

AIR PRESSURE



Submitted To,

Smt Linimol KS

**(lecture and my teacher in physical
science)**

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Keeping an Atmosphere

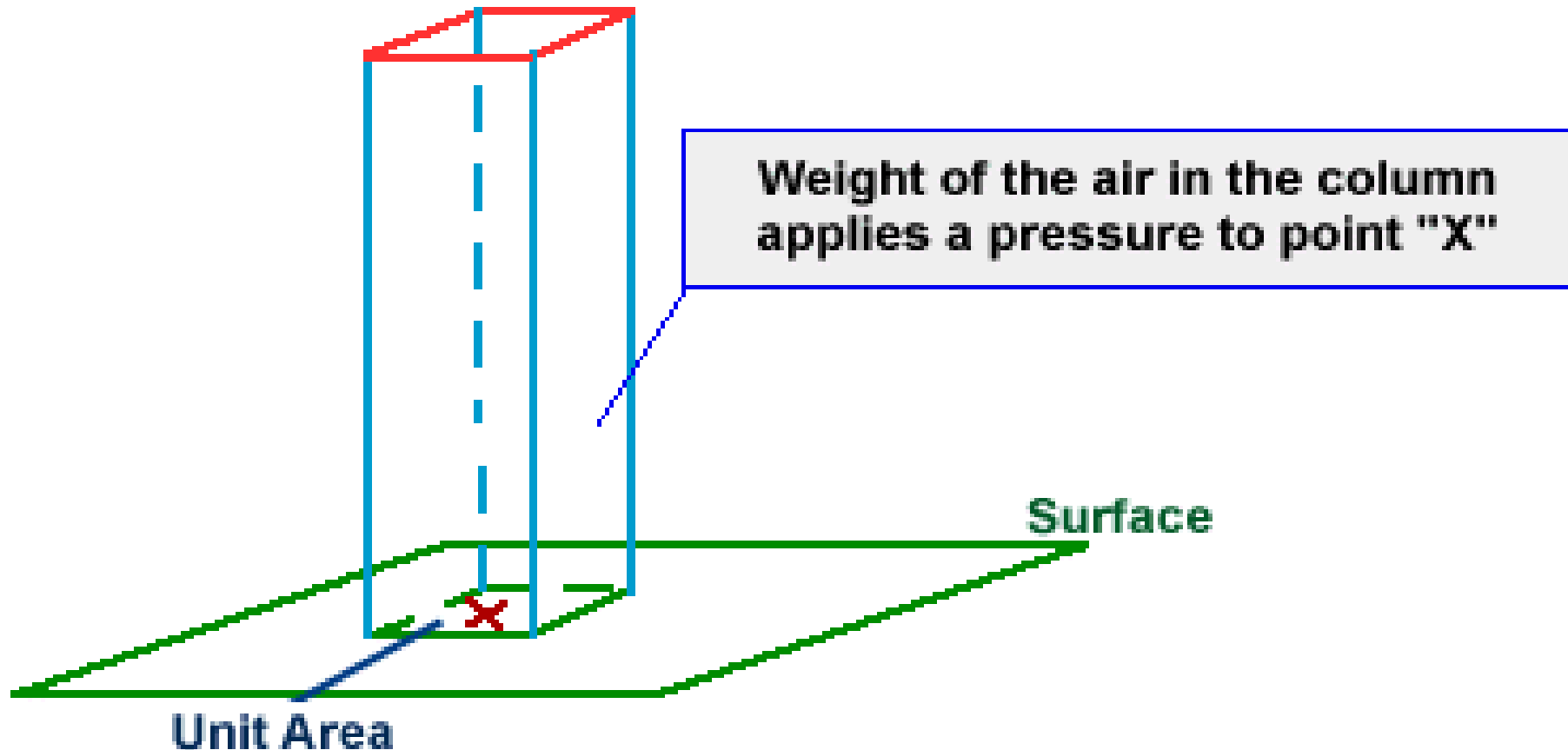


- Atmosphere is *kept* by the planet's gravity
 - Low mass (small) planets = low gravity
= almost no atm.
 - High mass (large) planets = high gravity
= thick atm.
- Gravity and pressure
 - Air pressure depends on how much gas there is i.e. The atmospheric thickness.

