Tuesday
December 11, 2018

I can:

✓Summarize the layers of the atmosphere.

Agenda

(15) Knight's Charge
(20) Notes: The Atmosphere
(35) Foldable: Layers of the Atmosphere
(15) Glue Notebook

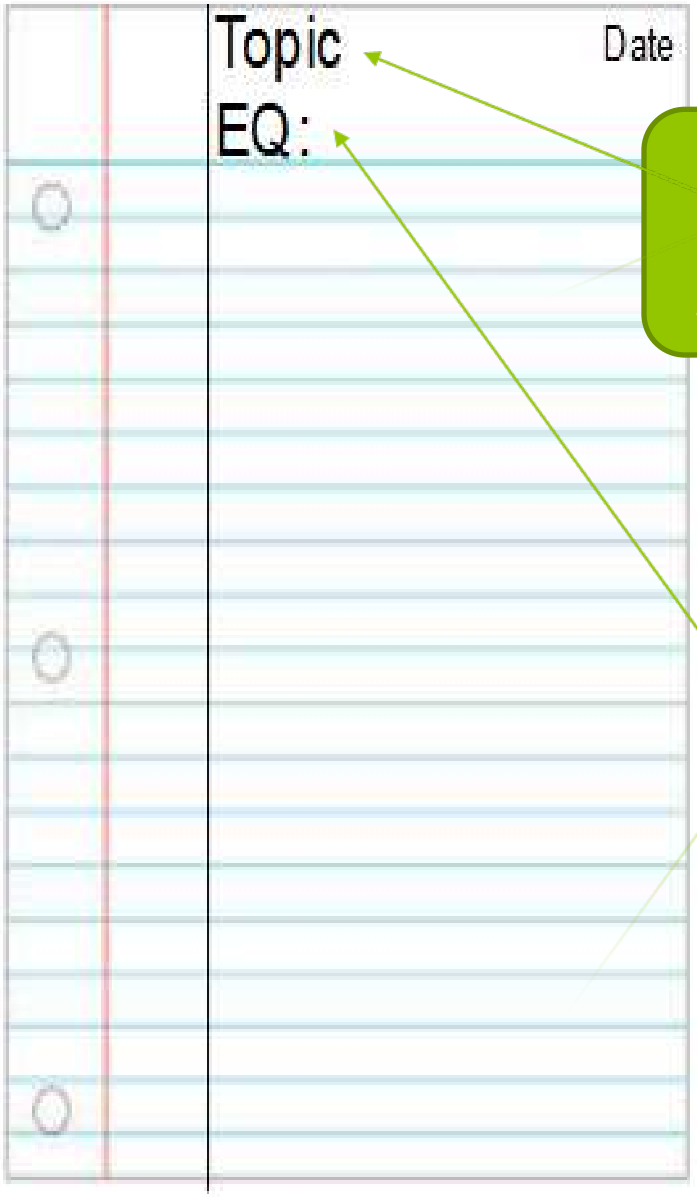
Knight's Charge

1.On **page 113** of your notebook, write **today's date** and **'KC'** on the first line.
2.Skip one line and answer the question below in a complete sentence.

1. **What is the atmosphere?**
2. **Why is the atmosphere important?**

HW: Incomplete/Late Work

Set up your paper like this:



Page ---

The Atmosphere

What are the layers of the atmosphere?

The Atmosphere

- **Atmosphere = layer of gases that surround earth**
  - Where **weather** occurs

- **Without the atmosphere, LIFE WOULD NOT BE POSSIBLE**
  - Effects climate
  - Protects from UV radiation
  - Provides breathable oxygen

Parts of the Atmosphere

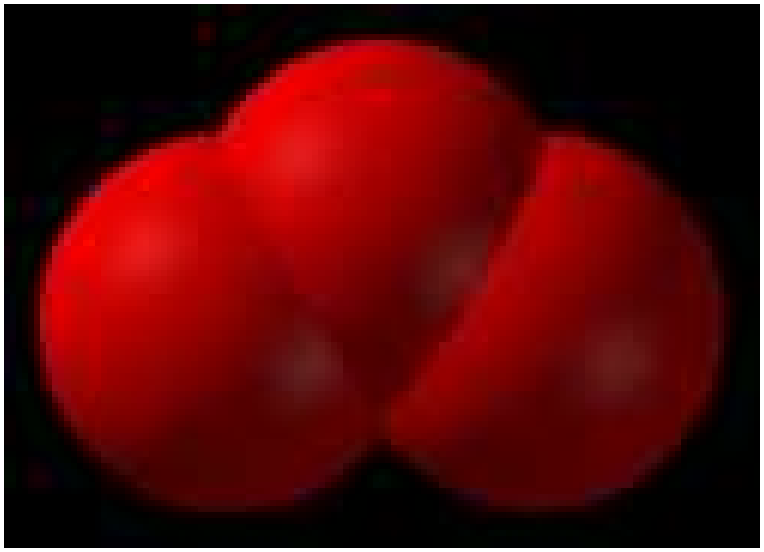
- Air contains:
  - **Oxygen**
  - **Carbon Dioxide**
  - **Nitrogen**
  - **Argon**
  - **Other gases and solids...**

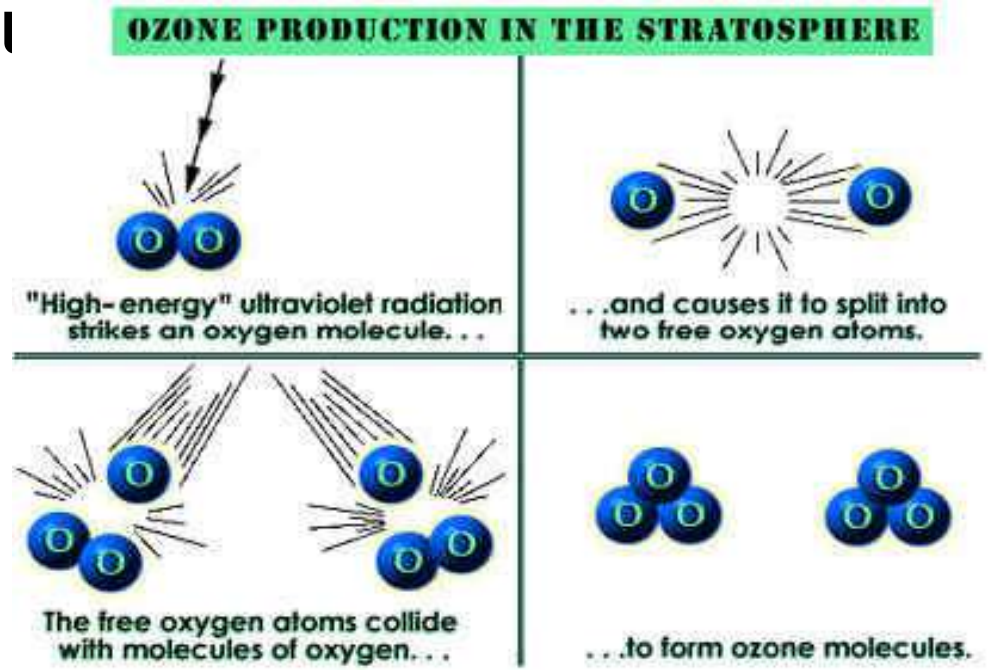
REALITY…

Gas	Symbol	Percent by Volume
Nitrogen	N_2	78.08 %
Oxygen	O_2	20.94 %
Argon	Ar	0.934 %
Carbon Dioxide	CO_2	0.033 %

Other gases…

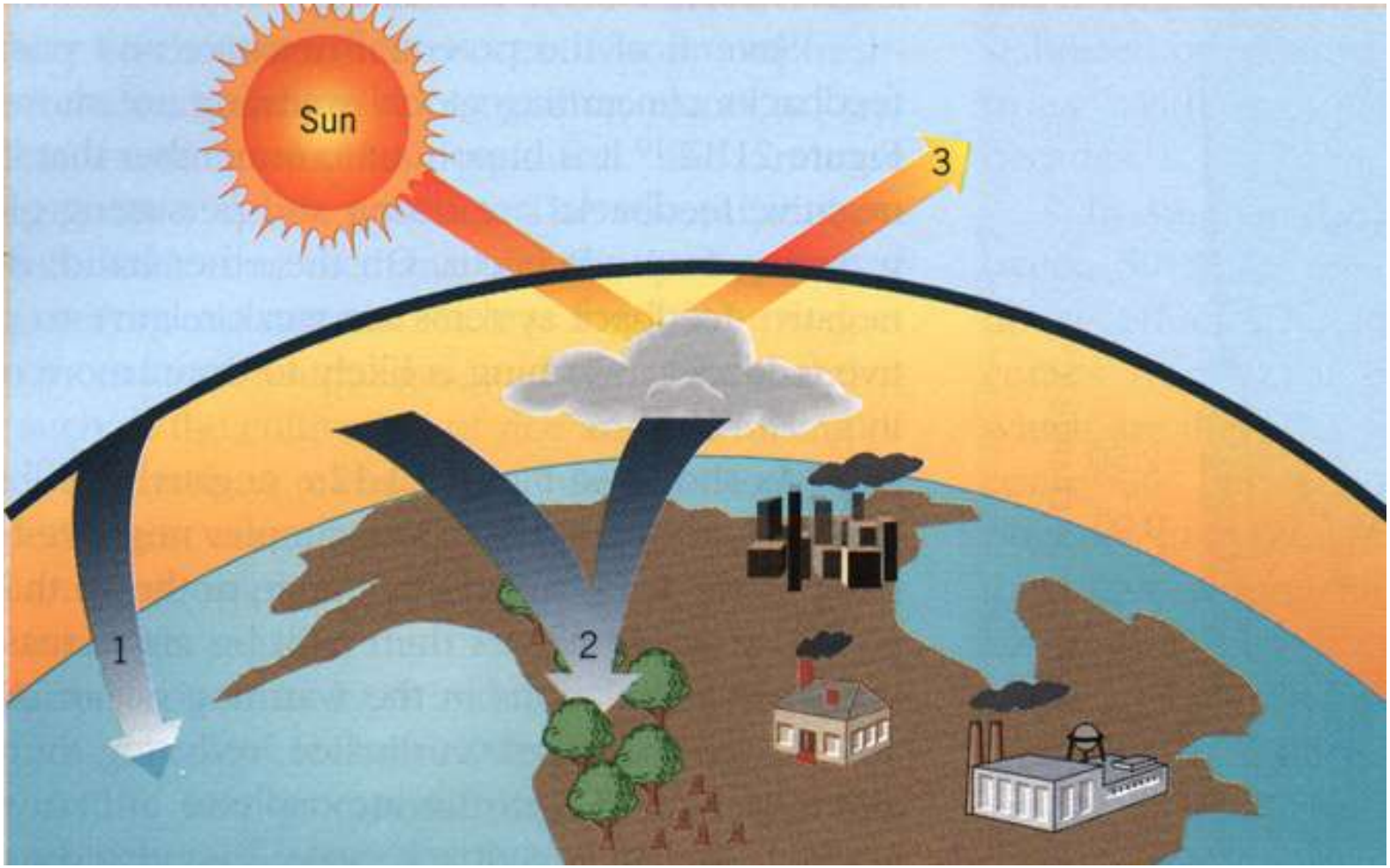
- Ozone: (O_3)
  - –3 oxygen atoms
  - –Ozone Layer (10-50 km above earth surface)
  - –Absorbs harmful u





