Isobars Name_____ period_____

What is an isobar?

A line drawn on a weather map connecting points of equal pressure is called an "**isobar**". Isobars are generated from mean sea-level pressure reports and are given in millibars.

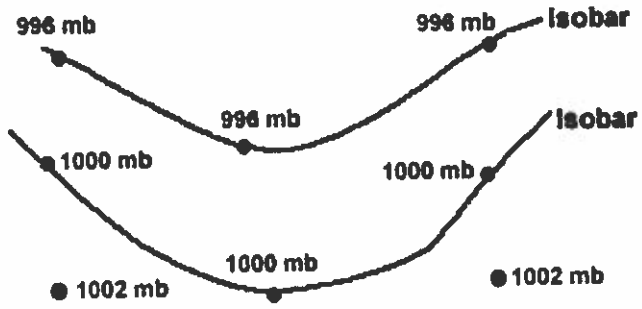
What is air pressure?

Air pressure is the force exerted on you by the weight of air molecules.

Objective

Using a pencil, lightly draw lines connecting identical values of sea level pressure. These lines, called isobars, do not cross each other. Isobars are usually drawn for every four millibars, using 1000 millibars as the starting point. Therefore, these lines will have values of 1000, 1004, 1008, 1012, 1016, 1020, 1024, etc., or 996, 992, 988, 984, 980, etc.

The diagram below depicts a pair of sample isobars. At every point along the top isobar, the pressure is 996 mb while at every point along the bottom isobar, the pressure is 1000 mb. Points above the 1000 mb isobar have a lower pressure and points below that isobar have a higher pressure.



Procedure

Begin drawing from the 1024 millibars station pressure over Salt Lake City, Utah (highlighted). Draw a line to the next 1024 value located to the northeast (upper right). Without lifting your pencil draw a line to the next 1024 value located to the south and then to the one located southwest, finally returning to the Salt Lake City value. Isobars are smooth lines with few, if any, kinks.

The result is an elongated circle, centered approximately over Eastern Utah. The line that was drawn represents the 1024 millibars line and you can expect the pressure to be 1024 millibars everywhere along that line. Repeat the procedure with the next isobar value. Remember, the value between isobars is 4 millibars. Since there are no 1028 millibars values on the map, then your next line will follow the 1020 millibars reports. Then continue with the remaining values until you have all the reports connected with an isobar.

Label each isobar with the appropriate value. Traditionally, only the last two digits are used for labels. For example, the label on the 1024 mb isobar would be 24. A 1008 mb isobar would be labeled 08. A 992 mb isobar will be labeled 92. These labels can be placed anywhere along the isobar but are typically placed around edges of the map at the end of each line. For closed isobars (lines that connect) a gap is placed in the isobar with the value inserted in the gap.

Analysis

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.

1. Label the center of the high pressure area with a large blue "H".
2. Label the center of the high pressure area with a large red "L".

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.

3. Shade, in green, the state(s) would you expect to see rain or snow.
4. Shade, in yellow, the state(s) would you expect to see clear skies.

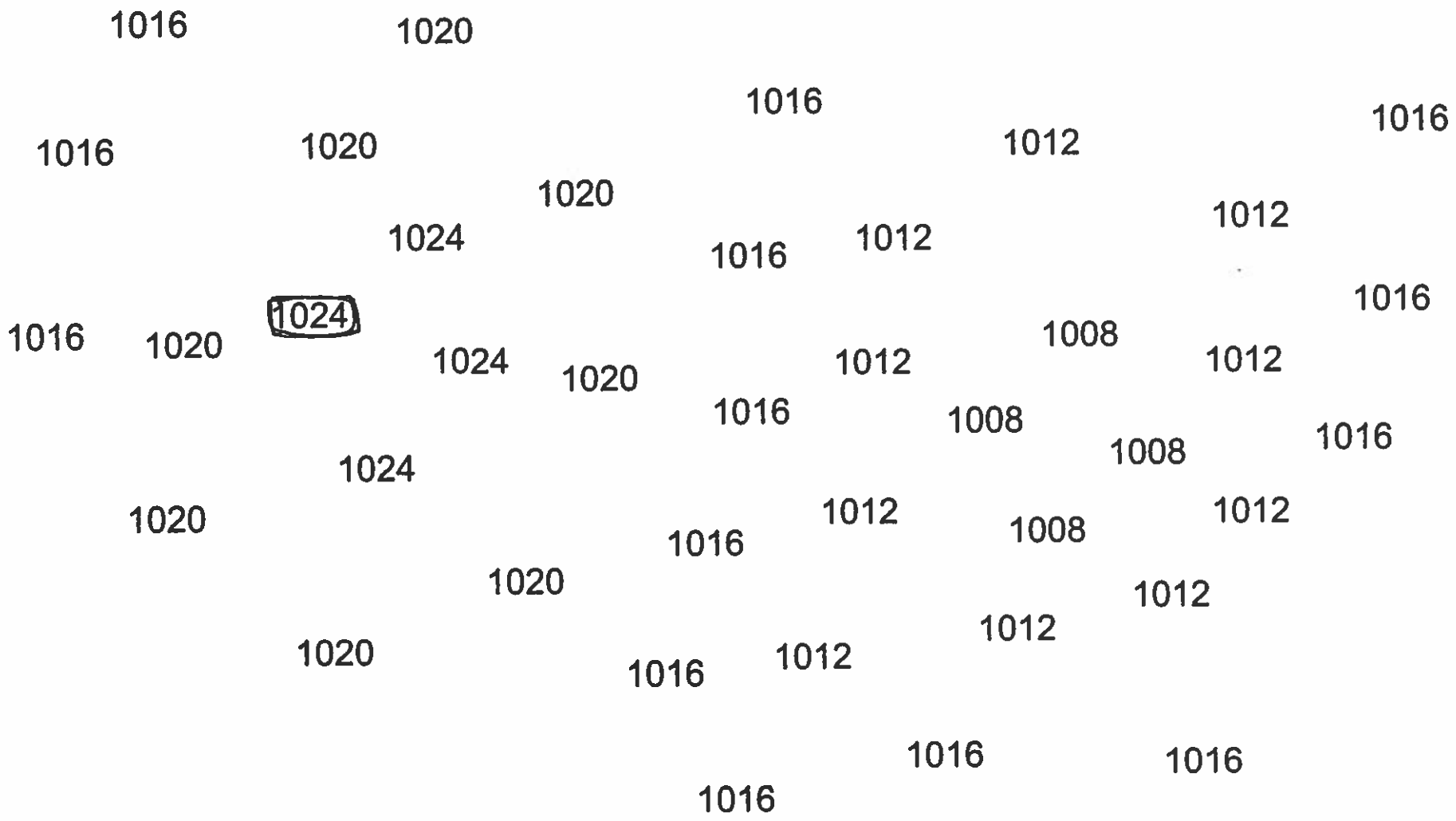
In the northern hemisphere the wind blows clockwise around centers of high pressure. The wind blows counterclockwise around lows.

