



# THE TEACHER...THE RAINMAKER!

## **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 do temperature changes affect the 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**

### **Teacher**

1 hot plate

1 pie pan

1 teakettle or small pot

ice cubes

oven mitt

*Water Dance* by Thomas Locker

## **ENGAGE**

Read *Water Dance* by Thomas Locker. Share the beautiful illustrations and the factual information about the water cycle with the students. Tell them you are going to create a mini water cycle right in the classroom!

### **EXPLORE (Teacher Demonstration)**

During the teacher demonstration, students should be recording what is happening in a journal. Have them draw and explain what is happening during the activity.

- Fill the teakettle or small pot half full with water.
- Use the hot plate to heat the water to the boiling point.
- Put the ice cubes in the pie pan.
- Using an oven mitt, hold the pie pan just above the steam coming from the pot.
- Look at the bottom of the pan. What's happening?
- Water droplets will form on the bottom of the pie pan. These droplets are just like rain.

### **EXPLAIN**

*Describe what you observed during the investigation.*

*How is this model like the water cycle?*

*What did the teakettle or coffee pot represent? (a source of heat energy – the sun)*

*Why do you think the water in the teakettle had to be hot? (The hotter water gets, the faster its molecules move, and the faster it evaporates.)*

*Why do you think the water in the saucepan had to be cold? (Cooler air cannot hold as much water vapor as warmer air. As the air cools, the water vapor condenses - changes from a gas into a liquid - and forms water droplets on the saucepan.)*

### **EXTEND/APPLY**

Discuss with students that we can connect our model to the water cycle that occurs naturally on earth. Introduce vocabulary - precipitation, condensation, and evaporation. Discuss 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. Remind students that the investigation done earlier involved temperature differences.

### **EXTENSION**

Share some trade books to reinforce and extend this lesson.

- *The Trip of a Drip* by Vicki Cobb
- *Weather* (Eyewitness Books) by Brian Cosgrove

### **ASSESSMENT**

Have students illustrate and label a diagram of the water cycle in their science journals. They should describe each stage using the appropriate vocabulary – precipitation, condensation, and evaporation.