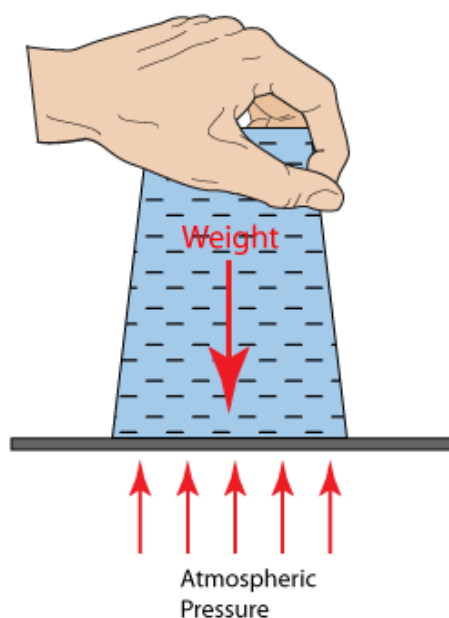


Science 20F

Atmospheric Pressure

Lesson # 5



Notes! - Keep with you at home
don't return to this lesson to school.

Date: _____

S2-4-05 Collect, interpret, and analyze meteorological data related to a severe weather event. Include: meteorological maps, satellite imagery, conditions prior to and following the event.

Atmospheric Pressure

If all the weather occurs in the troposphere what effect do the other layers of the atmosphere have on the troposphere?

Each layer of air applies pressure on the layer below to create atmospheric pressure. The air molecules in the layers of the atmosphere are being pulled towards the earth's surface by the force of gravity.

So why don't we feel the atmospheric pressure?

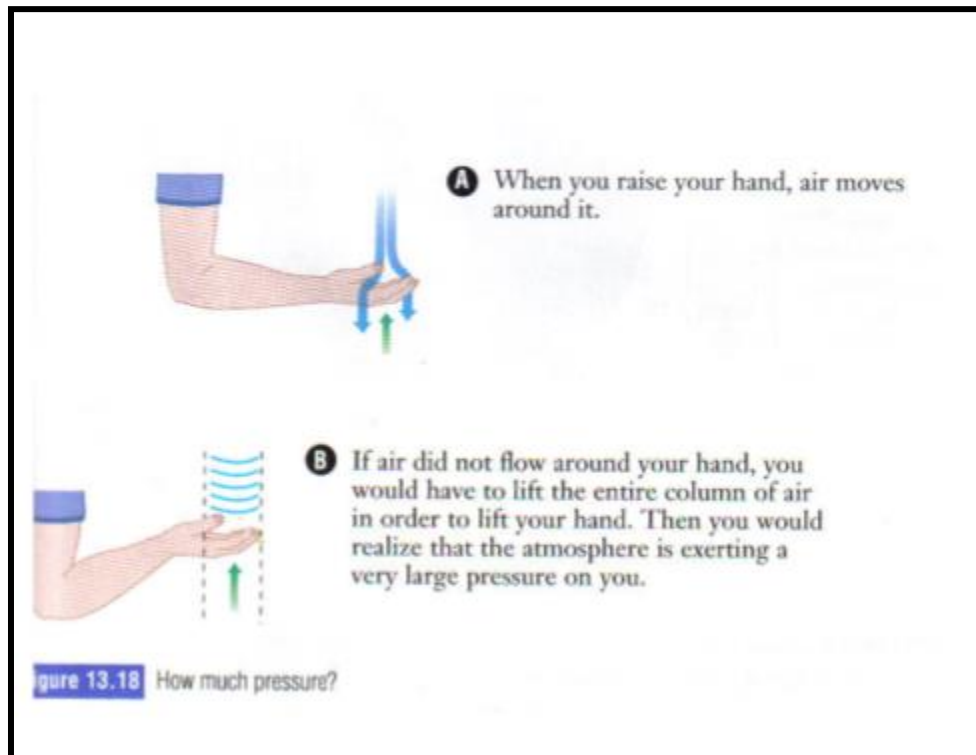
Two reasons:

- 1) We are use to the pressure, it pushes all around us in all directions, not only downward
- 2) The atmosphere consists of gases which we move through and it moves around us, so we don't feel the pressure. Look at fig. 13.8



Figure 6.14 Air pressure exists everywhere and is exerted in all directions.

pressing from the inside out is



Standard Barometric Pressure:

Scientists have chosen the standard atmospheric pressure to be 101.3 kilopascals (kPa). This is the atmospheric pressure in dry air at sea level at 25°C. A barometer is used to measure atmospheric pressure. The barometer is filled with mercury. The atmospheric pressure at sea level is 760 mm of mercury.

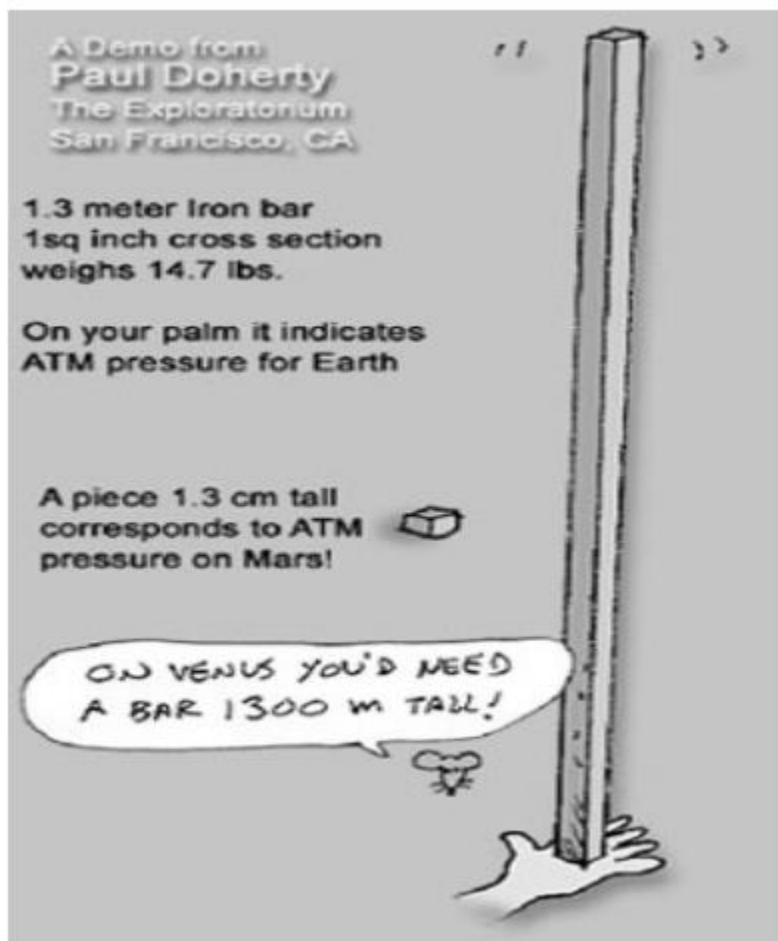
Standard Barometric Pressure
760 mm = 101.3KPa = 1013 millibar (mb)

How does Altitude Affect Atmospheric Pressure?

