NAME _____ *DATE* _____

INSTRUCTOR _____ *PERIOD* _____ *PARTNER* _____

UNIT 6: Weather

LAB 6-2: WEATHER WATCH ANALYSIS

INTRODUCTION: Weather records are interesting as a recollection of previous phenomena. They can also be used to draw inferences as to the cause of weather and hence to predict future changes. Although weather cannot be predicted with absolute accuracy, a probability of occurrence, based on percentage, can be established.

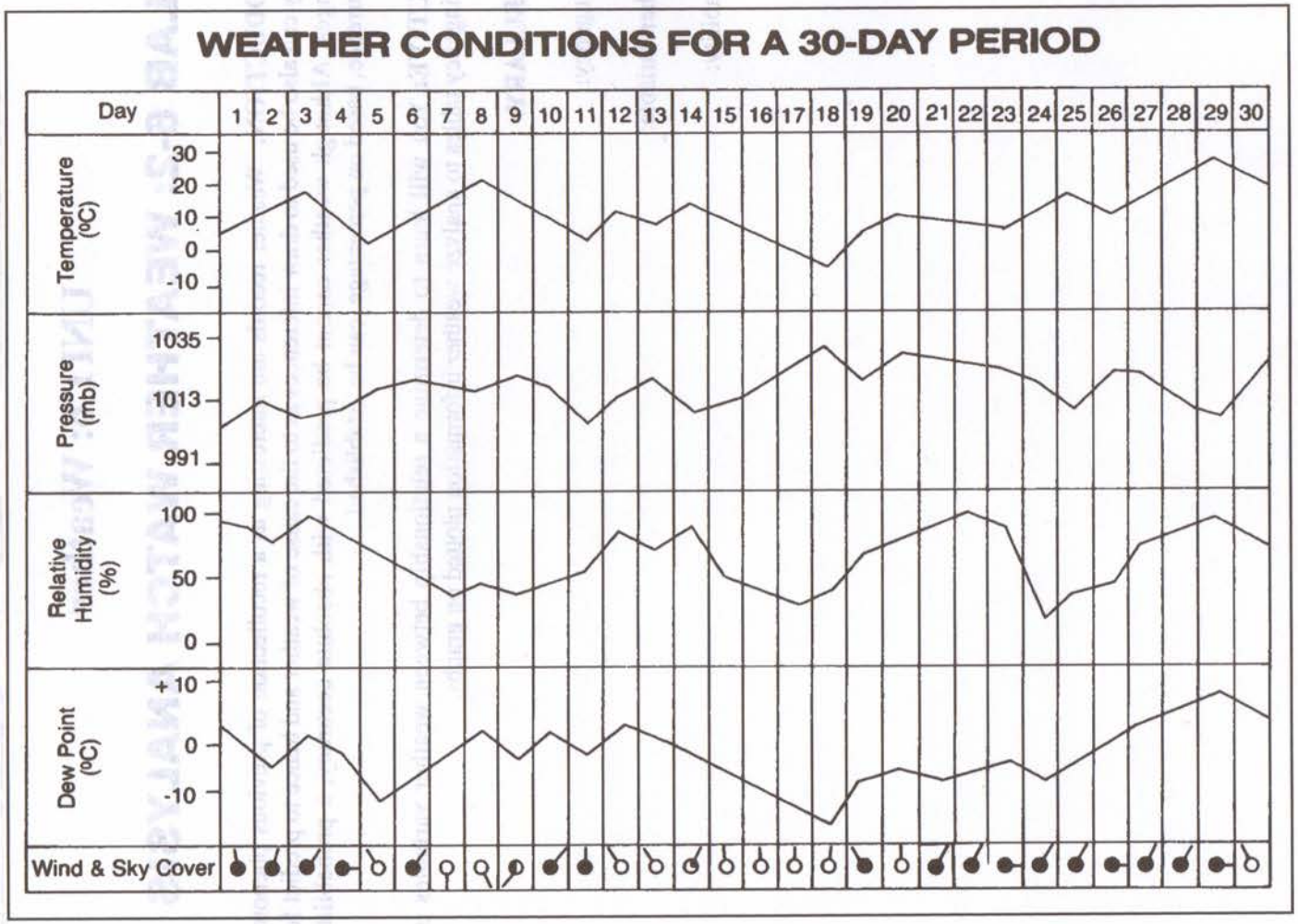
OBJECTIVE: You will learn to determine a relationship between weather variables using contingency tables to analyze weather information plotted on graphs.