5. Draw arrows around the "H" on your map to indicate the wind direction.
6. Draw arrows around the "L" on your map to indicate the wind direction.

Conclusion

1. The pressure in a HIGH is _____ than the surrounding air.
2. The pressure in a LOW is _____ than the surrounding air.
3. Why are high pressure regions usually associated with dry weather?
4. Why do low pressure regions usually bring precipitation?
5. Which states did you expect to see rain or snow?
6. Which states did you expect to see clear skies?
7. In the Northern hemisphere, around centers of high pressure, which direction does the wind blow?
8. In the Northern hemisphere, around centers of low pressure, which direction does the wind blow?

Surface Air Pressure Map



Name :

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BLM-10b

Mapping Exercise—Air Pressure and Isobars

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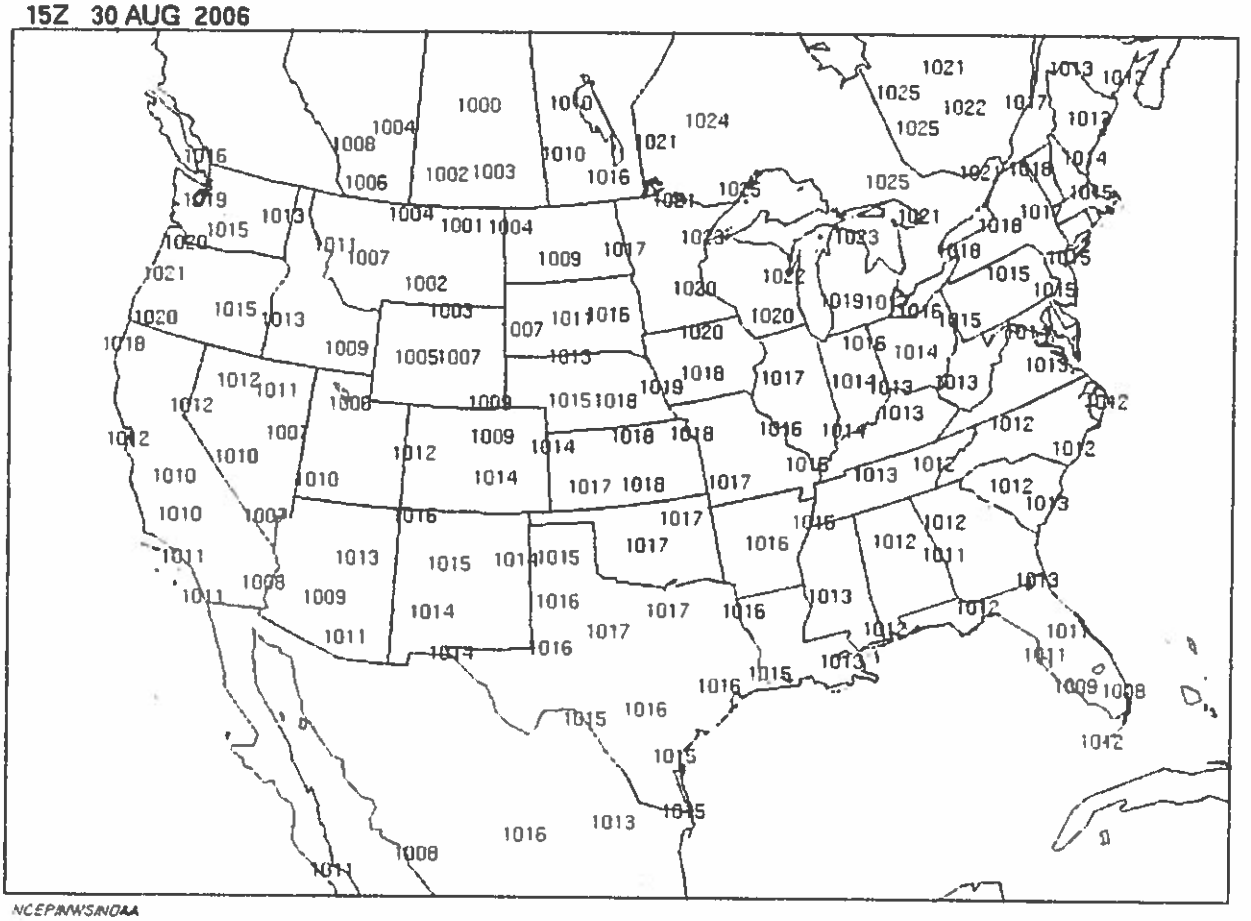

Challenge! You can do it!