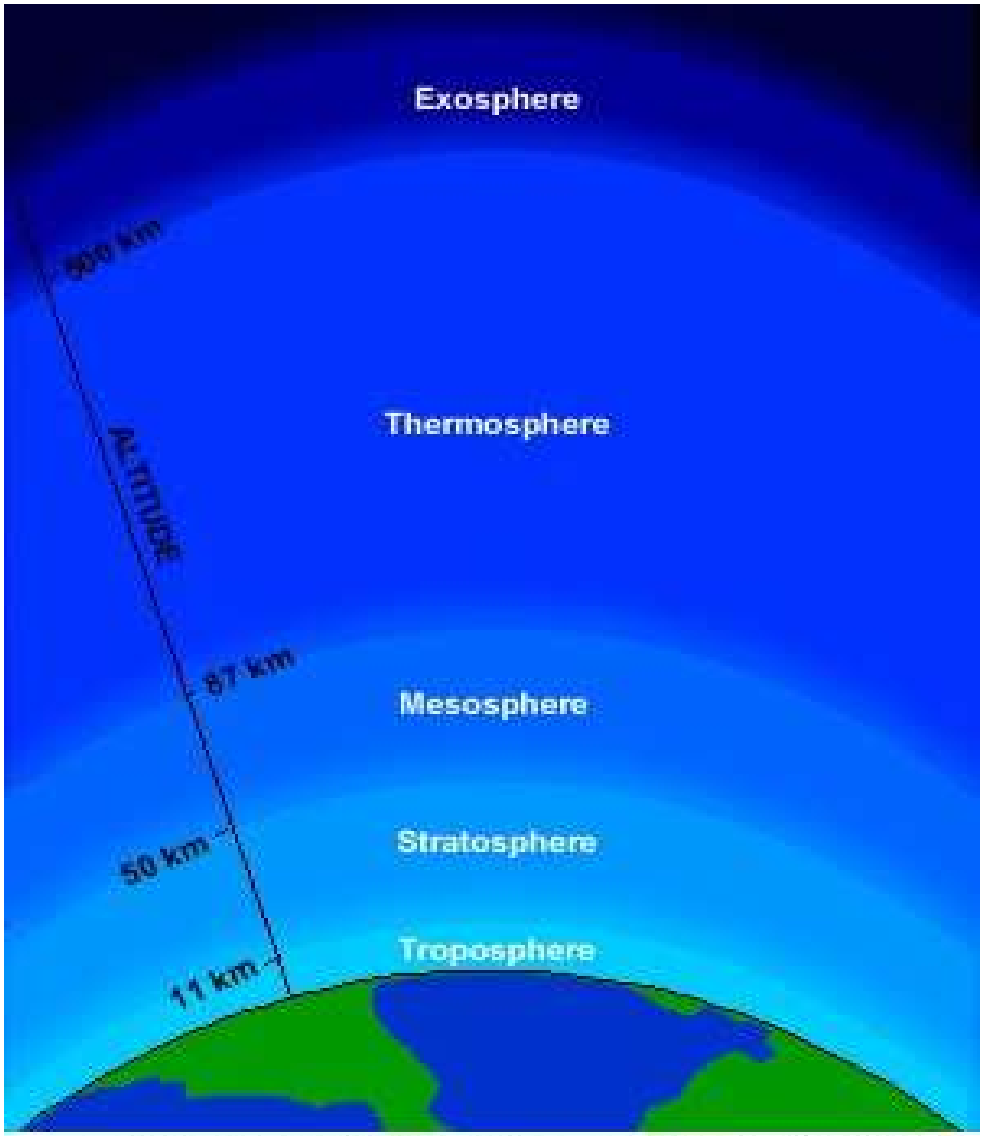
Without CO_2 and ozone, WE WOULD FREEZE on Earth

- Average temperature would be 21° F



Layers of the Atmosphere

https://www.youtube.com/watch?v=5sg9sCOXFIk



Why is the Earth's atmosphere important??

Weather Rocks!!

Weather Rocks!!

Weather Rocks!!

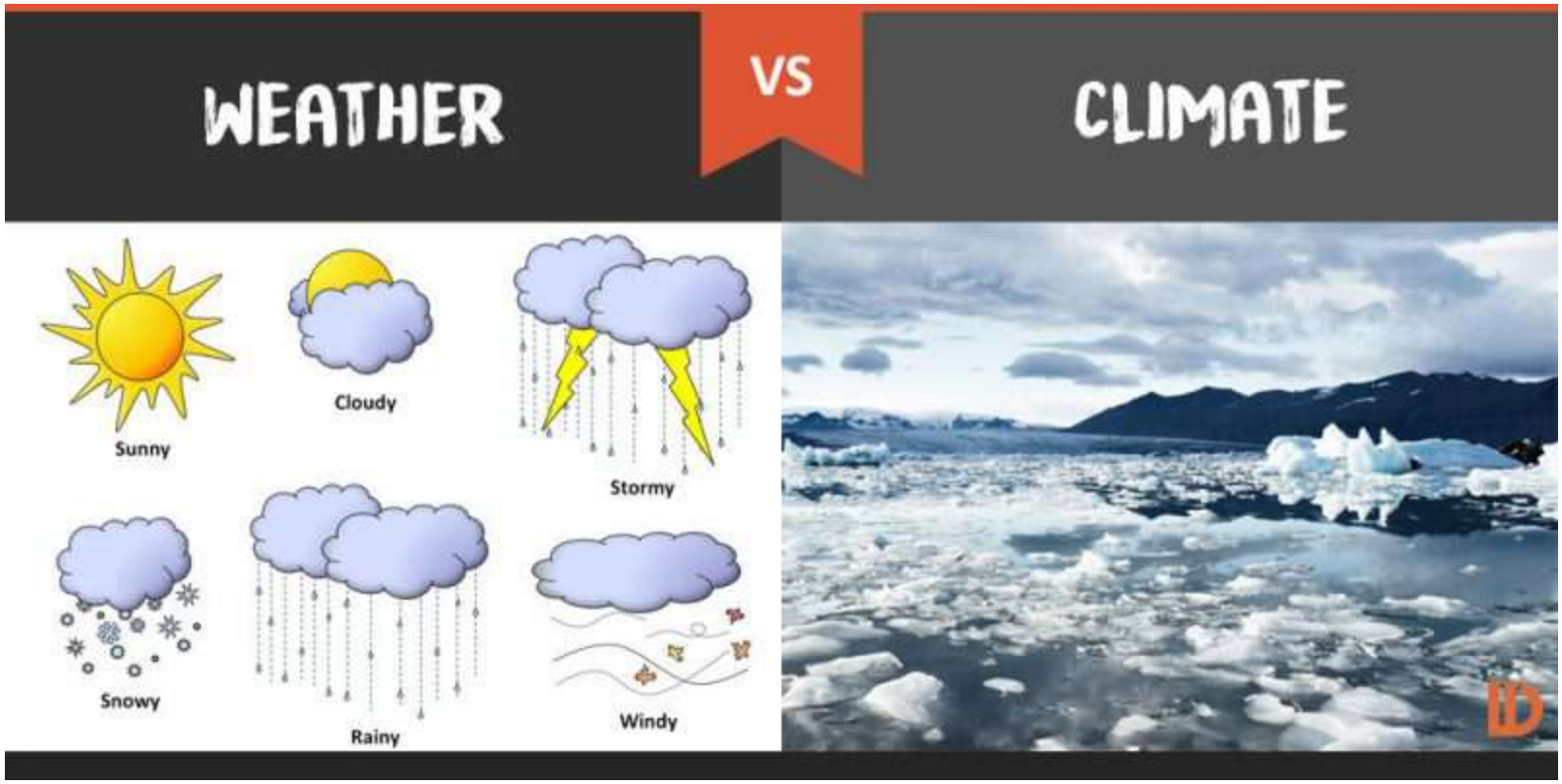
Climate vs. Weather

- **Climate** - how the atmosphere "behaves" over relatively **long periods of time**
  - Florida's climate is warmer than Maine's
  - The climate in Florida during the summer is hot.