VOCABULARY:

contingency:

weather variable:

probability:

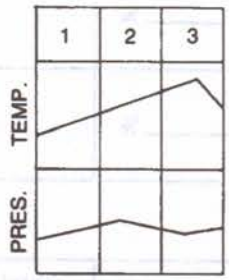

WEATHER CONDITIONS FOR A 30-DAY PERIOD
Day
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Temperature (°C)
30
20
10
0
-10
Pressure (mb)
1035
1013
991
Relative Humidity (%)
100
50
0
Dew Point (°C)
+ 10
0
-10
Wind & Sky Cover

PROCEDURE:

The weather conditions for a 30-day period are shown on the chart.

You are to analyze the relationships between pairs of weather variables. These will be recorded on the Report Sheet.

As an example, to compare the changes in air pressure that occur at the same time there is a change in temperature, you will look at the first two graphs.



AIR PRESSURE CHANGE

TEMPERATURE CHANGE	Rising	Falling	Total
Rising	#1 ____ %	#2 ____ %	
Falling	#3 ____ %	#4 ____ %	

1. On Day 1 the temperature is rising. Find the temperature on Report Sheet # 1. Since temperature is rising, you are going to keep score for this day by placing a mark in one of the two boxes across the top (1 or 2 in the example). But which one?
2. On Day 1 the pressure is rising. To score that, you would use Box 1 or 3 on the example.

Temperature Rising: Box 1 or Box 2

Pressure Rising: Box 1 or Box 3

The relationship shown by Box #1 is that, on this day the temperature was rising and the pressure also was rising. Place a mark in Box #1.

On Day #2 the pressure changes during the day. In such cases, use the trend for most of the day. If it changes in the middle of the day, use the afternoon trend. You now have temperature rising (Box 1 or 2) and pressure falling (Box 2 or 4). They match in Box #2. Place a mark in Box #2.

Continue this procedure for each of the 30 days keeping score in the proper boxes.

3. Under "Total", enter the sum of the markings in the first two columns.

AIR PRESSURE CHANGE

TEMPERATURE CHANGE	Rising	Falling	Total
Rising	I 1 + II 2 =		3
Falling	III 3 +	IIII 4 =	7

For each box, calculate the percent probability that two factors vary in this pattern.

In the sample shown:

Temperature and pressure were both rising on only one day out of a total of three days.

$^1/_3 \times 100 = 33.3\%$

The temperature was falling while pressure was rising on 3 out of the total of 7 times.

$^3/_7 \times 100 = 43\%$

4. Analyze the 30 day weather chart and fill in the required data and calculations on your Report Sheet.

REPORT SHEET

AIR PRESSURE CHANGE

TEMPERATURE CHANGE	Rising	Falling	Total
Rising	_____ %	_____ %	
Falling	_____ %	_____ %	

DEWPOINT CHANGE

RELATIVE HUMIDITY CHANGE	Rising	Falling	Total
Rising	_____ %	_____ %	
Falling	_____ %	_____ %	

AIR PRESSURE CHANGE

CLOUD COVER	Rising	Falling	Total
Clear	_____ %	_____ %	
Partly Cloudy	_____ %	_____ %	
Cloudy	_____ %	_____ %	

AIR PRESSURE CHANGE

WIND DIRECTION	Rising	Falling	Total
N-NW	_____ %	_____ %	
NE-E	_____ %	_____ %	
SE-S-SW	_____ %	_____ %	

DISCUSSION QUESTIONS: *(Answer in Complete Sentences)*

1. What do you think is the least percentage of occurrence that two factors must vary in a given pattern before you decide that there is a connection between them?

2. List the 6 changes in atmospheric variables that usually precede rain, as shown by the contingency tables.

3. List the 6 changes in atmospheric variables that usually precede fair weather, as shown by the contingency tables.

4. What is the relationship between the following variables?
   a) Air Pressure and Temperature:

   b) Air Pressure and Cloud Cover:

   c) Air Pressure and Wind Direction:

5. As the relative humidity increases, what change in dew point temperature can you predict?

6. As the difference between dew point temperature and air temperature decreases, what is the probability of precipitation?

CONCLUSION: How can contingency tables be used for predicting the weather?