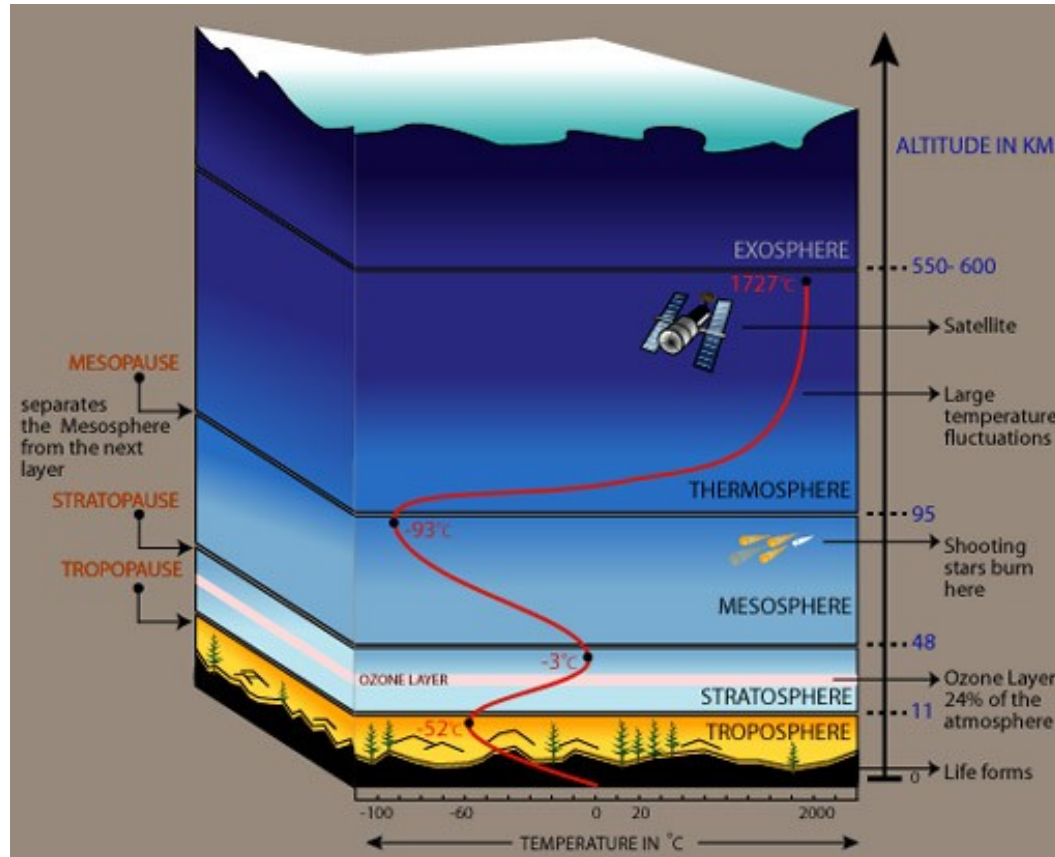
Gravity and Atmospheric Pressure

- The stronger the gravity, the more gas is held by the planet and also increases the weight of atmosphere on unit area

Top of the Atmosphere



Earth's Atmosphere



- About 10 km thick
- Consists mostly of molecular nitrogen (N_2) and oxygen (O_2)

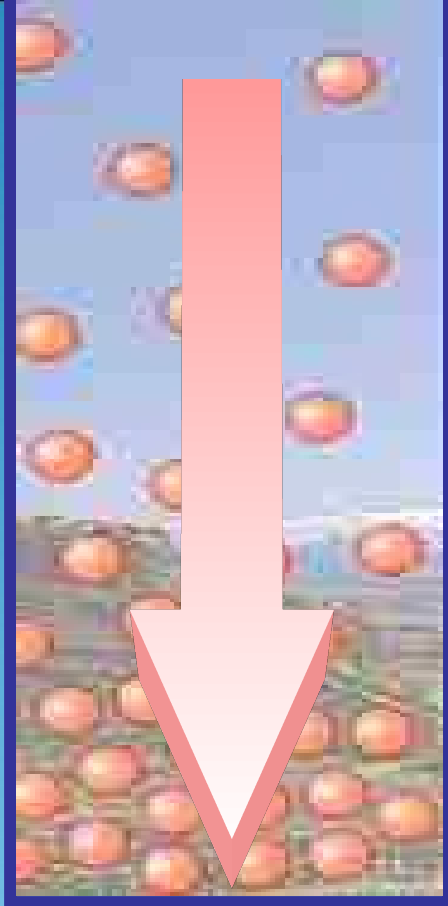


The air is made up of molecules.

