

Water Cycle Whirl

“We forget that the water cycle and the life cycle are one.” – Jacques Cousteau

Background Information:

Bin Information

This lesson is the first in a series of lessons on water. The purpose of this activity to give students an introduction to the water cycle and to build connections to water by them working through the journey that a water droplet goes through. After completing the main activity, there are several extension options to connect to different topic areas.

This lesson is followed by “Water(sheds), Water(sheds) Everywhere” where students will learn more about the watersheds around them, and the interconnectedness of water and “The Great Groundwater Debate” in which students will learn about and discuss groundwater as a resource.

Vocab

Lower elementary:

- **Solid:** one of the three main states of matter. Solid objects keep their shape.
- **Liquid:** one of the three main states of matter. Liquids take the shape of the container that they are in.
- **Gas:** one of the three main states of matter. Gases fill the container that they are in.
- **Melt:** To move from a solid to a liquid.
- **Freeze:** To move from a liquid to a solid.
- **Evaporation:** To move from a liquid to a gas.
- **Condensation:** To move from a gas to a liquid.
- **Water cycle:** The ongoing system in which water moves through the oceans, atmosphere, and land. In the water cycle, water can take the form of a liquid, solid, or gas.
- **Gravity:** A pulling force that works across space.
- **Dew:** Tiny water droplets that form on cool surfaces at night.

Upper elementary and middle:

- **Precipitation:** Liquid and solid water particles that fall from clouds. Rain, snow, hail, and sleet are all types of precipitation. Fog is not.
- **Molecule:** The smallest possible amount of a substance that still has all of the properties of that substance.
- **Perspiration:** Another word for sweat.

Author:

Adapted from “The Incredible Journey” from Project WET Curriculum and Activity Guide by Dominique Menard

Themes:

Empathy, Water Cycle, Earth Science

Estimated Duration:

50 minutes

Audience Identified:

This lesson can be adapted for use from lower elementary to middle school.

Location:

Large open space, such as a field or gym.

Goal:

Students will learn about the movement of a water drop through the water cycle.

Objectives:

Students will be able to describe the movement of water within the water cycle.

Students will be able to identify the states of water as it moves through the water cycle.

- **Respiration:** The act or process of breathing.
- **Digestion:** Breaking down food that is eaten into energy that the body can use.
- **Transpiration:** The process by which plants absorb water from the soil and eventually release water vapor through the leaves.
- **Sublimation:** When a solid turns directly into a vapor.
- **Deposition:** When water vapor changes directly to ice.

Materials and Set-Up:

This kit includes:

- Station markers
 - Soil
 - Plant
 - River
 - Cloud
 - Ocean
 - Lake
 - Animal
 - Ground
 - Glacier
- Station dice (One per station)
- Pony beads (One color per station)
- Pipe cleaners
- A copy of *Go Home River* by James Magdanz
- Master Copy of Water Journey Map
- Master Copy of Water Cycle Table

You will need:

- *Optional:* Writing utensil (One per student)
- *Optional:* Copies of Water Journey Map (One per student)

Set-Up:

- Ensure that the dice and color of beads are properly matched to the correct station using the Water Cycle Table as a guide.
- Set up each station with the proper marker, dice, and container of beads. You can use the Water Journey map to determine where to place them, or if the lesson is outside you may choose to match the stations to some real-life markers; for example, placing the plant station next to a tree or the lake station next to a water source.
- Make copies of the Water Journey Map if it is being used.
- *Optional:* Add one color of bead to each pipe cleaner if you would like to preselect the station that each student will start at.

Introduction:

Estimated Duration: 5 minutes

Attention Getter

Any established group or classroom attention-getters can be used to regain the attention of the students when giving directions or transitioning activities. If you choose to use an attention-getter personalized to this lesson, introduce the following before introducing the lesson:

- The instructor calls out “Water!”
- The students call back “Cycle!” and spin around a single time, stopping so that they face the instructor, ready to hear the next instructions.

Warm Up

“In just a moment, we will be learning about the water cycle by being water molecules and traveling through the water cycle! Before we do that, we need to get into character as water molecules, so we’re going to do some acting exercises.”

Have students arrange themselves in a large circle, or other formation where they can clearly see the instructor and their peers and have some room to move. Go over different forms that water can take or places that it can go, and create and stretch or movement for each one. For example, water falling as rain could be portrayed as reaching towards the sky and wiggling fingers as rain while bending down to touch the ground. The instructor can lead the first few, but then have students share ideas and come up with movements. This can also be a spot to reiterate or introduce vocab words for this lesson.

Content and Methods:

Estimated Duration: 30 minutes

Incredible Journey Game

- After the warm up, it is time to move through the water cycle. Tell students that they will be tracking their progress with a bracelet and map (optional).
- Point out the nine stations that are set out. If the station markers are not easily visible, be sure to run through what the stations are, where each is located, and what colors correspond to each station.
- Tell students that they will have a pipe cleaner that they will use to track their journey. At each station the first thing that they do will be to grab one of the pony beads and add it to their pipe cleaner. Then, they will roll the cube for that station. The cube will either tell them the next station to stay. Each station will also have a cube to roll which will tell them the next station to visit, or it will tell them to stay. If they stay, they will still take a bead for that turn.
- Sometimes stations will have multiple people at them. Students should line up behind the cube and roll it. If it tells them the next station, they should head there, and if it tells them to stay, they should take a bead and return to the end of the line.
- If students are using the water journey map, they should also track their progress by tracing lines between the stations that travel to and marking each ‘stay’ that they get with a symbol of their choosing, such as a star.
- Hand out each a pipe cleaner to each student. If you have started them with a station bead ahead of time, instruct the students to start at that station. Otherwise you may distribute them evenly among the stations or allow them to choose their own.

