Part A – Water Vapor Capacity of Air, Relative Humidity, and Dew-Point Temperature

Activity 1: Water Vapor Capacity of Air
The water vapor capacity of air is directly related to, and limited by, its temperature. The table below presents the water vapor capacity of a kilogram of air at various temperatures. Use the table to answer the following questions.

Table 1: Water vapor capacity of a kilogram of air at average sea level pressure.

Temperature (ºF)	Temperature (ºC)	Grams of water vapor per kg of air (g/kg)
- 40	- 40	0.1
- 22	- 30	0.3
-4	- 20	0.75
14	- 10	2
32	0	3.5
41	5	5
50	10	7
59	15	10
68	20	14
77	25	20
86	30	26.5
95	35	35
104	40	47

1. To demonstrate the relation between air temperature and water vapor capacity, prepare a graph by **plotting data from Table 1 in Figure 1**.

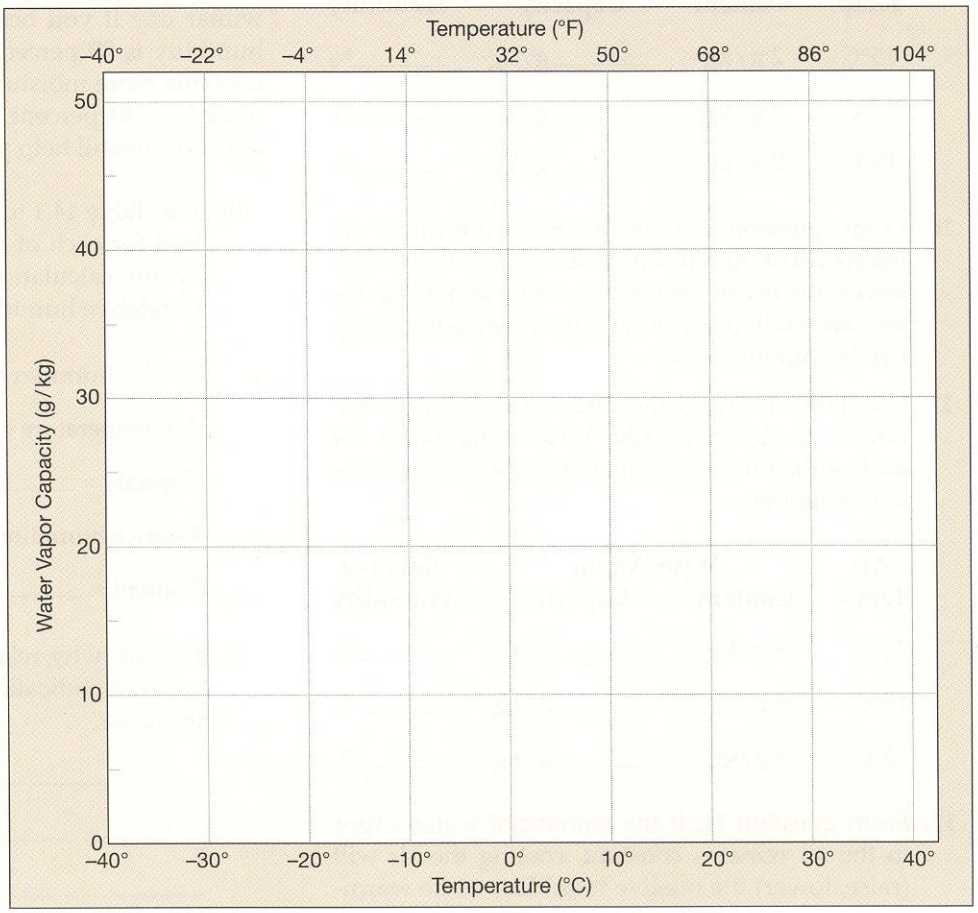

Figure 1: Graph of water vapor capacity of a kilogram of air versus temperature. Refer to Table 1 for values.

2. Read your graph to determine the water vapor capacity of a kilogram of air at each of the following temperatures	40º C: _____ grams/kilogram 68º F: _____ grams/kilogram 0º C: _____ grams/kilogram -20º C: _____ grams/kilogram	
3. Read your graph to determine the effects described below. Write your answers in the areas to the right.	Change in water vapor capacity (increase/decrease)	Amount of change of the water vapor capacity in grams of a kilogram of air
Lower the air temperature from 10 to 5 ºC		
Lower the air temperature from 35 to 30 ºC		

4. Using your graph and the table, write a brief statement that relates the water vapor capacity of air to the temperature of air.