

- Repeat the investigation only this time place a small piece of foil over the test tube. Look at the foil. What is on the foil? What caused the liquid to change to gas? Why did it change back to a liquid?
- Review: Liquid may be changed into a gas by adding heat. When vapor cools, it may change back into a liquid.

Pre/Post visit activities are adapted from Project WET, Ottawa Park Nature Education Center Teachers Resource Packet and Science on a Shoestring and may need to be adjusted depending on the grade level.

**Ohio Academic Content Standards reinforced or introduced by this program:**

- First Grade  
Physical Science: 2, 3, 4, 8  
Scientific Inquiry: 1, 2, 5, 9
- Second Grade  
Earth and Space Sciences: 4  
Life Sciences: 1  
Scientific Inquiry: 10
- Third Grade  
Scientific Inquiry: 5, 6  
Scientific Ways of Knowing: 2
- Fourth Grade  
Earth and Space Sciences: 2, 3  
Physical Sciences: 1, 4  
Scientific Ways of Knowing: 2
- Fifth Grade  
Earth and Space Sciences: 5, 6  
Scientific Inquiry: 3
- Sixth Grade  
Physical Science: 3, 4, 8
- Seventh Grade  
Earth and Space Sciences: 1, 2, 3, 4, 9  
Physical Sciences: 1

**Evaluation Form**

Please fill out the evaluation form and return it to Geauga SWCD. We appreciate your comments and suggestions. If you enjoyed the program and would like to see future programs offered please write a letter to the Geauga County Commissioners and thank them for funding the Geauga SWCD. Thank you for inviting us to your classroom and we look forward to coming back!

**This brochure was created by the Staff of the Geauga Soil and Water Conservation District under the authority of the Board of Supervisors and assistance from the USDA-Natural Resources Conservation Service.**

**Funding for this brochure was made possible by the continuing financial support from the Geauga County Commissioners and the Ohio Department of Natural Resources-Ohio Soil and Water Conservation Commission.**

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

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**Geauga Soil and Water Conservation District**

**Incredible Journey Teacher Guide First-Seventh Grade**

**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!**



**Water Cycle!**

## 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.

## Vocabulary

**Sunshine**-Heats up oceans, lakes and rivers creating energy.

**Evaporation**-Turning a liquid (water) into a vapor (gas) by heat (sun).

**Condensation**-Vapors rise and cool to form clouds then forming a liquid.

**Percipitation**-The water falls back to the Earth as a liquid (rain, sleet or snow).

**Ground Water**-Water found in spaces in soil particles underground.

**Transpiration**-Water is absorbed through the ground through plant roots and is emitted through their leaves.

## Pre-Visit Activities- What has transpired here?

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-conducive. 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!

## Post Visit Activities-

Explain to the students they are going to be scientists and they need to observe what is going to happen during the experiment.

- You will need tin foil (to set the candle on), food warming candles, heat resistant test tubes (small), eye droppers, matches, wooden clothes pins and goggles. For younger students you as the teacher can do the experiment while they watch.
- Pass out the supplies (foil, candle, test tube, goggles and clothes pin) to each group of 4 students. Explain the safety rules!
- Go around and light each groups candle and drop several drops of water into their test tube.
- Have the students hold the tube over the flame. What is happening? Is anything leaving the test tube? Where is the water going? Has the liquid water changed into a gas? How do you know? Has anything happened to the test tube? It turned black from the carbon.