**The air is made up of
molecules.**

AIR PRESSURE

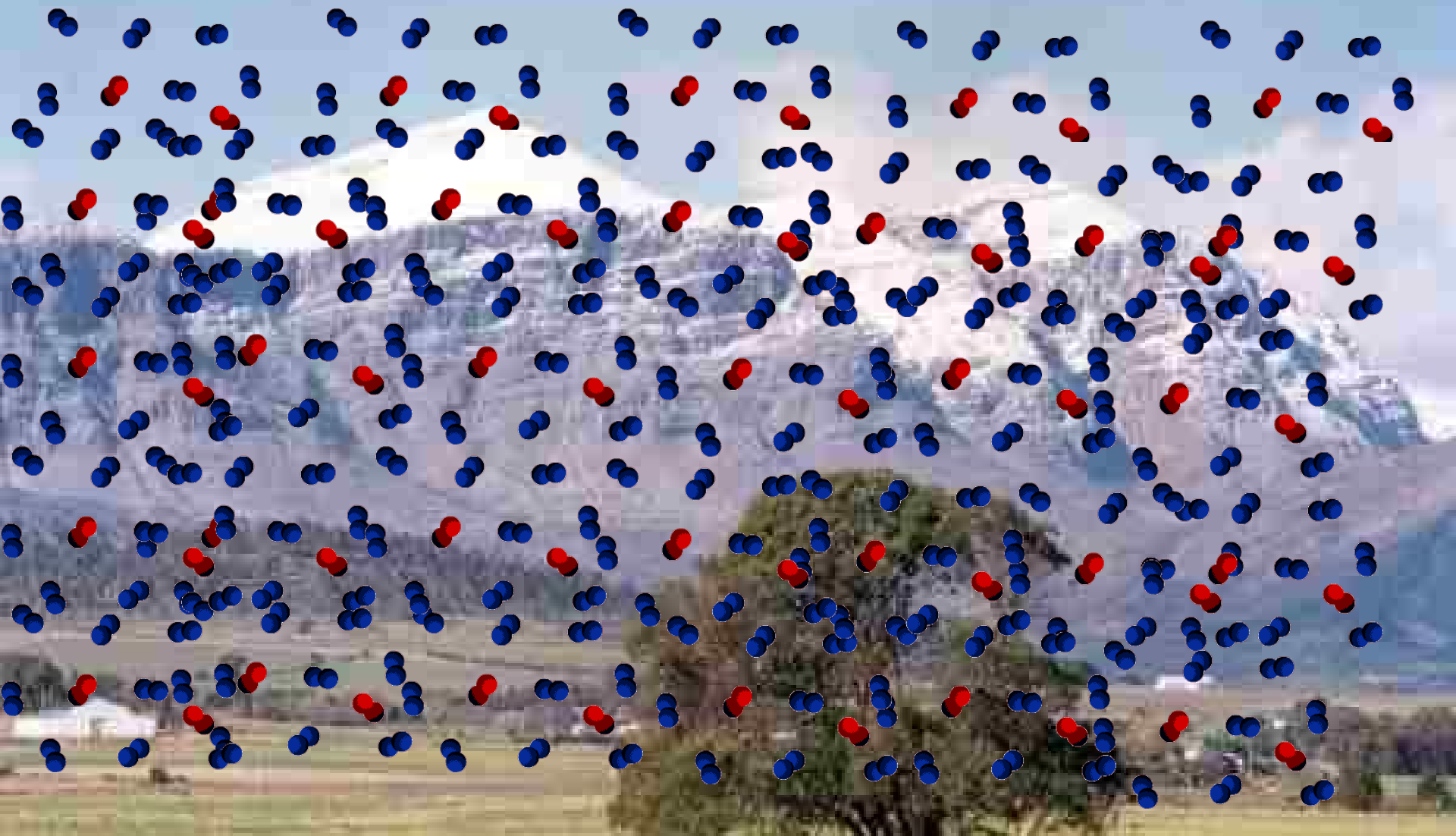
Gravity pulls the air molecules toward the earth, giving them weight. The weight of the air molecules all around us is called the air pressure.



**HIGHER
AIR PRESSURE**

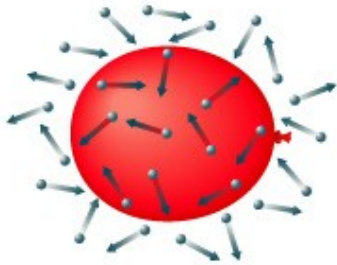
SEA LEVEL

High altitudes = lower pressure

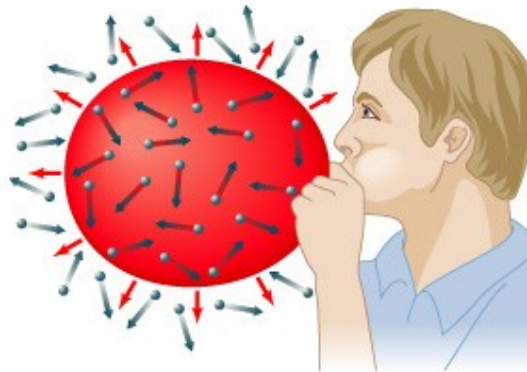


Low altitudes = higher pressure

Atmospheric Pressure



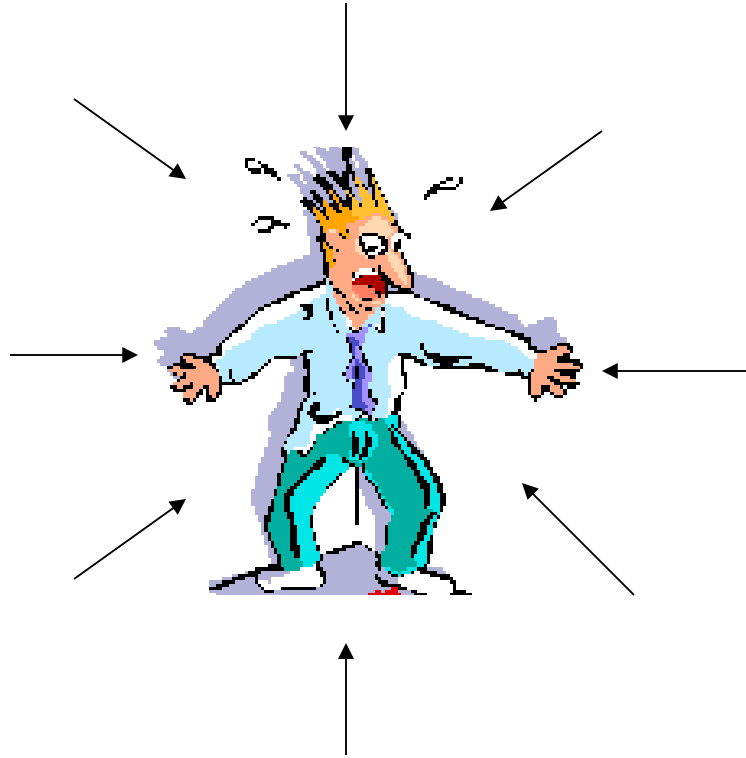
Gas pressure depends on both density and temperature.



