

## LESSON 4 - THE WATER CYCLE

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## **LESSON 4 - THE WATER CYCLE**

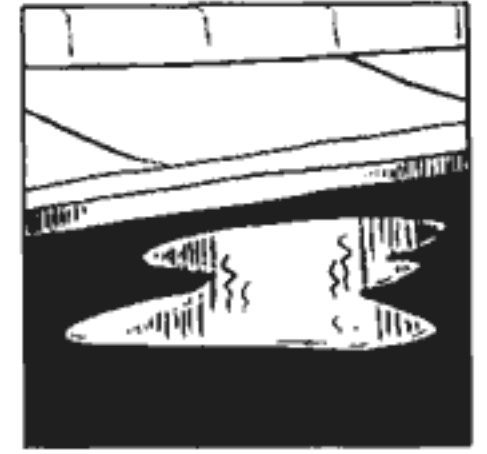
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Water has been cycling about our planet for several billion years, shaping the land and sustaining life. Earth's most basic forces, the sun's energy and gravity, deliver fresh clean water as rain and snow to higher elevations, then pull it down hill into rivers and ultimately to the ocean. Along the way it carries waste products (autumn's leaves, for example) to serve as raw material for other processes. Sometimes water's return trip is a quick one, as mighty rivers carry spring rain to the sea. Other journeys are longer, if it finds its way to deep aquifers or is locked frozen in glaciers or ice caps. But always the sun lifts water through evaporation, and gravity reclaims it as condensation. The water cycle embodies one of nature's most enduring balances.

"Rain" and "snow" are some of the earliest words we learn. As adults we remember that rain is part of the water cycle. But how did we learn about it? Did we memorize terms such as "evaporation" and "condensation" and only later apply a more complex grasp of these phenomena? Did we see a poster in the classroom, or fill in a worksheet with those words?

Puddle Poetry asks students to consider a familiar phenomenon: puddles. They observe puddles systematically and write poetry about them. Evaporation and Condensation moves the puddles indoors into petri dishes and adds substances, salt and gravel. Our World in Two Jars demonstrates condensation by closing the system.

## Lesson 4 Water Cycle



### ACTIVITY 4-1 PUDDLE POETRY

**SUMMARY** Through measurement and observation, students will discover what happens to puddles on a sunny day. They will write poems to describe what they discover.

**CONTENT AREAS** language arts, math, science

**GOAL** to become familiar with evaporation and the water cycle

**TIME** several short sessions during the day

**MATERIALS**

- puddles
- measuring tape or rulers
- clipboards for students will be helpful

#### ADVANCE PREPARATION

- Find location to do activity. If your black top area is very new it may be too smooth. You might want to use a plastic tarp for the puddles.
- Create puddles if necessary.
- Create student working groups.
- Students may want to wear boots.

#### TEACHER PROCEDURE

1. Investigate the parking lot or paved play area at your school. Find several spots where puddles form when it rains. Ideally you will do this activity the morning after it has rained, but you can also create your own puddles. During the activity students will measure the length and width of a puddle. Each student can determine where to measure the length and the width because the puddles will be shaped irregularly.
2. Bring students to the puddles. Several students can work at each puddle and measure together, but everyone should complete his or her own data form and poetry.
3. Have students look at their puddle. They should measure its length and width. They can measure any part of the puddle, but they must measure the same way each time. Then they should make other observations. After making and recording observations they can write the first line of their poem.
4. After an hour, they should repeat their observations and measurements and write the second line of their poem.
5. Repeat the measurements every hour or so for as often as possible during the day. After each measurement students should write another line to their poem.
6. You might want to have students check the puddles the next day.
7. After completing the conclusion section students should revise and complete their poems.
8. When students have written the poems on the puddle page they can be displayed in the classroom.

