



IMPORTANT:

Read all instructions before proceeding

WEATHER AND WATER

OVERVIEW: Students will learn about different aspects of weather. They will discuss different types of weather (rain, snow, fog, etc.) and learn how water is an important part of all of them. Students will learn about evaporation through heat energy and wind energy. Students will learn about evaporation, condensation, and how clouds are formed. Finally, students will get to hold a cloud.

OBJECTIVE: The students will learn how water is important to all types of weather; how clouds are formed; how evaporation and condensation are important in the water cycle

GRADE LEVEL: K-2

COMMON CORE STANDARDS:

K-Earth and Space Science

1. Weather changes are long-term and short-term
2. The moon, sun and stars can be observed at different times of the day or night

Grade 1—Earth and Space Science

1. The sun is the principal source of energy
2. The physical properties of water can change

Grade 2—Earth and Space Science

1. The atmosphere is made up of air
2. Water is present in the air
3. Long and short-term weather changes occur due to changes in energy

TIME: 40 minutes

VOCABULARY

Weather, clouds, evaporation, condensation, wet bulb thermometer, dry bulb thermometer, temperature

MATERIALS

- Hot plate
- Sun lamp
- Sponges

Materials continued:

- * Flask
- * Aquarium
- * Wooden Board with center cut out
- * Fan
- * Tornado tube and two 1 liter bottles
- * Humidity chart
- * Wind chill chart
- * Large bucket (5 gallon)
- * Dry ice and cooler (to hold dry ice)
- * Extension cord with at least 3 outlets
- * Paper towels
- * Orange construction paper

DEVELOPED BY:

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PROCEDURE:

Before the demonstration:

Put water in the flask and heat to boiling.

Set the aquarium on the board and put some dry ice on top of it and in it to provide the cooling to condense the steam.

Fill the large bucket half to two-thirds full of water.

Wrap one thermometer's sensor with a wet paper towel.

Set up the sun lamp where it can shine on some wet paper later.

Set up the fan where it can blow on one portion of the blackboard.

Make a tornado make for the demo if it isn't already made.

The demonstration: Get the class to offer up different types of weather (rain, snow, sunny, foggy, etc.). Discuss how water is an important part of all of them. (A sunny day is shown by its lack of water.) Ask how does all that water get up into the sky.

Get two volunteers to come up and dip the middle of two sheets of construction paper or brown paper towels into the bucket of water. Have one put their towel under the sunlamp and turn it on. Have the other put their towel on the table where it won't be disturbed. Discuss evaporation through heat energy from the sun.

Get 5-6 volunteers to come up. Give each a sponge, have them get it good and wet in the bucket, and write something (numbers, letters, etc.) with water on different parts of the blackboard. Turn on the fan so that it blows on some of the wet blackboard, but not all. Observe the different speed with which the water dries on different areas. Discuss evaporation through wind energy. Discuss wind chill and its effect on living things.

Get a couple of students to read the two thermometers. Discuss how evaporation makes the readings different. Display the humidity chart and explain how weathermen find the current humidity in the air by comparing the readings from “wet bulb” and “dry bulb” thermometers. The lower the humidity in the surrounding air, the faster water will evaporate, and the greater the temperature difference will be.

Call attention to the boiling/condensing water setup. Suspend wooden board over boiling flask. Move one end of the aquarium over the hole so the boiling steam goes into the aquarium. Discuss how evaporated water vapor condenses as it rises into the cooler atmosphere above us. This forms clouds and fog and eventually causes the condensed water to fall back to Earth in some form. (The top of the aquarium where the dry ice sits may have enough frost for you to scrape off and make a “snowstorm”). Put evaporation and condensation together for a discussion of the water cycle. What would the Earth be like if water didn't follow the cycle?

Return to the paper under the sun lamp and on the table. Show how much faster the paper under the lamp is drying.

Get your completed tornado maker. Have a volunteer demonstrate how to make it go. Discuss how tornadoes are formed. Discuss tornado safety.

For the conclusion, let the kids “hold a cloud.” Place a big chunk or two of dry ice into the large bucket. A cloud will form in the bucket above the water line. Let the class come by in a row to feel and try to hold the cloud. This cloud is made by pushing tiny drops of water up out of the bucket using bubbles of carbon dioxide. However, the cloud that is formed is very similar in composition to real clouds formed by evaporation and condensation.