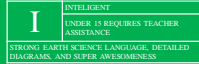


Lesson – Atmospheric Temperature, Pressure & Density

THE FOLLOWING VIDEO HAS BEEN APPROVED FOR ALL AUDIENCES BY THE EARTH SCIENCE TEACHERS ASSOCIATION OF AMERICA, INC. THE VIDEO HAS BEEN RATED



- I can define weather
- I can name the 3 scales for temperature & how to use the ESRT chart
- I can name the instrument used to measure temperature
- I can describe air pressure & use the ESRT
- I can name the instruments used to measure pressure
- I can explain how moisture in the air affects density & pressure

### Weather is ...

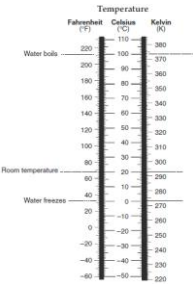
- The condition of the **variables** in the atmosphere at a given time and place.
- **Variables** - temp, air pressure, wind, cloud cover, precipitation, etc.

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### Measuring Temperature

- 3 different scales to measure temp.
- Celsius
- Fahrenheit
- Kelvin

ESRT pg 13



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### Temp is ...

- **Measured** using a thermometer (liquid filled glass tube)
- **Modeled** on maps or charts by using isolines (isotherms)

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### When air rises in the atmosphere it expands & its temperature decreases

ESRT pg 14

July 3<sup>rd</sup>, 1982

A truck driver with 45 weather balloons rigged to a lawn chair took a 45-minute ride aloft to 16,000 feet today before he got cold, shot some balloons out and crashed into a power line. "I know it sounds strange, but it's true," Lieut. Rod Mickelson said after he stopped laughing. "The guy just filled up the balloons with helium, strapped on a parachute, grabbed a BB gun and took off."

**The Lawn Chair Pilot -Larry Walters**



**Pressure & Density**

- **Pressure & Density** are **directly related**
- **Denser the atmosphere the greater the weight & therefore the greater the pressure**

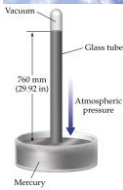


Giant Can Crush

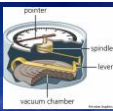
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**Measuring Air Pressure**

**Barometers**



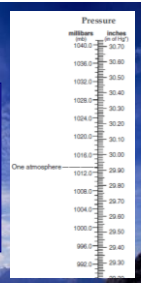
- **Mercury barometer** (inches of mercury)
- **Aneroid barometer** (millibars)



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ESRT pg 13

- 1013.2 mb = 29.92 inches
- 1022.8 mb = 30.20 inches
- 30.53 inches = 1034.0 mb
- 29.81 inches = 1009.5 mb



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Greater amount of water vapor the lower the air pressure & density... but **WHY?**

Type of Gas	Relative Molecular Weights
N = N <sub>2</sub> , Nitrogen molecules	14
O = O <sub>2</sub> , oxygen molecules	16
H = H <sub>2</sub> O, water molecules	18



Water weighs less than the O or N that it replaces, which is why the more water vapor in the air the lower the pressure & density.

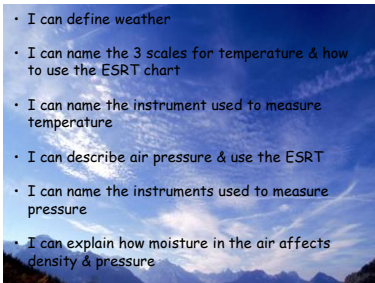
WRITE→

- As the temp of air increases the density & pressure decreases
- As the altitude increase the density & pressure decreases



Selected Properties of Earth's Atmosphere



- 
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