Table 13.5 Atmospheric Pressure and Altitude

Altitude (km)	Atmospheric pressure (kPa)
0.0	101.3
1.0	88.5
2.0	77.3
3.0	67.6
4.0	59.0
5.0	51.6
7.5	36.8
10	26.2
15	13.3
20	6.8
25	3.5
50	0.1

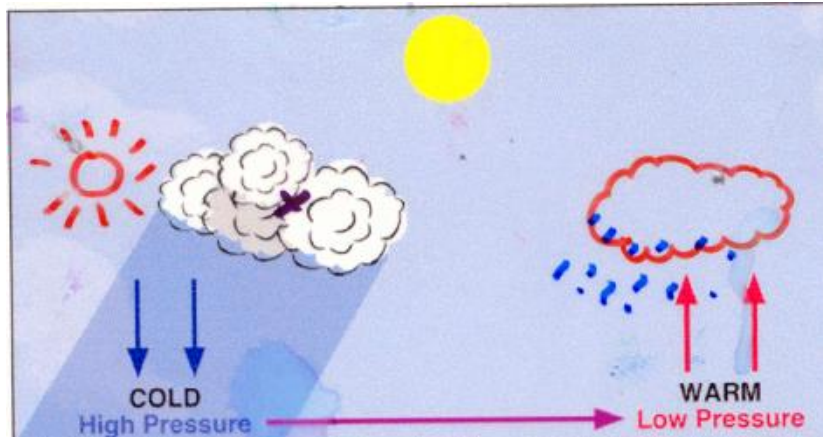
Comparing ATM Pressure with other Planets



The atmospheric pressure on Mars is much less than on Earth it is about 1/1000th the pressure on Earth.

Venus has an atmospheric pressure about 100 times that of Earth. It has a thick CO2 atmosphere. The atmosphere is poisonous to people and because it is so thick it is difficult to see objects far away from you

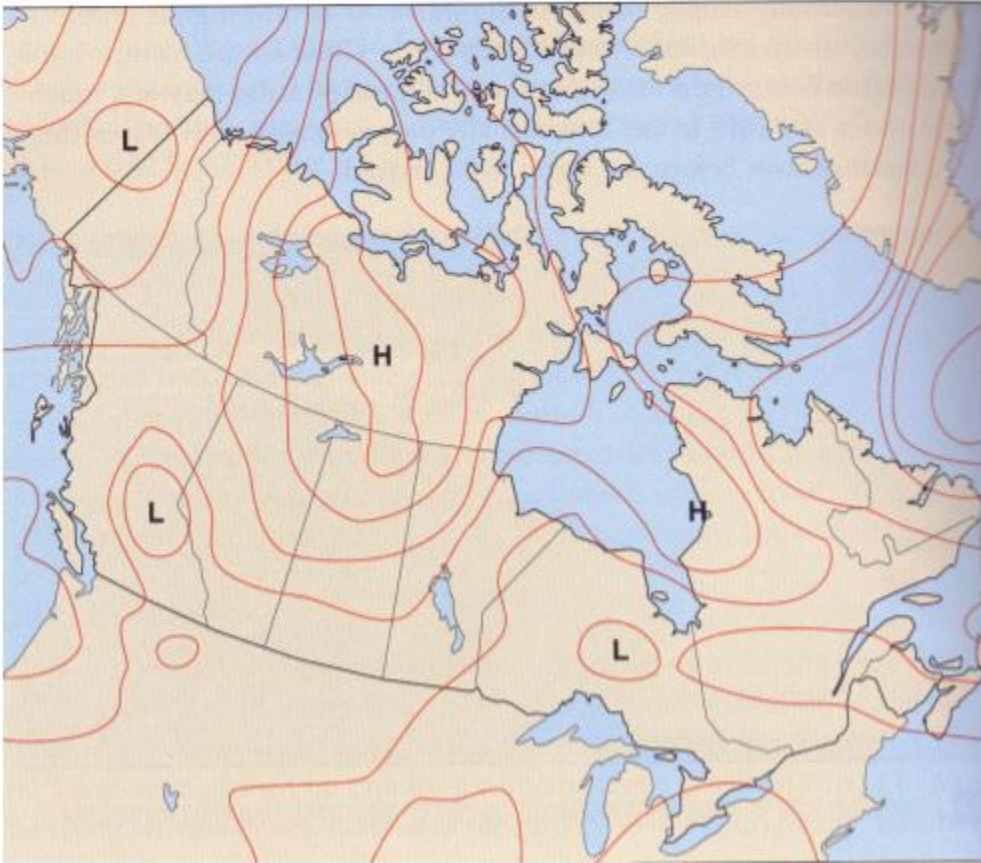
Atmospheric Pressure and the Weather



Air Pressure systems are responsible for most weather conditions on the earth.

