

Environnement  
Canada

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Name :













Date:

BLM-1

## Weather Vocabulary—Definitions



Match the following weather terms with the appropriate descriptions by writing the correct letter in the space provided. Each answer may be used only once.

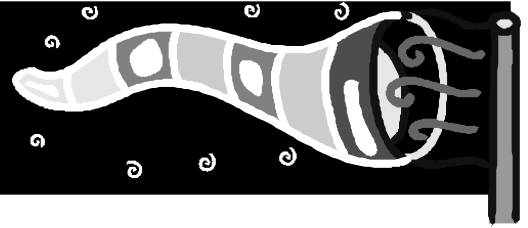
- |  |   |
|--|---|
| 1. sublimation    | a. A term used to describe how hot, humid weather feels to the average person   |
| 2. tornado        | b. The changing of a liquid into a vapour                                       |
| 3. haze           | c. A line on a weather map joining points with equal atmospheric pressure       |
| 4. isobar        | d. The changing of a solid into a vapour  |
| 5. dew point    | e. Tiny visible water droplets that are suspended in the air                    |
| 6. front        | f. A violently rotating column of air extending from the base of a thunderstorm |
| 7. evaporation  | g. The temperature at which the air will become saturated                       |
| 8. typhoon      | h. A suspension of dry particles such as dust or smoke in the air               |
| 9. fog          | i. Another name for a hurricane in other parts of the world                     |
| 10. cyclone     | j. Another name for any low pressure system                                     |
| 11. humidex     | k. The process by which warm air rises  |
| 12. convection  | l. A line on a weather map representing the boundary between two air masses     |

Name :

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BLM-2

## Weather Instruments



Match each weather element with the name of the instrument used to measure it or detect its presence. In some cases, there may be more than one correct answer.

Then, from the selection at the bottom, choose the correct unit of measurement for each in Canada.

Weather Element

Measured with a

Units

Relative humidity



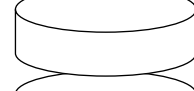
Cloud height



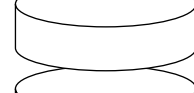
Precipitation



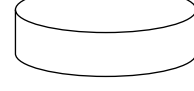
Wind speed



Temperature



Air pressure



Weather Instrument

Units of Measurement

a. Hygrometer

e. Barometer

b. Anemometer

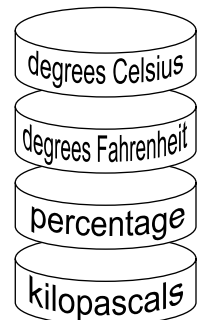
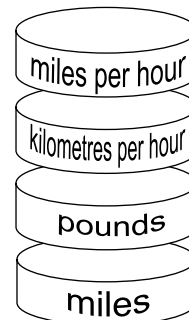
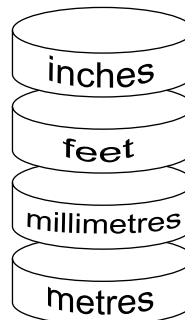
f. Ceilometer

c. Thermister

g. Sling psychrometer

d. Tipping bucket rain gauge

h. Thermometer



Name :

Date:

BLM-3

## Weather Quiz



Indicate whether the following statements are True (T) or False (F).

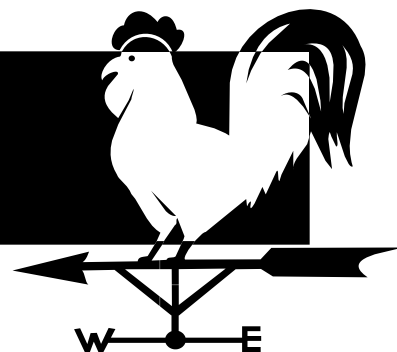
1. \_\_\_\_\_ The term jet stream refers to a warm ocean current in the Atlantic Ocean, just off the east coast of North America.
2. \_\_\_\_\_ A front is the transition zone between two different air masses.
3. \_\_\_\_\_ Radar uses microwave energy to detect precipitation.
4. \_\_\_\_\_ A stratocumulus cloud has an anvil-shaped top.
5. \_\_\_\_\_ If the grass is wet with dew in the morning, then skies were probably clear overnight.
6. \_\_\_\_\_ Fog only forms when the relative humidity is high.
7. \_\_\_\_\_ Seasons are caused by the earth rotating on its axis.
8. \_\_\_\_\_ Clouds can be made of water droplets, ice crystals, or both at the same time.
9. \_\_\_\_\_ Temperatures are normally warmer five kilometres above the Earth than they are at the Earth's surface.
10. \_\_\_\_\_ Air moves from areas of higher pressure toward areas of lower pressure, creating wind.
11. \_\_\_\_\_ Lightning is only dangerous to people holding metal objects.
12. \_\_\_\_\_ Earth's atmosphere receives its heat directly from the sun.
13. \_\_\_\_\_ Air masses can pick up moisture as they move over large bodies of water, which can be deposited in the form of precipitation when they move onshore again.
14. \_\_\_\_\_ In Canada, weather systems move predominantly from west to east.
15. \_\_\_\_\_ Both Humidex and the UV Index were developed in Canada.