- **Weather** - conditions of the atmosphere are over a **short period of time**
  - The weather for today is rain, snow, sun, wind
  - On Friday it will be hot.

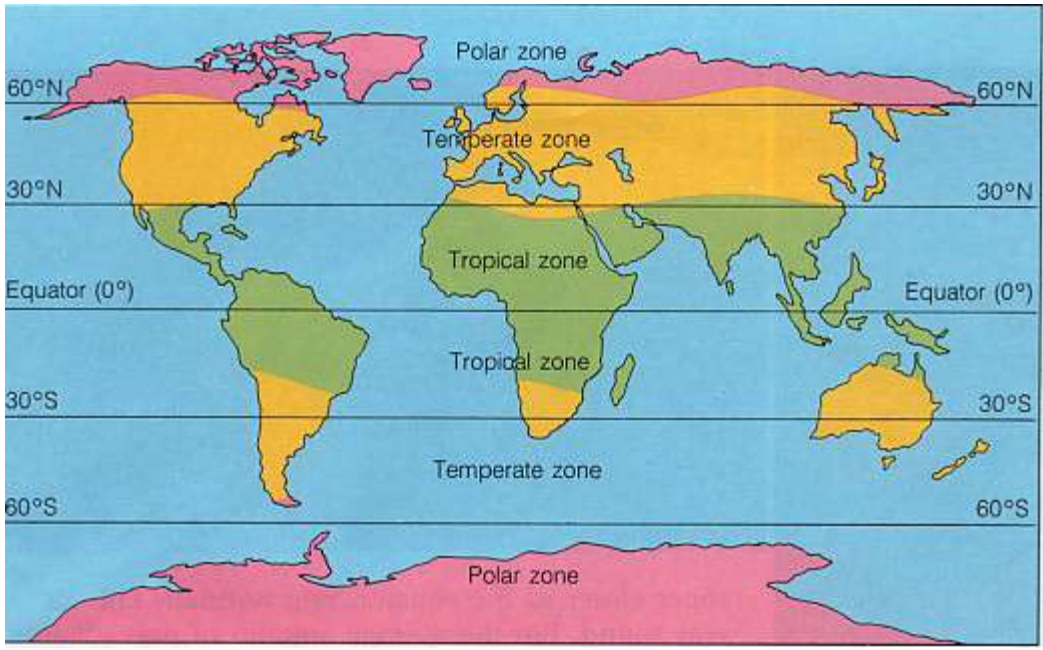
Climate vs. Weather

https://www.youtube.com/watch?v=XirAUvS_29I



Climate Zones

- Divisions of the Earth's climates according to average temperatures and average rainfall.
  - *polar*- coldest temperatures (almost always below freezing)
  - *temperate*- moderate temperatures and rainfall year-round
  - *tropical zones*- warmest temperatures and gets the most rain



Temperature & Heat

- **Temperature**: a measurement of how rapid or slow molecules move around; measurement of the intensity of heat
  - High temperature: fast moving molecules
  - Low temperature: slow moving molecules

- **Heat:** the amount of energy in an object
  - Heat flows from an object of **high** temperature to an object of **low** temperature

Temperature
Example - Water

- Which of these do you think has the **fastest moving molecules**? *Slowest*?

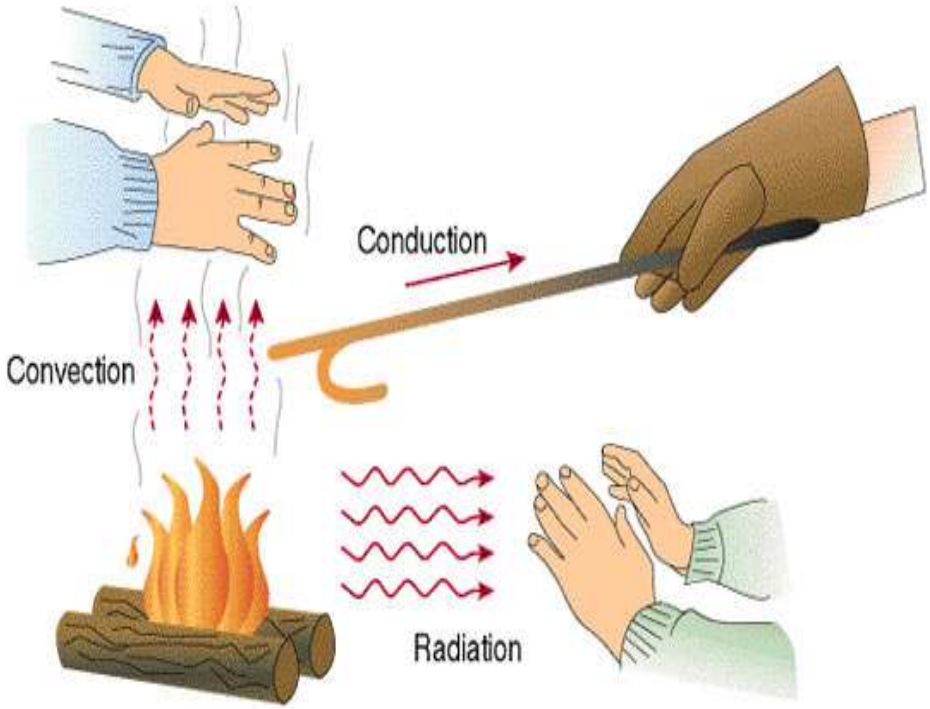
Temperature
Example - Water

- Which of these is the **hottest**? *Coldest*?

Heat

- **SUN** is the source of all energy in atmosphere

- Heat transferred in 3 different ways:
  - **Radiation**
  - **Conduction**
  - **Convection**