Adding air molecules increases the pressure in a balloon.



Heating the air also increases the pressure.



Air pressure is
equal in all
directions.

Pressure = force per unit area

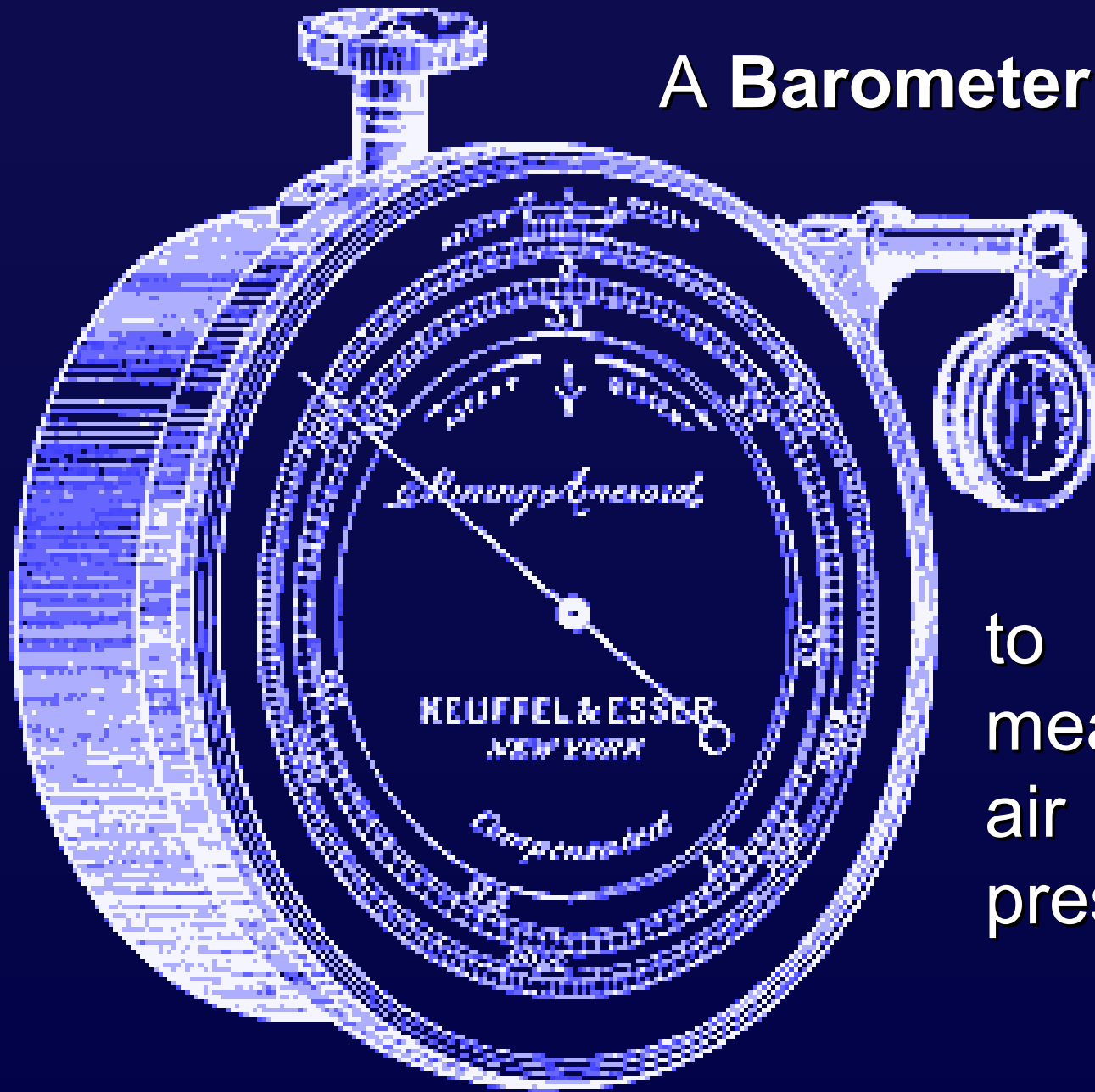
This is an inverse relationship.

