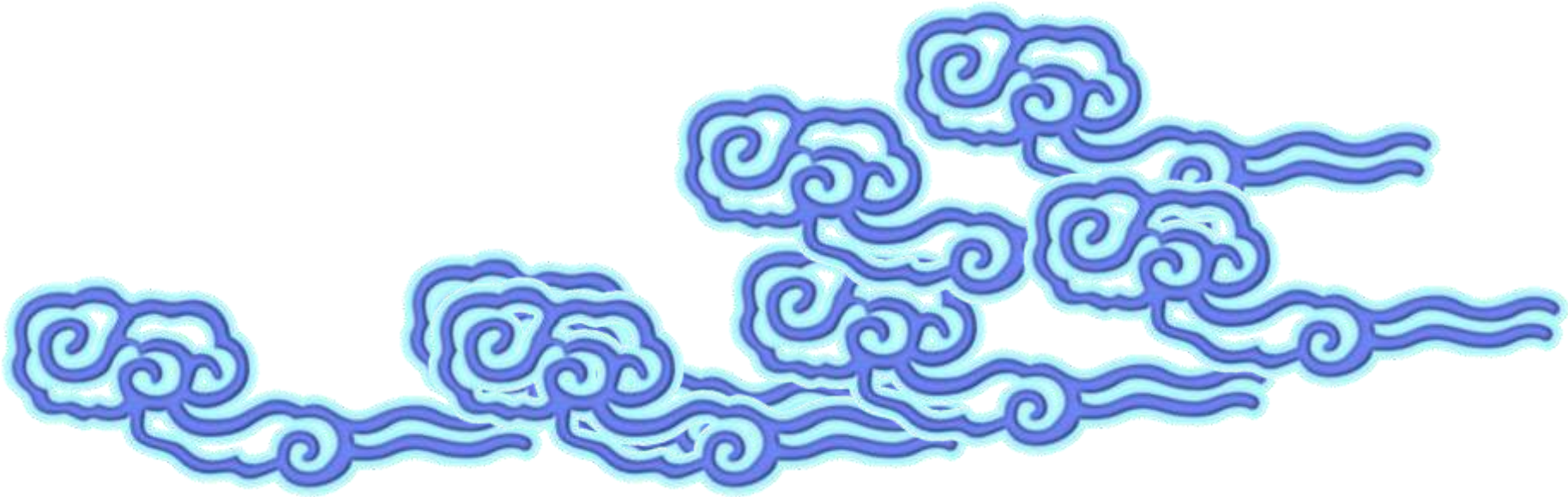
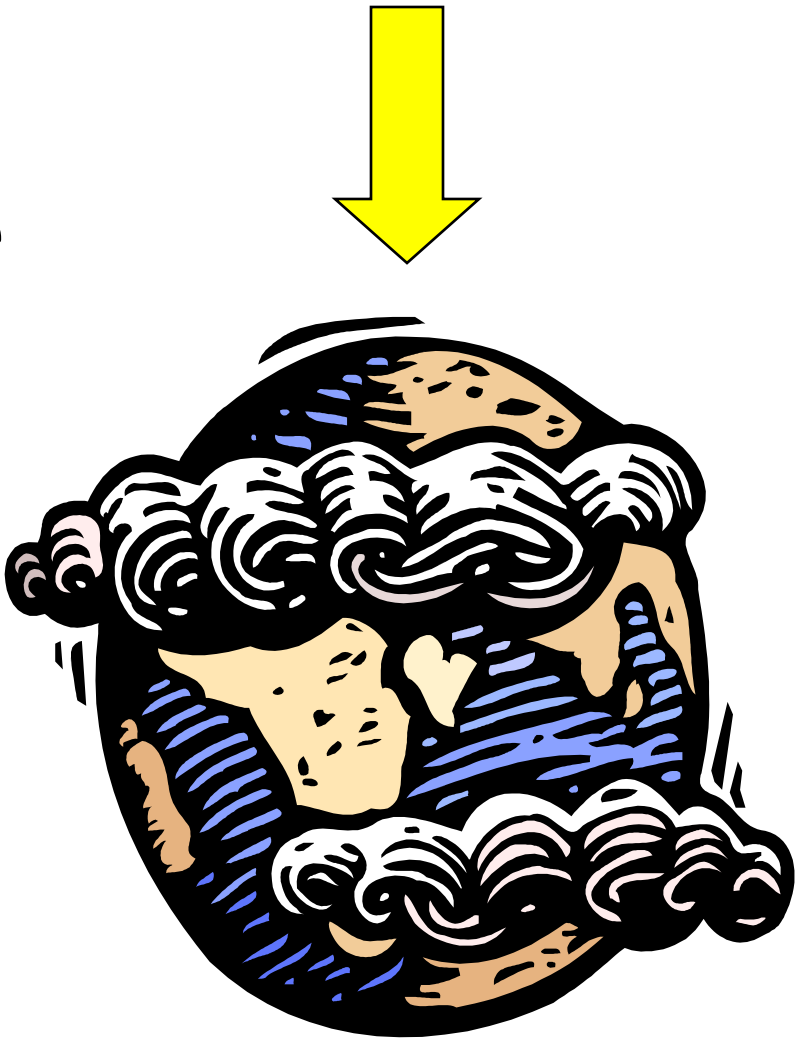


