



Weather and Atmosphere

Air

- What is it composed of?
- Where does it come from?

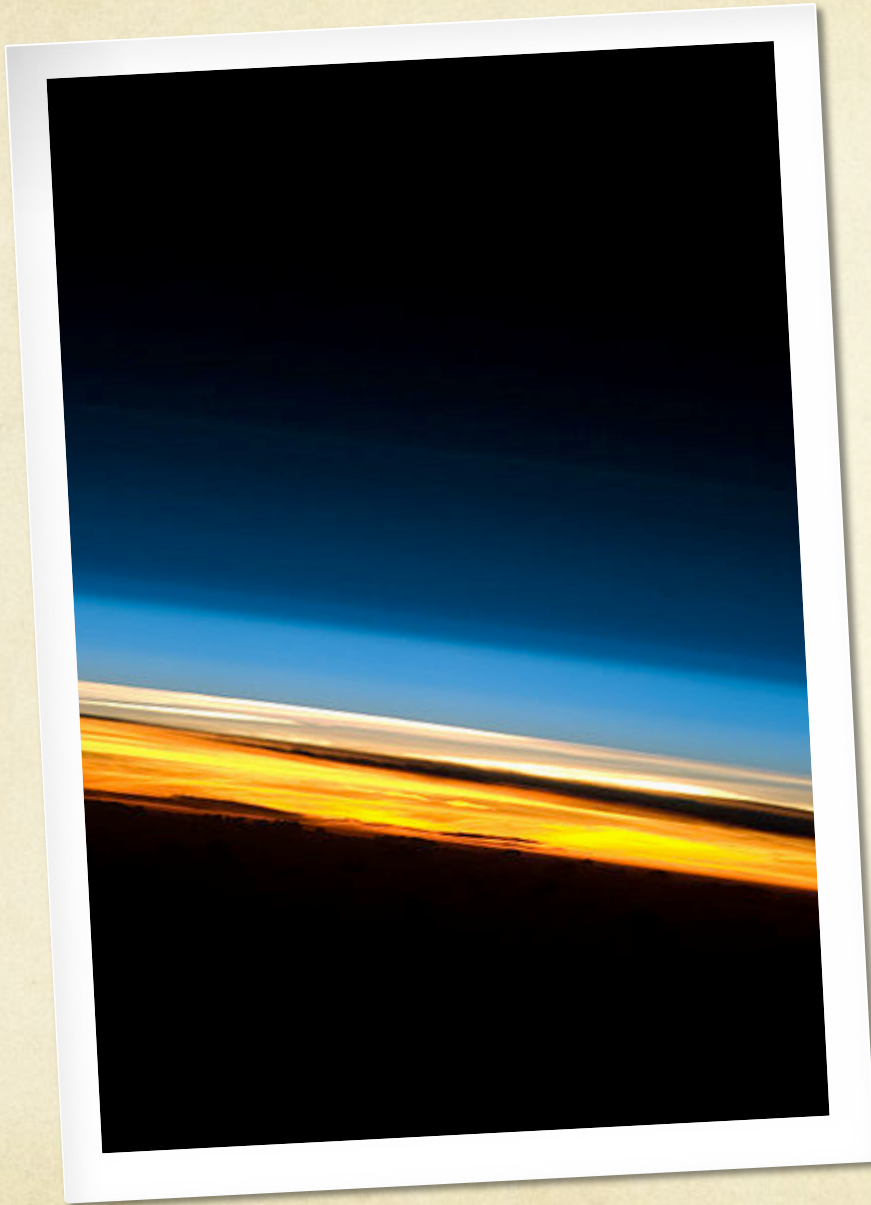


Composition of Air

- 78.09% nitrogen
- 20.95% oxygen
- 0.93% Argon