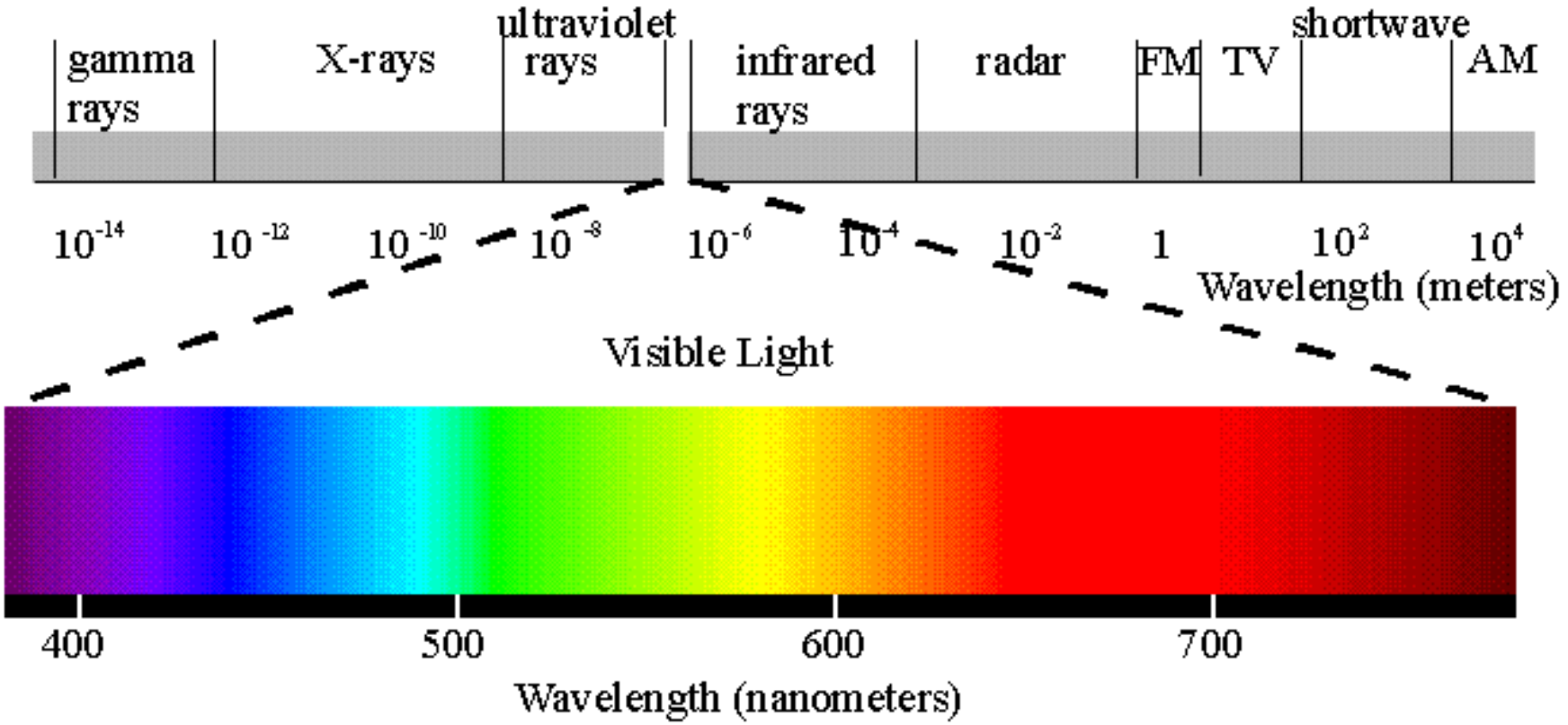


- Heat always transferred from **hotter to colder object**

Radiation - transfer of energy by electromagnetic waves; no physical contact

- **emit in the form of rays or waves**

Electromagnetic Spectrum



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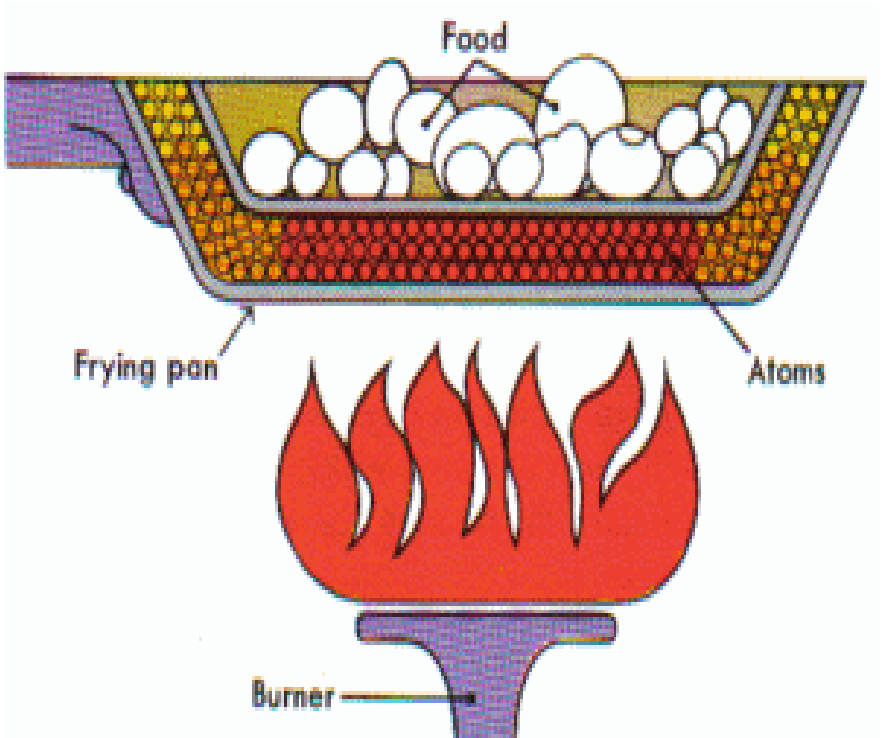
Visual Stimulus

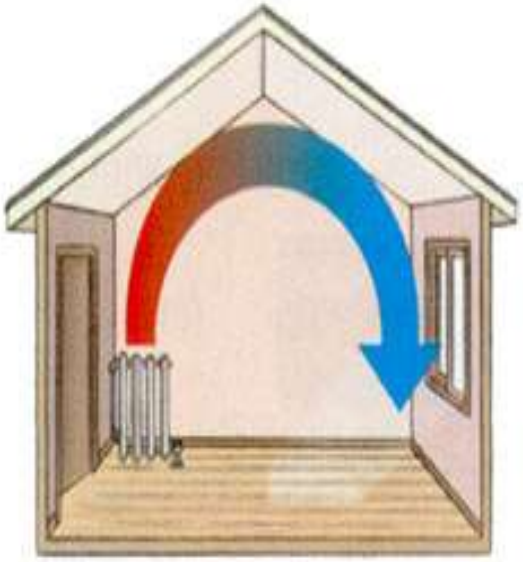
Conduction - Heat is transferred from one object to another when molecules collide; metal is a good conductor but air is not

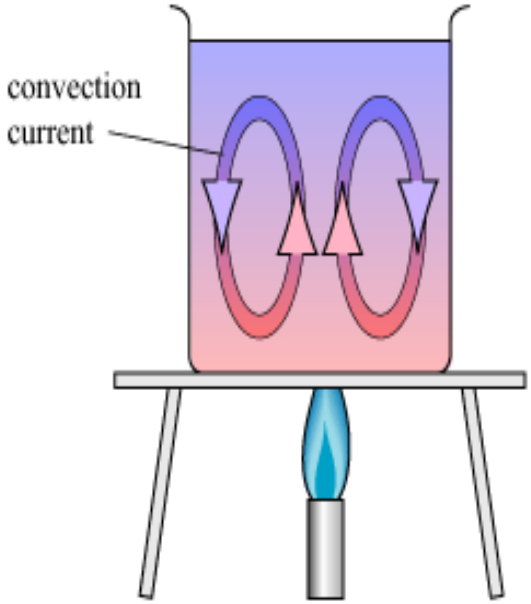
- Conduction = ***CONTACT***

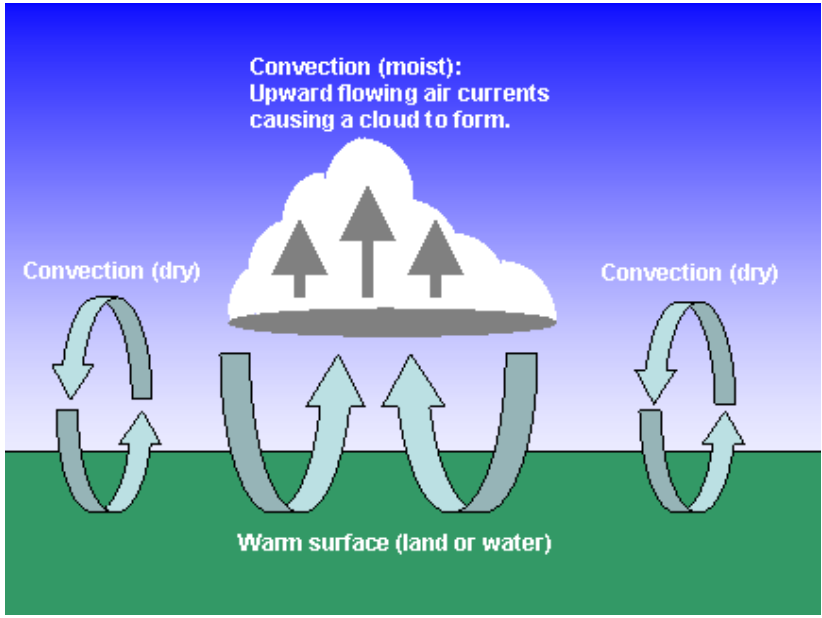


Convection - Transfers heat within fluids and air (gas) in a circular pattern

- Convection = **vents, currents**







Monday
December 10, 2018

I can:

✓Summarize the layers of the atmosphere.

Agenda

(15) Knight's Charge
(20) Notes: The Atmosphere
(35) Foldable: Layers of the Atmosphere
(15) Glue Notebook

Knight's Charge

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1. **What is the atmosphere?**
2. **Why is the atmosphere important?**

HW: Incomplete/Late Work

Atmosphere Foldable

- **Directions:** Cut and paste the labels and pictures on the map of the atmosphere. Under the pictures, there is a measurement to help with where to paste. ALSO using **RED** and **BLUE** markers, show how the temperature changes between the layers.

- **put up on board

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Knight's Charge

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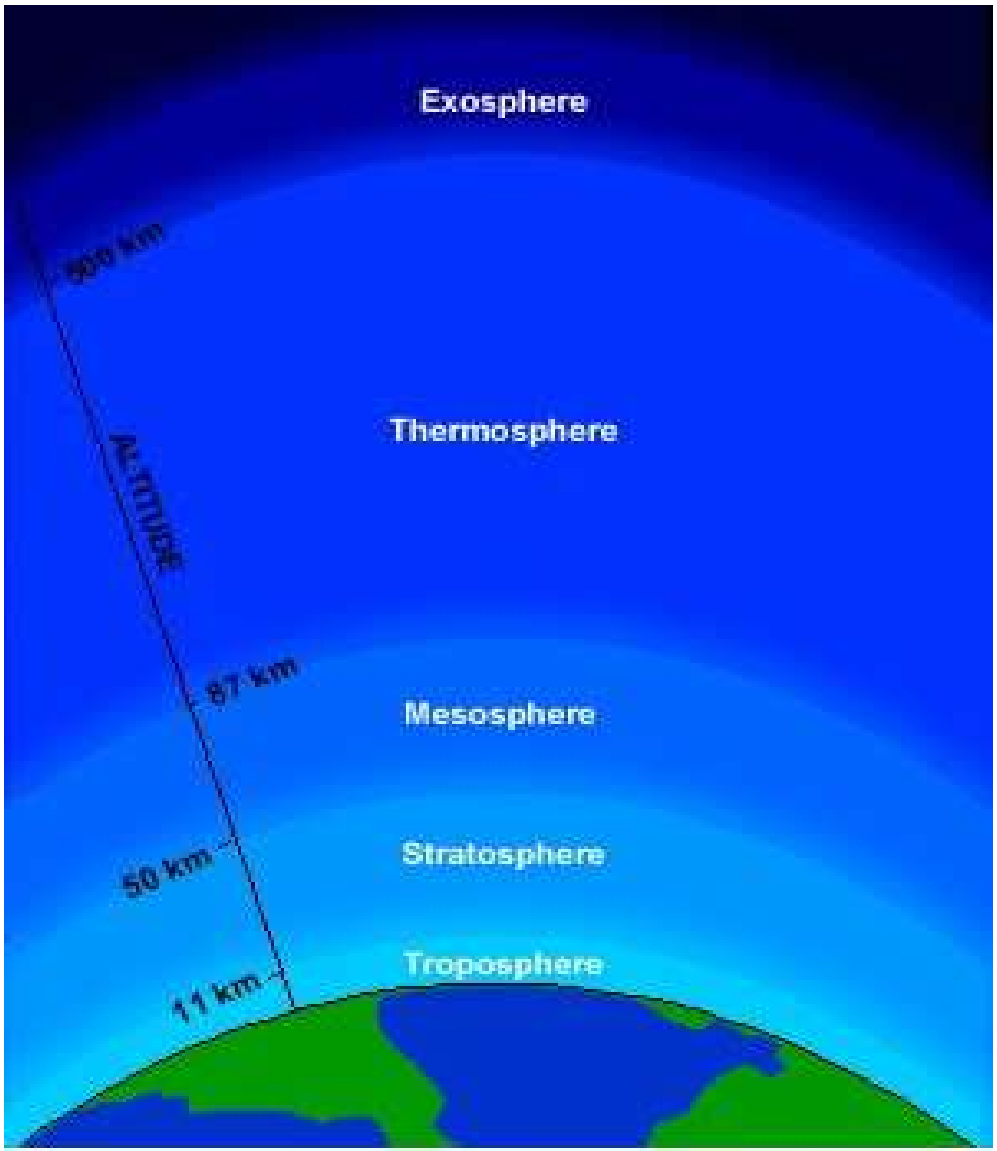
HW: Incomplete/Late Work