Air Pressure

Air Pressure

- **Air Pressure** is a measure of the force of the air pressing down on the earth's surface

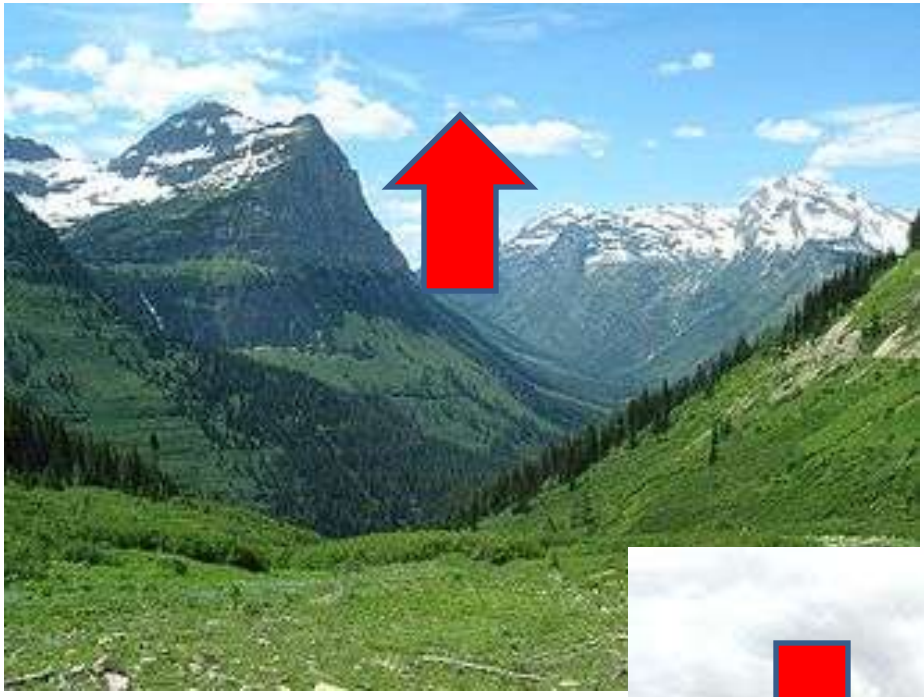


http://www.youtube.com/watch?v=OHY9fFQhX68 Marshmallows

Air Pressure

Air Pressure can vary at any particular point on the Earth depending on the density of the air

- ✓ Density = mass / volume



Where is air pressure higher, up in the mountains or

down in the valley?

http://www.youtube.com/watch?v=GWEyFbyvElc&feature=related

Air Pressure and Altitude

This bottle was photographed at 3600m (left) then again at sea level (right)

At sea level, because air is compressible, the weight of all that air above us compresses the air around us, making it denser.

We all live underneath a huge ocean of air that is several miles deep: the atmosphere.

