Skills Practice Lab   DATASHEET A

Weather Map Interpretation

Weather maps use many map symbols and lines to show the weather conditions in an area at a given time. In this lab, you will study the symbols used on a weather map to learn about the relationships between temperature, pressure, and winds.

OBJECTIVES

Construct a pressure and temperature map.

Interpret a weather map.

Explain how weather patterns are related to pressure systems.

MATERIALS

- paper
- pencil
- pencils, red and blue

PROCEDURE

1. Use the following weather map. This map is also in Appendix E in your textbook.

   - Use the map symbols on the same page of the appendix to study the map.

   - The number on the right of each station on the map represents atmospheric pressure to the nearest tenth of a millibar (mb).

   - The number on the left of each station represents temperature in degrees Celsius (°C).
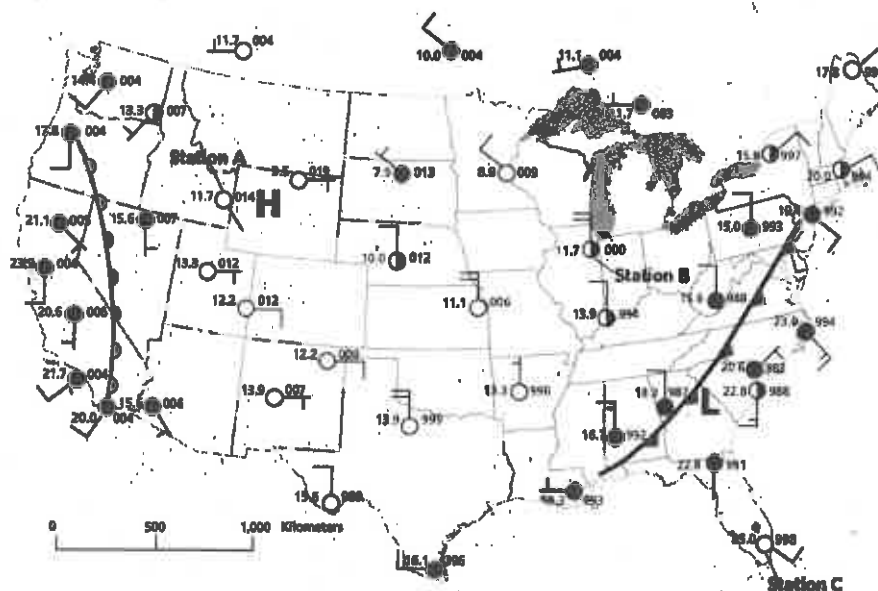
Weather Map Interpretation *continued*

2. Use a red pencil to draw a line on your copy of the weather map that marks a 10.0 °C isotherm. (Note: An isotherm is a line that joins all places that have the same temperature.)

- Find a station that has a temperature below 10.0 °C.

- Find nearby stations that have temperatures above 10.0 °C.

- Mark a point that should have a temperature near 10.0 °C between the stations.

- Find stations that have a temperature of 10.0 °C.

- Use a red pencil to draw a line that connects the points and the stations that have temperatures of 10.0 °C.

- Label the isotherm with the temperature it marks.

3. Using the same method as in step 2, draw an isotherm for each of the following temperatures: 8.0 °C, 12.0 °C, 14.0 °C, 16.0 °C, 18.0 °C, 20.0 °C, 22.0 °C, and 24.0 °C.

- Label each isotherm with the temperature it marks.

4. Use a blue pencil to draw a line on your copy of the weather map that marks a 1,001.2 mb isotherm. (Hint: This pressure appears as 012 to the right of the station.)

- Follow the same method that you used in step 2 to draw a 1,001.2 mb isobar.

- Label the isobar with the pressure it marks.

5. Using the same method as in step 2, lightly draw isobars for each of the following pressures: 998.4 mb (984); 998.8 mb (988); 999.2 mb (992); 999.6 mb (996); 1,000.0 mb (000); 1,000.4 mb (004); 1,000.8 mb (008); and 1,001.6 mb (016).

- Label each isobar with the pressure it marks.

ANALYSIS

1. **Identifying Trends** What is the lowest temperature isotherm that you drew?

_____

What is the highest temperature isotherm that you drew?

_____

Which isotherm forms a closed loop?

_____

_____

| Weather Map Interpretation *continued*

2. **Making Inferences** Does the closed isotherm that you drew show a cold air mass or a warm air mass? Explain your answer.

The closed isotherm shows a _____ air mass.

_____

_____

_____

3. **Analyzing Data** Look at the wind direction ahead of the cold front and behind the cold front. Is there a shift in the wind direction? If so, describe the shift.

_____

_____

_____

Look at the wind direction in front of the warm front and behind the warm front. Is there a shift in the wind direction? If so, describe the shift.

_____

_____

_____

4. **Identifying Trends** What is the value of the lowest-pressure isobar that you drew?

_____

What is the value of the highest-pressure isobar that you drew?

_____

Is either isobar a closed loop? If so, which one?

5. **Drawing Conclusions** At the time that the map shows, where was an area of low pressure?

_____

What weather conditions would you expect to find in this area?

_____

_____

At the time that the map shows, where was an area of high pressure?

_____

What weather conditions would you expect to find in this area?

_____

| Weather Map Interpretation *continued*

EXTENSION

1. **Making Predictions** Predict the weather conditions at Station A, 24 h after the observations for your map were made.
   Record your predictions in the table below.
   Make and record predictions for Station B.
   Make and record predictions for Station C.

PREDICTIONS OF WEATHER CONDITIONS

Station	Pressure	Wind direction	Wind speed	Temperature	Sky condition
A					
B					
C					