Name :

Date:

BLM-4

## ***Weather Lore***



**From the choices below, pick any 2 old folk sayings and explain in your own words why they might work.**

1. When the dew is on the grass,  
Rain shall never come to pass.
2. Red sky at night, sailor's delight.  
Red sky at morning, sailors take warning.
3. When windows won't open and salt clogs the shaker,  
The weather will favour the umbrella maker.
4. When halo rings the sun or moon,  
Rain or snow will happen soon.
5. When the wind is blowing from the east,  
'Tis not fit for man nor beast.
6. When clouds appear like rocks and towers,  
Earth's refreshed by frequent showers.

Name :

Date:

BLM-5a

## ***Weather and Climate—Graphing***



**For this exercise, you will need to use a computer with Internet access, or your teacher may choose to collect the information for the class. You may use data for the capital city of your province or territory, or select another location from the city list on the Environment Canada Web site at [www.weatheroffice.ec.gc.ca](http://www.weatheroffice.ec.gc.ca). Set up this exercise at the end of one month so that you can track the temperatures for the entire following calendar month.**

1. Use the Past Weather link on the side menu to find the Climate Normals for the city you've chosen. Check to be sure that that location also reports daily highs and lows on their weather forecast Web page.
2. Find the normal daily maximum and minimum temperatures for that city for next month, and draw lines on the graph on the next page to represent these temperatures. Use a different colour for each, but don't use red or blue. For example, if the normal daily maximum is  $16.2^{\circ}\text{C}$ , you could draw a straight line in green at that point running from the first day of the month to the end of the month.
3. The Past Weather section of this Web site gives you Climate Data Online as well. You can use this link once a week for the following month to retrieve the actual daily high and low temperatures for that same city. Plot the daily temperatures using red for the maximum and blue for the minimum. Make a line graph by connecting the dots that represent the temperature values.
4. At the end of the month, compare the lines representing the actual temperatures with the lines representing the normal or average temperatures.
  - Did the actual temperatures match the normal ones?
  - Which lines would be considered weather and which would be climate?
  - In your own words, explain why they are different.

Name :

Date:

BLM-5b

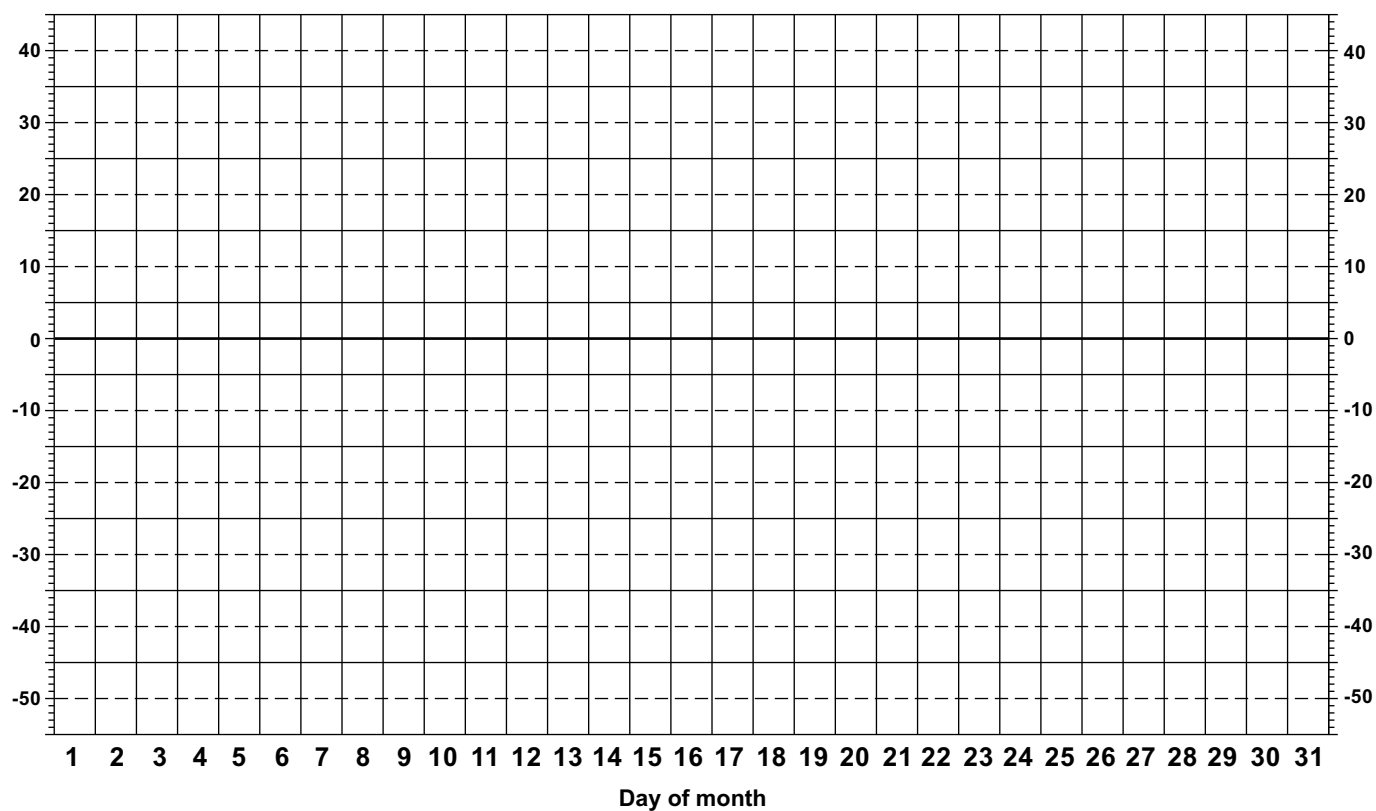
## Weather and Climate—Graphing



### MAXIMUM AND MINIMUM TEMPERATURE CHART

Month: \_\_\_\_\_

Monitored daily at: \_\_\_\_\_



Maximum & minimum temperatures (°C)

☐ maximum daily temperature    ☐ minimum daily temperature



Name :

Date:

BLM-6

## ***Weather or Climate—That's the question!***



Identify whether the following statements relate to weather (W) or climate (C).

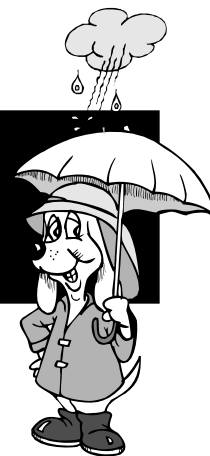
- \_\_\_\_\_ 1. The sky is partly cloudy this morning in Yellowknife, NT.
- \_\_\_\_\_ 2. Halifax, NS, gets more snow than Eureka, NU.
- \_\_\_\_\_ 3. Freezing rain overnight made travel so hazardous that schools in Prince Edward Island were closed for the day.
- \_\_\_\_\_ 4. A tornado was reported near Argyle, NB, on the July long weekend.
- \_\_\_\_\_ 5. It rained every single day while we were at the Calgary Stampede.
- \_\_\_\_\_ 6. In Quebec City, we always have snow for Christmas.
- \_\_\_\_\_ 7. It was so hot in Toronto yesterday that many types of labour had to be restricted and some businesses closed early.
- \_\_\_\_\_ 8. Timmins, Ontario, has such cold winters that some automobile companies test their vehicles there.
- \_\_\_\_\_ 9. Schools in rural Manitoba have a better chance of having a "snow day" than schools in Vancouver, BC.
- \_\_\_\_\_ 10. St. John's, NF, is on Canada's east coast on the shore of the Atlantic Ocean and has almost four times as many foggy days as Regina, SK.

Name :

Date:

BLM-7

## Severe Weather Quiz



Circle the appropriate word or words within the brackets to correctly complete each sentence.

