Name_____ Date _____ Hour _____

Dew Point Lab

Part I: Pre-Lab

1. What is the dew point? _____

   _____

2. What is condensation? _____

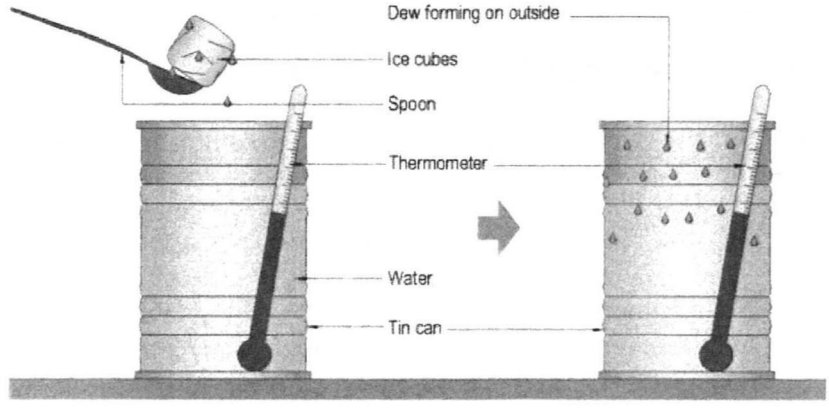
Part II: Doing the Dew!

Materials:

(1) metal can	(1) thermometer	(2) paper towels
(1) 250 mL beaker	(1) spoon	cup of ice (crushed works best)

Procedures:

1. Fill the metal can ½ full with room temperature water.
2. Measure and record the beginning temperature in the data table.
3. Wipe the outside of the can completely dry and place thermometer back into the can.
4. Slowly and carefully add ice into the can. Stir the water gently using the thermometer.
5. Run your finger gently on the outside of the can. Remove and record the temperature the moment a thin film of condensation (may appear as fog on can) appears. This is the dew point.
6. Repeat steps 1-5 for a total of 3 trials.



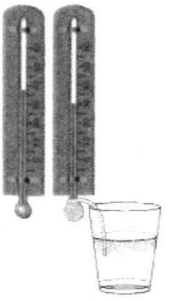
Temperature (°C)	Trial 1	Trial 2	Trial 3	Average Temperatures (°C)
Beginning Temperature				
Dew Point Temperature				

Analysis Questions:

1. What was evidence that the dew point was reached? _____
2. Where did the water that formed on the outside of the can come from? _____
3. What had to happen to the temperature of the air for the dew point to be reached? _____
4. What part of the water cycle is where the dew point is reached? _____
5. When the dew point is reached in the atmosphere, what is likely to form? _____
6. How would the amount of moisture in the air affect the dew point and this process?

Name_____ Date _____ Hour _____

Relative Humidity Lab



Part I: Pre-Lab

Read the sections in your text book which talk about humidity, relative humidity and dew point (pages 452 and 453), then answer the questions which follow.

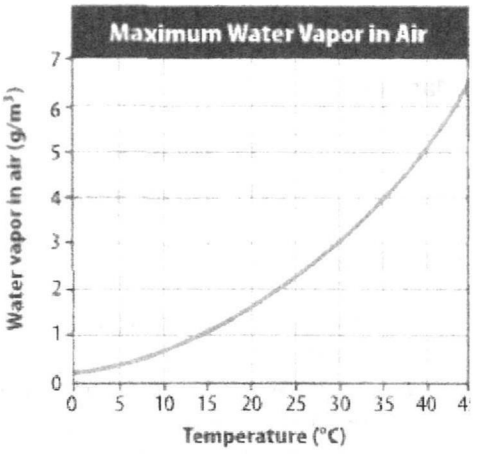
1. What is humidity? _____
2. What is relative humidity? _____

   _____
3. According to the graph, how much water vapor can air at 15 °C hold? _____
4. According to the graph, how much water vapor can air at 45 °C hold? _____
5. If you were to measure the amount of water vapor in the air at 2 different locations, one was cooler and one was warmer, which of these locations would you expect to find the greatest amount of water vapor? _____

   Explain: _____

   _____

   _____



Part II: Calculating Relative Humidity Practice.

Directions: Use the Relative Humidity Table to complete the table below.

1. Find the difference between the dry bulb and wet bulb by subtracting the dry bulb reading from the wet bulb reading. Be sure to show your work and calculations in the space shown.

2. Follow the directions on the Relative Humidity Table. You will use the dry bulb reading first, then the difference between the dry bulb and wet bulb to determine the relative humidity.

3. The first one is done for you below and is highlighted on the relative humidity table.

	Dry Bulb (°C)	**Wet Bulb** (°C)	**Difference Dry Bulb – Wet Bulb =** (°C)	**Relative Humidity %** (use table)
1.	**20**	15	20 – 15 = **5**	59%
2.	20	13		
3.	27	17		
4.	25	22		
5.	31	32		

Which combination of temperatures created the highest relative humidity? The temperatures which were closest together (least difference) or those farthest apart (most difference)? _____

Part III: Determining Relative Humidity Lab

Materials:

(1) 100-250 mL beaker
(1) psychrometers
(2) paper towel
(1) thermometer
(1) bulb pipette

Procedures:

1. Place a dry paper towel on your lab table.
2. Place the psychrometers on top of the paper towel, sliding each thermometer apart from each other.
3. Put some room temperature water in the bottom of the beaker (about ¼ full).
4. Fill the bulb pipette and moisten the wet bulb wick. The wick should be completely damp, but not dripping wet. Use the paper towel to blot any extra water on the wick and dry up any other water. Make sure the dry bulb remains dry at all times!
5. Wait one minute or until temperature on wet bulb has stopped dropping.
6. Sling the psychrometer for the count of 10 seconds then record the dry and wet bulb temperatures in the data table.
7. Calculate the relative humidity and record the results in the data table below.
8. Repeat steps 1-6 if recording on different days.

