



# Conservation Education Teacher Guide

## INCREDIBLE JOURNEY

Students will engage in hands on activities to learn concepts associated with the water cycle. Students learn about the water cycle by becoming a water molecule. They also learn ways to conserve and protect the freshwater resources that we depend on!

### Pre-Visit Activity- Water, Water, Everywhere!

The path water takes through the water cycle varies. Heat energy directly influences the rate of motion of water molecules. When the motion increases due to an increase in heat energy water changes from solid to liquid to gas. With each change in state comes a change in location. Glaciers melt to pools which overflow to streams where water may evaporate into the atmosphere. Water travels slowly underground, seeping and filtering through particles of soil and pores within rocks. Although unseen, water's most dramatic movements take place during its gaseous phase. Water is constantly evaporating, changing from a liquid to a gas. In fact, water vapor surrounds us all the time. Where it condenses and returns to Earth depends upon loss of heat energy, gravity, and the structure of Earth's surface. The greatest movers of water among living organisms are plants. The roots of plants absorb water. Some of the water is used within the body of the plant, but most of it travels up through the plant to the leaf surface. When water reaches the leaves, it is exposed to the air and the sun's energy and is easily evaporated. This process is called transpiration, condensation, evaporation, precipitation, ground water, transpiration and the sun all work together to move water around.

#### Geauga SWCD Mission:

"To conserve, protect, and enhance the resources of Geauga County by providing leadership, education, and assistance to all."



## Vocabulary

- **Sunshine**-Heats up oceans, lakes and rivers creating energy.
- **Evaporation**-The process that changes liquid water to a gas (water vapor). Evaporation is driven by heat.
- **Condensation**-The process that changes gaseous water (water vapor) to liquid water. Condensation is a water phase change.
- **Precipitation**-Water released from clouds in the form of rain, freezing rain, sleet, snow, or hail that falls over the land surface.
- **Ground Water**-Liquid water stored underground, within cracks in rocks of all kinds and in the pore spaces of sediments and sedimentary rocks. The term “aquifer” refers to rocks that can hold substantial amounts of water. Groundwater can be fresh, saline, or brackish.
- **Transpiration**-The release of gaseous water (water vapor) from plant leaves.

Post Visit Activity-  
What has transpired here?

### Ohio Learning Standards, Ohio Revised Science Standards and Model Curriculum

#### Kindergarten

Earth and Space Sciences: 1

#### First Grade

Earth and Space Sciences: 1, 2

#### Second Grade

Earth and Space Sciences: 1, 2, 3  
Life Sciences: 1

#### Third Grade

Earth and Space Sciences: 2, 3  
Physical Science: 2,

#### Fourth Grade

Life Sciences: 1

#### Seventh Grade

Earth and Space Sciences: 1

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Transpiration is the process by which plants release excess water (as vapor) into the atmosphere. To demonstrate transpiration, try the following experiment.

- Divide your class into pairs. Provide one “Zip-lock” baggie to each pair.
- Instruct each pair of students to find a leaf on a tree or shrub and, without removing it, zip the baggie closed around the leaf’s stem.
- After an hour or more, return to the bagged-leaf sites. The baggies will be filled with water droplets released by the tree through its leaf.
- Variations: Indoor house plants can be used if the weather is non-conductive. Instruct your group to bag different trees, coniferous and broad-leaved trees and trees located in full sun as well as trees in shade. Discuss any observations your students make.
- Fun Fact: Sugar Maple trees during a single, hot summer day, can release up to 200 gallons of water!