- 0.093% Carbon dioxide

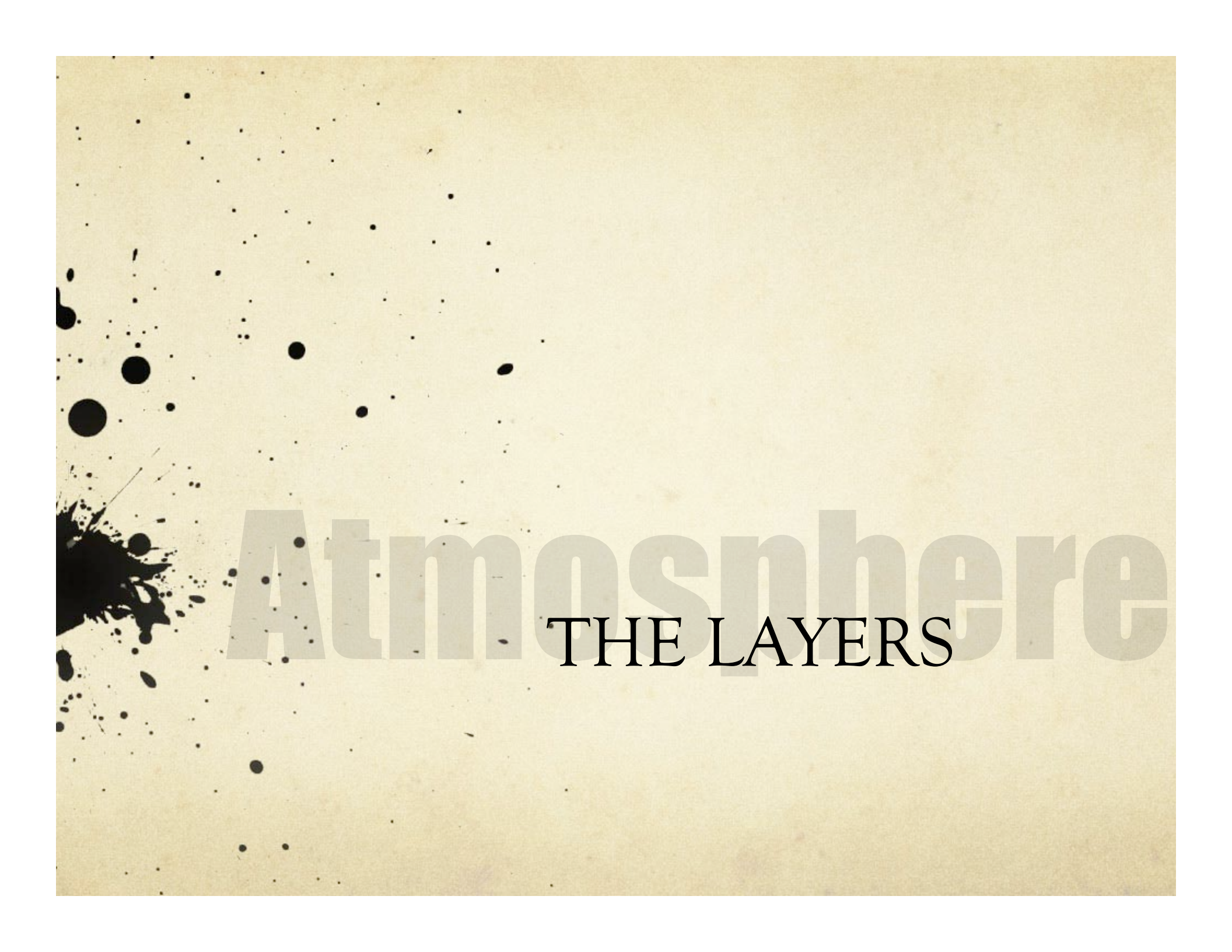


What purpose does air serve?



Earth's Atmosphere

- What is it?
- Why don't the gases escape?
- What purpose does it have?