Location	**Dry Bulb** (°C)	**Wet Bulb** (°C)	**Difference Dry Bulb – Wet Bulb =** (°C)	**Relative Humidity %** (use table)
1.				
2.				
3.				

Analysis Questions:

1. Which would form more clouds in the atmosphere, a lower or higher relative humidity? _____
   Explain your answer: _____
   _____
2. When the temperature of the thermometers is both the same, what would the percent relative humidity be? _____ Explain: _____
   _____
3. When relative humidity is 100%, the _____ has been reached which means _____ is more likely to occur.
4. Which temperature of air has the greatest capacity to hold the greatest amount of water vapor, cooler or warmer air? _____ Justify/explain your answer: _____

Part VI: How Relative Humidity Affects Weather Interactive

Directions: Now investigate how relative humidity and temperature changes interact to cause different types of weather by following the steps indicated below.

a. Go to the Scholastic Weather Maker Link (http://teacher.scholastic.com/activities/wwatch/sim/game.htm)

b. Change only the controls indicated by sliding the buttons up and down on the meters.

c. The first slider controls the temperature coming from the equator.

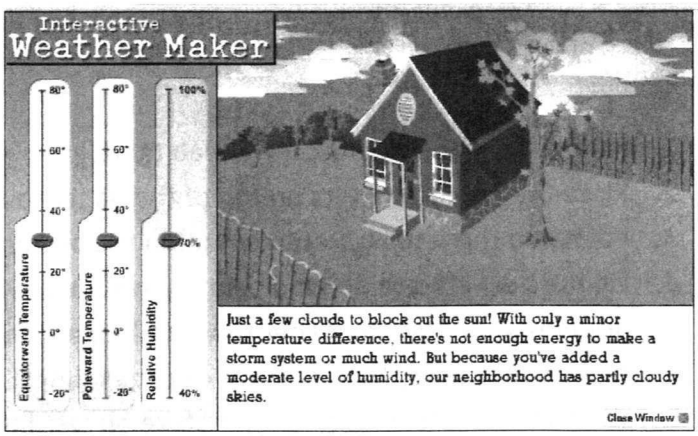
d. The second slider controls the temperature coming from the North and South poles.

e. The third slider controls the relative humidity.

f. You may never have more than 70 degrees difference in temperature.

g. Move the sliders to the position indicated in the table and complete the missing information.

h. Hit the refresh arrow to reset.



Weather System	Equator Setting	Pole Setting	Relative Humidity Setting	Describe the Amount of Clouds and Type of Precipitation (if any)	Describe the wind
#1.	30° (pre-set)	30° (pre-set)	40%		
#2.	30° (pre-set)	30° (pre-set)	100%		
#3.	40°	30° (pre-set)	70% (pre-set)		
#4.	40°	20°	100%		

5. When the relative humidity was set at 100% in system # 4, why didn't it make more snow?

6. Predict what will happen if you increase the equator temperature up to 60°, keeping pole setting at 20°

7. Try it (Equator = 60°, Pole = 20°, RH = 100%) Describe what happened.

8. Experiment and try to make the most serious rain storm possible. Write down your settings and describe the weather conditions.

9. Once you've created a heavy rain storm, keep your temperatures the same, but change the relative humidity. Describe if you increased it or decreased it and what happened.

   RH setting = ___% Changes=_____

   RH setting = ___% Changes= _____

10. How does relative humidity affect the amount of clouds and precipitation that will occur? _____

Name Date

Relative Humidity Table

STUDENT RESOURCE PAGE **2.3**
INFORMATION SHEET

To determine relative humidity:

1. Subtract the wet-bulb temperature from the dry-bulb temperature.
2. Find this number—the difference in degrees—at the top of the chart and place your finger on it.
3. Find the dry-bulb temperature in the first column on the left. Place your finger on it.
4. Bring your fingers down the column and across the row. The relative humidity percentage appears where column and row intersect on the chart.

Dry Bulb (°C)	Number of degrees difference between the wet- and dry-bulb readings (°C)									
	1	2	3	4	5	6	7	8	9	10
10	88%	77	66	56	45	35	26	16	7	--
11	89	78	67	57	47	38	28	19	11	2
12	89	79	68	59	49	40	31	22	14	5
13	89	79	69	60	51	42	33	25	16	9
14	90	80	70	61	52	43	35	27	19	11
15	90	80	71	62	54	45	37	29	22	14
16	90	81	72	63	55	47	39	31	24	17
17	91	82	73	64	56	48	41	33	26	19
18	91	82	73	65	57	50	42	35	28	21
19	91	82	74	66	58	51	44	37	30	24
20	91	83	75	67	59	52	45	38	32	26
21	91	83	75	68	60	53	47	40	34	27
22	92	84	76	69	61	54	48	41	35	29
23	92	84	77	69	62	56	49	43	37	31
24	92	84	77	70	63	57	50	44	38	32
25	92	85	77	71	64	57	51	45	40	34
26	92	85	78	71	65	58	52	46	41	35
27	93	85	78	72	65	59	53	47	42	37
28	93	86	79	72	66	60	54	49	43	38
29	93	86	79	73	67	61	55	50	44	39
30	93	86	80	73	67	61	56	50	45	40
31	93	86	80	74	68	62	57	51	46	41
32	93	87	80	74	68	63	57	52	47	42
33	93	87	81	75	69	63	58	53	48	43
34	93	87	81	75	69	64	59	54	49	44

Copyright © Houghton Mifflin Company. All Rights Reserved.