**As
elevation
goes up**

**Barometric
pressure
goes
down.**

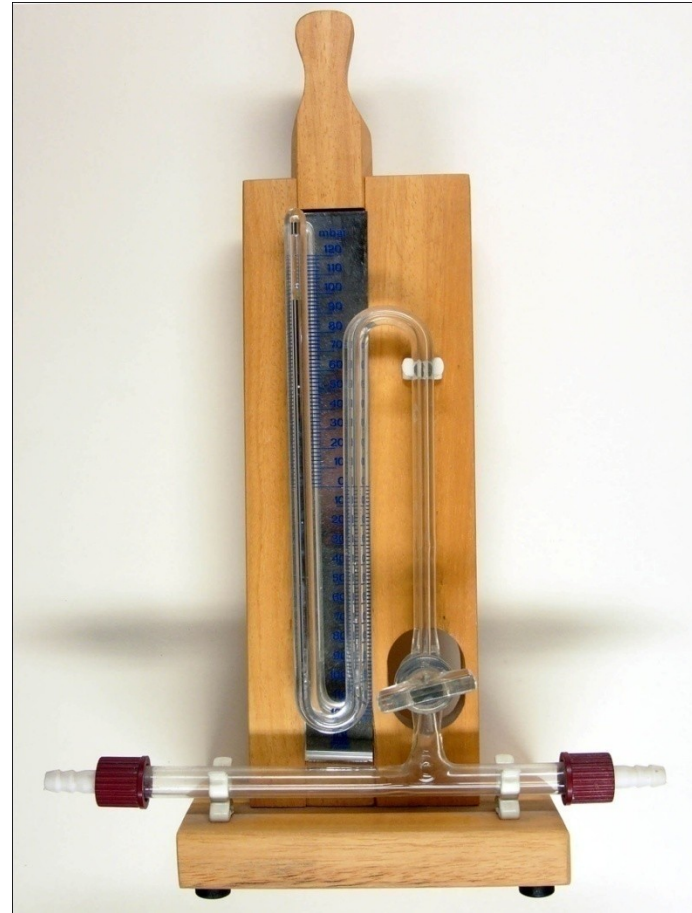


A Barometer



is
used

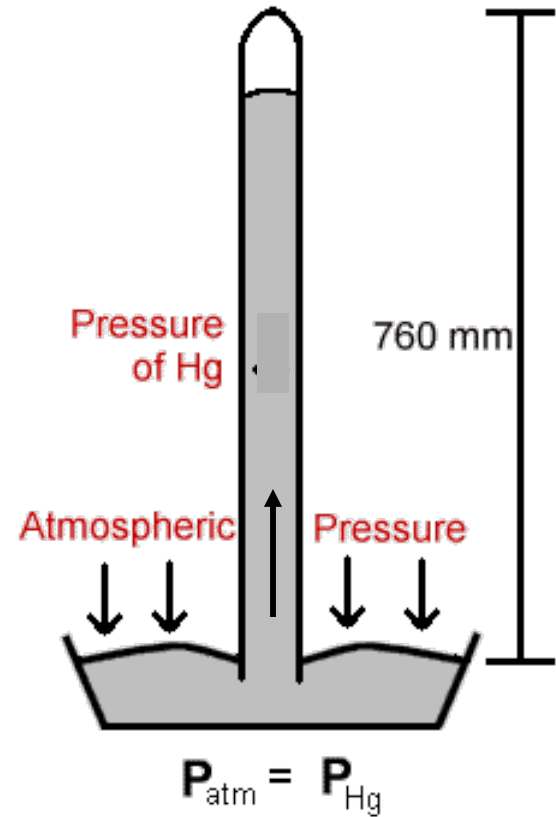
to
measure
air
pressure.



**In 1643, Evangelista Torricelli
invented the barometer**

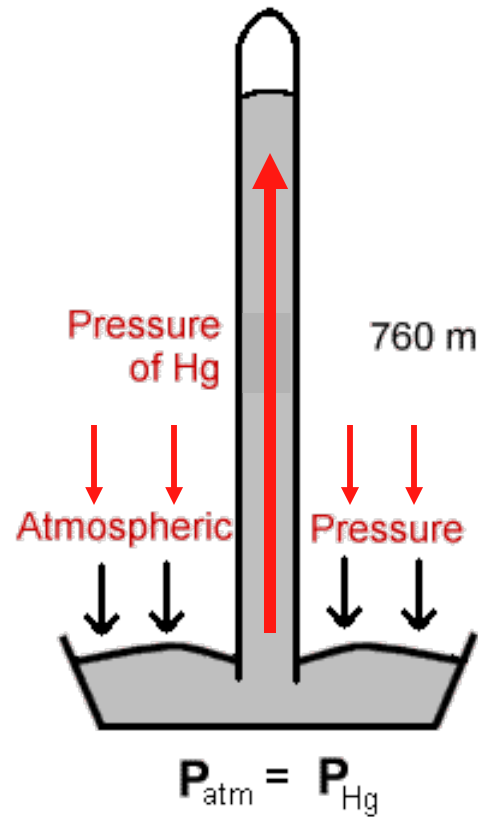
Torricelli's barometer used a glass column suspended in a bowl of mercury. The pressure of the air molecules pushed the mercury up into the glass tube.