Layers of the Atmosphere

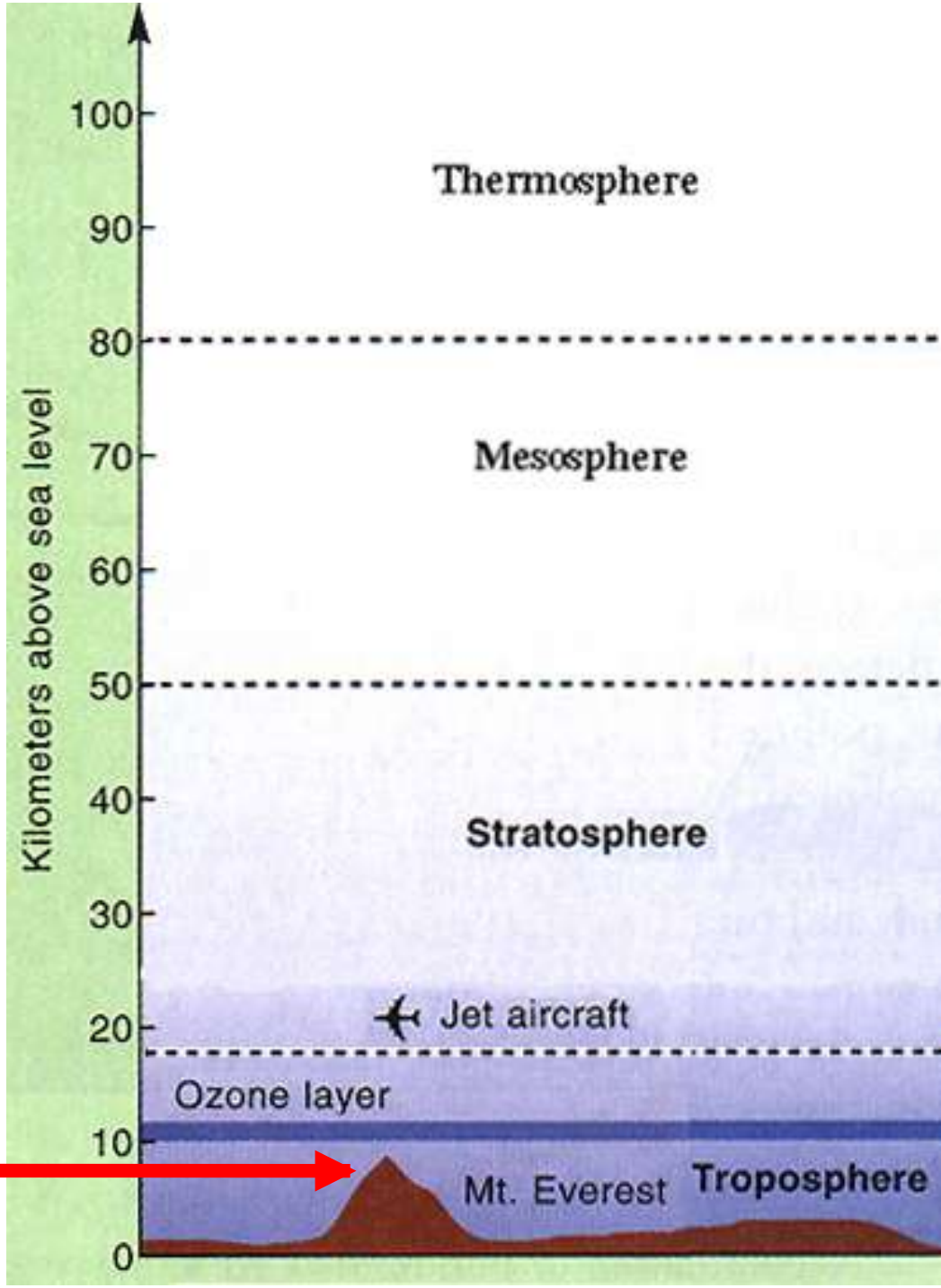
- Farther out --> **air is thinner**
- Layers defined by **temperature changes**



Troposphere

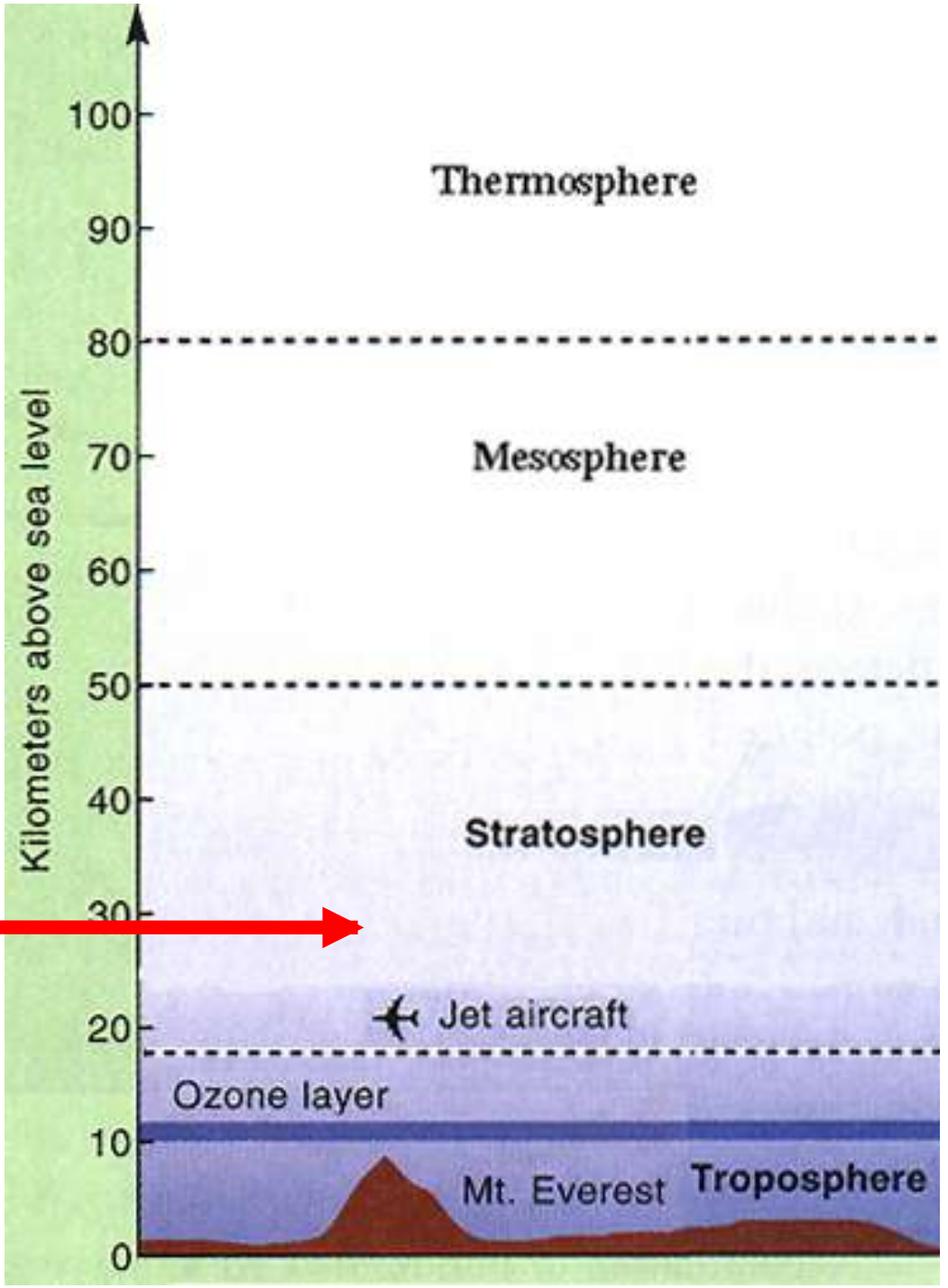
"Always Changing"

- **Surface of Earth - 15 km high**
- **Temperature decreases as you rise**
- Contains **ozone gas**
- **Weather**
- Most **air pollution** stored here.