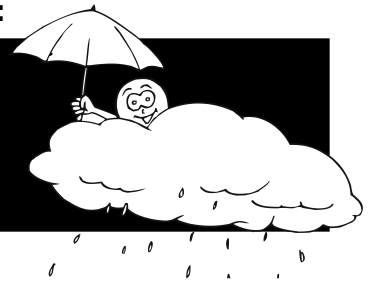
1. Compared to a hurricane, a tornado is (**larger** / smaller / the same size).
2. In the eye of a hurricane, the weather is (**stormy** / cold / calm).
3. The only cloud that will produce lightning is (**nimbostratus** / cumulonimbus / cirrocumulus).
4. The safest place to seek shelter if you are outdoors when a thunderstorm approaches is (**in a car** / under a tree / out on a lake).
5. High wind chills can affect (**you** / your dog / both).
6. (**Floods** / tornadoes / lightning strikes) kill more people in the developed world than any other natural phenomenon.
7. In Canada, though, an average of (**40** / 80 / 120) people die each year from exposure to extreme cold — more than from floods, tornadoes and lightning combined.
8. The glow of a lightning flash is caused by the air in a narrow channel being rapidly heated to (**1000°C** / 10,000°C / 30,000°C) in a fraction of a second.
9. To help prevent hypothermia or low body temperature when outdoors on cold winter days, you should wear (**a hat** / wet mitts / a light jacket).
10. Hurricanes only form over (**warm water** / warm land / cold water).

Name :

Date:

BLM-8

## Severe Weather Safety



Develop an emergency plan for your family to prepare for and deal with one of the following events at home. Be sure to indicate which things should be done in advance, which should be done during the event and what should be done after the threat has ended.

Choose from:



Tornado



Flood



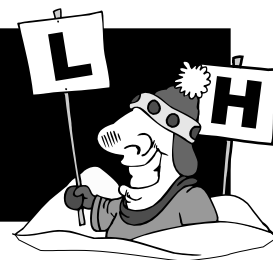
Ice storm

Name :

Date:

BLM-9

## Characteristics of High and Low Pressure Systems



In the table below, insert the correct word under the appropriate type of pressure system.

	High	Low
As you move toward the centre, the atmospheric pressure will <b>(increase, decrease)</b> .		
Surface winds blow in a <b>(clockwise, counter-clockwise)</b> direction around the centre.		
Surface winds blow slightly <b>(in toward, out from)</b> the centre.		
In this system, the air is generally <b>(rising, descending)</b> in the centre.		
Near the centre, the sky is usually <b>(clear, cloudy)</b> .		
In general, these systems will bring <b>(fair, stormy)</b> weather.		

Name :

Date:

BLM-10a

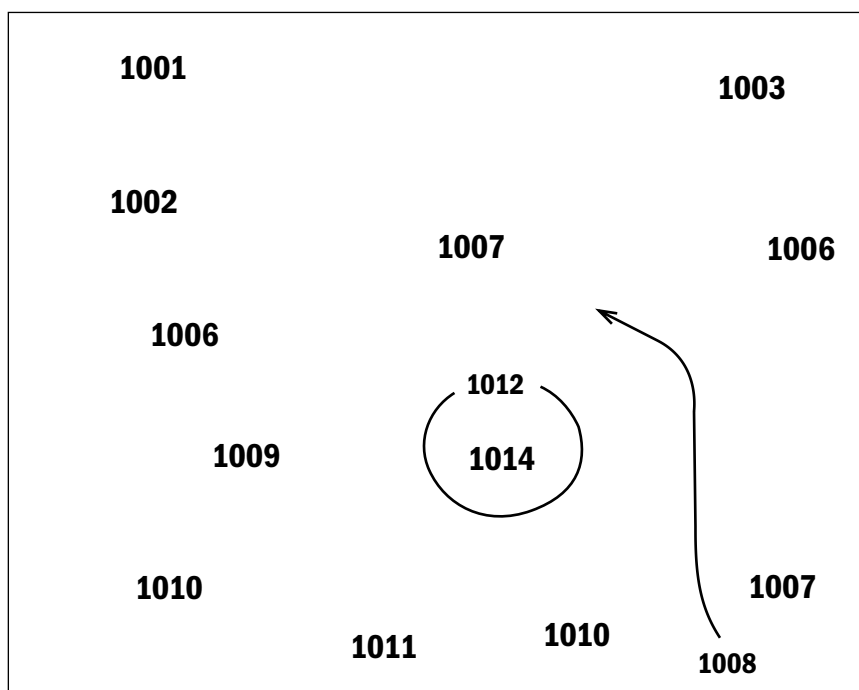
## Mapping Exercise—Air Pressure and Isobars



**Isobars are lines joining points with equal atmospheric pressure. You will be able to practice the technique of drawing isobars, first by completing the sample and then by analyzing a full map.**

In this exercise, air pressure is shown in hectopascals (hPa) at various locations. These examples use whole numbers and not the traditional station plot format for the purpose of this exercise only. Isobars are drawn at 4-hPa intervals.