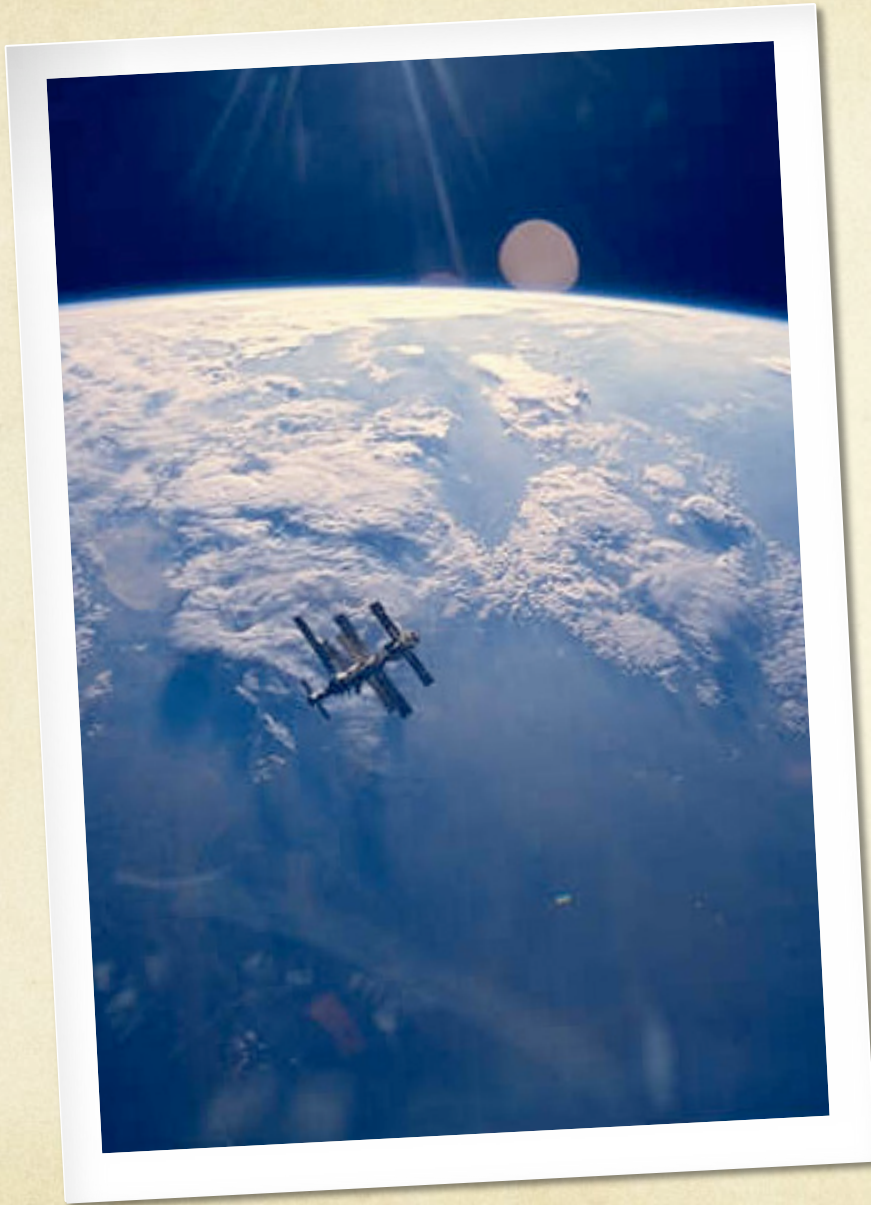
Atmosphere

THE LAYERS



Exosphere

- Uppermost layer
- 500 km (310 miles) from earth's surface to space
- Consists of mostly hydrogen and helium
- Very low density



Thermosphere

- Biggest layer
- 80 – 500 km (50 – 310 miles)
- Temperature increases with altitude and can reach 2,500 degrees Celsius
- Radiation results in charged particles known as ionosphere



Aurora Borealis

What do you think causes this in the thermosphere?



Mesosphere

- 50 – 80 km (31-50 miles)
- Temperature decreases with increasing altitude. Top of this layer, the menopause, is coldest place on Earth at -100 degrees Celsius.



