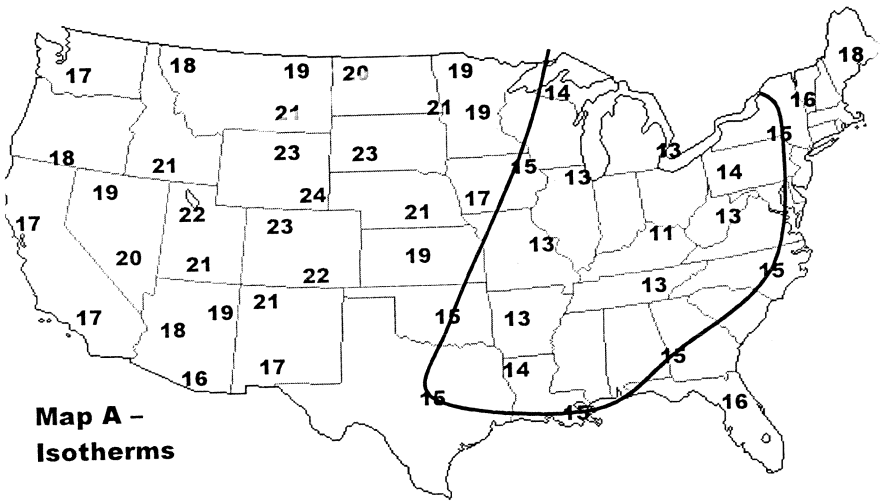
Isotherms, Isobars and Wind Lab

Name:_____ Partners:_____ _____Block:____

Objective: To identify warm and cold air masses, and areas of high and low pressure using synoptic weather data.

Map A: Study the solid line that has been drawn through all of the weather stations that have a temperature of 15°C. Notice that the solid line sometimes goes between values of 14 and 16°C, this is because we must estimate a temperature of 15°C to exist between them (recall the rules for drawing isolines). On Map A, **draw isotherms on a 2°C interval (15 has already been done for you)**. On this map, isotherms will form closed loops as there are two different temperature air masses present within the U.S. at this point in time.



1. Which isotherms are the only isotherms that form closed loops on this map?

2. What is the lowest temperature found on the map, and in which portion of the country is this?

3. What is the highest temperature found on the map, and in which portion of the country is this?

These closed loops allow us to identify where an air mass is located.

4. Where is the center of the cold air mass (state)? _____
5. Where is the center of the warm air mass? _____

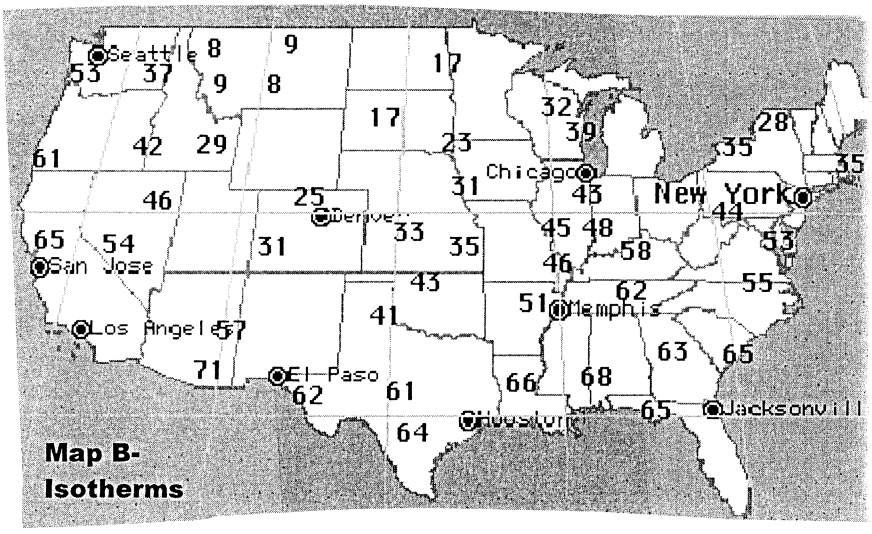
Map B: Draw in the 10, 20, 30, 40, 50, 60 and 70 degree isotherms. Label each isotherm when you are finished.

6. Name a state over which a cold air mass is located.

7. Name a state over which a warm air mass is located

Air masses are also categorized as dry or humid. Humid air develops over the ocean waters as water vapor evaporates from the surface. Dry air masses come from large inland areas. For example, an air mass over the Gulf of Mexico would be warm and humid.

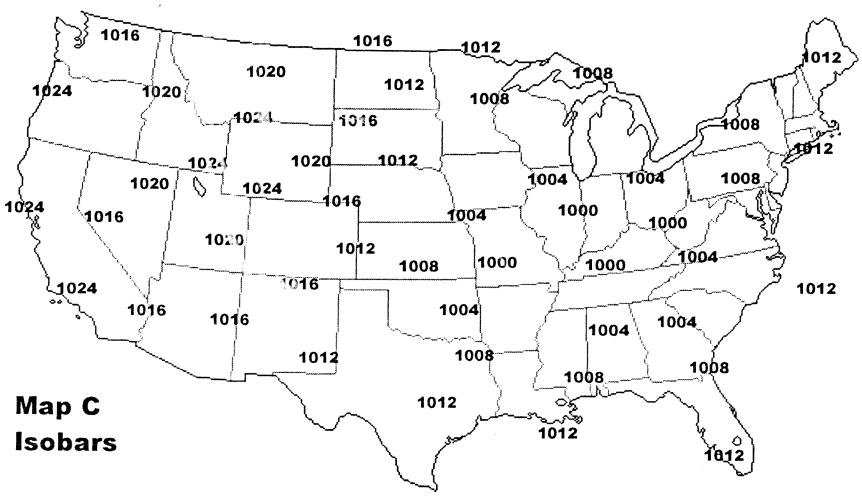
8. How would you describe the air mass moving into the United States from Canada?



9. How would you describe the air mass moving into the United States in the south east?

Map C: On map C you will draw isobars. You will use these isobars to locate the center of areas of high and low pressure in the U.S. The numbers on the map measure pressure in millibars. Draw and label the 1000, 1005, 1008, 1012, 1016, 1020 and 1024 mb isobars. (Start with low pressure and work your way out to 1012, then start with high pressure at 1024 mb and work your way out).

Some of these isobars form closed loops; the center of each of this loop represents an area of high or low pressure, depending upon the numerical value.



10. What is standard, sea level pressure (normal air pressure?)

    _____

    Anything below this amount would be considered _____ pressure. Anything above this value would be considered _____ pressure.

11. Label the center of both the low and high pressure systems on your map with a "H" for high pressure in blue and a "L" for low pressure in red.
    What is the lowest air pressure measured? _____
    What is the highest air pressure measured? _____

12. Wind blows from areas of _____(high or low) pressure to area of _____ (high or low pressure). Draw with a dark arrow on your map the direction you might expect the winds to blow.

13. What type of wind would this be called (remember winds are named after the direction they come from)?

14. Is air rising or sinking in the High pressure system?

15. Is air rising or sinking in the Low pressure system?

16. In which area of the U.S. would you expect to see more precipitation/cloud cover due to air rising?

17. In which area of the U.S. would you expect to see clear skies due to the sinking of air?