Name \_\_\_\_\_ Date \_\_\_\_\_

# Puddle Poetry

Measurement

Observation

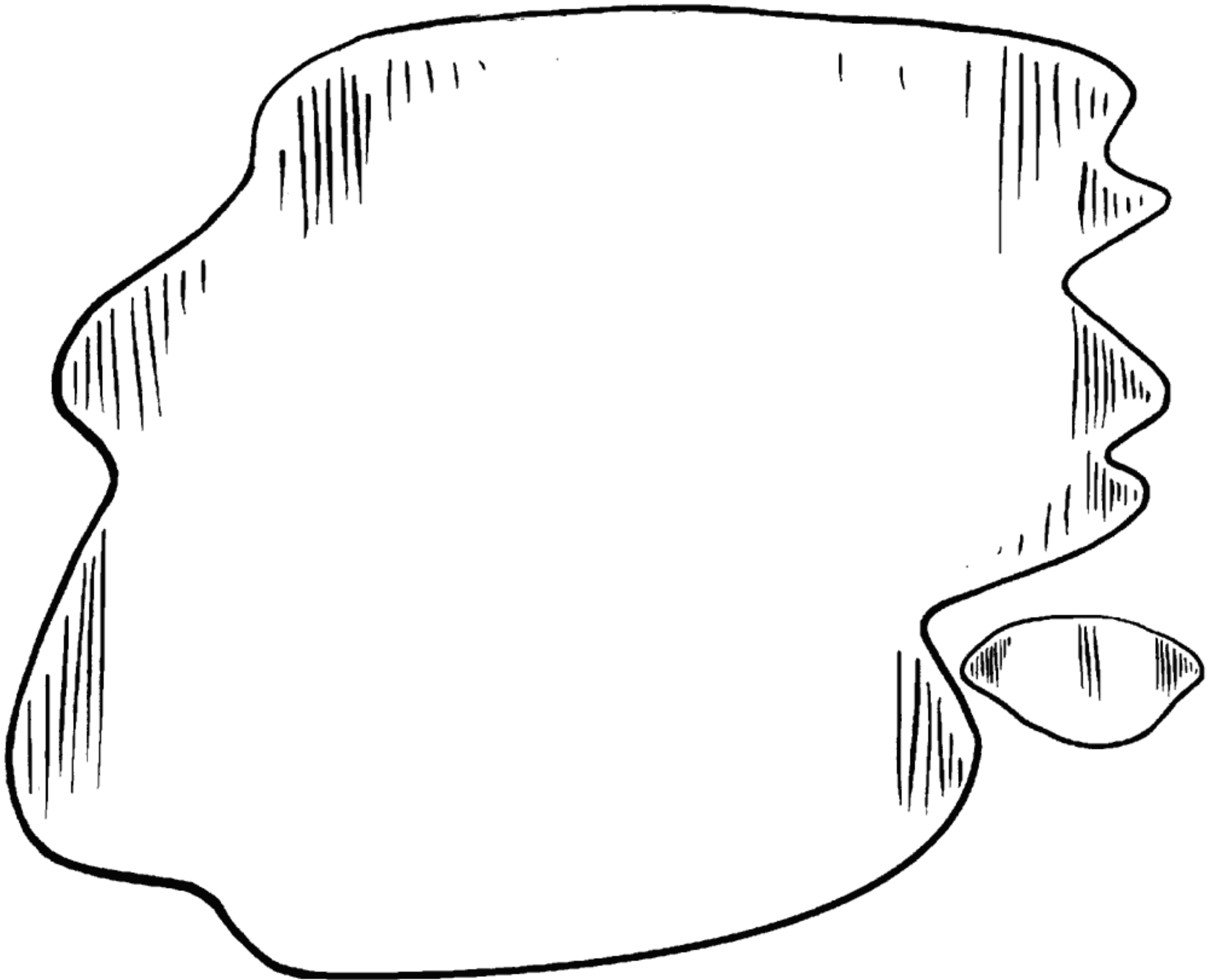
Poem

1.		
2.		
3.		
4.		
5.		
6.		
7.		

