

Around and Around

Strand	Earth’s Patterns, Cycles, and Changes
Topic	Water cycle
Primary SOL	3.9 The student will investigate and understand the water cycle and its relationship to life on Earth. Key concepts include b) the energy from the sun drives the water cycle; c) the water cycle involves several processes.
Related SOL	3.1 The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which d) natural events are sequenced chronologically; l) models are designed and built.

Background Information

Approximately 97% of the water is found in the oceans and the other 3%, which is fresh water, is found in glaciers, icecaps, rivers, lakes, underground, and in the atmosphere. Of this 3%, only 1% is suitable for drinking. Water continuously circulates between Earth’s surface, the air, and underground. This circulation is driven by the sun’s energy. As the sun warms the surface of oceans and other water sources, the movements of water molecules increase until some molecules change state from liquid water to gaseous water (water vapor). This is called evaporation. When energy is lost, the water vapor condenses, forming liquid water again. This is called condensation. When the droplets get large enough, they fall back to Earth as precipitation.

Materials

- “Water Cycle Journey Record” handout (attached)
- Eight cups
- Water cycle scenario strips (attached)
- Bulletin board paper

Vocabulary

water cycle, evaporation, condensation, precipitation, water molecule

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

Introduction

1. Set up eight water-cycle stations throughout the classroom. Using the attached list of stations, the teacher will make a sign for each station that displays the station name and number.
2. Cut each station’s scenario strips apart and place them in a cup at the station.
3. Give a copy of the “Water Cycle Journey Record” to each student.
4. Explain to the students that each of them is a water molecule.

5. Divide the class into eight groups and send each group to a station to begin.

Procedure

1. Students will draw a strip from the cup at their station to find out about the molecule's (their) journey through the water cycle. Students will write the information on their journey record and then put the strip back into the cup.
2. The teacher will say the word *cycle* when it is time for the students to move to the next station, as directed by the strip, and repeat the process.
3. Students will repeat steps 2 and 3 until most of the students have cycled through most of the stations.
4. Remind students that they return to the same station more than once.

Conclusion

1. After finishing the stations, have the students return to their seats and use their "Water Cycle Journey Record" to make a colored and labeled diagram of the path they took on larger sheets of bulletin board paper.
2. Show an example on chart paper or board display like: from the Cloud to the Mountain to the Cloud to the Lake to the Animal to the Lake.
3. Have students display water cycle drawings in the hallway.

Assessment

- **Questions**
 - Why is it important to understand the water cycle?
 - How is this cycle like any other cycle? Different?
- **Journal/writing prompts**
 - You are a raindrop, write a story about your journey through the water cycle. Make it exciting!
 - The water cycle is a journey that never ends. Tell about another journey that doesn't end. Be very detailed.
- **Other**
 - Have students draw and label a picture of the water cycle to show understanding of the process.

Extensions and Connections (for all students)

- Students can create their own scenario strips.

Strategies for Differentiation

- On Water Cycle Scenario strips, provide text with rebus-style pictures for nouns and vocabulary.
- In each of the groups, assign a scenario strip student reader.
- Have students create an illustration of the water cycle by using a draw or paint program.
- Divide students into groups based on stations and act out what the water molecule does in that scenario.
- Use short video clips to explain the water cycle process.

- Have a meteorologist come to the class to discuss the aspects of the Water Cycle.
- Use images for visual reminders for the different parts of the Water Cycle.
- Create a reminding phrase, sentence or picture for each of the parts of the water cycle.

Water Cycle Journey Record

Name: _____ Date: _____

I am a molecule of water. Here is a record of my journey through the water cycle:

WHERE I AM	WHAT I DO	WHERE I GO	CLASSIFICATION
Ex: cloud	fall as rain	mountain	precipitation
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Water Cycle Scenario Strips

STATION 1 – CLOUD

You fall as rain onto a mountain. Go to the mountain.
You fall as snow onto a mountain. Go to the mountain.
You fall as rain into a stream. Go to the stream.
You fall as rain on a farmer’s field. Go to the plant.
You fall as rain onto a parking lot. Go to the stream.
You fall as snow into a lake. Go to the lake.

STATION 2 – MOUNTAIN

You evaporate into the air. Go to the cloud.
You soak into the ground and become part of the groundwater. Go to the groundwater.
You soak into the ground and are absorbed by a plant’s roots. Go to the plant.
You roll downhill and become part of a lake. Go to the lake.
You become frozen and stay there. Stay at the mountain.
You drip off the rocks and join other molecules in a small stream. Go to the stream.

STATION 3 – STREAM

You evaporate into the air. Go to the cloud.
You continue rolling across the land and become part of the ocean. Go to the ocean.
You are pulled down into the soil on the bank. Go to the groundwater.
An animal drinks you. Go to the animal.
You flow into a lake. Go to the lake.
While flowing down the mountain, you freeze and stay there. Go to the mountain.

STATION 4 – LAKE

An animal drinks you. Go to the animal.
You flow into a stream. Go to the stream.
You remain in the lake. Stay in the lake.
You are absorbed by the leaves of a plant. Go to the plant.
You evaporate into the air. Go to the cloud.

STATION 5 – GROUNDWATER

You become part of an underground river that flows to the ocean. Go to the ocean.
You are absorbed by the roots of a plant. Go to the plant.
You are pumped out of a well for a person to drink. Go to the person (animal).
You are pumped out of a well for a person to wash dishes. Go to the stream.
You are pumped out of a well for a farmer to irrigate his field. Go to the plant.
You become part of an underground river that flows to the ocean. Go to the ocean.
You stay in the aquifer. Stay at the groundwater.

STATION 6 – ANIMAL

You are breathed out of a person's lungs into the air as water vapor. Go to the cloud.
A person uses you for brushing his or her teeth. Go to the stream.
After using you to process food, the animal urinates, and you end up on the ground. Go to the mountain.
You are excreted as sweat and evaporate into the air. Go to the cloud.
A person takes a drink of water and spits you out onto the ground. You seep into the soil and become part of the groundwater. Go to the groundwater.

STATION 7 – PLANT

The plant transpires you through its leaves, and you evaporate into the air. Go to the cloud.
The plant stores you in its fruit, and you are eaten. Go to the animal.
The plant uses you to grow. Stay at the plant.
The plant transpires you through its leaves, and you evaporate into the air. Go to the cloud.
The plant stores you in a root, and you are eaten. Go to the animal.

STATION 8 – OCEAN

You are one of the many water molecules in the ocean, and you stay there. Stay at the ocean.
You evaporate into the air. Go to the cloud.
A kelp plant takes you in, releases you through its leaf, and transpires you into the air. Go to the cloud.
You are swallowed by a fish. Go to the animal.