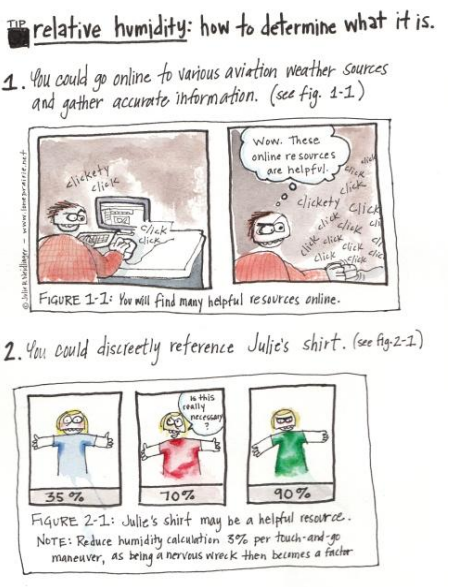
Relative Humidity Lab

*Name:*_____

Relative Humidity: - Relative humidity is the ratio of the current absolute humidity to the highest possible absolute humidity (which depends on the current air temperature). A reading of 100 percent relative humidity means that the air is totally saturated with water vapor and cannot hold any more, creating the possibility of rain.



Determining the Dew Point:

1. Fill a beaker half full with water and allow the water to reach room temperature. Record the temperature in the chart below.

2. Add three or four ice cubes to the beaker. Stir the water and ice mixture while carefully observing the temperature of the water.

3. Continue stirring until moisture begins to appear on the outside of the beaker.

4. When moisture forms on the outside of the beaker, record the temperature of the water. This temperature represents the **dew point** in the classroom.

	Temperature (^{o}C)
Initial Temperature	
Dew Point	

Determining Relative Humidity:

1. Obtain a sling psychrometer. The bulb of one thermometer needs to remain dry while the other remains wet. If needed, add one dropper of water to the cotton covering on one of the thermometers. With this set-up you can measure both the air temperature and the cooling effect of evaporation.

2. Carefully spin both of the thermometers until the reading on the wet-bulb thermometer stops changing. Read and record the temperature of each thermometer on the chart below.

3. Use the chart below the table to find the relative humidity based on your temperature readings. This number is expressed as a percentage.

LOCATION	DRY-BULB	WET-BULB	Difference in wet and dry bulbs	RELATIVE HUMIDITY
Classroom				
Commons				
Outside				

Table 2

Dry-Bulb Temp. (°C)	Relative Humidity (%)																		
	Difference Between Wet- and Dry-Bulb Temp. (°C)																		
	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°	16°	17°	18°	19°	20°
−10	67	35																		
−9	69	39	9																	
−8	71	43	15																	
−7	73	48	20																	
−6	74	49	25																	
−5	76	52	29	7																
−4	77	55	33	12																
−3	78	57	37	17																
−2	79	60	40	22																
−1	81	62	43	26	8															
0	81	64	46	29	13															
1	83	66	49	33	17															
2	84	68	52	37	22	7														
3	84	70	55	40	26	12														
4	85	71	57	43	29	16														
5	86	72	58	45	33	20	7													
6	86	73	60	48	35	24	11													
7	87	74	62	50	38	26	15													
8	87	75	63	51	40	29	19	8												
9	88	76	64	53	42	32	22	12												
10	88	77	66	55	44	34	24	15	6											
11	89	78	67	56	46	36	27	18	9											
12	89	78	68	58	48	39	29	21	12											
13	89	79	69	59	50	41	32	23	15	7										
14	90	79	70	60	51	42	34	26	18	10										
15	90	80	71	61	53	44	36	27	20	13	6									
16	90	81	71	63	54	46	38	30	23	15	8									
17	90	81	72	64	55	47	40	32	25	18	11									
18	91	82	73	65	57	49	41	34	27	20	14	7								
19	91	82	74	65	58	50	43	36	29	22	16	10								
20	91	83	74	66	59	51	44	37	31	24	18	12	6							
21	91	83	75	67	60	53	46	39	32	26	20	14	9							
22	92	83	76	68	61	54	47	40	34	28	22	17	11	6						
23	92	84	76	69	62	55	48	42	36	30	24	19	13	8						
24	92	84	77	69	62	56	49	43	37	31	26	20	15	10	5					
25	92	84	77	70	63	57	50	44	39	33	28	22	17	12	8					
26	92	85	78	71	64	58	51	46	40	34	29	24	19	14	10	5				
27	92	85	78	71	65	58	52	47	41	36	31	26	21	16	12	7				
28	93	85	78	72	65	59	53	48	42	37	32	27	22	18	13	9	5			
29	93	86	79	72	66	60	54	49	43	38	33	28	24	19	15	11	7			
30	93	86	79	73	67	61	55	50	44	39	35	30	25	21	17	13	9	5		
31	93	86	80	73	67	61	56	51	45	40	36	31	27	22	18	14	11	7		
32	93	86	80	74	68	62	57	51	46	41	37	32	28	24	20	16	12	9	5	
33	93	87	80	74	68	63	57	52	47	42	38	33	29	25	21	17	14	10	7	
34	93	87	81	75	69	63	58	53	48	43	39	35	30	28	23	19	15	12	8	5
35	94	87	81	75	69	64	59	54	49	44	40	36	32	28	24	20	17	13	10	7

Analysis and Conclusions:

1. Would the dew point be the same in the first part of the experiment if we performed this activity on a different day or outside of school? WHY?

2. Based on the relative humidity you found in the classroom, can the air hold more evaporated water? How do you know?

3. If you remained in the class and wet the back of your hand, would the water evaporate and cool your skin? Explain.

4. Suppose you exercise in a room where the relative humidity is 100%. Would moisture on your skin from perspiration evaporate readily?

5. In the same exercise room, would you be able to cool off easily? Explain.

6. Suppose you have just stepped out of a swimming pool. The relative humidity is low, about 30%. How would you feel – warm or cool? Explain.

Relative Humidity Affects Climate:

7. When you see a low relative humidity area over time, what can you infer about the climate in that region?

8 . When you see a high relative humidity area over time, what can you infer about the climate in that region?

9. When you see an area of high relative humidity over time, what can you infer about the amount of vegetation in that region?

10. When you see an area of low relative humidity over time, what can you infer about the size of the human population in the area? Why?

11. Is relative humidity typically higher or lower over land? Over water? Why?

12. Is high relative humidity likely to support or slow insect population growth? Why?