The weight of the mercury in the tube was equal to the weight of the air pressing down on the mercury in the dish.



As
atmospheric
pressure
increases...

**The mercury in
the tube rises.**



Sea level pressure used as a reference point

The Mercury Barometer

Good:

- Simple to construct
- Highly accurate

Bad:

- Glass tube is fragile
- Mercury is very *toxic!*

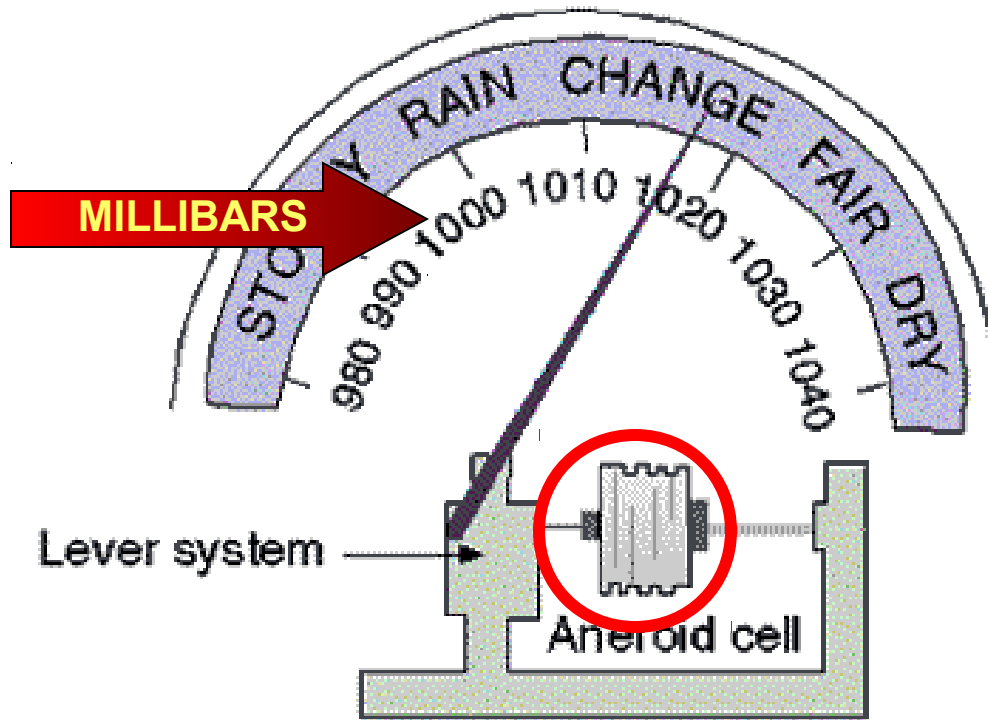
The *Aneroid* Barometer



- No fragile tubes!
- No toxic chemicals!
- No batteries!
- Never needs winding!



Most aneroid barometers have a needle which can be set to remember the previous reading.