The pressure on our bodies is about the same as ten meters of sea water pressing down on us all the time.

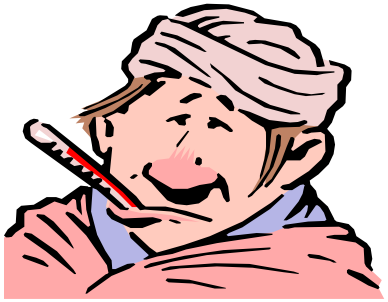
Density = Mass / Volume

→ Warm air is less dense than cool air. Warm air rises. Cool air sinks.

→ Air at high altitudes is less dense than air at lower altitudes.

Factors that affect Air Pressure

✓Temperature



✓Water Vapor

✓Elevation

TEMPERATURE AND AIR PRESSURE

HEAT → Molecules move faster

↓

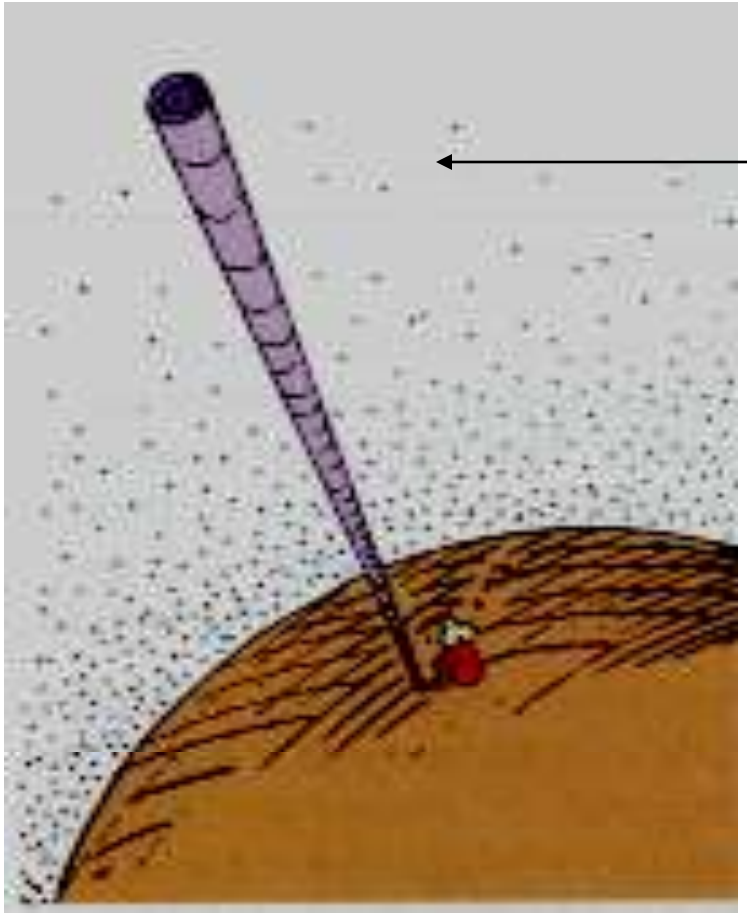
Move apart, become fewer and weigh less

← LESS AIR PRESSURE

HIGH TEMPERATURE, *LOW AIR PRESSURE*

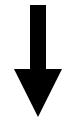
LOW TEMPERATURE, *HIGH AIR PRESSURE*

AMOUNT OF WATER VAPOR



consists of air and water molecules

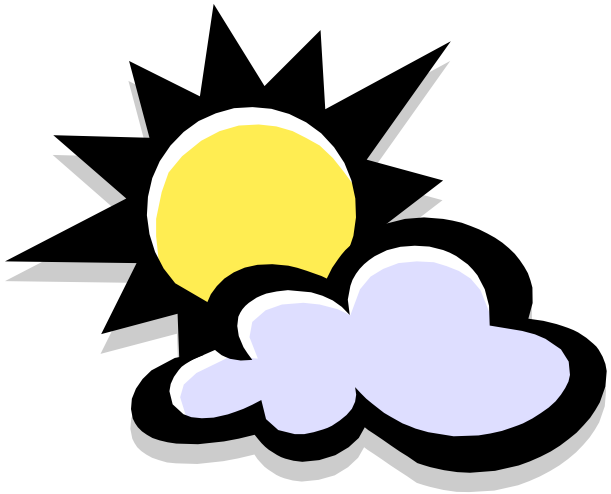
More water vapor means less air molecules (more water molecules)



