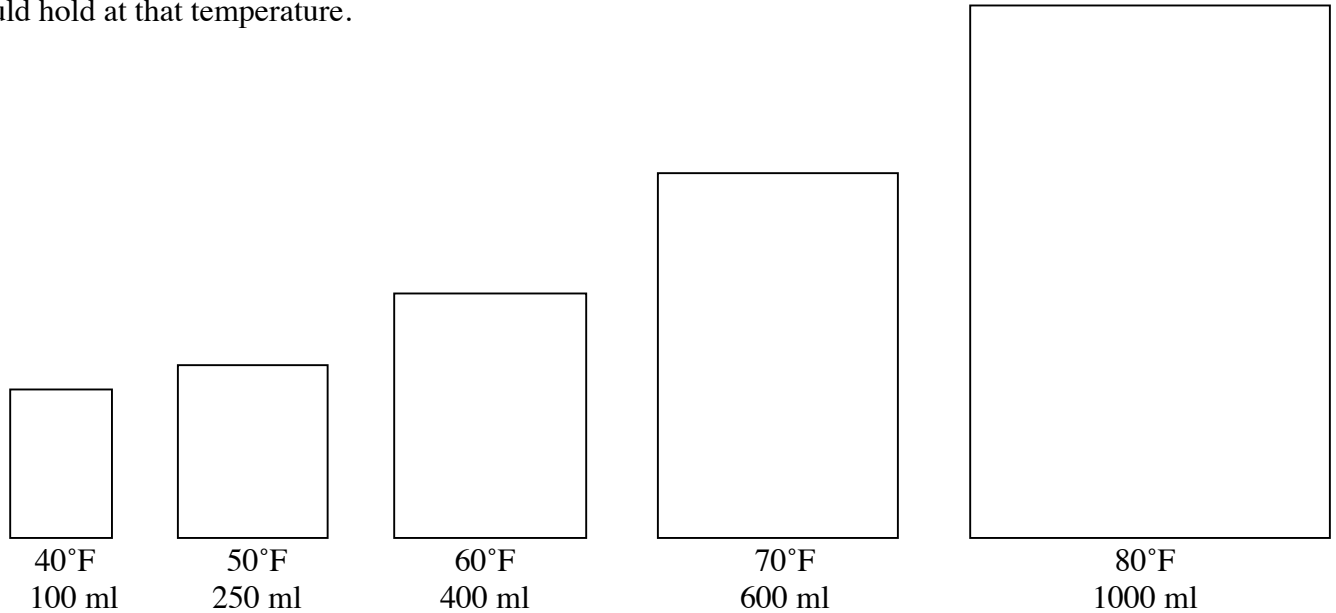


**RELATIVE HUMIDITY****Part 1: Relative Humidity and Temperature**

Each beaker represents the maximum volume of water a volume can hold at each temperature.

The beakers are not proportional and do not represent the actual amount of water a given volume of air would hold at that temperature.



1. **Pour 50 ml of water into the 100 ml beaker.** What temperature does this beaker represent?

\_\_\_\_\_°F

How full is the beaker? \_\_\_\_\_% Color the picture of the 100 ml beaker.

What is the relative humidity? \_\_\_\_\_%

2. **Pour the 50 ml of water from the 100 ml beaker into the 250 ml beaker.** What temperature is the air now? \_\_\_\_\_°F

How full is the beaker? \_\_\_\_\_% Color the picture of the 250 ml beaker.

What is the relative humidity? \_\_\_\_\_%

3. When we increase the temperature, the amount of water being evaporated from oceans, lakes, plants, animals, and the ground increases. We represent the increased water vapor in our model by **adding 100 ml of water into the 250 ml beaker.**

What is the relative humidity now with the additional water vapor due to evaporation? \_\_\_\_\_%

Color the additional water using a second color in the 250 ml beaker.