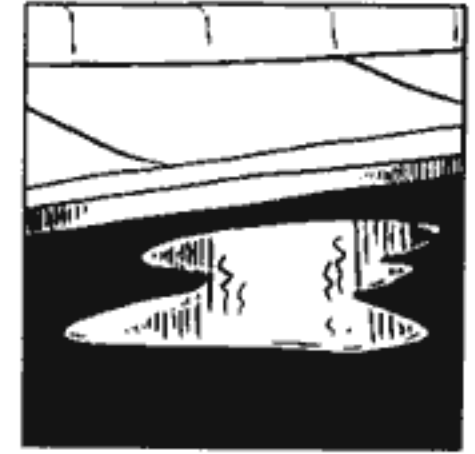


# Puddle Poetry

Write your poem inside the puddle.



## Lesson 4      Water Cycle



# ACTIVITY 4-2    EVAPORATION AND CONDENSATION

**SUMMARY** \_\_\_\_\_ Students will create two different mixtures which they will leave in the sun for five days. They will predict what they think will happen and make observations each day.

**CONTENT AREAS** \_\_\_\_\_ science, language arts

**GOAL** \_\_\_\_\_ to show that when water evaporates other materials are left behind

**TIME** \_\_\_\_\_ one class session and four short sessions for observations and data collection

**MATERIALS** \_\_\_\_\_

- water
- salt (kit)
- gravel (kit)
- clear petri dishes -- 2 for each group (kit)
- marking pens
- ruler
- teaspoon

### ADVANCE PREPARATION

- You may want to prepare petri dishes for students.
- Create student working groups.
- Arrange area in room where petri dishes can sit for 5 days.
- Copy student pages.

### TEACHER PROCEDURE

1. Have the materials available to the students.
2. Give out instructions and review with students.
3. Each petri dish will need eight lines, each two millimeters apart. Demonstrate how to put the lines on the petri dishes. Some teachers may want to put the lines on for the students.
4. After setting up the experiment students should fill in "Day 1" of the data recording page.
5. Students should check their experiments and record their observations and data each day for the next four days. Some students will use the lines to quantify their data.
6. After day 5 students should complete the conclusion section.

# Evaporation & Condensation

**Introduction** Why are oceans salty while rainwater isn't? What happens to the salt during the water cycle? You will investigate these questions during this activity.