Stratosphere

- 10 – 50 km (6 – 31 miles)
- Stratified in terms of temperature: warmer higher up, cooler farther down
- Ozone layer is here



Troposphere

- Surface to 10 km (6 miles)
- 75 % of Earth's mass and 99 % of water vapor
- Where most weather occurs
- Temperature and pressure decrease with altitude

See if you can construct a graph
of temperature changes across
the atmosphere

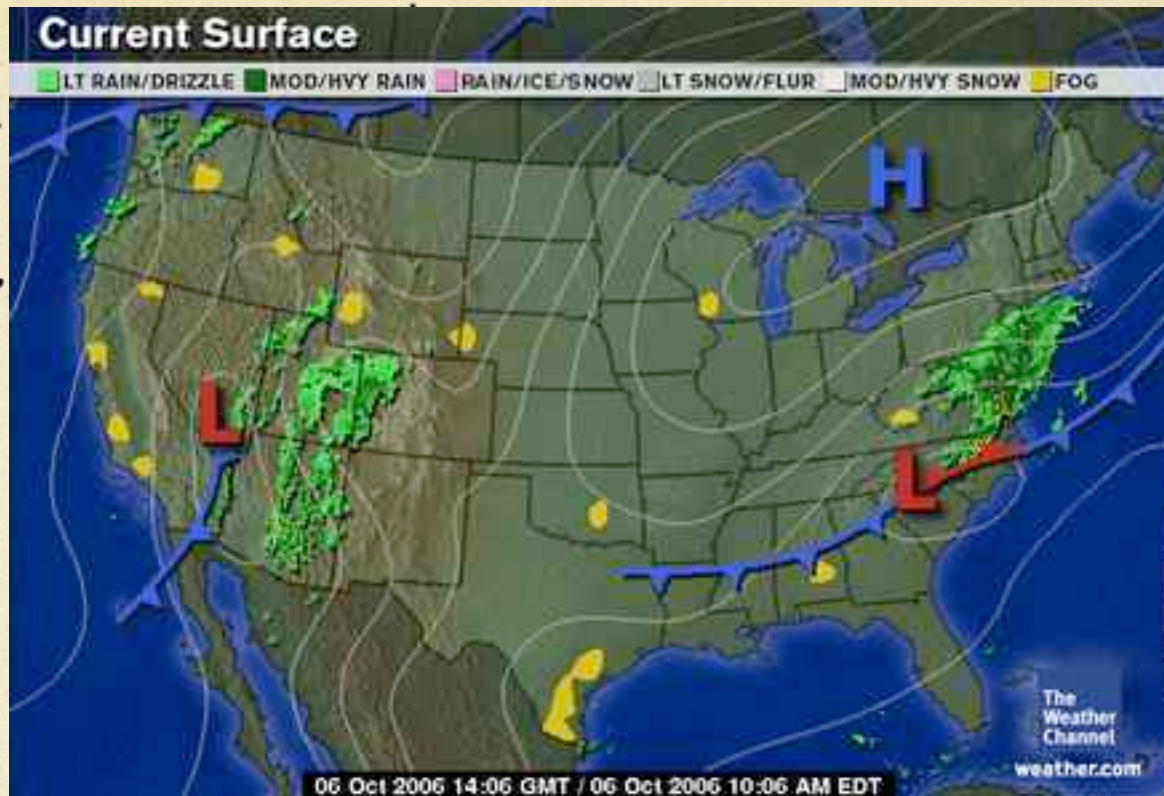
$$D = M/V$$

$$P = F/A$$



Weather

- What does weather refer to?
- What are some examples of weather phenomenon?



Causes of Weather

- Differences in these two quantities result in weather phenomenon. Can you name them?

Various Weather Phenomenon

Weather Fronts

Cold Fronts

- Move faster
- Leading edge of temperature drop off
- Associated with worse weather
- Generally move west to east

Warm Fronts

- Move slower
- Leading edge of warm air mass
- Associated with fog and light rain
- Move poleward

Which is more dense? Has more pressure?