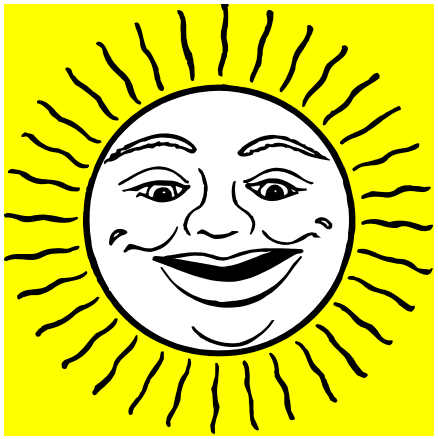
LOW AIR PRESSURE

DRY AIR = HIGH AIR PRESSURE

Air Pressure & Weather

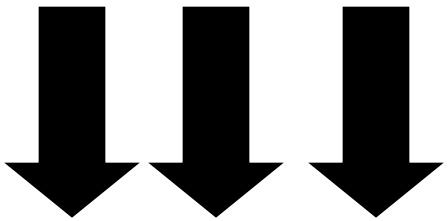


High pressure generally means fair weather



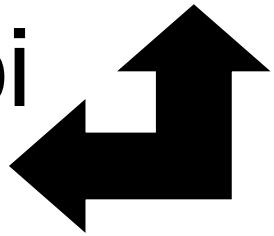
Air mass in upper atmosphere

No clouds

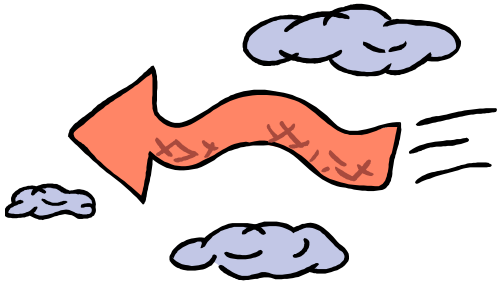


Layer of Air

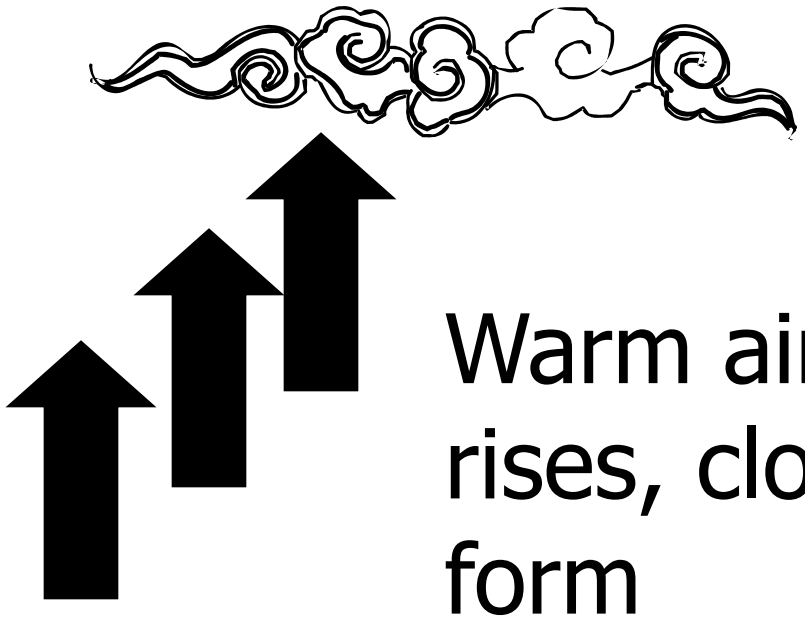