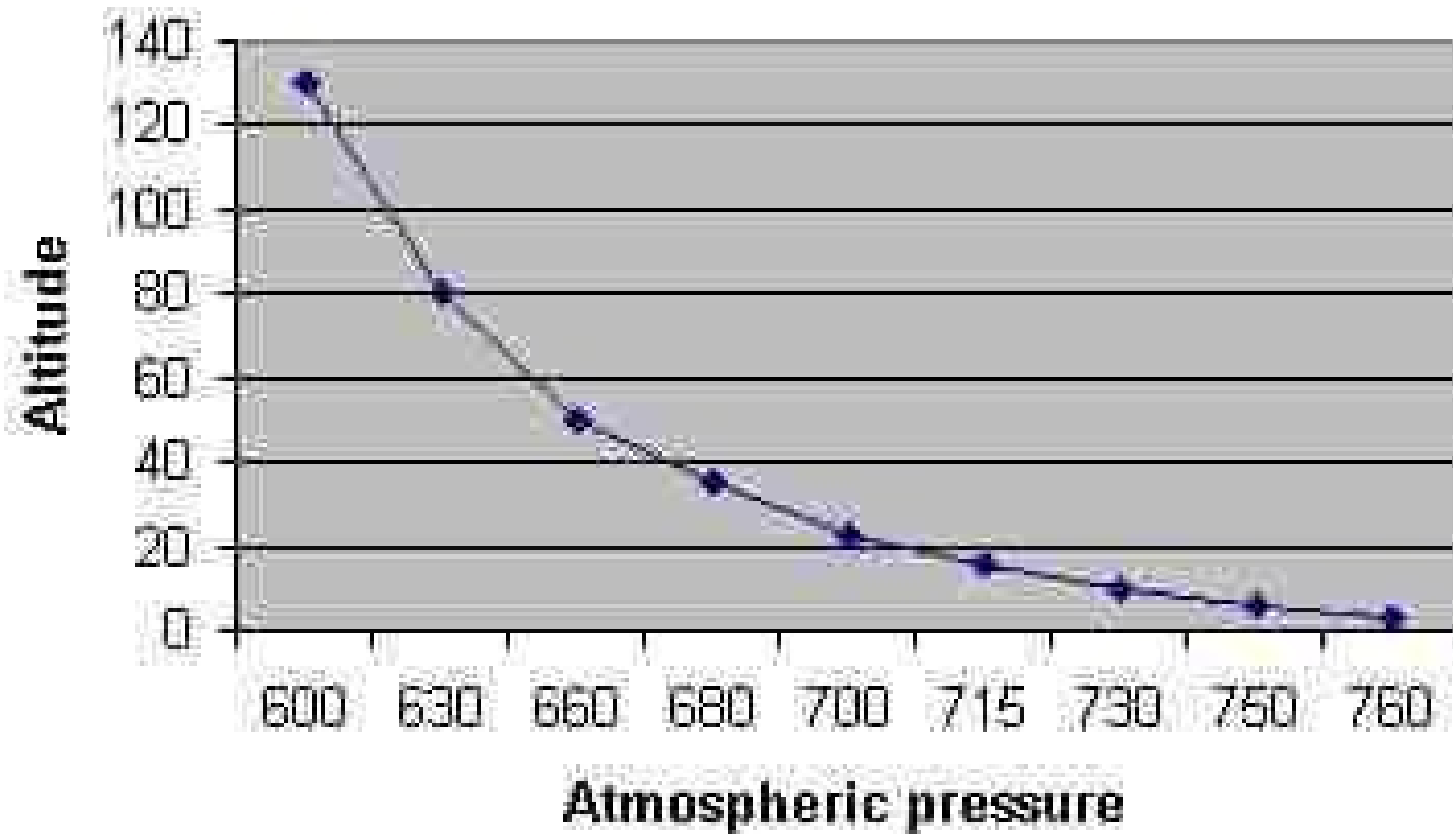
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An aneroid barometer uses a cell which has had most of the air removed.

As the air pressure around the cell increases, it presses on the cell, which causes the needle to move.

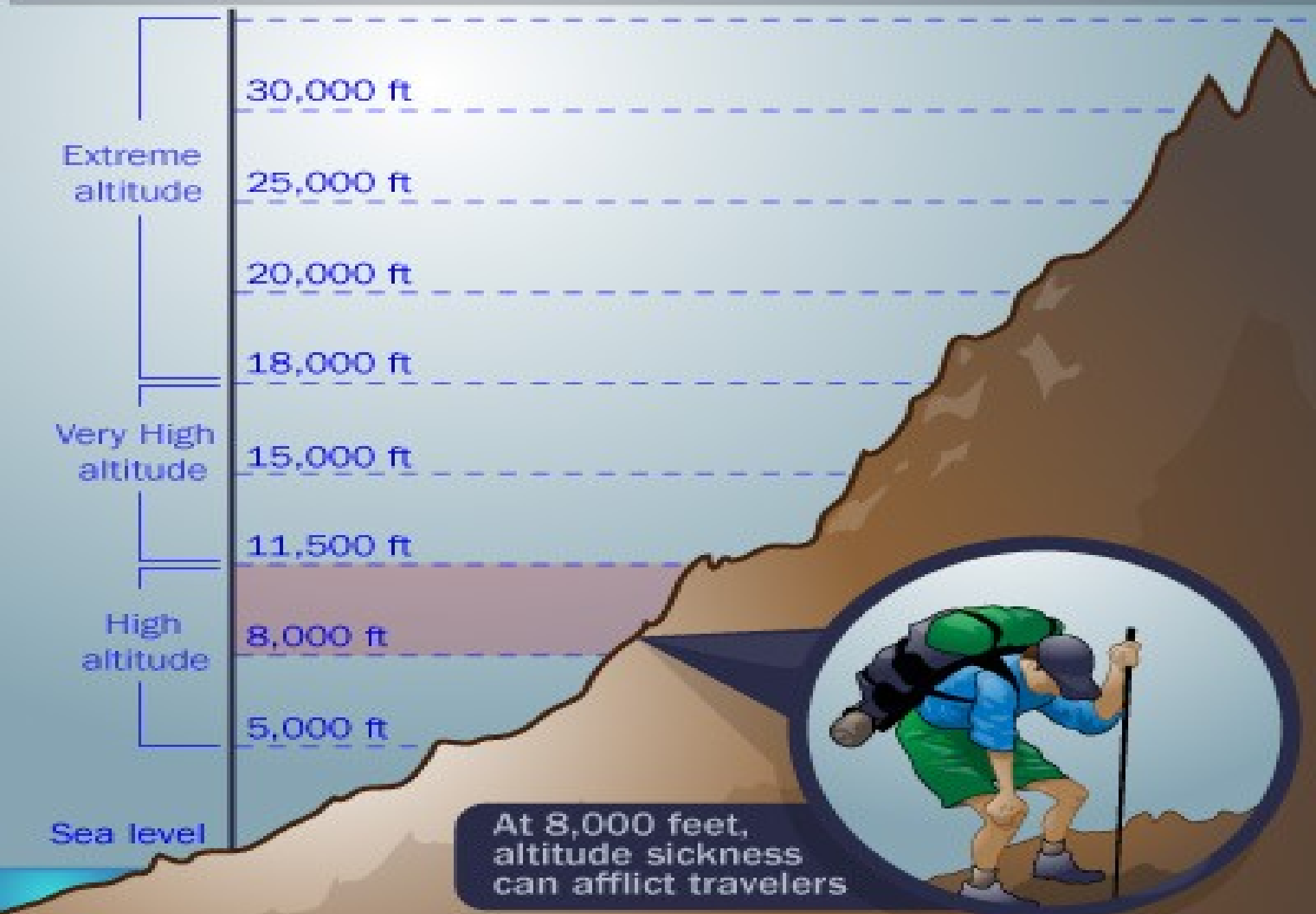
Television weather forecasters usually give barometric pressure in inches of mercury. However, meteorologists measure atmospheric pressure in *millibars*.

