

## **SNWA Goal 1 Objective 1.4**

### **CCSD Curriculum Essentials Framework**

#### **Science**

*It is expected that students will:*

- (4) 5.2 exchange scientific observations and ideas [NS 18.4.4]
- (4) 5.3 model and describe contributions made to scientific thought and design technology

#### **English Language Arts**

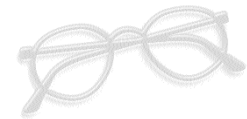
*It is expected that students will:*

- (4) 10.3 share ideas, opinions, and information clearly and effectively [NS 10.4.3]

#### **Social Studies**

*It is expected that students will:*

- (4) 3.35 list examples of how people use and manage natural resources within Nevada [NS 5.4.7]



**Purpose:** This activity is designed to explore the concept of condensation.

**Time:** Two 50-minute sessions

#### **You will need:**

- a pair of eyeglasses

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

- a large bowl, basin or pan
- plastic cup
- plastic wrap (enough to cover the bowl)
- small rock
- damp potting soil (enough to fill the pan with a layer of soil at least 10 cm deep)
- a large piece of construction paper
- markers or crayons



#### **Each student will need:**

- science notebook or paper
- pencil

You will also need access to a sunny place where students' projects will not be disturbed overnight.

### **Introduction**

1. Using your own eyeglasses, (or ask a student to use theirs) breathe on them, and hold them up for the students to see. Ask, "Have you ever seen people breathe on their glasses before wiping them clean? Where did the water on the lenses come from?" (The warm water vapor in your breath condenses on the cold glasses.)

2. Ask, “Did you ever see your own breath turn into a cloud on a cold day? Where did the cloud come from?” (The cloud was made of tiny droplets of water. Invisible water vapor in your warm breath condensed into tiny droplets of water when it hit the cold air.)

### ***Making Discoveries***

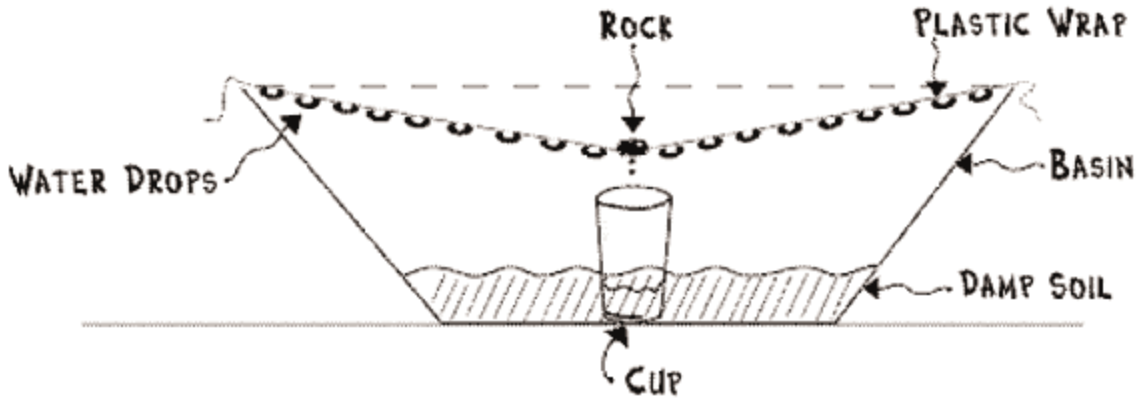
3. Tell the students that explorers and pioneers sometimes used condensation to help them get water in the desert. Ask, “What do you think they might have done to use condensation to get water?” Discuss student responses.
4. Tell the students that sometimes desert travelers would pile up rocks at night. In the morning they would turn the rocks over and the bottom side of the rocks would be damp. Ask, “How did the rocks get wet?” (The bottom of the rocks became cooler than the air during the night, causing water vapor to condense.)
5. Tell the students, “People soon discovered another way to use condensation to find some water in the dry desert. Using the kinds of materials your group will have to work with, they were able to get a small amount of water from the desert soil. Pretend you are early settlers crossing the desert. How will you use these materials to find some water?” Give students time to design a plan with their groups. Be sure to visit each group and ask questions that will cause students to consider how their plan might work. Students should draw a diagram of their design on the large piece of construction paper and write a brief explanation of how they think it should work.
6. Ask each group to share their plan with the class and explain how they think their design will work. Give students time to construct their distillation devices.
7. Set all distillation devices out in the sun in a place where they will not be disturbed overnight. Observe them as soon as possible the following morning. Did anyone find water? Students should measure the amount of water, if possible, and record the results of their exploration in their notebooks.

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

*Desert travelers dug a hole in the desert soil and set a container in the bottom of the hole, near the center. They covered the hole, and weighted down the cover over the container with a rock. As the temperature of the cover became cooler during the night, warm air from the soil underneath it*

## Condensing Water (cont.)

rose. When it came into contact with the underside of the cooler cover, water vapor condensed. The drops of water slid down the cover and dropped into the container set into the middle of the hole.



Desert Distillation Device

### **Closing**

8. Students should share the results of their exploration. Lead a class discussion about why each project did or did not produce water. Discuss ways each project could be modified to produce better results. Ask, “What would you do differently if you could make another device?”

### **Assessment Opportunity**

Use this opportunity to assess students' abilities to conceive and carry out a plan for investigation. Do they collaborate effectively? Come up with a plan in a reasonable amount of time? Use readily available materials? Revise their plan if it is unproductive?

**Word Bank**

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

**condensation:** the process of changing from a vapor (gas) to a liquid

**distillation:** a process of evaporation and condensation

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