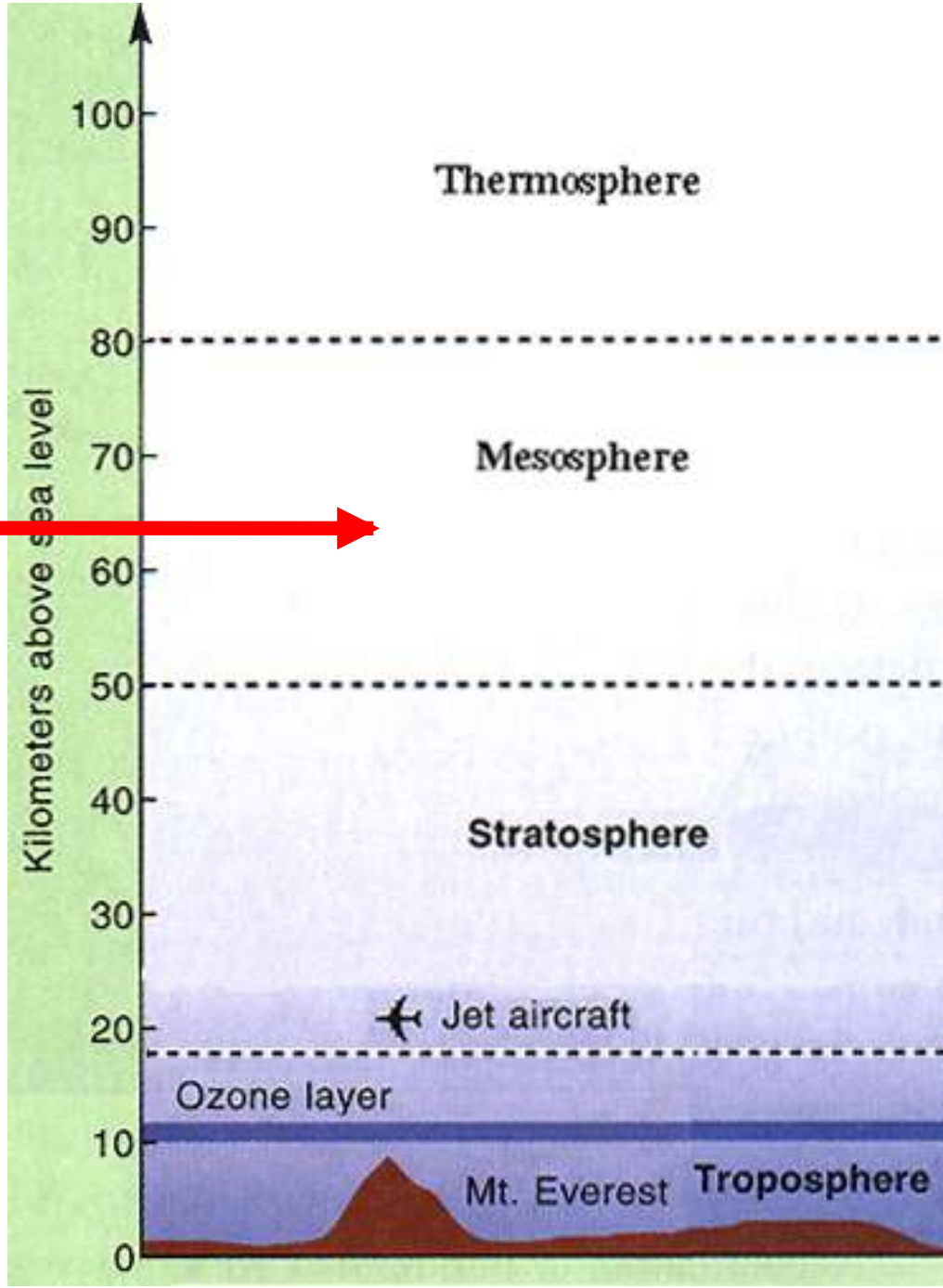
Stratosphere
Ozone Layer

- **15 km - 50 km**
- **Temperature increases as you rise**
- **Blocks UV radiation**
- **Airplanes**



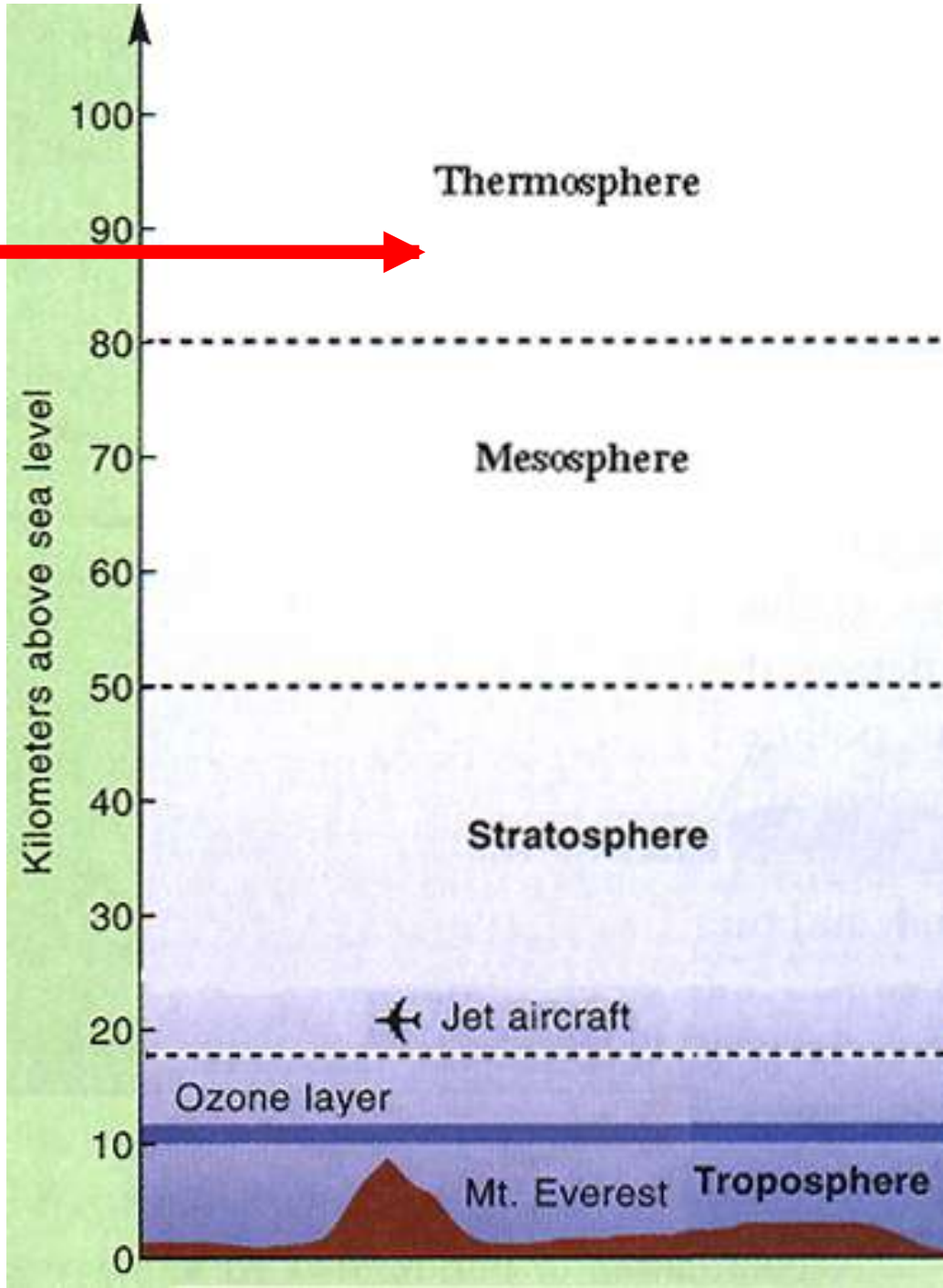
Mesosphere
In the middle

- 50 km - 80 km
- **Temperature decreases as you rise**
- **No ozone gas**
- **Air is very thin**



