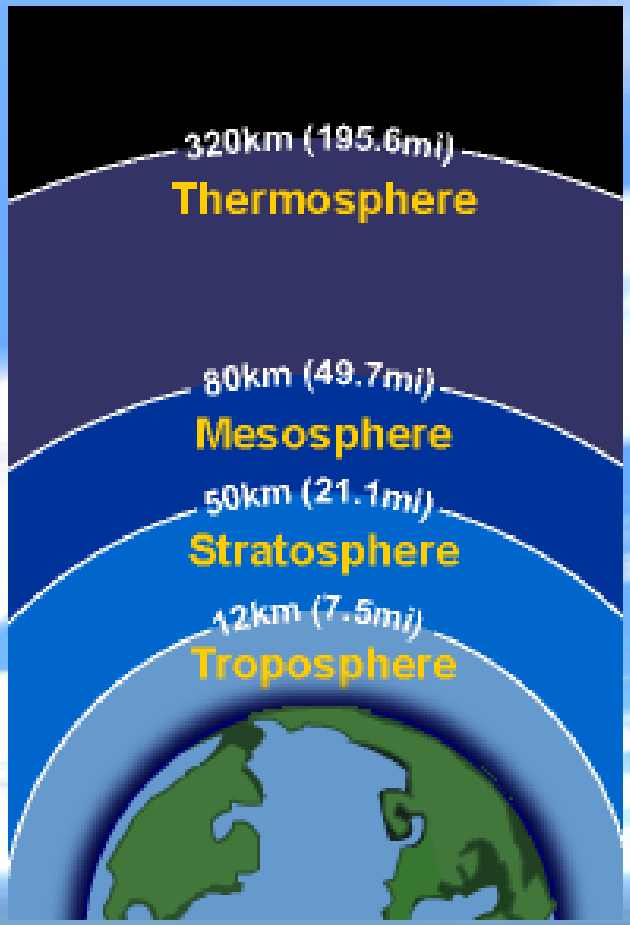
The Atmosphere



What is the Atmosphere?

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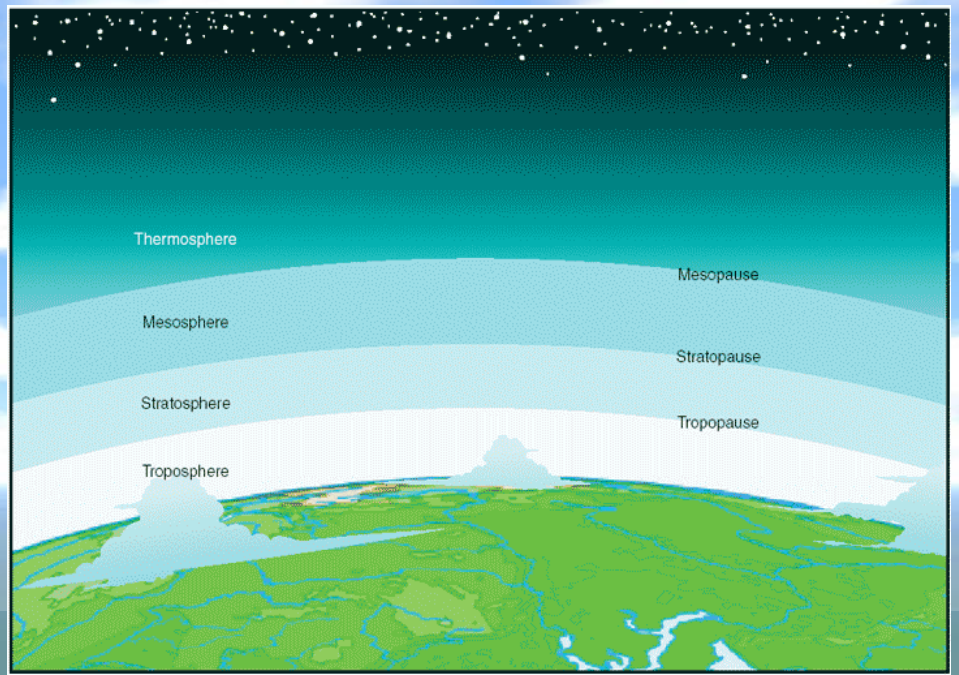
- **Atmosphere:** The layer of gases surrounding Earth
- 78% nitrogen and 21% oxygen
- 1% other (water vapor, dust, pollutants, etc.)

