it’s one big cycle .
- Ask students questions which will lead to inquiry about the water cycle (Use a few questions below):
- Where does the water go after it forms puddles on the pavement?
- Wet clothes are put into a dryer and come out dry. Where does the water go?
- What are clouds? How are clouds made?
- What 3 things are necessary to form clouds?
- What is fog?
- What is rain? How does rain happen?

- From where does ground water come?
- What causes streams and rivers?
- Review the water cycle- Evaporation, Condensation, Precipitation movement exercise and put on to Water Cycle Sheet

PART 5: THE INCREDIBLE JOURNEY (10 minutes)

- Categorize the places water can move through into seven stations: Clouds, Plants, Animals, Rivers, Oceans, Lakes, Ground Water, Soil, and Glaciers. Place posters and dice in locations around the room (Set up during Pre-assessment)
- Assign an even number of students to each station.
- Explain that students will roll of the die determines where water will go
- Students roll the die and go to the location indicated by the label facing up. If they roll stay, they move to the back of the line.
- Students should keep track of their movements. This can be done in the Incredible Journey Worksheet in their packets.
- Have students use their travel records to share stories about the places water has been either to the class or in pair sharing. They should include a description of what conditions were necessary for water to move to each location and the state water was in as it moved. Discuss any cycling that took place.

PART 6: CONCLUSION TO ACTIVITY (5 minutes)

- What did we learn about water today?
- What can we do to use less water?

FURTHER THOUGHT

The problem with this explanation of the water cycle is that it doesn't quite account for water conservation – if water is infinitely recycled throughout the Earth, then what's the danger of taking a 30 minute shower? I didn't "waste" the water because it can never go away!

This very valid question requires a more nuanced understanding of the water cycle. Yes, it is the case that water never disappears from the Earth. However, human beings do still "use" water with potentially negative consequences, including the following:

- **The water that evaporates does not necessarily fall down straight where it evaporated.** Water moves through the air. If individuals living the desert use up all their groundwater to water artificial lawns, the water that evaporates will rain on a different part of the world and the desert town will be even drier than it was before.
- When humans interact with water, **they run the risk of polluting the water.** Whether it's poop, fertilizers, soap, or something else, every time we use water to flush our toilets, water our plants, or wash our hands, we add chemicals to the water. Those then have to be filtered out before the water can be safely returned to the rivers, lakes, and oceans around us. This process of treating the water is time consuming and expensive. The less water you use, the less treatment is needed, the more water is available for future use by humans, other animals, or plants.