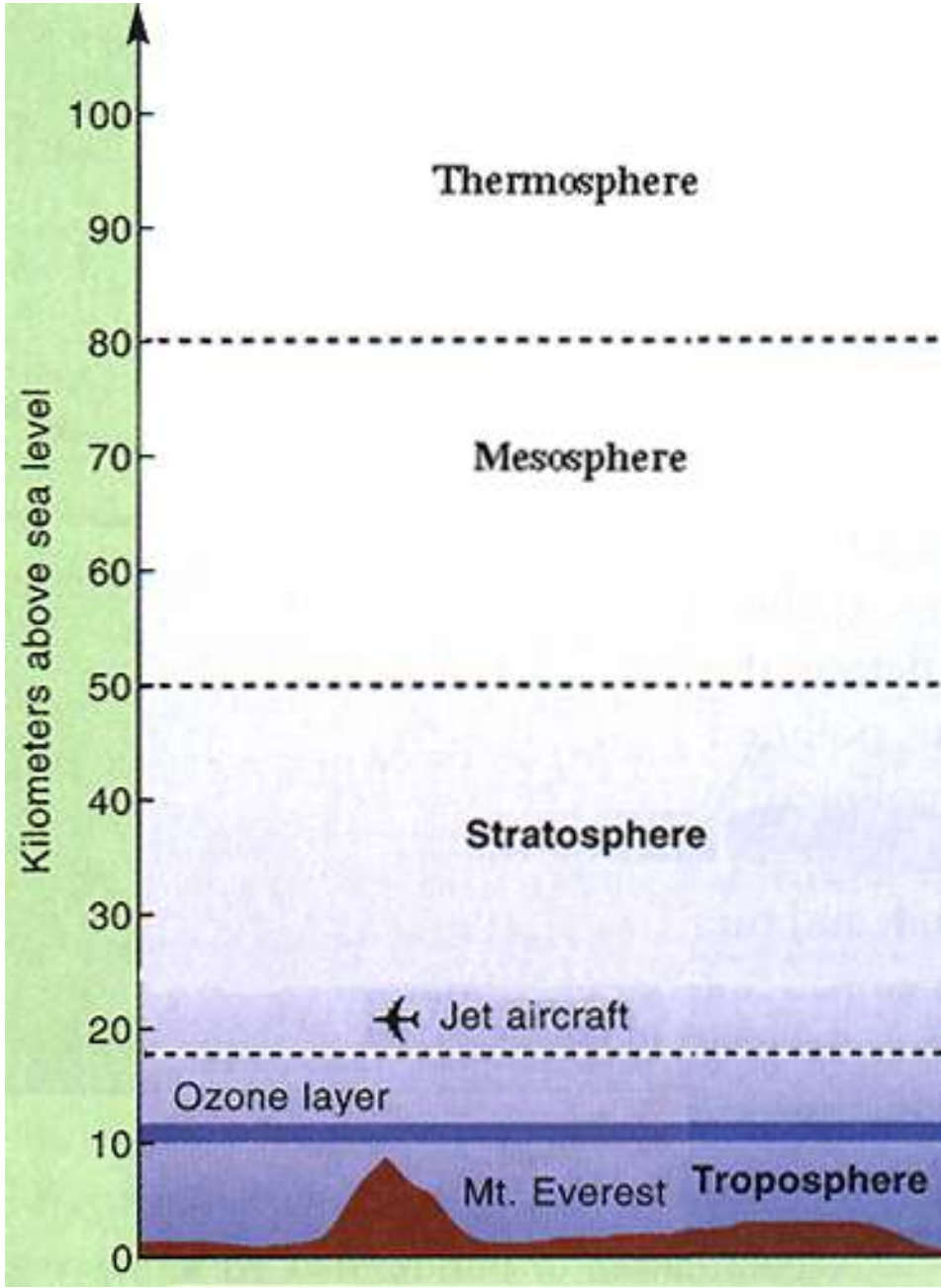
Thermosphere
HOT

- 80 km - 10,000 km
- **Temperature increases as you rise**
- **Hottest layer** – directly exposed to sun's energy
- **Air is *extremely* thin**



Exosphere

- **Outer Space**
- Air pressure is low
- **Satellites orbit here**



Mnemonic Device

- With a partner, come up with a phrase to remember the 5 layers of the atmosphere:

- **T**roposhere**T**arget
- **S**tratosphere**S**ells
- **M**esosphere**M**any
- **Th**ermosphere**Th**ings
- **E**xosphere**E**veryday

Tuesday
May 1, 2018

I can:
✓Summarize the layer of the atmosphere.

Agenda
(10) Knight's Charge
(25) GN: The Atmosphere
(40) Lab: Layers of the Atmosphere

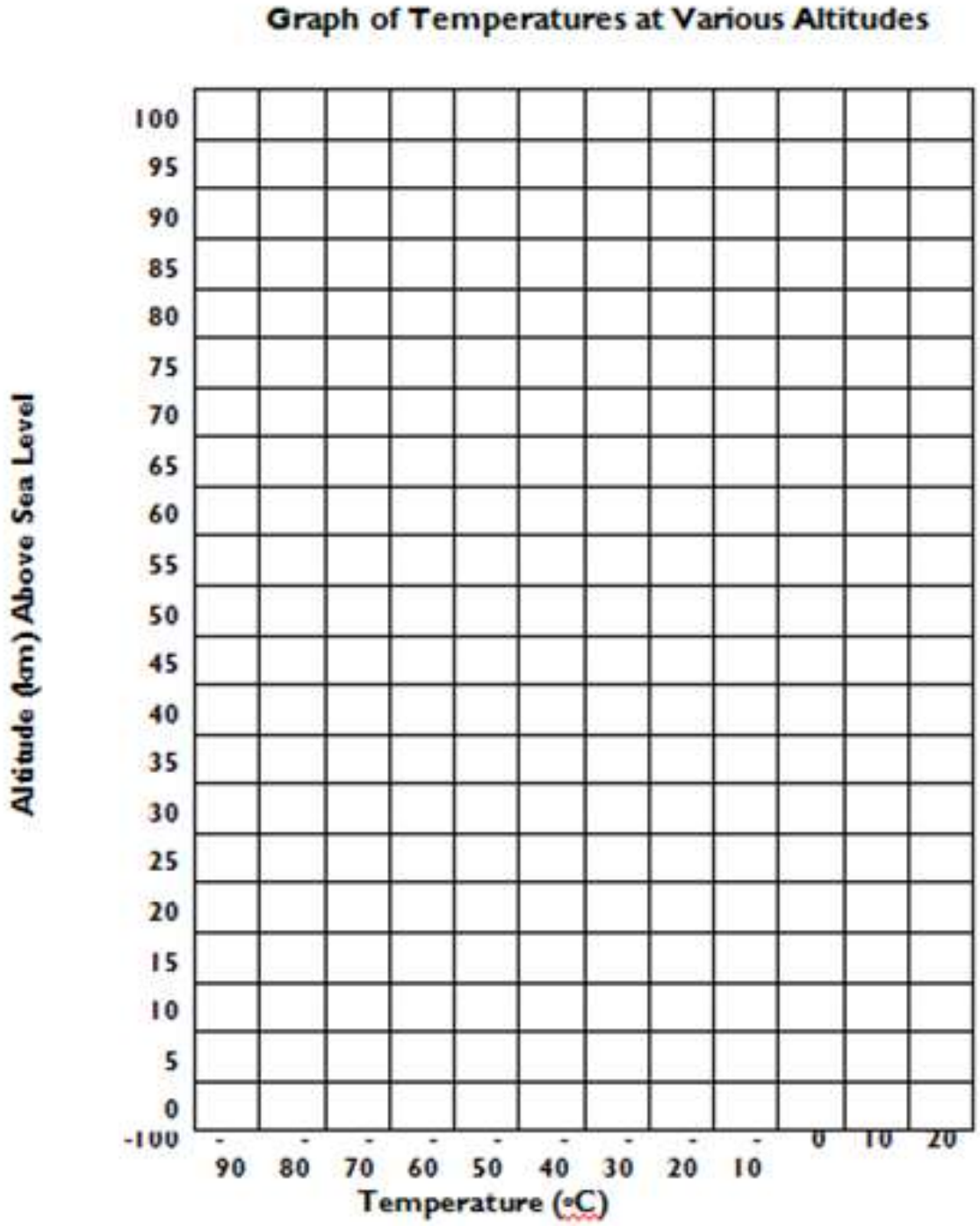
Knight's Charge (pg. 112)
1. What is the atmosphere?
2. Why is the atmosphere important?
3. GOOD THINGS!

HW: None ☺

Lab: Layers of the Atmosphere

1. Work in groups of 2-3 students to complete the lab. **START BY READING THE OBJECTIVE AND BACKGROUND!!!!**
2. Each student is completing the lab.
3. Each student is inputting ideas and not one student is doing all of the work.
4. Be prepared to discuss your graphs!!

Altitude (km)	Temperature (°C)
0	15
5	-18
10	-49
12	-56
20	-56
25	-51
30	-46
35	-37
40	-22
45	-8
48	-2
52	-2
55	-7
60	-17
65	-33
70	-54
75	-65
80	-79
84	-86
92	-86
95	-81
100	-72



1. What is the basis for dividing the atmosphere into four layers?

2. Does the temperature increase or decrease with altitude in each layer?

   a. Troposphere _____

   b. Stratosphere _____

   c. Mesosphere _____

   d. Thermosphere _____

3. What is the approximate height and temperature of each atmosphere layer division?

	(Height)	(Temperature)
a. Tropopause	_____	_____
b. Stratopause	_____	_____
c. Mesopause	_____	_____

d.

