

## **SNWA Goal 1 Objective 1.2; Goal 2 Objective 2.4, 2.5**

### **CCSD Curriculum Essentials Framework**

#### **Science**

*It is expected that students will:*

(4) 5.2 exchange scientific observations and ideas [NS 18.4.4]

#### **English Language Arts**

*It is expected that students will:*

(4) 5.6 write short expository texts with supporting details [NS 5.4.6]



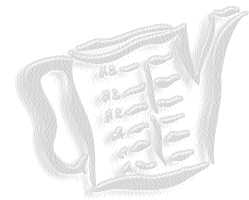
### **PART ONE**

**Purpose:** This activity introduces evaporation and conditions that may affect the rate of evaporation.

**Time:** 45 minutes

#### **For each pair of students you will need:**

- 1" paint brush
- container of water
- measuring cup or beaker
- a sunny day
- chart or butcher paper for class recording
- stopwatch or a watch with a second hand



#### **Introduction:**

1. Tell students that they will be “painting” pictures with water today.

#### **Making Discoveries**

2. Ask students to measure out 100 ml of water into their measuring cups or beakers.
3. Take the students, their notebooks, their cups/beakers of water and their brushes to an outdoor sidewalk or other concrete area. Depending on the weather, allow 5 minutes for students to “paint” pictures on the concrete with the water. (On hot, arid days you may want to shorten the amount of time for this.) Students should use all the water in their cup or beaker.
4. Ask two or three students to time with a stopwatch how long it takes for their pictures to dry and record the time in their notebooks. Have a short discussion about their pictures, asking, “What do you notice about your pictures? Why do you think it is difficult to see the entire picture? What happened to the water?” If no one brings it up, introduce evaporation as what scientists call this process of water “disappearing.”



5. Back inside the classroom, ask students what would happen if they “painted” with water on their desks. Ask students to remeasure 100 ml of water into their measuring cups or beakers. Allow 5 minutes for them to “paint” with the water on their desks. Students should use all the water in their cup or beaker. Leave several students at their desks with stopwatches to time and record how long it takes for their pictures to dry.
6. Call the rest of the students to a common area (away from their desks) for a 10-minute discussion that you begin by asking, “What do you know about things that dry, or dry out? Can you think of some things that dry over time?” Begin a list on chart paper, e.g. hair, clothes in clothes dryer, puddles, spills, bread when you leave it out, paint on a picture. Post the chart for additions by the students. Ask, “Why do they dry? What happens to the liquid? Where does it go?”

### ***Teacher note:***

The liquid evaporates, becoming a gas, an invisible form of water droplets in the air.

7. Ask those students who stayed at their desks to time the drying time of their pictures to record and share their data. Students return to their desks and observe what has happened to their water pictures. If some are still wet, ask students to propose why some are wet and others are not.

### ***Closing***

8. Compare their indoor and outdoor pictures. Ask, “What is different about the conditions outside and inside? Could those conditions affect how fast a liquid evaporates? Was there anything else that might have affected how quickly the water evaporated?” Have students record their ideas in their notebooks and share.

### ***Teacher note:***

Rate of evaporation depends upon four conditions: the amount of water vapor already in the air, the temperature, the amount of surface area exposed to the air, and air movement over the surface.

## **Extension**

Repeat steps 5-7 above, but ask the students to try to make the water evaporate more quickly. What would happen if they spread the water out more when they painted their pictures? What would happen if they fanned their pictures? What would happen if they blew on their pictures? Students should record their ideas and results in their notebooks.

## **PART TWO**

**Purpose:** This activity focuses on rate of evaporation as a variable that is affected by the amount of water used and methods of slowing down evaporation.

**Time:** 30 minutes plus brief observations every hour or two

## **Introduction**

1. Ask, "Why is it important to know about evaporation? How does that affect our lives?" Allow time for discussion.
2. Brainstorm a list of water uses or sources that may be affected by evaporation, such as:
  - ♦ Sprinklers
  - ♦ Lake Mead
  - ♦ Pools
  - ♦ Lawns
  - ♦ Ponds
  - ♦ Streams
  - ♦ Gardens

## **Making Discoveries**

3. Tell students that our Mojave Desert environment has some general conditions that affect the rate of evaporation: our air is dry; our temperature is warm to hot; there is often a wind blowing.
4. Tell students that you have a challenge for them. Every two people will get a wet paper towel in a cup (50 ml of water poured on a paper towel). Each pair is to think of a way to slow or stop the evaporation process, then record the plan in their notebooks.
5. Check every hour and record results without changing the plan. Make additional checks the following day as needed.
6. After a day or two, have students share their results by referring to their notebooks and determine several plans, or strategies, that slow the evaporation rate.