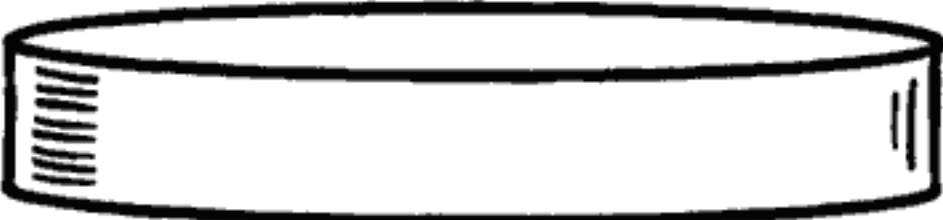
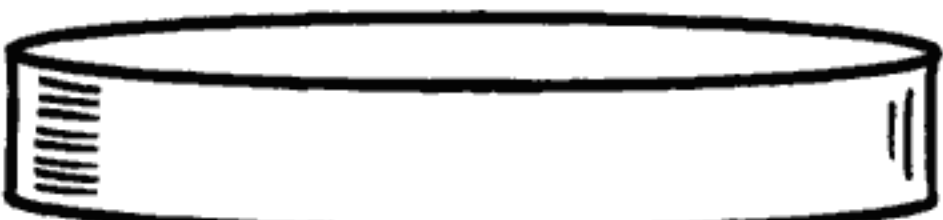
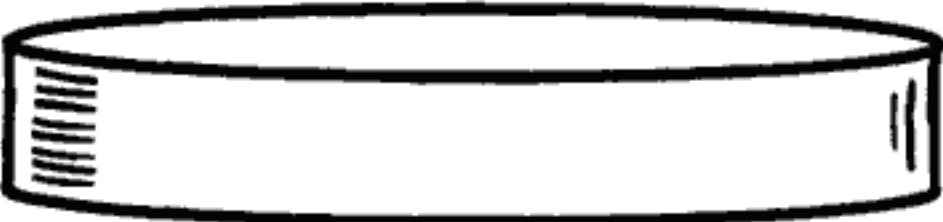
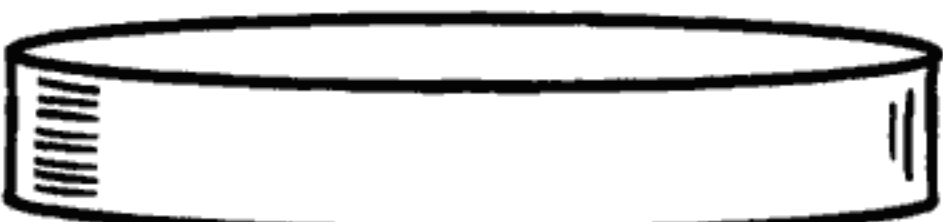
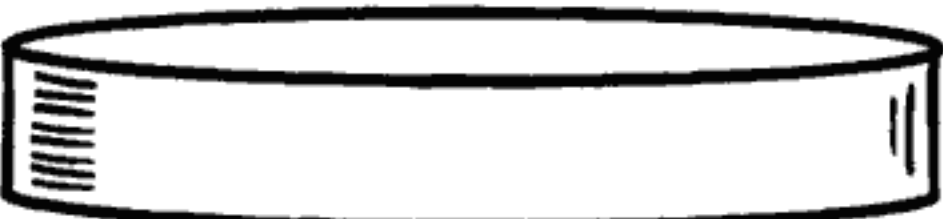
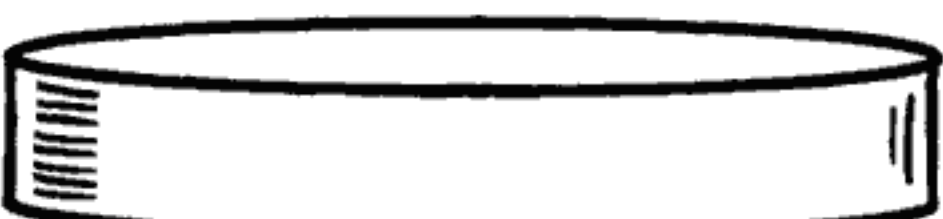
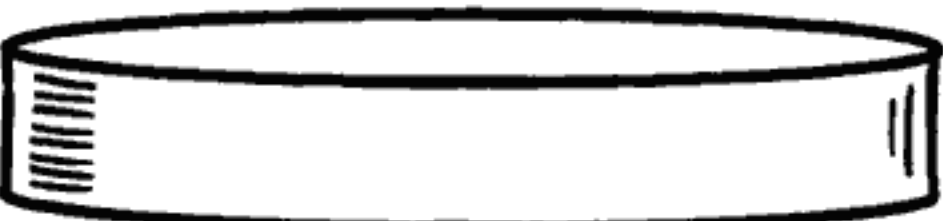
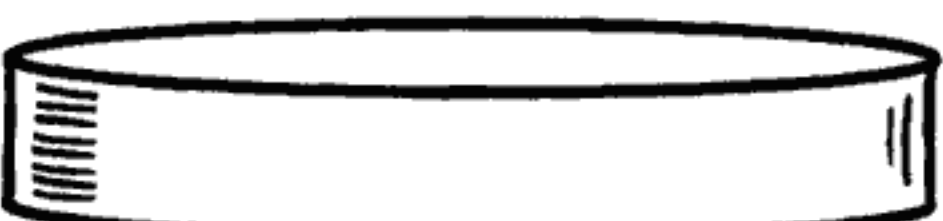
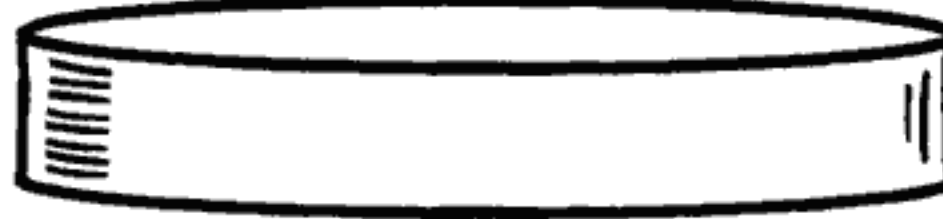
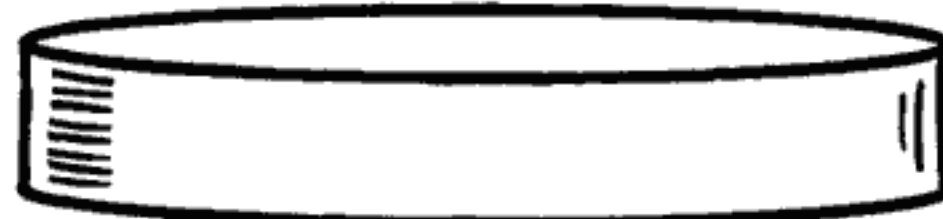
## Procedure

