the room. At each station, put an envelope filled with the strips designated for that station.

For Part B, on or near the school grounds, find two sloped sites with about the same angle of slope: one should have little or no vegetation on the soil (a roadway cutbank, or steep bare slope, works well), and one should be covered with plants (grass, shrubs, or trees). Alternatively, you can build two boxes about 16" long x 12" wide x 4" deep (40.6 cm x 30.5 cm x 10.2 cm). Make them watertight by lining with plastic material or aluminum foil. (You may use planter boxes, cake pans, or aluminum foil roasting pans with the approximate dimensions.) At one end of each box cut a v-shaped notch about 1.5" (3.8 cm) deep, and fit it with a spout of stiff paper so water is directed into a container (see diagram on page 145). Put a piece of sod (cut from a pasture, field, fence row, or lawn) in one box, and place bare soil (preferably from the same location) in the other. Set both boxes on a table so the spouts extend over the edge; place boards under the opposite ends to give both boxes the same slope. Place jars on stools underneath the spouts.

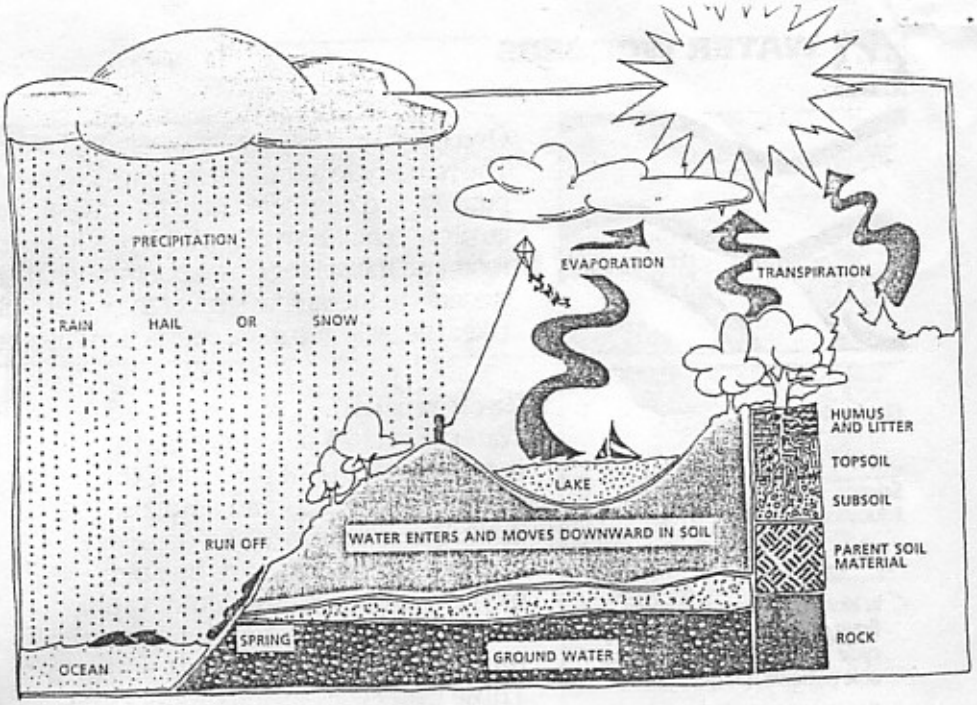
PART A
GO TO THE HEAD OF THE CLOUD

Doing the Activity

1. Ask students, "What is a cycle?" (A sequence of recurring events.) Invite them to name some cycles that are part of their life (morning, afternoon, night; fall, winter, spring, summer). Ask students whether they have heard of the water cycle before. Divide the class into pairs. Ask pairs to write down words that describe what they know about the water cycle or what they think the term water cycle might mean. Then ask them to write their own description of the water cycle. Ask volunteers to share their descriptions with the whole class.

2. On the chalkboard, draw a sketch of the water cycle as shown on this page. Make sure that students understand the terms evaporation, groundwater, and condensation (see "Glossary"). Use the following questions to focus their attention:

- If every living thing needs so much water, how come water isn't used up?
- Where does the water go when a puddle dries up?
- Why don't oceans and lakes dry up like puddles do?
- Where does rain come from?
- Do you think water always follows the same path as shown in the water cycle?



3. Explain that the water cycle is really a simplified model for looking at the "journey" of a water molecule. So students may learn more about the different paths water might take, invite them to play a game in which they each will be a water molecule. Have them use the score card on student page 147 to record the path they followed in the game. Later, they will compare score cards.

4. Divide students into seven approximately equal groups, and have each group begin at one of the stations.

5. Have students each remove a strip from the envelope at their station. They should read the strip and write on their water cycle score card, their current station stop, what happens to

to them, and their destination. They should return the strip in the envelope. When you call out "cycle", students should go to the next station as directed on their strip.

6. Repeat Step 5 about 10 times or until most students have cycled through the Cloud station a couple of times.

7. Ask students to go back to their seats, and write a brief story from a water molecule's point of view that describes the journey they just took through the water cycle. For example, a student whose journey was Mountain→Groundwater→Plant →Cloud→Ocean→Ocean→Cloud →Stream→Animal→Mountain might start a story, "I was a lonely water molecule frozen in ice on top of a mountain. When the spring came and the ice thawed, I slid down the mountain and sank deep into the earth."

