Connecticut Water Company
VIRTUAL Water Drop Watchers Curriculum

GRADES: 3 **TIME: 45-60 minutes** **SETTING: Virtual**

PURPOSE:
Learning how much freshwater is available on Earth and how it is commonly used, we can understand how to reduce our personal water use by using water more efficiently.

OBJECTIVES:
- Students will estimate how much of the earth is covered with water.
- Students will state different places where water can be found on planet earth.
- Students will state land areas where water is abundant and where it is scarce.
- Students will state how much fresh water is available on earth.
- Students will state four methods for conserving water / reducing water use at home.

BACKGROUND:
Earth is often referred to as "the blue planet," because, when viewed from space, you can see that most of the planet consists of water. Earth is made up of approximately 70% water, most of which is found in oceans that are salt rich. After oceans, the next most common place water is found is glaciers and ice, followed by groundwater and then fresh surface water (lakes, ponds, rivers, etc). Water is essential to all life on our planet and many species – humans included – depend on clean, fresh water for survival. Unfortunately, fresh water is scarce and it is distributed unevenly around the globe; some regions are hot, dry deserts while others are damp and lush with vegetation. Even in water-rich environments, it is important to conserve water so there is enough clean water to meet the needs of humans and wildlife alike.

ACKNOWLEDGEMENTS:
The activities in this program combine elements adapted from the following lesson plans published in *Project WET Curriculum and Activity Guide, Generation 2.0* (2011): "Blue Planet" (page 125); "Incredible Journey" (page 155); "A Drop in the Bucket" (page 257); and "My Water Footprint" (page 441).

CURRICULUM CONNECTIONS

Next Generation Science Standards (NGSS)
- 3-ESS2-2. Weather and Climate. "Obtain and combine information to describe climates in different regions of the world."
- 3-ESS3-1. Earth and Human Activity. "Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard."
- 3-5-ETS1-2. Engineering Design. "Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem."

Common Core - Mathematics
- 3.MD.A.2 "Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem."

CLOSURE/ASSESSMENT:

- Students can name at least at least four places that water is found on earth.
- Students can explain that water is not distributed evenly on earth, and that freshwater is the least abundant water resource.
- Students can describe different ways they use water every day, and explain that some things use a lot more water than others.
- Students can brainstorm ways to reduce their daily water use. Students may be able to calculate how much water they can save each day with the choices they make.

Part 1 – The Blue Planet

Time: 15 minutes

Objective: Students will estimate how much of the earth is covered with water. Students will state different places where water can be found on planet earth. Students will state land areas where water is abundant and where it is scarce.

Materials: N/A

Web Links:

- Online Spin Globe *(select terrain globe)*
- Ball Toss Video

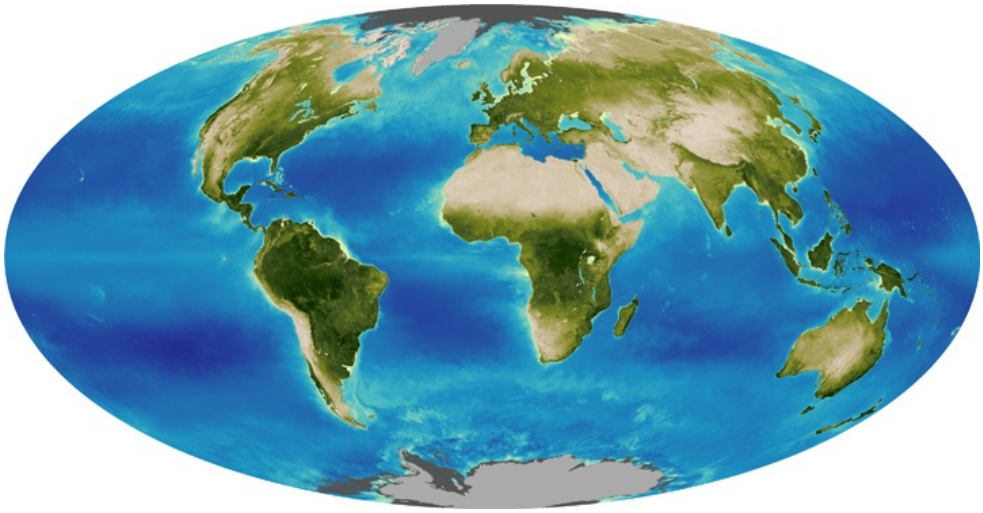
Overview: In this part of the activity, students will watch the video of a beach ball toss to learn how much of our planet is covered in water. They will then observe an online spinning globe to replicate the ball toss game.