- Air moves from high pressure to low pressure.
- Clear, cool, sunny skies are associated with high pressure systems.
- Cloudy, warm, wet skies are associated with low pressure systems.
- Cool air is heavy and exerts more pressure on the earth.
- Warm air is lighter and rises, exerting less pressure on the earth.
- However, as the warm air rises, it cools and condenses to form clouds which produces rain thunderstorms, tornados, hurricanes etc.

High and Low Pressure Systems



- The "H" is a represents the center of a High pressure system.
- The "L" represents the center of a Low pressure system.
- The isobars are lines that join the areas with the same atmospheric pressure.

Review the characteristics of a High Pressure and Low Pressure System

What are the characteristics of a high pressure system? page 499 in text

- Air is pushing down on the ground
- Air is cold and dense
- Air moves in a clockwise direction
- Air moves out at the bottom of the high pressure system
- Creates clear sky
- May be hundreds of km wide

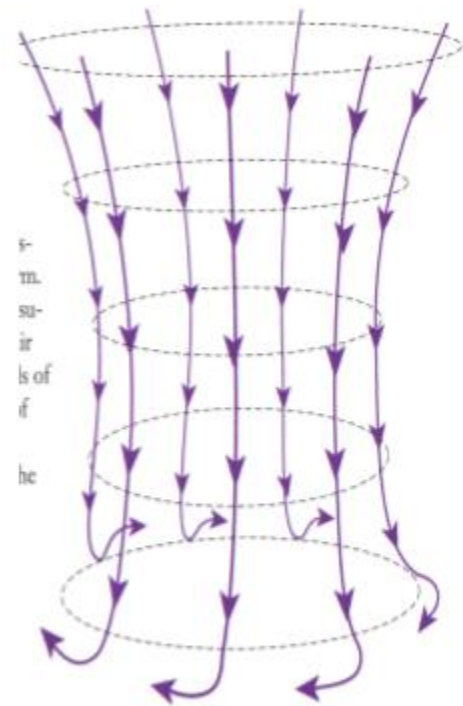


Figure 15.16 Weather conditions are usually quite stable in a high pressure cell. The air settles to the ground. This reduces the chances that clouds will form and prevents most turbulence.

What are the characteristics of a low pressure system? page 500 in text

- Air is being pulled up and creates clouds
- Air is warm
- Air moves inward at the bottom of the system
- Air moves in a counterclockwise direction
- Creates unstable conditions like snow and rain
- Usually smaller than a high pressure system

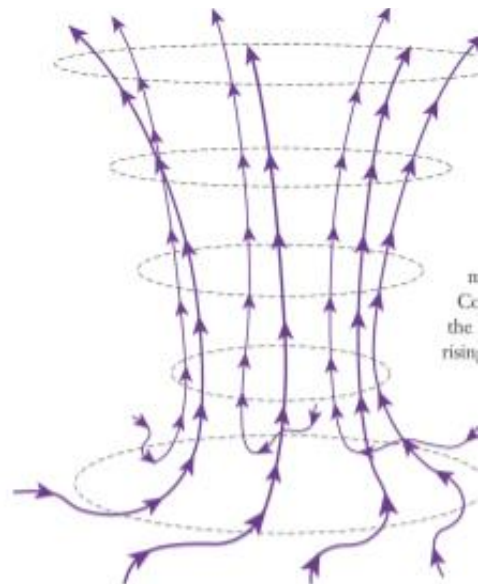


Figure 15.17 Low pressure systems usually bring unstable weather conditions. The rising air creates clouds. Precipitation often follows.