1. Send one group member to get materials. Label the two petri dishes with the initials of each group member.
  2. On each of the plastic petri dishes start at the bottom and mark eight lines that are each 2 millimeters apart.
  3. Fill each petri dish to the top line with a different mixture:  
petri dish 1 = half teaspoon of salt + water  
petri dish 2 = half teaspoon of gravel + water
  4. Use the "Day One" section of your data recording page to draw a picture and write a description of your experiment.
  5. Predict what you think will happen in each petri dish during the next four days. Will the water look different? Will the amount of water change?
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6. Check your experiment each day for the next four days. Use your data recording page to record what you observe each day.

# Evaporation & Condensation

Petri dish one

Petri dish two

	Petri dish one	Petri dish two
Day one		
Day two		
Day three		
Day four		
Day five		



# Evaporation & Condensation

1. After recording your day five results, write about what happened in your experiment and why you think it happened.

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2. Compare what happened in your experiment with what happens during the water cycle.

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3. If water evaporates from the ocean to create clouds and rain, why is rainwater fresh when oceans are filled with salt water?

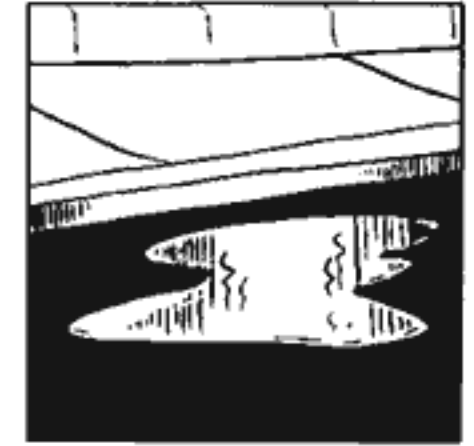
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## Lesson 4 Water Cycle



### ACTIVITY 4-3 “OUR WORLD IN TWO JARS”

**SUMMARY** Students will set up a miniature water cycle that they will observe over several days.

**CONTENT AREAS** science

**GOAL** to understand how water changes phases through the water cycle

**TIME** five short sessions

**MATERIALS** (for each student or group of students)

- two plastic aquaria or plastic boxes or two jars (kit)
- water and food coloring (premixed by teacher)
- small rocks or gravel
- tape

#### ADVANCE PREPARATION

- Arrange materials for students.
- Create student working groups.
- Arrange area for models to sit for five days.

#### TEACHER PROCEDURE

1. Have materials ready for students on a table.
2. Put students into small groups.
3. Each group should get a set of materials. Each student should get the student pages.
4. Guide students through the setting up of their water cycle models.
5. Each group should record their observations for day one.
6. Each day students should check their models and record observations.
7. After day five, students should complete the conclusion.

# Our World in Two Jars

**Introduction** During this activity you will make a water cycle in two containers. You will observe what happens during the water cycle.

**Materials** (for each student or group of students)

- two plastic aquaria or plastic boxes or two jars
- water and food coloring (premixed by teacher)
- small rocks or gravel
- tape
- direct sunlight

## Procedure

1. Get your group materials.
2. Label your containers with the initials of your group members.
3. Put the rocks in one side of one of the containers.
4. Pour about 3 cm of water on the other side.
5. Invert the other container over the top. Tape it closed. Make sure the containers are sealed.
6. Place in a spot with direct sunlight or near a heat source.
7. In the "day one" section of your recording page describe your model.
8. Each day for the next four days check your model and record your observations.
9. After day five complete the conclusion.