8. On the chalkboard, write the names of the seven stations. Beginning with Cloud, ask students to share all the different ways they got to Cloud. (For example, they evaporated from the ocean and transpired from the plant.) On the chalkboard, show each response by drawing arrows to Cloud. Repeat with the other stations.

9. Discuss the following questions:

- Even though individual molecules took different paths, was anything similar about the journeys they took?
- In the game, which stations seemed to be visited by the most water molecules, regardless of their particular journey? What can we infer from this?
- Can you think of other parts of the water cycle that were not included in the game? (lakes, reservoirs, rivers, wells, puddles) Where might they be included in the cycle?
- The water cycle is usually shown like this (point to sketch from Step 2). Do you think this is a useful way to show the cycle, even if the sketch doesn't include all the paths water might take?
- What makes water move through the cycle? (sun, gravity, physical properties of water) What would happen if the sun's energy were blocked from Earth?
- What might happen if all of Earth's water stayed in the oceans? In the clouds?
- How is the water cycle important to plants and animals? (It moves water to them; it makes water available at different times.)

PART B
DON'T MUDDY THE WATER

Doing the Activity

1. Ask students, "Have you ever wished water didn't act the way it does? For example, you might have wished that it didn't rain on a day when your family was going to the zoo, that a puddle didn't evaporate because you enjoyed stomping in it, or that snow didn't melt because you wanted to ski." Discuss these questions:

- Is there anything people can do to control or alter the water cycle? (build dams, cover reservoirs, seed clouds, make snow)
- Do you think plants have any effect on the water cycle?

2. Explain to students that the class will conduct an experiment to find one way that plants might affect the water cycle and protect soil from erosion. Take them to the slopes you identified in Getting Ready, or use the two boxes. Describe the experiment to students (see Step 3). Then have them predict whether there will be any difference in what occurs on the two slopes.

3. Fill the watering can or coffee can with water. Help students hold the can at the same height so they can pour or sprinkle water at the same rate over the same point of each slope. Have students look for the following:

STUDENT PAGE

GO TO THE HEAD OF THE CLOUD

(Make two copies; then cut strips apart.)

STATION 1—CLOUD

- You fall as rain onto a mountain. Go to Mountain.
- You fall as snow onto a mountain. Go to Mountain.
- You fall as rain onto a stream. Go to Stream.
- You fall as rain onto an ocean. Go to Ocean.
- You fall as snow onto an ocean. Go to Ocean.
- You fall as rain onto a parking lot. Go to Stream.

STATION 2—MOUNTAIN

- You evaporate into the air. Go to Cloud.
- You soak into the ground and become part of the groundwater. Go to Groundwater.
- You soak into the ground and get absorbed by a plant's roots. Go to Plant.
- You roll downhill and become part of a stream. Go to Stream.
- You roll downhill and become part of a stream Go to Stream.
- You get frozen in ice and stay there. Stay at Mountain.

STATION 3—OCEAN

- You are one of countless water molecules in an ocean and you stay there. Stay at Ocean.
- You are one of countless water molecules in an ocean and you stay there. Stay at Ocean.
- You evaporate into the air. Go to Cloud.
- You evaporate into the air. Go to Cloud.
- A kelp plant takes you in, releases you through its leaf, and transpires you into the air. Go to Cloud.
- Go to Plant, but do not draw a card. Then go directly to Cloud.

STATION 4—STREAM

- You evaporate into the air. Go to Cloud.
- You evaporate into the air. Go to Cloud.
- An animal comes to the stream and licks you up. Go to Animal.
- You continue rolling downhill and become part of an ocean. Go to Ocean.
- You continue rolling downhill and become part of an ocean. Go to Ocean.

STATION 5—GROUNDWATER

- You become part of an underground stream that flows to an ocean. Go to Ocean.
- You become part of an underground stream that flows to an ocean. Go to Ocean.
- You become part of an underground stream that flows to a spring, where you become part of a stream. Go to Stream.
- You become part of an underground stream that flows to a spring, where you become part of a stream. Go to Stream.
- A plant takes you in through its roots. Go to Plant.
- You are pumped out of the ground from a well to irrigate a farm. Go to Plant.

STATION 6—ANIMAL

- After using you to process food, the animal urinates and you end up on the ground. Go to Mountain.
- After using you to process food, the animal urinates and you end up on the ground. Go to Mountain.
- You are exhaled from a human's lungs into the air as vapor. Go to Cloud.
- You are exhaled from a human's lungs into the air as vapor. Go to Cloud.
- A person uses you for brushing his or her teeth. Go to Stream.

STATION 7—PLANT

- The plant transpires you through its leaves into the air as vapor. Go to Cloud.
- The plant transpires you through its leaves and you evaporate into the air. Go to Cloud.
- The plant transpires you through its leaves and you evaporate into the air. Go to Cloud.
- The plant uses you to grow. Stay at Plant.
- The plant stores you in its edible fruit. Go to Animal

STUDENT · PAGE°

WATER CYCLE SCORE CARD

WATER CYCLE SCORE CARD

STUDENT'S NAME:

STATION STOP	WHAT HAPPENS	DESTINATION
EXAMPLE Cloud	Fall As Rain	Mountain
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Describe your entire journey on the back of the card.