



Raindrops Keep Fallin' On My (Water) Shed

Background Information For Teachers

The water in a watershed is always being recycled. It has made this journey through forests, down the hills and under the ground before and it will make it again many times. This is, of course, due to the cycle of evaporation, condensation and precipitation we call the water cycle. As the sun heats the ocean surface, water evaporates. Winds carry the water vapor toward the land. On the way, the vapor cools enough for tiny droplets to condense into clouds. When the clouds bump into mountains and are forced to rise higher, more cooling occurs. The cooled water droplets now form true drops and fall as rain or turn into snow crystals. This precipitation falls on watersheds everywhere, and the water begins its journey back to the ocean. Along the way, a water droplet may encounter any number of events. It may be absorbed by a tree root, a natural occurrence, or be used to wash dishes, a human-caused event. By developing their own stories of a water drop's journey through a watershed, students will be led to consider the complex interactions between people and watersheds.

Skills

Experimenting, discussion, cooperative learning, observation, critical thinking, creative writing, illustrating, investigation

If **More Ideas** section is used:
Video technology

Subject Areas

Science, language arts, art

If **More Ideas** section is used:
Drama

Materials

Baggies (one per student)

Small paper cups (one per student)

Tape

Writing and illustration paper

Learning Outcome

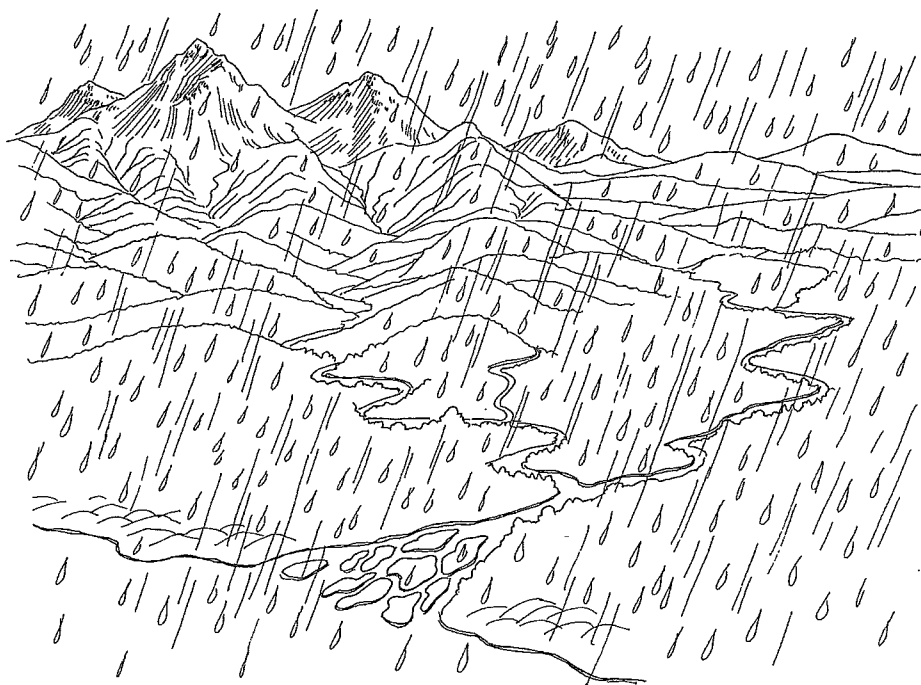
Students will demonstrate an understanding of the complex interaction between people and watersheds.

Learning Procedure

The Water Cycle: Explain that the class will be talking about the water cycle, but first you want them to perform an experiment. Hand one baggie and one cup to each student. Students are to put about 2 oz. of water in each cup, mark the waterline, tape or staple the cup inside the baggie so it won't spill and seal the baggie. Tape baggies to classroom windows and observe what takes place over the next few days.

Discuss observations based on the baggie-cup experiment. Review the water cycle and point out that the water evaporated from the cups just as it does from the oceans. It condensed on the sides of the baggie similarly to the way it condenses in clouds. The water flowed down the sides and accumulated in the bottom of the bag in the same way it flows down hillsides into lakes (and under the ground.)

