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Conceptual Physics: _____
Date: _____

Unit XI
Meteorology
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XI

Understanding Isobars

1. Determine which 4 millibar intervals will be necessary to use for this map. (Keep in mind that the isobars are found every 4 millibars such as 996, 1000, 1004, etc.)
2. Draw in the isobars on the map you have printed out. Start with the 1000 mb line, then adding 996 mb, 1004 mb, etc. Label each isobar. *Note: isobars form sets of curves that do not cross each other.*

Isobars can be used to identify "Highs" and "Lows". The pressure in a high is greater than the surrounding air. The pressure in a low is lower than the surrounding air.

3. Label with an "H" the center of a high pressure area.
4. Label with an "L" the center of a low pressure area.

High pressure regions are usually associated with dry weather because as the air sinks it warms and the moisture evaporates. Low pressure regions usually bring precipitation because when the air rises it cools and the water vapor condenses.

5. Over which state would you expect to see rain or snow?
6. Over which state would you expect to see clear skies?

In the northern hemisphere the wind blows clockwise around centers of high pressure. The wind blows counterclockwise around lows. It is the opposite in the southern hemisphere.

7. Draw arrows around the "H" on your map to indicate the wind direction.
8. Draw arrows around the "L" on your map to indicate the wind direction.

Imagine that you live in El Paso, TX.

9. If a High were approaching you from the west, describe the shift in wind direction as the High approaches you and then passes to the east.
10. How would pressure measurements change as the High approaches and then passes to the east.

Imagine that you live in New York City.

11. If a Low were approaching you from the west, describe the shift in wind direction as the Low approaches you and then passes to the east.

The strength of the wind is determined by changes in the pressure, the pressure gradient. A large change in pressure over a short distance would indicate strong winds. On a weather map, isobars that are close together indicate a strong pressure gradient.

12. Indicate on your map where you expect the strongest winds (the steepest pressure gradient).

Creating an Isobar Map

Objective: *Create a map using isobar lines to identify high and low pressure centers.*

Directions

1. You will make a contour map showing the regions of different pressure. Lines will be drawn between the numbers dividing the map into the following regions

Below		1000
1000	to	1009
1010	to	1019
1020	to	1029
Above		1030

2. Lines should never cross. Line should not stop until they have hit the edge of the paper. Some lines may form a closed loop.
3. When you have finished drawing lines print a large "L" at the centers of low pressure. (Any region below 1009) Draw arrows pointing inward and counterclockwise. The arrows indicate the wind direction around the low pressure centers.
4. Print a large "H" at the high pressure centers. (Any region with pressure over 1020.)
 1. Draw arrows pointing outward and clockwise around the high pressure centers.
 2. The arrows indicate the wind direction around the high pressure centers.
5. Meteorologists use such maps to identify any patterns. When your map is completed examine it to see any patterns.

Conclusion

How Barometers Work:

A Barometer contains a vertical column of mercury. The glass tube is sealed at the top and is open at the bottom. The air pressure outside the tube keeps the mercury from falling out. The height of the mercury changes with changes in the air pressure.

Isobar Map