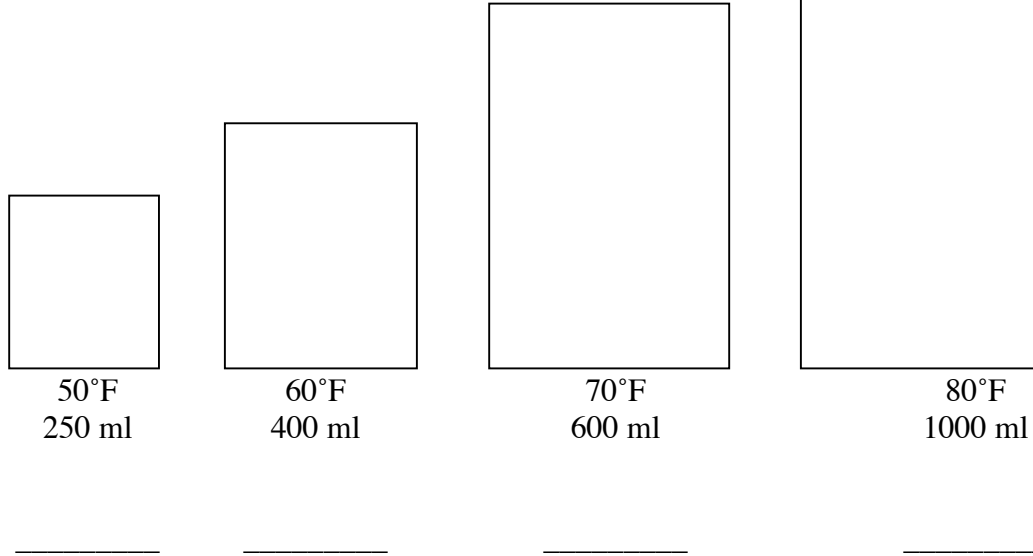
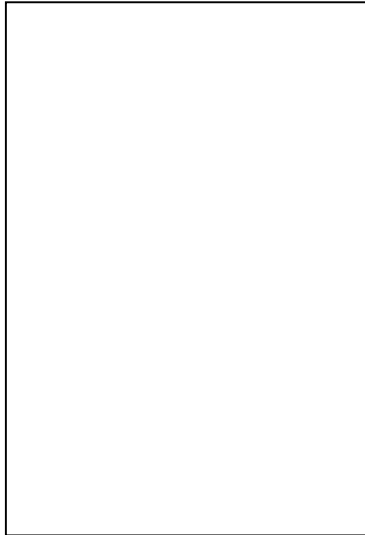
# RELATIVE HUMIDITY

Name \_\_\_\_\_

Period \_\_\_\_\_ Date \_\_\_\_\_

## Part 2: Relative Humidity and Temperature during a Day

Suppose it is a typical summer day.



7:00 am      The temperature is 50°F, and the relative humidity is 100%. You observe dew on the grass and your car's windshield is covered with water.  
 Color the beaker above to represent the relative humidity and write the relative humidity under the 50°F beaker.  
 How many ml of water will represent this relative humidity. \_\_\_\_\_ml. **Add water to the 250 ml beaker to represent this relative humidity.**

10:00 am      The temperature is now 60°F (400 ml beaker). **Pour the water from the 250 ml beaker to the 400 ml beaker.**  
 If no evaporation occurred and no additional water vapor was added to the air, how much water should be in the beaker? \_\_\_\_\_ml  
 What would be the relative humidity \_\_\_\_\_%  
 Color the beaker to represent the relative humidity.

But evaporation has occurred, so **add another 70 ml of water to the 400 ml beaker.**  
 What is the total amount of water in the beaker? \_\_\_\_\_ml

Name \_\_\_\_\_

Period \_\_\_\_\_ Date \_\_\_\_\_

## RELATIVE HUMIDITY

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What is the relative humidity now? \_\_\_\_\_%

Color the additional water using a second color beaker and write this relative humidity under the 400 ml beaker.

1:00 pm

The temperature is now 70°F (600 ml beaker). **Pour the water from the 400 ml beaker to the 600 ml beaker.** Evaporation has increased the amount of water vapor in the air by so **we add another 100 ml into the 600 ml beaker.**

What is the total amount of water in the beaker? \_\_\_\_\_ml

What is the relative humidity? \_\_\_\_\_%

Color the 600 ml beaker to represent the relative humidity and write this relative humidity under the 600 ml beaker.

3:00 pm

It is the heat of the day. The temperature is 80°F (1000 ml beaker). The air is at 60% relative humidity. **Pour the water from the 600 ml beaker to the 1000 ml and enough water to reach 60% humidity.**

Color the 1000 ml beaker to represent the relative humidity and write this relative humidity under the 1000 ml beaker.

How many ml does 60% relative humidity at 80°F represent? \_\_\_\_\_ml

5:00 pm

By late afternoon, the temperature cools. So **pour the water from the 1000 ml beaker into the 600 ml beaker**, which represents 70°F.

What is the relative humidity now? \_\_\_\_\_%

7:00 pm

**By early evening, the temperature cools again to 60°F. Pour the water from the 600 ml beaker to the 400 ml beaker.** As the temperature decreases farther, what happens to the water in the beakers?

What does this represent?

# RELATIVE HUMIDITY

Name \_\_\_\_\_

Period \_\_\_\_\_ Date \_\_\_\_\_

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## Part 3: Conclusion Question

1. What would the relative humidity be if you had a 500 ml beaker with 200 ml of water in it?

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2. How much water would the 500 ml beaker require to represent 90% humidity?

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3. Briefly describe how this demonstration illustrates the correlation between air temperature and relative humidity.

a. What happens to the percentage of relative humidity as the temperature increases?

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b. What happens to the percentage of relative humidity as the temperature decreases?

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c. Why does evaporation increase the relative humidity if the temperature remains constant?

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4. Explain why the overflow of water from the beakers represents precipitation.

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Adapted from: "What is relative humidity relative to anyway?" *Science Scope*, October 2006