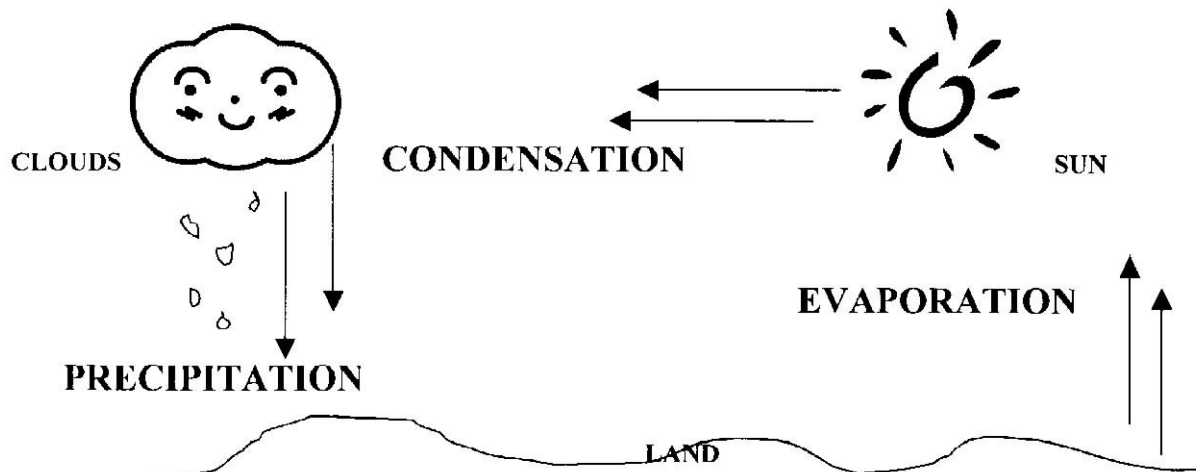


# RAINMAKERS



## **BENCHMARK and TASKS**

**SC.D.1.2.3** The student knows that the water cycle is influenced by temperature, pressure, and the topography of the land.

- The student simulates the water cycle.
- The student explains the stages of the water cycle (evaporation, condensation, precipitation) to illustrate that when liquid water evaporates, it turns into a gas (vapor) in the air and condenses as a liquid when cooled, or as a solid if cooled below the freezing point of water.

## **KEY QUESTION**

How can we create a mini water cycle?

## **BACKGROUND INFORMATION**

The **water cycle** is a never-ending cycle that includes **evaporation**, **condensation**, and precipitation. The **sun** is the **energy** that keeps the cycle moving. The **heat** energy from the sun changes water into vapor. This invisible vapor then condenses and forms billions of droplets that make up clouds. The moisture from the clouds returns to the earth as rain, snow, or other forms of precipitation. Temperature plays an integral role in this never-ending process by affecting the rate of evaporation and the type of precipitation (e.g., rain, snow, ice). **Topography**, the shape of the land caused by differences in elevation, can affect the amount of precipitation an area receives.

Evaporation is the process in which matter changes from a liquid state to a gaseous state (vapor). Condensation is the process in which matter changes from a gaseous state (vapor) to a liquid state. Condensation occurs as air with water vapor in it cools; clouds are evidence of condensation. Precipitation forms when water droplets in clouds become too heavy to stay in the atmosphere. The water droplets fall in some form, such as snow, ice, or rain, to the earth's surface.

## **MATERIALS**

### **Per group**

1 quart-size, resealable bag  
1 clear medicine cup  
1 permanent marker

masking tape  
water  
log for recording observations

## **Teacher**

*A Drop Around the World*, Barbara Shaw McKinney, Dawn Publications

## **TEACHING TIPS**

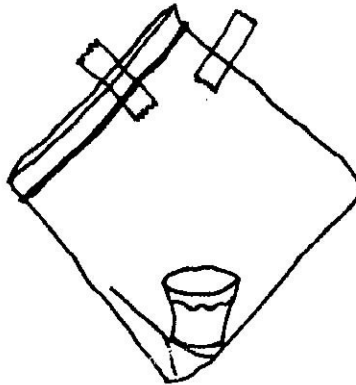
1. You will need access to a large window for this activity.
2. Each student will need to create a log for recording observations.

## **ENGAGE**

Share the book *A Drop Around the World* by Barbara Shaw McKinney. The author takes the readers on a journey from Maine to Mumbai with one raindrop as it touches plant, animal, and human life all around the world.

## **EXPLORE**

1. Distribute materials to each group
2. Each group should fill a medicine cup 1/3 full. Then students should mark the water line with a permanent marker.
3. The cup should be placed in the bottom corner of the resealable bag. Taping the cup to the baggie from the inside will secure it.
4. Instruct students to tape their bags to a window. Make sure the bag is taped at an angle.
5. Students should observe and record the changes in the bag each day for a period of seven to ten days.



## **EXPLAIN**

Discuss during the investigation:

*What does the model represent?* (a mini water cycle)

*What is occurring inside the bag?* (The water is evaporating and condensing.)

*What is happening to the water level in the cup?* (It is gradually getting lower.)

*What energy source causes the water cycle to occur?* (the sun)

*What is evaporation?* ( the process in which matter changes from a liquid state to a gaseous state - vapor)

*What is condensation?* (the process in which matter changes from a gaseous state (vapor) to a liquid state.)

*What is precipitation?* (Precipitation forms when water droplets in clouds become too heavy to stay in the atmosphere. The water droplets fall in some form such as snow, ice, or rain to the earth's surface.)

*Does the outside air temperature play any role in the rate of evaporation?* (The hotter water gets,

the faster its molecules move, and the faster it evaporates.)

*Does the outside air temperature affect the type of precipitation that occurs (e.g., rain, snow, or ice)?*

### **EXTEND/APPLY**

Explain to the students that they have created a mini water cycle that demonstrates the process of evaporation, condensation, and precipitation. Relate the investigation to the natural water cycle.

### **EXTENSIONS**

1. Take students outside to a paved area. Pour a small bucket of water on concrete. Have students draw a chalk line around the puddle. Periodically, the students should draw a new chalk line around the existing puddle. Eventually the puddle will be partially gone or totally gone (depending on time and the sun). Discuss what has occurred. To extend, have students measure the circumference of the circle at different intervals and report the results.
2. Explain to the students that the water on earth now has been recycled over thousands and thousands of years. Make sure the students understand that the water cycle is a never-ending cycle. Students can take the point of view of a raindrop and detail through writing their adventures through thousands of years.

### **ASSESSMENT**

Have students think about where rain comes from and then explain why the earth never runs out of rain.