Write a Water Cycle Story: Explain that students will be writing stories describing the journey of a water particle from the time it evaporates



from the surface of the ocean until it arrives back in the ocean. Their stories will be bound in a book with opening and closing paragraphs to complete the description of the water cycle. (See opening and closing paragraphs provided at the end of this activity.) Brainstorm with the class to think of things the water particle might encounter on its journey. What might happen in mountains and forests? What might happen in a stream or lake? What might happen as the stream passes a farm? As it passes a city? (When you have completed Lesson 10: *Finding Out About Watersheds* use the ideas recorded on butcher paper or blackboard to help students think about this process.)

Divide students into groups of three. Each student will be responsible for writing one paragraph of a three-paragraph story. To begin, they jot down or sketch their ideas using the following guidelines:

Paragraph 1: Tell where the water drop landed in a forest and what happened to it there. (For example: Does it fall onto a leaf and slide off onto an animal's back? Does it hit the ground, sink into the soil and flow underground into a spring? What does it see along its journey through the forest?) All raindrops must end up in a stream by the end of this paragraph.

Paragraph 2: Tell about three things that happen to the drop as it travels downstream. (Perhaps it passes a farm and is polluted by run-off fertilizer. Perhaps it passes through wetland grasses and gets clean again.)

Paragraph 3: Think of one last adventure for the water drop before it flows back to the ocean. (Perhaps it arrives at a dam and passes through the turbines. Maybe it gets diverted into an irrigation ditch. Perhaps it gets soaked up in the clothing of people wading in the stream, goes through a washing machine, passes through a sewage treatment facility and lands back in a river. Or, it might be used by a plant and released through transpiration back into the air.)

After teams have outlined their three paragraphs, instruct them to write and illustrate their water drops' journeys. Bind stories into a class book with the provided opening and closing paragraphs. Keep the book in the school library so other students can learn what happens in a watershed.

Where Does Your Rainwater Go? Take students outside to investigate what happens to water after it hits the school roof. Tell them to locate gutters, drainpipes, drainage and catch basins, etc. Does the water go into a storm drain or does it go into the ground? Have students investigate where the water goes after it enters the storm drain or the ground. Pupils could write a group letter asking someone from the public utilities department (or whatever agency is responsible for managing drainage in your community) to speak to the class. Or, the class could take a field trip to the facility.

Discuss what would happen to a raindrop falling on the roof of your school. What kind of journey would it have? How would that be different from or similar to the journeys created in class?

Opening Paragraphs: One sunny day a drop of water was swimming in the ocean. As the day got warmer and warmer, the drop of water started to evaporate. Invisible to the human eye, the water vapor rose through the air until it encountered a layer of much colder air. Then the water drop joined with many other water drops to form a cloud.

Later that afternoon, a big wind started to blow over the ocean toward the distant hills, cooling the land. The cloud of water drops was caught in the mighty wind's power and pushed faster and faster toward the land. Suddenly a big hill loomed in front of the cloud, and the cloud either had to crash into the hill or rise and go over it. As the cloud was pushed over the hill by the rush of air behind it, it encountered an even colder layer of air. This freezing cold layer caused the cloud to contract, forcing the water drops to fall to the forest below.

Closing Paragraph: The drop of water finally made it back to the ocean. What an adventure! As the drop moved through the salty water, the sun rose higher in the sky, causing the air to become warmer and warmer. It began to evaporate once again. The water drop invisibly rose into the air off on another adventure!

More Ideas

1. Students dramatize their journeys for the rest of the class. The teacher, parent helper or students videotape dramas. The video will be a "live" version of the class book. Have a student read the opening paragraphs at the beginning of the video and the closing one at the end. Share the video with other classes in your school.
2. Perform the same baggie-cup experiment with salt water. Discuss desalination. Try it again with colored water. Imagine that the food coloring is a pollutant. What happens to pollutants during the water cycle?
3. Design a cartoon strip explaining the journey of the raindrop.

Assessment: What Did We Learn?

Students will demonstrate their levels of understanding through writing their water drop journeys.