Warm, moist air cannot rise



Low pressure generally means cloudy, rainy weather



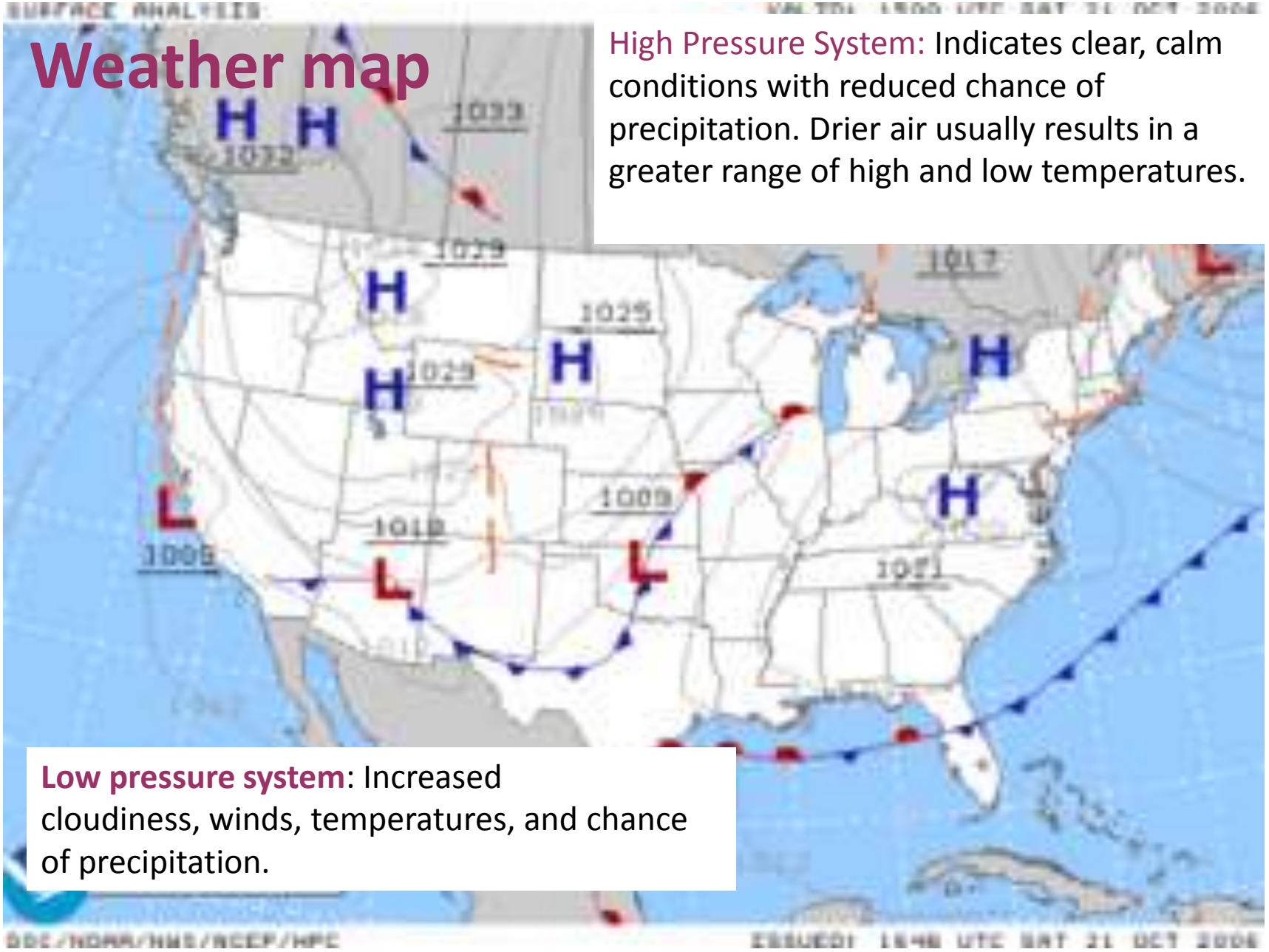
Air masses move apart



Warm air rises, clouds form

Weather map

High Pressure System: Indicates clear, calm conditions with reduced chance of precipitation. Drier air usually results in a greater range of high and low temperatures.