The Activity:

1. Share your screen to show the spinning globe (select the "terrain" globe). Use the curser to spin the globe showing the north and south polls. Ask the students to state different places where water can be found on earth that you can see on a globe (ocean, river, lake, ice cap/glacier).

2. Tell the students you will now show a video of an experiment designed to determine how much of the earth is made up of water. Any guesses? Show the ball toss video. The results of the ball toss to show the planet is covered with more water than land (~71% water).

3. What was the result of the ball toss? Where do you think most of the water on earth is found? Explain that in the next lesson they will learn about different places water can be found on earth.



Water = 71% **Land = 29%**

Part 2 - The Incredible Journey

Time: 15 minutes

Objective: Students will state different places where water can be found on planet earth.

Materials:
The teacher should provide these materials to the students prior to the class.

- Water Cycle Worksheet for each student (optional: answer key)

make sure you print out a worksheet for yourself so you can follow along with the students

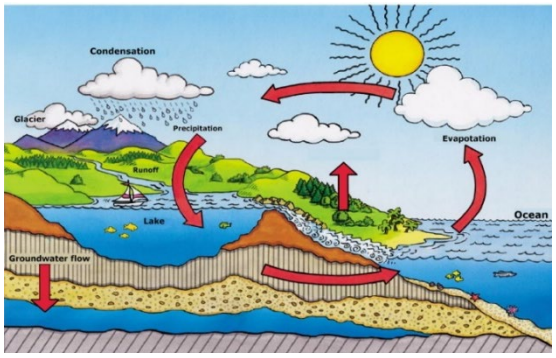
- One colored marker or crayon for each student *(and yourself)*

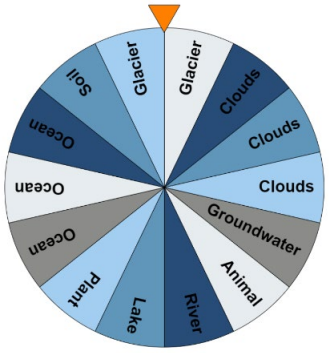
Web Link: WaterDropSpinner *Tip: click "Ctrl + or -" to adjust the view of the spinner.*

Overview: In this part of the activity, students draw the path of the water drop as it makes its way around the planet - moving between different places where water can be found.

The Activity:

1. Ask the students to look at their Water Cycle Worksheet (share fillable form) and identify various places water can be found: oceans, lakes, rivers, groundwater, soil, glaciers, clouds, plants, and animals. Instruct the students label each place water can be found using the word bank on the worksheet (demonstrate using fillable form – use Caps Lock). Tell the class to imagine a droplet of water and explain that the water drop is about to go on an "incredible journey" around the planet.





2. Share your screen with students and use the online spinner to begin the journey: WaterDropSpinner. Click to spin. (Note that ocean, cloud, and glacier are weighted to demonstrate that a water drop can get "stuck" in these locations since they are so vast).

3. Instruct the students draw an X for the water droplet's starting point (demonstrate with your own worksheet and hold up to the camera). Continue to spin the spinner (about 10 times) while the students follow along by tracking the journey of the water drop on their worksheets.

4. Ask students to make observations about the journey. Where there any surprises? Did the water drop get stuck in one location for many turns? Ask students to share ideas about why that might be; make connections back to the ball toss and the distribution of water around the planet. If time allows, briefly discuss the how water would move from one place to another (precipitation, condensation, evaporation, etc).

Part 3 - A Drop in the Bucket

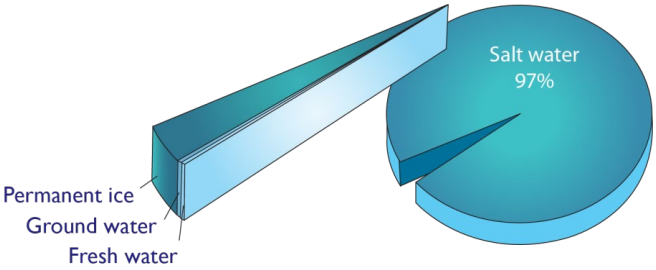
Time: 10 minutes

Objectives: Students will state how much fresh water is available on earth and how much of that water is potable (drinkable).