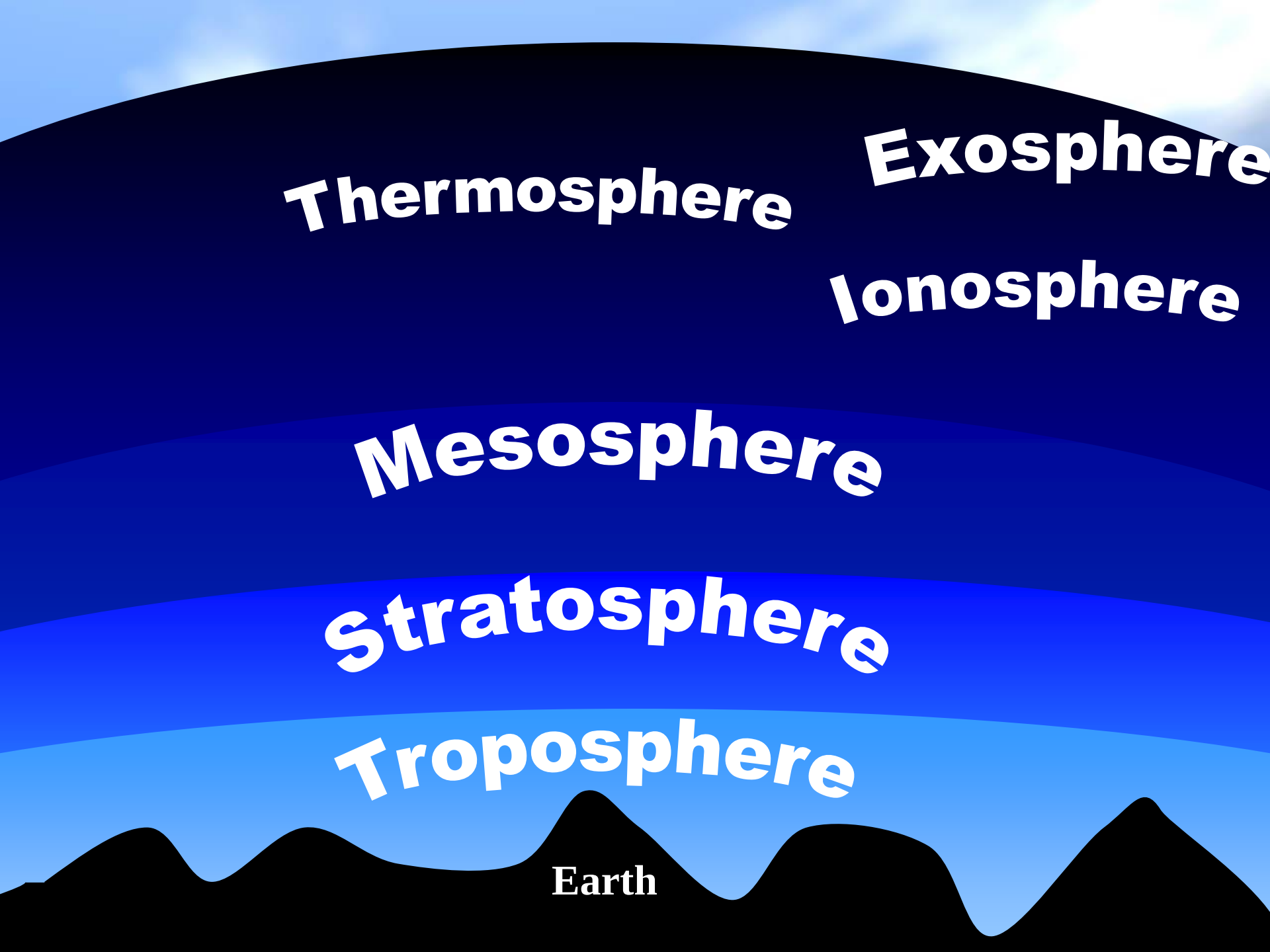


- Brainpop:
- Earth's atmosphere

What are the layers of the Atmosphere?

