

Water Cycle

Environmental Education Lesson
EDWARDS CAMP AND CONFERENCE CENTER

Summary

Students will learn the basics about the water cycle. They will learn about the water on Earth, how much there is, what we use it for, and how to conserve it.

Usage - Grade levels: 3rd – 6th. All year

IL Standards

11.A.1e; 11.A.1f; 12.E.1a; 12.E.1c; 13.B.1e
11.A.2c; 12.C.2b; 12.E.2a; 13.B.2f
11.A.3f; 12.E.3a; 12.E.3b; 13.B.3e

Objectives

Upon completion of this lesson students will...

- Be able to explain the water cycle
- Be able to state how much usable water is on the Earth
- Be able to explain ways to conserve water

In addition students could...

- Gain a better understanding of how the water cycle really works
- Gain a better understanding of how much water we use on a daily basis

Materials

- Traveling Raindrop Sheet
- 9 Station Dice
- 9 Station Cards
- Dry Erase Markers
- Gallon blocks
- Fact Sheet
- Gallon Jug
- Clear plastic cup
- Spoon

Set-Up

- Before class starts set up the station cards with dice for the Incredible Journey
- Fill up the Gallon Jug with water
- Place out the Gallon blocks for the water relay

Introduction (5 Minutes)

Water is very important to our everyday life. Earth's water is the same water that was here since the beginning of time. We never get new water; it is just recycled through what is called the water cycle. No one can say where the water cycle actually starts.

However, the water cycle isn't a continual circular motion, it can vary. The water goes to rivers, oceans, plants, animals and other places; therefore it may not directly evaporate into the atmosphere.

There is plenty of water on the Earth to keep the water cycle going for a long time. Actually 75% of the Earth's surface is covered in water. However, 97% of the water is at the moment unusable saltwater. The leaves only 3% of water that is fresh. Glacier and ice caps take 2% of the that water. That leaves 1% of water left and more than half of that is underground, and unattainable by us. As a result, less than half of 1% of the world's water is usable by humans.

People use a lot of water in many different ways on a regular basis. We use water for lawns, dishes, clothes, toilets, hygiene, drinking, and the production of food and materials to name a few.

Because there is limited amount of water for people to use and there are many ways of using it people need to learn how to reduce the waste of water. Don't leave the water running while doing the dishes, brushing your teeth, or to get cold when getting a glass. Only use machines such as the washing machine or dishwasher when it is full. Take shorter showers. These are just a few ways to be conscientious about your water waste.

Incredible Journey (40 min)

Start activity by asking the students a couple of questions to start them thinking about where rain goes. Can anyone tell me where the water might be able to go when it starts to rain? It is in the soil, underground, marshes, swamps, ponds, streams, rivers, lakes, glaciers, and ocean to name a few. The water cycle isn't a predictable cycle. Rain doesn't come down on the ocean get heated back up to the clouds and then come right back down again. There are many factors that come into play during the cycle, and the water may stay on earth for a long time.

The students are going to act as rain drops simulating the water cycle. Make sure that the cards are spread out (if you want to play outside attach them to trees). Divide the students up so there are eight groups. Give each group a "Traveling Rain Drop" sheet. Assign each group a starting point. At each station there is a die with different outcomes. Have the students roll the die, and make a tally mark on their sheet by the corresponding word. Then have the student go to that station. If the die lands on 'stay' then the group will stay at their current station and make another mark on their sheet. Tell the students their goal is to get to as many stations as possible; they want to be the group with the most tallies.

Tell the students to make sure they make a tally every time they roll the die.

After about 20 minutes gather the students and collect data. Ask the students how many times they went to the different stations; get a total for each station. On the white board make a simple bar graph of how many times everyone went to each station. Each group went to different places at a different time and in a different order. That is exactly how

the real water cycle works. Water doesn't have a specific place it goes or specific time to stay.

Transition- We now know that the water that is on the Earth has been here since the beginning. But have you ever stopped to think how much of the water on Earth is usable by us?

How Much Do We Have To Use? (10 Minutes)

There is a lot of water on the Earth. In fact 75% of the Earth surface is made up by water. We are going to simulate how much water we can actually use. Get the gallon water jug and fill it with water. Pretend the water in the water bottle represents all the water in the world. What is the biggest source of water on Earth? Oceans, can we drink ocean water? No, why? Because it is salty. Around 97% of the water comes from oceans (pour a little bit of water from the water bottle into a plastic cup representing the 3% of freshwater we have left). That leaves about 3% of water that is fresh. Where do you think that fresh water is? Glaciers and ice caps, ground water, and bodies of water like lakes. Glaciers and ice caps take up 2% of that water. Can we get to that water? No, it's frozen (Now scoop out a spoonful of water. The spoonful of water represents the 1% of water that is left). We have 1% of water left from all the water on the earth. Another place for fresh water is in the ground where people can't get at it. Why can't we get at it? Because it is so deep in the ground. Actually over half of the water we have left is in the ground. (Pour off a little more than half of the spoon full of water, leaving less than half a spoonful on the spoon. The water left on the spoon represents the .4% of water that is left for us to use.) If this water bottle represented all the water in the world this is how much water we have on the Earth that can be used and obtain by us, about .4%. With this water we need to be able to get drinking water, bathe in it, wash dishes in it etc.

Water Relay (15 Minutes)

What are ways we use water? Let the group answer the question. We are going to play a game trying to figure out how much water is used in everyday activities. Divide the group into two teams. Have them line up in two single file lines with the blocks set up 20-50 ft away from the starting point. Explain to the students that you are going to read a question such as 'How many gallons of water do we use to take a shower?' The first person on your team will run down and get what they think is the correct answer block and hand it to the teacher so the group can discuss it. It takes 15-32 gallons of water to take a shower. Use the Water Relay sheet attached at the end of the packet to finish the game.

Conclusion (5 Minutes)

What are some ways water travels through the Water cycle?
What are some ways we can be more mindful of water waste?

WATER RELAY LIST

- Watering the lawn: 180 gallons
- Washing the dishes: 9-20 gallons
- Washing clothes: 30 gallons
- Flushing the toilet: 4-7 gallons
- Brushing teeth: 2 gallons
- Drinking water: ½ gallon
- Needed to produce one ton of steel: 62,000 gallons
- Needed to process one can of fruit or vegetables: 9.3 gallons
- Needed to manufacture a new car and it's four tires: 39,090 gallons

WAYS TO SAVE WATER

- Run your washing machine and dishwasher only when they are full and you could save 1000 gallons a month.
- Keep a pitcher of water in the refrigerator instead of running the tap for cold drinks, so that every drop goes down you not the drain.
- Use a broom instead of a hose to clean your driveway or sidewalk and save 80 gallons of water every time.
- Time your shower to keep it under 5 minutes. You'll save up to 1000 gallons a month.
- Collect the water you use for rinsing produce and reuse it to water houseplants.
- Time your shower to keep it under 5 minutes. You'll save up to 1000 gallons a month.
- Designate one glass for your drinking water each day. This will cut down on the number of times you run your dishwasher.
- When you clean your fish tank, use the water you've drained on your plants. The water is rich in nitrogen and phosphorus, providing you with a free and effective fertilizer.
- Turn off the water while you brush your teeth and save 4 gallons a minute. That's 200 gallons a week for a family of four.
- Make sure your toilet flapper doesn't stick open after flushing.
- Do one thing each day that will save water. Even if savings are small, every drop counts.