Materials: N/A

Web Link: A Drop in the Bucket Video
**Be sure to turn up the volume on the video and remind the students that they can turn up the volume on their computers too if the video volume is too low.*

Overview: In this part of the activity, students will watch a video to give them a visual of where water is found on the planet and how freshwater makes up a very small percentage of that water and only a small fraction of that is available to drink (potable).

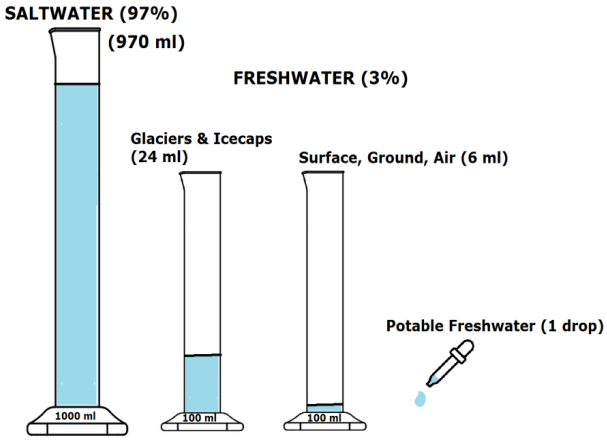


The Activity:

1. Where most of our planet's water is found? 97% of our water is located in the oceans (as observed in the ball toss and water cycle journey). Where does our drinking water come from? What percent of water on earth is available to drink? Explain that you will show a video explaining how much water on earth is available to drink.

2. Show the video.

3. Where was the most water on earth found (97% in the ocean)? If only 3% of the earth's water is freshwater, but most of it is locked up in glaciers, deep in the ground, or not safe to drink (polluted), how much of that water is drinkable (1.2%)? Explain that the next lesson will talk about how we use water every day.



Earth's Total Water Supply	(100%)
Oceans	97.25%
Glacial and Other Land Ice	2.051%
Groundwater	0.68%
Rivers & Lakes	0.0101%
Atmosphere/Soil Moisture/Biosphere	0.00604%

Part 4 – My Water Footprint

Time: 15 minutes

Objectives: Students will identify varying volumes of water they use in common, daily activities. Students will state methods for conserving water or reducing water use at home.

Materials:
The teacher should provide these materials to the students prior to the class.

- My Water Footprint Worksheet
- Water Drop Watchers Pledge
- Pencil

Online Link: Be a Leak Detective

Overview: In this part of the activity, students will get a sense for the volume of their daily water usage and explore engineering solutions for using less water and/or using it more efficiently.

The Activity:

1. Now we are going to talk about different ways that you use water. While we watch the next video, I want you to think about different ways that you use water every day. Show video.

2. Which of those water-use activities did you do today? Which of those activities use lots of water? What is one other way you used water today?

3. Using the worksheet, have students add up their water use. Share your screen showing the online fillable PDF so that students can follow along.

Water Use Activity	Number of Times in One Day		Amount of Water Used Each Time		Total Water Used SHOWER DAY	Total Water Used BATH DAY
Brushing Teeth (30 sec)	**2**	X	1 gallon	=	**2**	**2**
Washing Hands (30 sec)	**6**	X	1 gallon	=	**6**	**6**
Flushing a Toilet	**4**	X	2 gallons	=	**8**	**8**
Taking a Shower (8 min)	**1**	X	16 gallons	=	**16**	**n/a**
Taking a Bath	**1**	X	70 gallons	=	**n/a**	**70**
			TOTAL	=	**32**	**86**

4. Once the table on the front page of the worksheet is complete, explain to the class that these numbers multiply by how many people are living in their home. Explain that if a person typically uses the toilet about 4 times a day (once in the morning, once at lunchtime, once around dinner, once before bed) that equals 6 gallons each flush x 4 times a day equals 24 gallons for one person per day. Multiply by 4 people in the home equals 24 x 4 = 96 gallons per day. Instruct students to complete the remainder of the worksheet with the other members of their household.

5. Introduce the Water Conservation Pledge. Ask the students to be a Water Drop Watcher and sign the pledge and bring home to share with their household.