A 1012-hPa isobar, which encircles one station in this sample, has already been drawn. Complete the 1008-hPa isobar that has been started. Finally draw the 1004-hPa isobar. Label each isobar by writing the appropriate pressure value at its end point.



Now you're ready to analyse the map on the next page. To begin, look for values near 1000. For instance, if the pressure is 999 at one station and 1002 at a neighbouring station, then somewhere between them, the pressure must be 1000 hPa and your isobar will lie between them. Once you have drawn and labeled the 1000 hPa isobar, work upward to 1004, 1008, etc., and down to 996, 992, and so on until isobars have been drawn to include all locations on your map. Label each isobar and then use "H" and "L" to locate High and Low pressure centres.

**Date:**

## Mapping Exercise—Air Pressure and Isobars

NCEPINWSINQAA

# APPENDIX

## ANSWER KEY



## Exercise 1

1-d    2-f    3-h    4-c    5-g    6-l    7-b    8-i    9-e    10-j    11-a    12-k

## Exercise 2

Relative humidity: hygrometer or sling psychrometer; percentage

Cloud height: ceilometer; metres

Precipitation: tipping bucket rain gauge; millimetres

Wind speed: anemometer; kilometres per hour

Temperature: thermister or thermometer; degrees Celsius

Air pressure: barometer; kilopascals

## Exercise 3

1-F    2-T    3-T    4-F    5-T    6-T    7-F    8-T    9-F    10-T    11-F  
12-F    13-T    14-T    15-T

## Exercise 4

1. Dew forms on clear calm nights when the Earth's heat radiates back out to space, allowing the air near the ground to cool to its dew point. The absence of cloud makes rain unlikely.
2. In Canada, weather systems move generally from west to east. The sun sets in the west, so a red sky in the evening would be west of your location. The setting sun is shining through a high concentration of dust particles. This usually indicates high pressure and stable air coming in from the west, bringing basically fair weather. The dust particles split the sunlight into all the colours of the spectrum—colours with shorter wavelengths are scattered leaving only red, with the longest wavelength, visible.  
  
If the sky is red in the morning to your east, the high pressure system has already passed you by and lower pressure may bring unsettled weather with it.
3. High humidities may cause wooden windows to swell with absorbed moisture, and similarly salt grains will absorb moisture and clump together. In summer, daytime heating combines with high humidity to promote the development of cumulus-type cloud that typically will give afternoon showers.
4. A halo around the sun or moon indicates the presence of cirrostratus cloud, which is composed of ice crystals. These ice crystals act as tiny prisms, producing a halo. As cirrostratus cloud often precedes a warm front and associated low pressure system, there's a good chance that rain or snow will follow.
5. Winds blow counter-clockwise and into a centre of low pressure, so that east winds are common in advance of a low pressure system. Low pressure is normally associated with stormy weather.
6. Clouds that look like “rocks and towers” are part of the cumulus cloud family. They may start off as little cotton puffs, then grow vertically with the help of daytime heating, developing cauliflower-like bulges on top. Some may even become thunderheads or cumulonimbus clouds. These clouds produce showery precipitation that can start and end abruptly.



## Exercise 5

- No, the actual temperatures didn't match the normal ones. The daily temperatures fluctuated above and below normal.
- The straight lines showing the normal temperatures represent the long-term climate of that location, while the day-to-day temperatures show the daily variation in weather.
- Climate is based on daily weather, but averaged over a long period of time.

## Exercise 6

1-W    2-C    3-W    4-W    5-W    6-C    7-W    8-C    9-C    10-C

## Exercise 7

1. smaller
2. calm
3. cumulonimbus
4. in a car
5. both
6. lightning strikes
7. 80
8. 30,000°C
9. a hat
10. warm water

## Exercise 8

Compare your students' suggestions to those on the Web site of Public Safety and Emergency Preparedness Canada at [www.psepc-sppcc.gc.ca](http://www.psepc-sppcc.gc.ca).

