



**Grades:** 2-5

**Time:** 50-60 minutes

**NGSS connections:**

**2-ESS2-3.** Water is found in the ocean, rivers, lakes, and ponds, Water exists as solid ice and liquid form.

**4-ESS2-1.** Rainfall helps to shape the land and affects the types of living things found in a region.

**5-ESS2-1.** Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes.

**5-ESS2-2.** Nearly all of Earth's available water is in the ocean. Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere.

**Essential Question:** How do water molecules move within the water cycle?

### Materials

- Cloth bags with sticks inside for each water station (*list of sticks at the end of this document*)
- Images for water stations
- Incredible Journey worksheets
- Pencils

### Learning Objectives

1. Students will understand the concept of a cycle.
2. Students will understand that water continually cycles among land, ocean, and atmosphere.
3. Students will understand that water is connected around the world.
4. Students will understand that sun and gravity make water move.

**Vocabulary:** cycle, precipitation, evaporation, condensation

**Pre-class Activity:** Read [A Drop Around the World](#) by Barbara McKinney; discuss the places water can travel.

### Set-up:

- Place pictures and bags around the room to create nine water stations

### Introduction (15 min.):

- Ask students where the Columbia River is and start drawing an Oregon/Washington map on the board. Where does the river start? Where does it go? Once water reaches the ocean, where does it go? Evaporation!
- Draw a simplified water cycle with help from students focusing on evaporation, condensation, and precipitation. What causes water to evaporate? Sun! What causes water to precipitate? Gravity!
- Explain that the cycle is much more complicated! Water exists in many additional places and doesn't always cycle in a perfect circle.



- Write the essential question on the board. Brainstorm a list of places water can be found: oceans, rivers, inside our bodies, ice cubes, water vapor in the air we breathe, etc. Identify solid, liquid, and gas states in the list.
- Ask: where is most of the water? Draw a pie chart dividing out the ocean and freshwater (96.5% of water is in oceans, about 2% is frozen in ice caps and glaciers, the rest is in the other brainstormed places). Announce that in this activity you will be focusing on nine places where water is found.

### **Activity (25 min.):**

- In this activity, students will transform themselves into water molecules (or water drops for younger students) and make a journey through the hydrosphere.
- Place the nine bags at the appropriate water stations, point out the stations to class, and pass out the Incredible Journey datasheet.
- Divide students evenly into the nine stations; all stations should have an even number of students (if there is an odd number, the extra student should be at the Cloud station). Explain that water molecules travel in pairs to form a water droplet, so each student will start with a partner in their station.
- Pairs will draw a popsicle stick and write the location down on the Incredible Journey sheet, then travel to that location. It is important that they put the sticks back into the same bag before they move on. If a water droplet needs to go to the cloud station, they leave their partner behind (because evaporation only takes small water molecules) and each person individually draws a stick. Once they get to the new station, they need to wait to join another water molecule.
- The process is repeated until the game is stopped. Students can add numbers to the worksheet if they get to more than 8 stations.

### **Wrap-up (10 min.):**

- Once students return to their seats, have a few volunteers walk their journeys for the class and draw the cycle on the board.
- Ask students: Did anyone never visit the same place twice? How many got stuck for two or more turns in a glacier? In the ocean? In groundwater? Emphasize the concept of a cycle – returning to the same place. Remember the pie chart from the introduction – much of the water stays in oceans and glaciers.
- Ask students: How could a water droplet travel from one station to another? Write down student suggestions of how water travels from a plant to an animal, a river to a lake, a cloud to an ocean, etc. (a list is found at the end of this document).
- Emphasize that water is a finite resource. The water molecules present during the time of the dinosaurs are the same water on Earth today. Remember the pie chart from the introduction – clean, fresh water is limited and once it is polluted, it's hard to undo!

### **Extensions**

- Students write a story about a water droplet in one of the places they visited on their journey.
- Students make a visual art representation of their path through the cycle.
- Add an element of pollution: with small cotton balls or sticky balls of tape, start several stations with pollution and see how it travels with students throughout the stations. Notice that pollution is left behind when water evaporates because water molecules do not carry pollution when they evaporate.

## Water Cycle Table – explanations of movement

STATION	EXPLANATION
<b>Soil</b>	<p>Water is absorbed by plant roots.</p> <p>The soil is saturated, so water runs off into a river.</p> <p>Water is pulled by gravity; it filters into the soil.</p> <p>Heat energy is added to the water, so the water evaporates and goes to the clouds.</p> <p>Water remains on the surface (perhaps in a puddle, or adhering to a soil particle).</p>
<b>Plant</b>	<p>Water leaves the plant through the process of transpiration.</p> <p>Water is used by the plant and stays in the cells.</p>
<b>River</b>	<p>Water flows into a lake.</p> <p>Water is pulled by gravity; it filters into the soil.</p> <p>Water flows into the ocean.</p> <p>An animal drinks water.</p> <p>Heat energy is added to the water, so the water evaporates and goes to the clouds.</p> <p>Water remains in the current of the river.</p>
<b>Clouds</b>	<p>Water condenses and falls on soil.</p> <p>Water condenses and falls as snow onto a glacier.</p> <p>Water condenses and falls into a lake.</p> <p>Water condenses and falls into the ocean.</p> <p>Water remains as a water droplet clinging to a dust particle.</p>

STATION	EXPLANATION
<b>Ocean</b>	<p>Heat energy is added to the water, so the water evaporates and goes to the clouds.</p> <p>Water remains in the ocean.</p>
<b>Lake</b>	<p>Water is pulled by gravity; it filters into the soil.</p> <p>An animal drinks water.</p> <p>Water flows into a river.</p> <p>Heat energy is added to the water, so the water evaporates and goes to the clouds.</p> <p>Water remains within the lake or estuary.</p>
<b>Animal</b>	<p>Water is excreted through feces and urine.</p> <p>Water is respired or evaporated from the body.</p> <p>Water is incorporated into the body.</p>
<b>Ground Water</b>	<p>Water filters into a river.</p> <p>Water filters into a lake.</p> <p>Water stays underground.</p>
<b>Glacier</b>	<p>Ice melts and water filters into the ground.</p> <p>Ice evaporates and water goes to the clouds (sublimation).</p> <p>Ice melts and water flows into a river.</p> <p>Ice stays frozen in the glacier.</p>

**Water Cycle**  
**Water Molecule Distribution**  
(12 per station/bag)

Soil

- 2 plant
- 2 river
- 2 groundwater
- 4 clouds
- 2 soil

Plant

- 6 cloud
- 2 animal
- 4 plant

Animal

- 9 cloud
- 3 animal

Ocean

- 4 cloud
- 8 ocean

Cloud

- 2 soil
- 2 glacier
- 2 lake
- 4 ocean
- 2 cloud

Lake

- 2 groundwater
- 2 animal
- 2 river
- 2 cloud
- 4 lake

Groundwater

- 4 lake
- 2 river
- 6 groundwater

Glacier

- 2 groundwater
- 2 cloud
- 2 river
- 6 glacier

River

- 2 lake
- 2 groundwater
- 2 ocean
- 2 animal
- 2 cloud
- 2 river