Name \_\_\_\_\_ Date \_\_\_\_\_

# Observation Recording Page



Observations

Day one: The day you set up the experiment. Describe how it looks today.

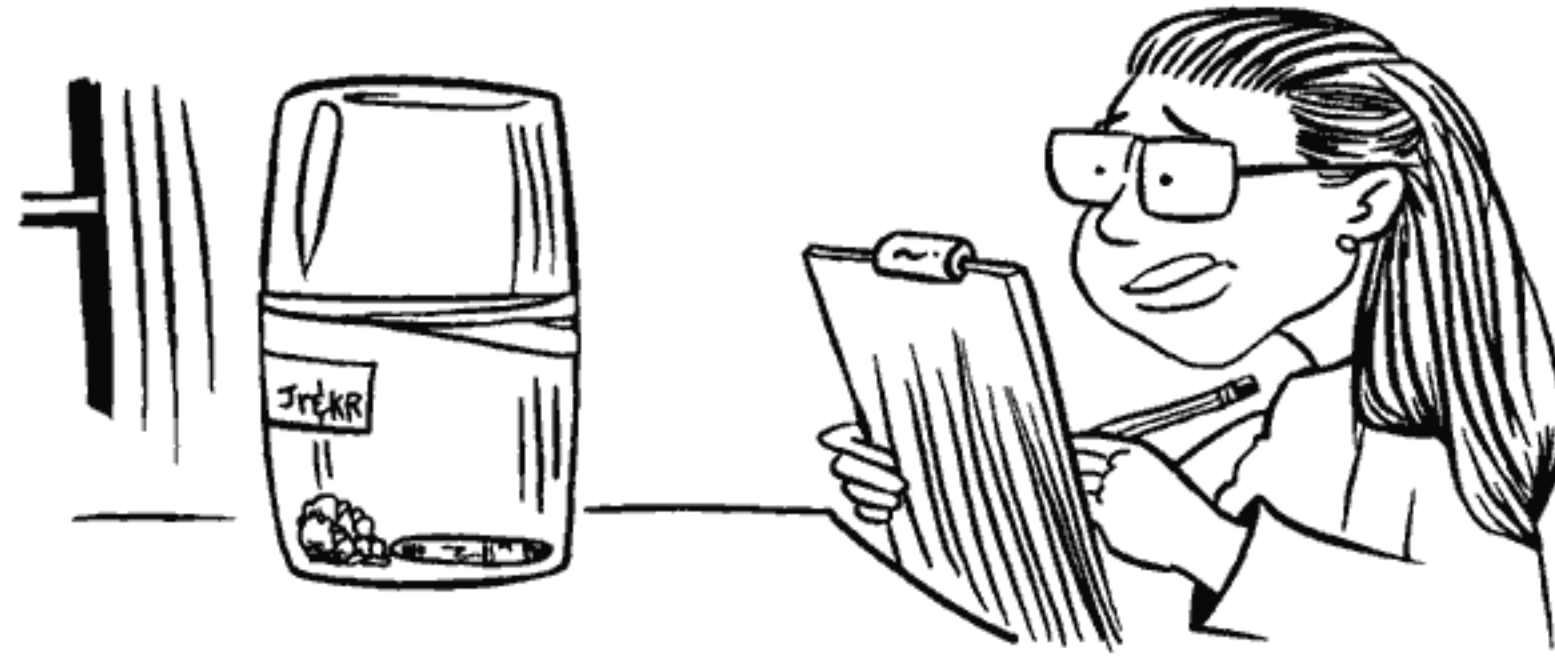
Day two

Day three

Day four

Day five

# Our World in Two Jars



1. After recording your day five results, write about what happened in your experiment and why you think it happened.

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2. Compare what happened in your experiment with what happens during the water cycle.

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