## Exercise 9

High	Low
Increase	decrease
Clockwise	counter-clockwise
Out from	in toward
Descending	rising
Clear	cloudy
Fair	stormy

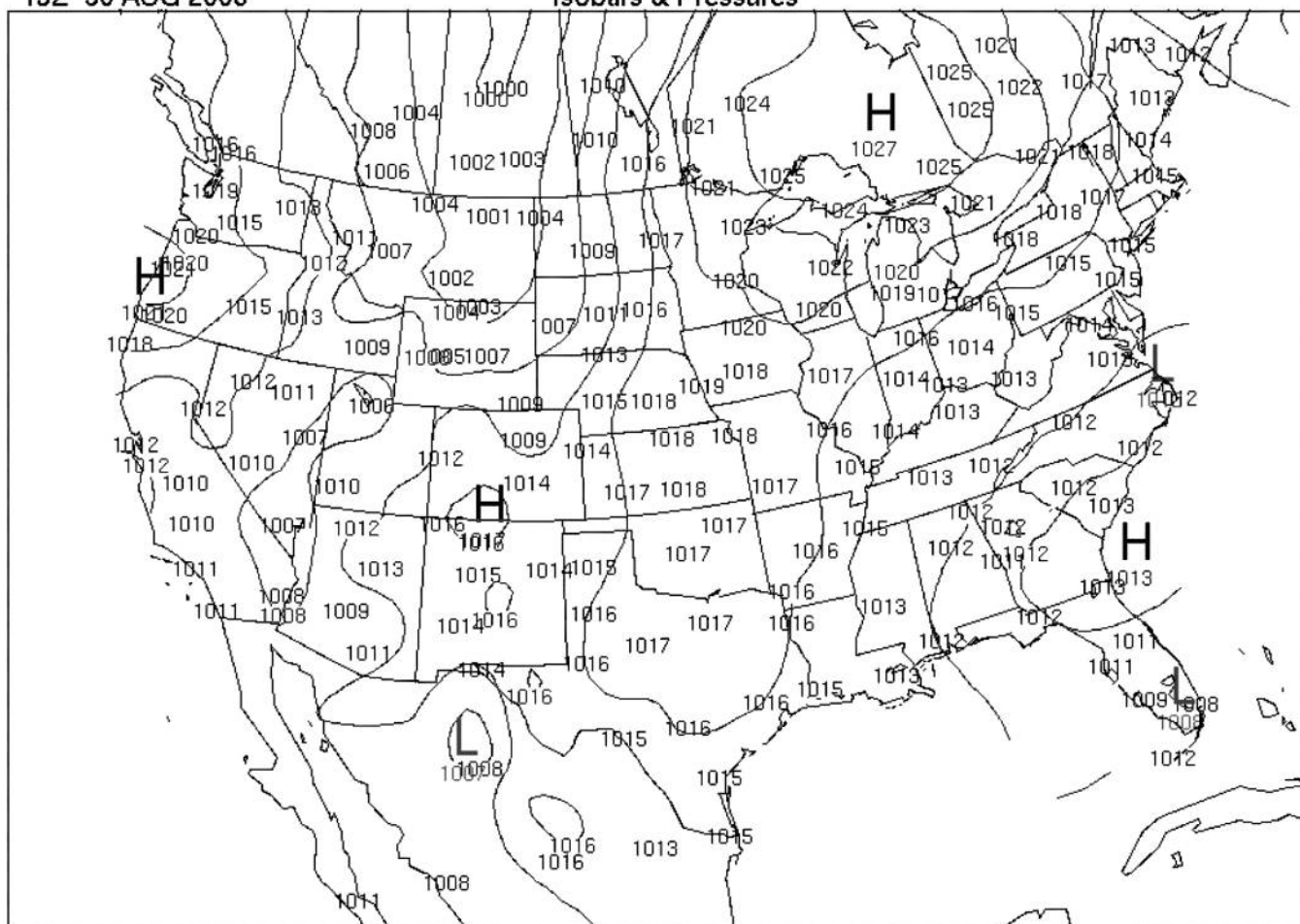
## Exercise 10

See map next page

## Analysed Pressure Map

15Z 30 AUG 2006

Isobars & Pressures



NCEP/NWS/NOAA