What are the layers of the Atmosphere?

- Each layer has a different temperature range.
- Different things take place or are found in each layer.


Exosphere
Thermosphere
Ionosphere
Mesosphere
Stratosphere
Troposphere
Earth

What are the layers of the Atmosphere?

1. Troposphere
   - Closest to the earth
   - Where weather occurs
   - Goes from surface of the earth to about 4-12 miles
   - Contains 80% of all the mass of the atmosphere and almost all the water vapor
   - The temperature decreases with height

What are the layers of the Atmosphere?

2. Stratosphere

- Jet planes fly in the lower levels
- Contains most of the ozone layer
  - Ozone absorbs ultraviolet (UV) radiation from the Sun and protects the surface of the Earth from the effects of UV rays
  - 90% of ozone layer in stratosphere; 10% in troposphere
- From about 7 - 31 miles above the earth's surface
- Temperature rise because of the ozone layer but still remains well below freezing

What are the layers of the Atmosphere?

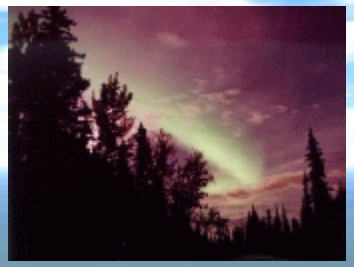
3. Mesosphere

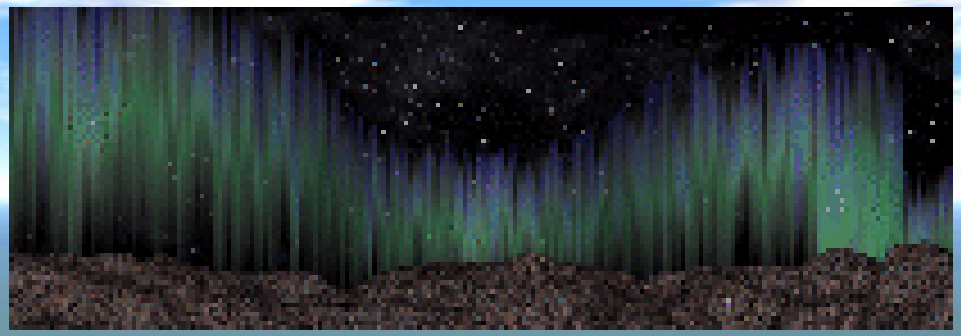
- Air is especially thin and molecules are great distances apart
- Where meteors burn up as they fall to Earth (seen as “shooting stars”)
- Temperature decreases with height
- About 31 to 50 miles above the surface of the Earth

What are the layers of the Atmosphere?

4. Thermosphere
   - First layer heated by the Sun
   - From 50 miles up to about 400 miles above the surface
   - Temperature increases with height and can rise to as high as 4,530 °F but the air would feel cold because the hot molecules are so far apart
   - The space shuttle orbits in the thermosphere
   - Aurora Borealis also in this layer
     - Aurora Borealis is caused when material thrown off the sun's surface collides with the atmosphere of the Earth

Aurora Borealis
a.k.a The Northern Lights





Northern Lights or Aurora Borealis

- Aurora Borealis is caused when material thrown off the surface of the sun collides with the atmosphere of the Earth
- When the particles collide with the gases in the thermosphere they start to glow, producing an array of colors consists of red, green, blue and violet.
- Can only be seen from the polar regions

What are the layers of the Atmosphere?

5. Exosphere
   - Very high up, the Earth's atmosphere becomes very thin.
   - Region where atoms and molecules escape into space
   - This is the upper limit of our atmosphere.

https://www.youtube.com/watch?v=I6jIMkPwahQ

Why do the temperatures change?

- Troposphere: temperature *decreases* with height because the concentration of air molecules decreases with height.
- Stratosphere: temperature *increases* with height because of the ozone layer which absorbs ultraviolet rays and heats up.
- Mesosphere: temperature *decreases* with height because the concentration of air molecules decreases with height.
- Thermosphere: temperature *increases* with height because of the tremendous absorption of solar energy by the gases in the atmosphere. Even though the temperature is hot at this level, it would not feel hot because there are so few air molecules in the air at this altitude.