Low pressure system: Increased cloudiness, winds, temperatures, and chance of precipitation.

Clear and Bright

Clear sky (at night)


Sunny day


Partly cloudy (at night)


Sunny intervals

Thunder


Thundery shower (night)


Thundery shower

Dark and Rainy


Black, low level cloud


Light rain shower (at night)
Drizzle
Light rain (day and night)


Light rain shower


Heavy rain shower (night)
Heavy rain


Heavy rain shower

Other Symbols

Sandstorm

Mist

Fog


Tropical Storm

Hazy

Hail and Snow


Sleet shower (night)
Cloudy with sleet


Sleet shower


Hail shower


Hail shower (night)
Hail


Light snow shower (night)
Light snow


Light snow shower
Light snow


Heavy snow shower (night)
Cloudy with heavy snow

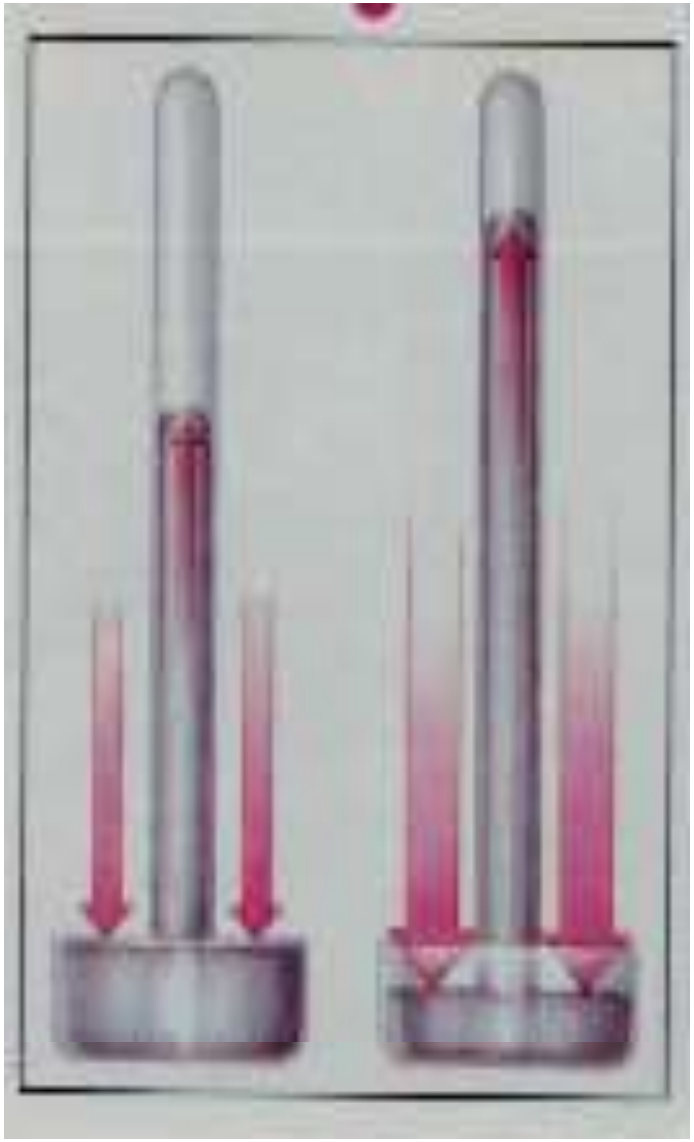

Heavy snow shower

Measuring Air Pressure

Air Pressure is measured by an instrument called

Types of Barometer

- Mercury Barometer
- Aneroid



- Air pressure increases, column of mercury rises

- Air pressure decreases, column of mercury drops

High Pressure:

Rising or steady - Continued fair

Slowing falling - Fair

Rapidly falling - Cloudy, Warmer

Medium pressure:

Rising or steady - Same as present

Slowing falling - Little change

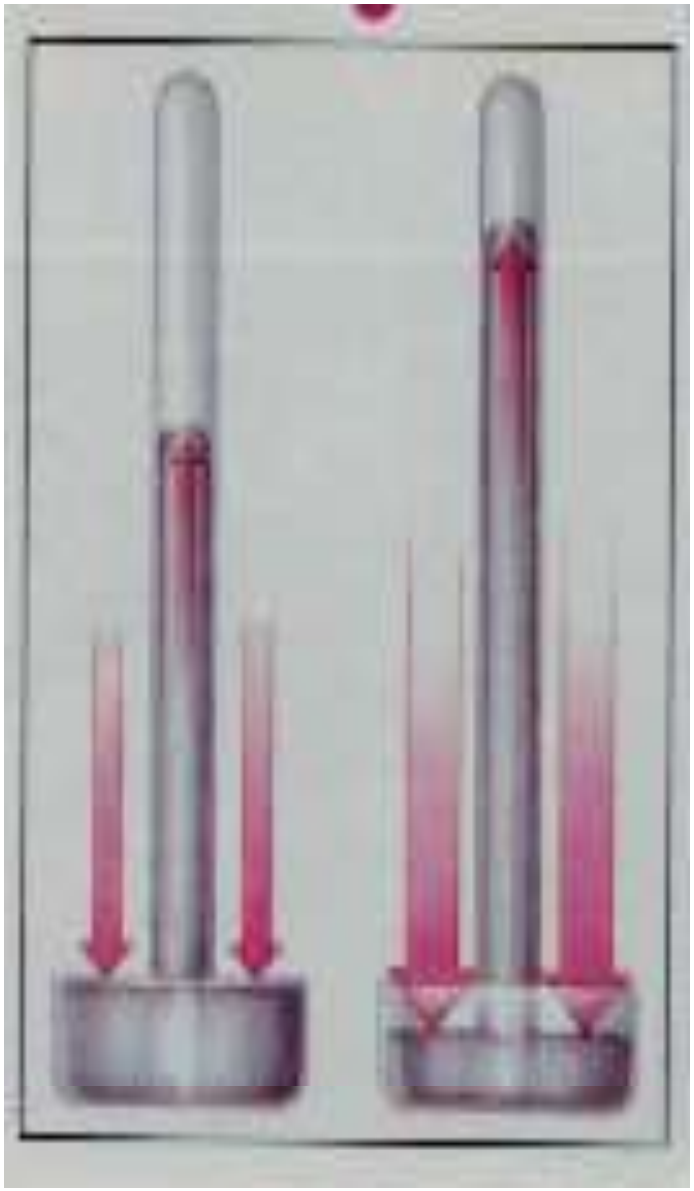
Rapidly falling - Precipitation likely

Low Pressure:

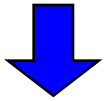
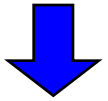
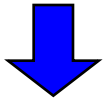
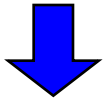
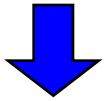
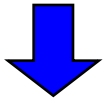
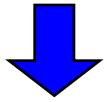
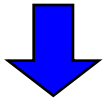
Rising or steady - Clearing, cooler

Slowing falling - Precipitation

Rapid falling - Storm



Factors Affecting Air Pressure

FACTOR	Increase/Decrease	Air Pressure
Density		
Density		
Temperature		
Temperature		
Water Vapor		
Water Vapor		
Altitude		
Altitude		

At the top of a mountain you drank a bottle of water, sealed it, but imploded on your way down. Why?

How does air pressure affect scuba diving?

A rising barometer indicates a spell of cool dry weather.

A series of hot, humid days is preceded by a falling barometer.

A southern, coastal areas tend to have lower air pressure than an inland area farther north.

Rapidly dropping temperatures are accompanied by a rising barometer.

You are planning a Picnic and check the barometer, which is falling. Why should you cancel the picnic?

Why would a serious athlete decide to train at a high altitude?

You are hiking Mount Everest and find it hard to breathe at a high altitude.

How does a hot air balloon work?