Humidity Lab

Name _____

Date _____

Objective: To determine relative humidity using a sling psychrometer and a Relative Humidity Table.

Materials: Sling Psychrometer*

*The sling psychrometer is two thermometers attached together on the end of a stick. One thermometer has a cloth on the end of it that will require dampening. This is the "wet bulb" and measures the wet bulb temperature. The other thermometer (without the cloth) measures the dry bulb temperature. The drier the air, the more water that will evaporate from the cloth on the wet bulb. When water evaporates, it cools the air around it. Thus, the drier the air, the cooler the wet bulb temperature. When the wet bulb temperature is compared to the dry bulb temperature, the wet bulb will ALWAYS be lower.

Lab Packet (includes Relative Humidity Table)
Coloring Tools (NOT markers)

Procedure:

1. Dampen the cloth on the wet bulb thermometer.
2. Twirl the psychrometer for 30 seconds. Record the wet bulb and dry bulb temperatures in the data table below as Trial 1.
3. Repeat Step 2 two more times as Trial 2 and Trial 3.
4. Using the Relative Humidity Table, calculate your relative humidity.

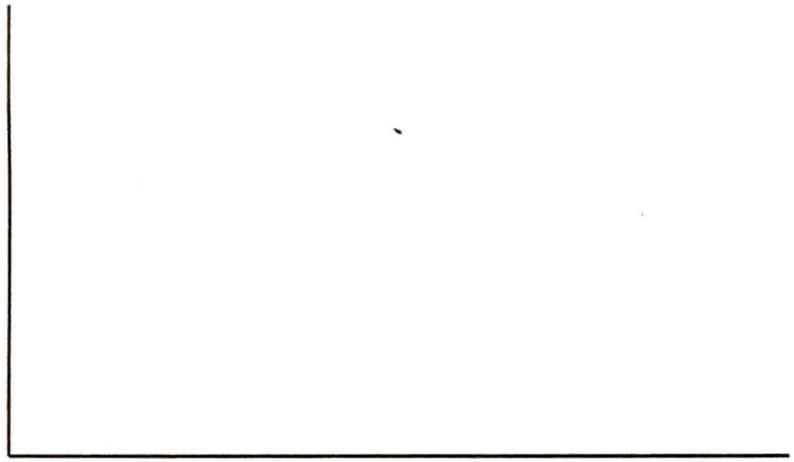
Data:

Trial	Location	Dry Bulb Temperature (°C)	Wet Bulb Temperature (°C)	Temperature Difference (°C)	Relative Humidity (%)

5. Complete the missing items in the chart below using the Relative Humidity Table. These readings were taken at Outback International Airport.

Date	Dry Bulb Temperature (°C)	Wet Bulb Temperature (°C)	Temperature Difference (°C)	Relative Humidity (%)
Jan. 1, 1998	30	20		
Jan. 21, 1998	28	19		
Feb. 10, 1998	30	20		
Mar. 1, 1998	26	18		
Mar. 22, 1998	24	18		
April 11, 1998	24	19		
May 1, 1998	22	19		
May 21, 1998	20	18		
June 10, 1998	20	18		
June 30, 1998	16	14		
July 24, 1998	16			81
Aug. 13, 1998	18			91
Sept. 5, 1998	20	16		66
Sept. 27, 1998	22	16		54
Oct. 19, 1998		17		49
Nov. 10, 1998		16		43
Nov. 30, 1998	26			46
Dec. 16, 1998	28			42

6. Plot the dates and the relative humidities from the Outback International Airport Chart chart on the graph below. Put Relative Humidity on the Y axis and the Dates on the X axis.



7. Connect your points from left to right to form a Relative Humidity profile.
8. Make your line red for lower humidities (less 70%).
9. Make your line blue for higher humidities (greater than 70%).
10. Answer the following questions based on your graph:
    a. Between what months do you think this location receives the most rain?

    b. Between what months does this location have drought concerns?

    c. Looking at the dry bulb temperature, does this location have to worry much about snow or other winter weather?

    d. If I told you that this location's rainy season was during the fall and winter, in what hemisphere is this location?

    e. If I wanted to vacation here during the driest month, when should I plan on going?

Relative Humidities Table (%)

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