## Closing

7. Ask, “How could these strategies be applied to the list of water uses and sources we brainstormed at the beginning of this lesson? How could the fact that water evaporates quickly in the desert affect people’s lives, ours and the first settlers who came here?”

## Assessment Opportunity

Using the following assessment page, students should draw ways to slow down or speed up the process of evaporation.

## Extension

Ask, “Which will evaporate the most water - a pond or a lawn?” Discuss possible reasons for the differences in rate of evaporation. (*More water will evaporate from the lawn because the surface area increases with each blade of grass.*)



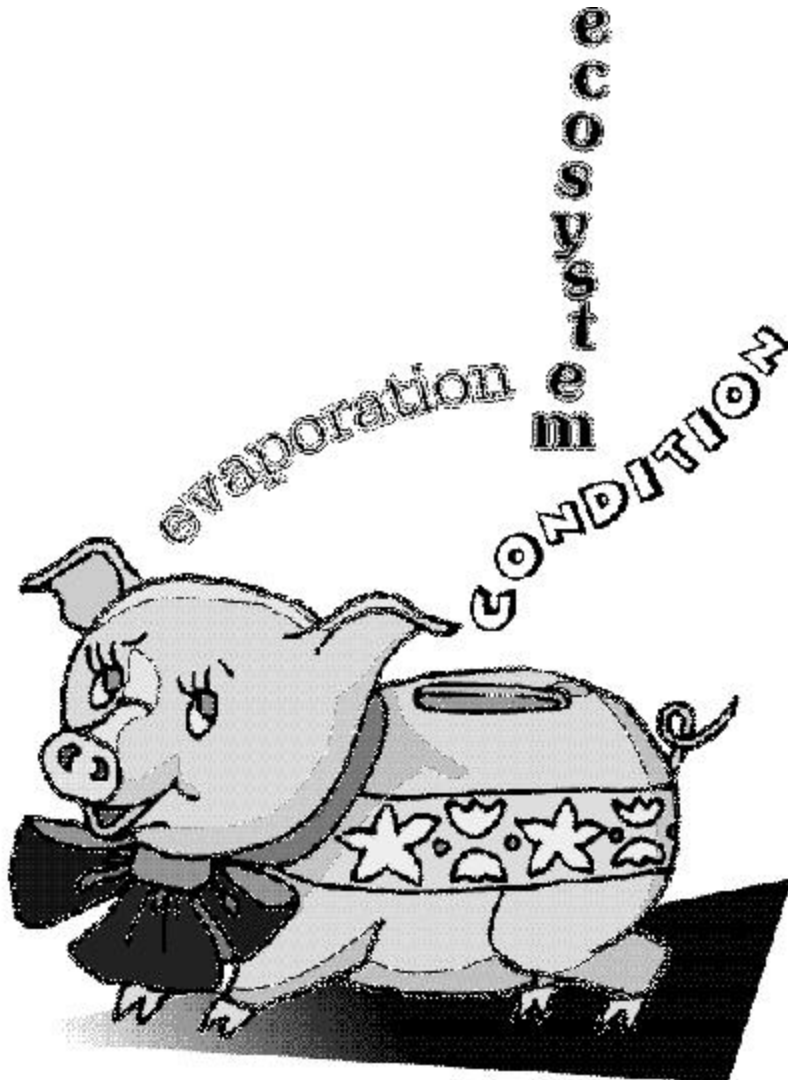
**Word Bank**

*The teacher should introduce or review the following vocabulary with the students within the context of this lesson.*

**condition:** something that makes a difference in the appearance or occurrence of something else

**evaporation:** process in which the heat energy of the sun causes the water on the Earth's surface to change into a vapor

**ecosystem:** the relationship between all the parts (living and nonliving) within an environmental community



Name \_\_\_\_\_

Date \_\_\_\_\_

## WHERE DOES WATER GO?

Assessment

Draw and write about how you would slow the evaporation of water from the wet paper towel in the cup.

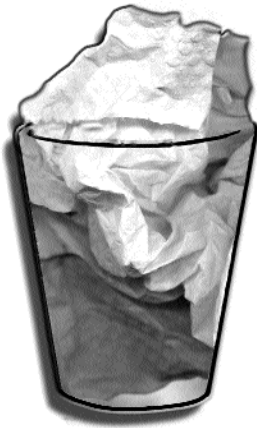
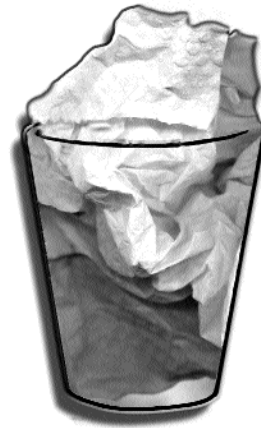
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Draw and write about how you would help the water evaporate more quickly from the wet paper towel in the cup.

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