Atmospheric pressure decreases with increasing altitude



How Altitude Sickness Works

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Changing Pressure

A rising barometer = increasing air pressure.

This usually means:

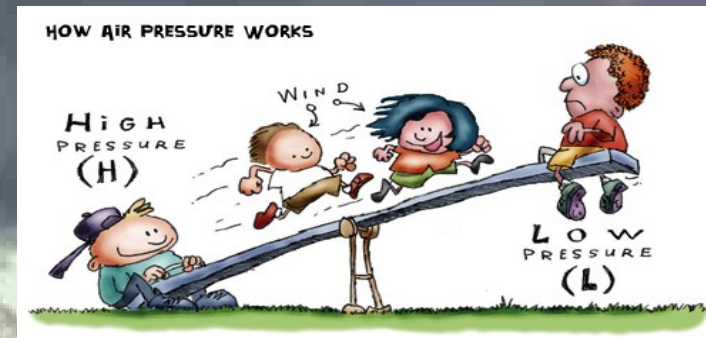
Rising barometer readings indicate that a high pressure system is approaching. Higher atmospheric pressure is usually associated with fair weather and clearing skies.

Changing Pressure

A falling barometer = decreasing air pressure.

This usually means:

Falling barometer readings usually indicate the approach of an area of low pressure. Low pressure readings are usually associated with storm systems. Tornadoes and hurricanes can produce very low barometric readings.



YOU'RE WELCOME, PAL.

HM?

I SAID, YOU'RE WELCOME.



I JUST HAPPENED TO NOTICE YOU ENJOYING THAT COLD BEVERAGE THROUGH A DRINKING STRAW, AND THOUGHT I'D GIVE YOU A HAND.

UH, THANKS...?



OH, I GET IT. YOU THOUGHT YOU WERE DOING IT ON YOUR OWN. TYPICAL. NOBODY EVER GIVES ANY CREDIT TO ME.

AIR PRESSURE

GUEST STARRING: RICH

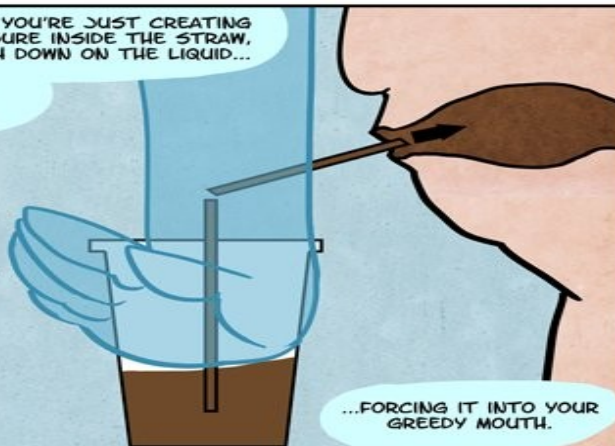


SEE, YOU THINK YOU'RE SUCKING THAT FROSTY DRINK THROUGH THE STRAW INTO YOUR MOUTH...



BUT IN REALITY, YOU'RE JUST CREATING NEGATIVE PRESSURE INSIDE THE STRAW, AND THEN I PUSH DOWN ON THE LIQUID...

(AT ABOUT 14.7 POUNDS PER SQUARE INCH!)



...FORCING IT INTO YOUR GREEDY MOUTH.

THIS IS WHY YOU CAN'T DRINK FROM A SEALED CONTAINER.



TRY IT!

NOR CAN YOU DRINK THROUGH A STRAW THAT'S TOO LONG...

THERE'S A POINT WHERE ATMOSPHERIC PRESSURE ISN'T ENOUGH TO FORCE THE LIQUID UP THE STRAW.

WOW, THAT'S PRETTY COOL.

(APPROX 32FT MAX)

SORRY I NEVER THANKED YOU BEFORE. HOW WILL I FIND YOU IN THE FUTURE?

OH, DON'T WORRY ABOUT THAT.



I'M EVERYWHERE.





Thank You