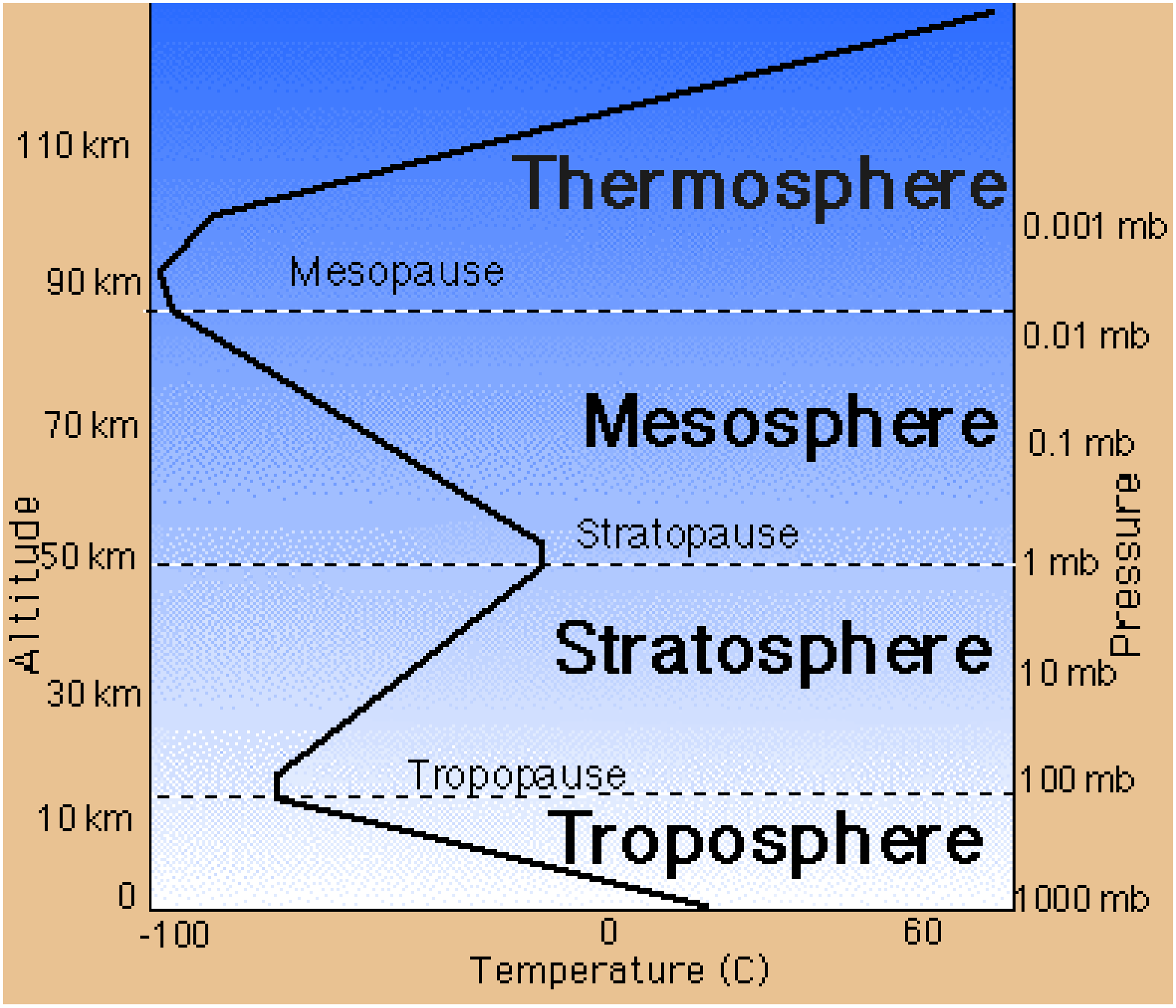
4. What causes the temperature to increase with height through the stratosphere and decrease with height through the mesosphere?

5. What causes the temperature to decrease with height in the troposphere?

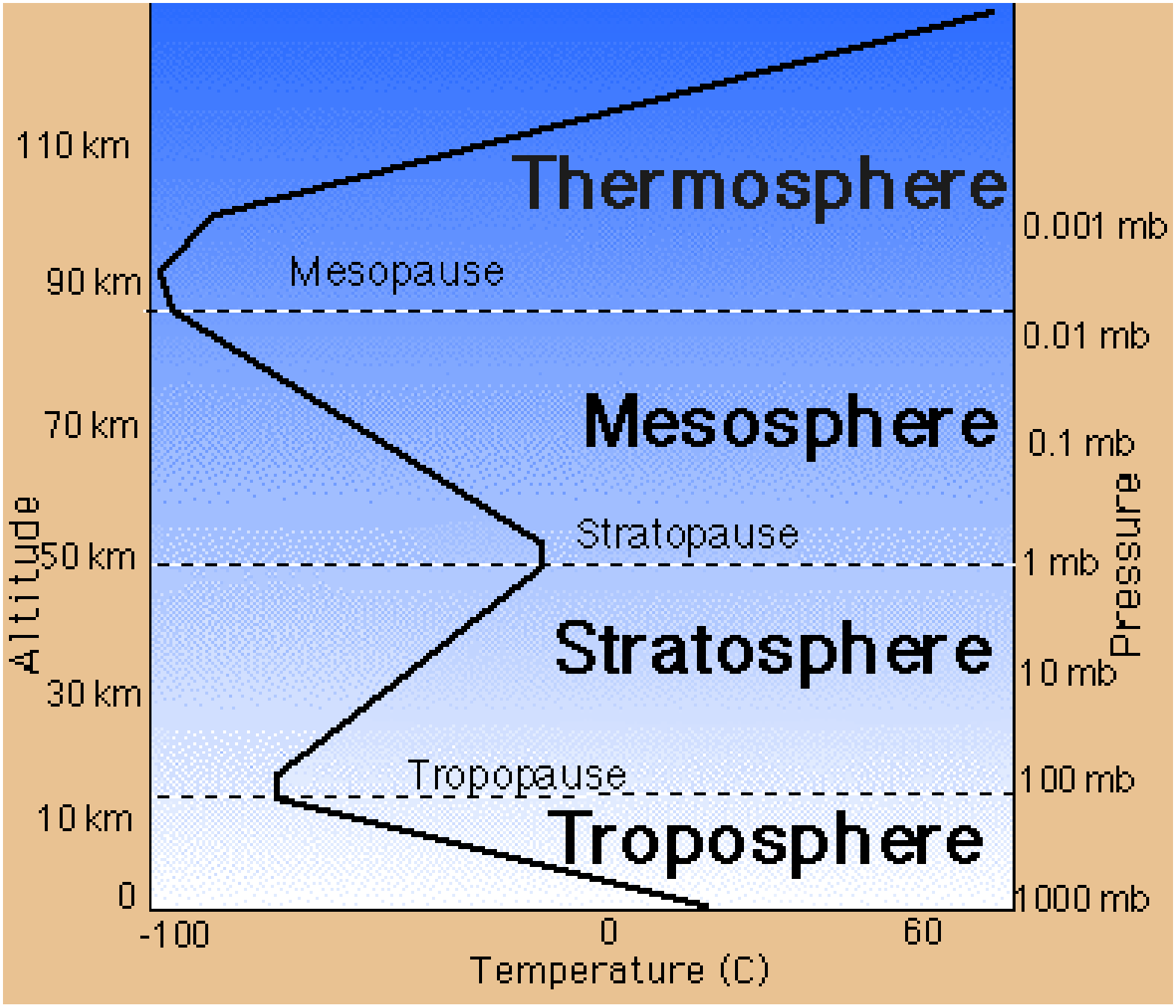
6. Determine which layer of the atmosphere has the greatest temperature range.

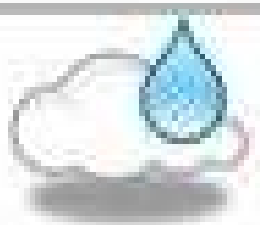
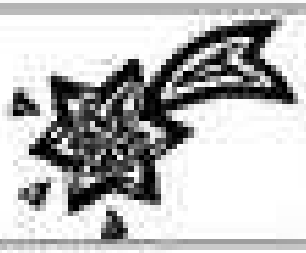
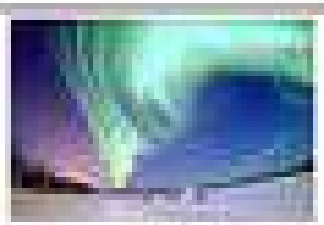
7. Describe temperature changes in the stratosphere. Why do they do this?

8. Explain how cloud cover can influence temperature in the lower atmosphere.


Thermosphere
Mesopause
Mesosphere
Stratopause
Stratosphere
Tropopause
Troposphere
110 km
90 km
70 km
50 km
30 km
10 km
0
Altitude
0.001 mb
0.01 mb
0.1 mb
1 mb
10 mb
100 mb
1000 mb
Pressure
-100
0
60
Temperature (C)

Mnemonic Device


Thermosphere
Mesopause
Mesosphere
Stratopause
Stratosphere
Tropopause
Troposphere
110 km
90 km
70 km
50 km
30 km
10 km
0
Altitude
0.001 mb
0.01 mb
0.1 mb
1 mb
10 mb
100 mb
1000 mb
Pressure
-100
0
60
Temperature (C)

Troposphere Layer	Stratosphere Layer	Mesosphere Layer	Thermosphere Layer	Exosphere Layer
				
This layer extends from 0 km to 16 km.	This layer extends from 16 km to 50 km.	This layer extends from 50 km to 90 km.	This layer extends from 90 km to 300 km.	This layer extends from 300 km to more than 600 km.
All weather happens at this layer.	Jets cruise near the bottom of this layer.	Meteors, or "shooting stars", burn up at this layer.	Shimmering curtains of light, called auroras, happen here.	**Many satellites orbit at this layer.**
Air pressure is the highest at this layer.	**The ozone layer is located here.**	This is the coldest layer of the atmosphere.	This is the hottest layer of the atmosphere.	**Air pressure is lowest at his layer.**
This layer contains 99% of the earth's water vapor.	Weather balloons are flown to this layer.	This is the hardest layer to study since planes cannot fly high enough and satellites cannot fly low enough.	**The space shuttle orbits at this layer.**	It is sometimes considered part of outer space.

Earth's Atmosphere

- https://www.youtube.com/watch?v=AkaY1dvZer4

Independent Practice

- You are given a table showing temperature and height in different layers of the atmosphere. Knowing what you know about heights of layers, **color in each row based on what layer of the atmosphere it is in**.
    - Ex. All layers from 0-15 km. high are troposphere, which you may choose to color red.

- Then, **use the colored-in table to answer the questions**.

different color for each layer.

Temp. (°C)	Height (km)
20	0
0	3
-20	6
-40	9
-60	12
-60	15
-60	18
-60	21
-54	24
-48	27

Exit Ticket

- **What is the atmosphere?**

- **Why is the atmosphere important?**

****write in complete sentences and be as detailed as possible!**