- Give a signal to start the game when each student is at a station. Let them know that there will be the same signal given when it is time to stop. The attention getter can be used, or a whistle or other method.
- Allow students to move through the stations for the first round. You may choose to set a time for each round or allow students to keep going as long as engagement stays high.

Conclusion:

Estimated Duration: 10 minutes

To conclude, have students take some time to examine the journey they took, and then to meet with at least three other students to compare bracelets and journey maps, paying attention to if there were any places they were 'stuck' and had multiple of the same beads in a row or if they returned to stations that they had been at previously.

Gather back as a large group to finish wrapping up. Call on students to share three beads in a row on their bracelet and work as a group to determine what forms the water would have been in to transition through those stations (for example, if the beads were cloud-lake-animal, then the water would have started as a vapor in the cloud, fallen as precipitation to the lake, and be drunk as a liquid by an animal).

Name locations in the immediate area, such as a puddle, nearby pond, animals, cloud, parking lot, etc. and have students name ways that water can move to and from that location, and what form it would be in.

Reflection and Evaluation:

Evaluation for this lesson takes place during the conclusion. Students will be considered successful if during the wrap up they can correctly identify the states that water is in while moving through the water cycle and describe the processes that move water.

Additional evaluation can take place if any of the extension activities are utilized.

Extensions:

Accessibility and Accommodation

Social Distancing: There are several different options that can be used in order to still run this lesson with social distancing parameters. Please note that the activity will take longer with social distancing to ensure that

Beads: Give each student a plastic spoon.

Water Journey Map: Alternatively, make copies of the Water Journey map to use instead of pipe cleaners and beads. Students will track their progress by tracing lines from each station as they travel between them and marking a star by each when they stay a round at that station.

Dice: Students can either be instructed to gently use a foot to roll the dice to avoid touching it with their hand, or if materials are available, each student can carry a six-sided dice with them. At each station, they will role their own die and use the number to reference a table telling them their next station.

Distance Learning: As a distance learning alternative, students will need the following materials in their own homes: drawing materials in 9 colors, a sheet of paper, a six sided dice (or use a random number generator like [this one](#)), and a physical or digital copy of the Water Cycle Table.

Either while virtually in class over web conferencing, or on their own time, students can individually roll their dice, see what station is next, and use the crayons or markers to draw a small symbol to mark each station. Evaluation can take place either through a class discussion or by submitting short answers to evaluation questions.

Moving as a Group: For students who may need extra hands on attention or help, move through the stations as groups of three instead of individuals with adults or other helpers placed with students as needed. Introduce this by asking if anyone has ever heard water called H₂O. Explain that each tiny water molecule has three even smaller building blocks that make it up, and that in the group two members will be hydrogen, and one will be oxygen.

Duration: The length of the game can be varied greatly based on students' needs. It can be shortened, played as multiple short rounds with discussions in between, slowed down, or students can be finished with the activity when a set number of stations has been completed. For ASD, consider having a visible countdown clock for the duration of the activity.

Lakeville Specific

After finishing the game, have students make a list of all the stations that were out, and as a class come up with the closest equivalent that exists in Lakeville. Students can draw a map of places that they are familiar with around their home or school and label the parts of the water cycle that exist around them. You may also choose to customize this based on the season that the lesson is being taught in: how does the water cycle look different in spring, summer, fall, and winter?

Project WET

The main activity in this lesson was adapted from "The Incredible Journey" from Project WET. Related Project WET lessons that can be taught in conjuncture with this lesson include:

- Blue Planet: How much of Earth's surface is covered in water
- A Drop in the Bucket: Calculating the percentage of freshwater on Earth
- The Thunderstorm: Students mimic a thunderstorm and measure and map rainfall

ELA

Have students write a short story from the perspective of the water droplet based on the stations that they traveled through. The story can cover the whole journey, or just a small section.

Math

Have each student record and graph the number of each color of bead that they recorded. Compile the data as a class and discuss different ways to graph the information. Compare ratios of beads to ratios of how many cube sides each station has.

Social Studies

After playing the incredible journey game, read the book *Go Home River* by James Magdanz, which provides an information about the water cycle through the lens of Alaskan natives. Compare and

contrast the journey of the young boy in the story as he follows the river to the journey that the students took as water molecules in the incredible journey game.

Reference Materials:

The Incredible Journey. (2011). In *Project WET: Curriculum and activity guide 2.0* (pp. 155-162). Bozeman, MT: Project WET Foundation and Council for Environmental Education.

Magdanz, J. (2001). *Go Home, River*. Anchorage, AK: Alaska Northwest Books.