Wind

- What causes wind?
- HINT: Think gradients
- <http://www.youtube.com/watch?v=c3FZtmlHwcA&feature=related>



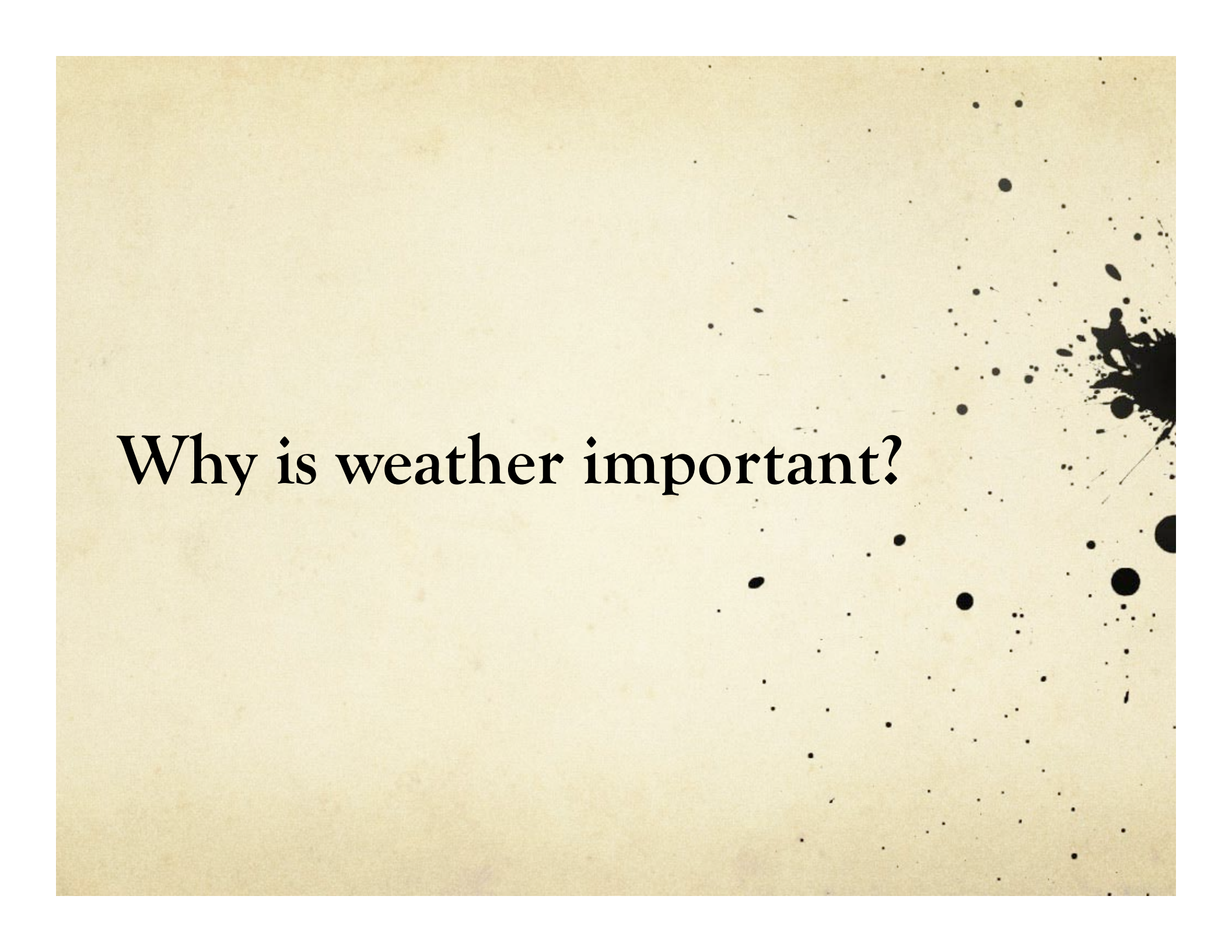
Clouds

- How do clouds form?
- Why are there different types of clouds?
- Rainmaking bacteria?
- <http://www.youtube.com/watch?v=yXnkzeCU3bE>



Tornadoes

- What are they?
- What causes them?
- <http://www.youtube.com/watch?v=kEUXr6FMtWk>



Why is weather important?