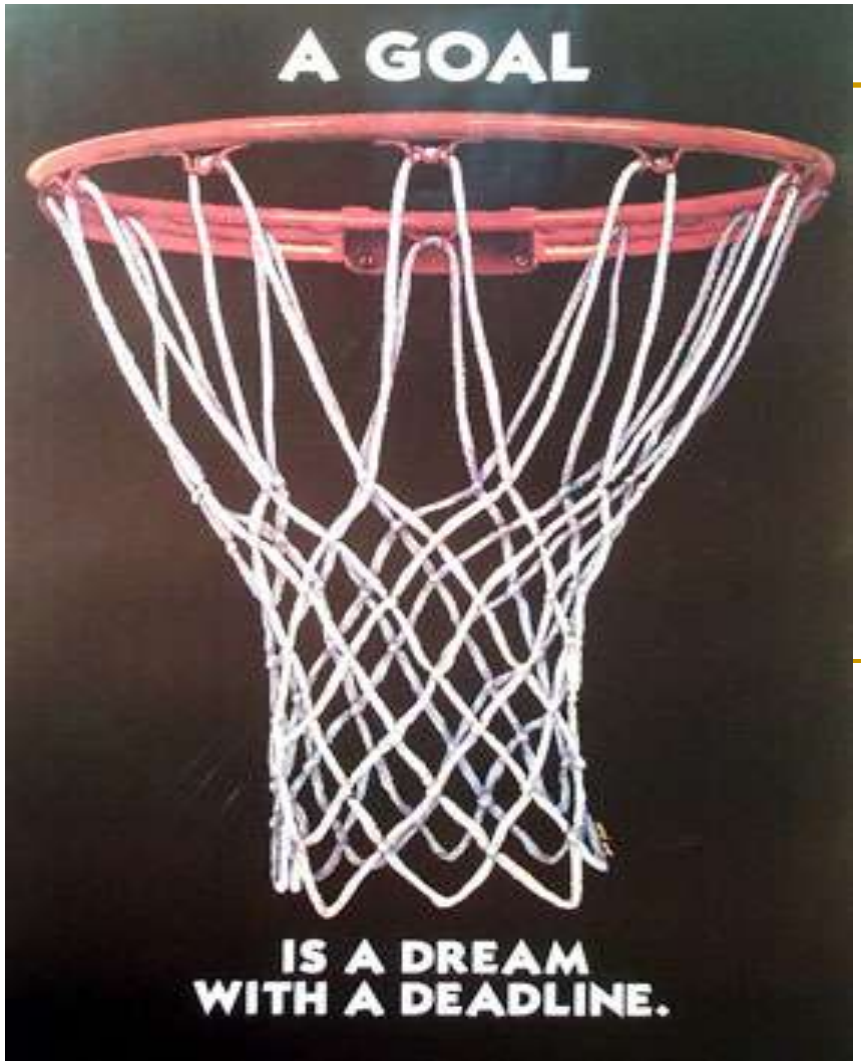


OBJECTIVES:

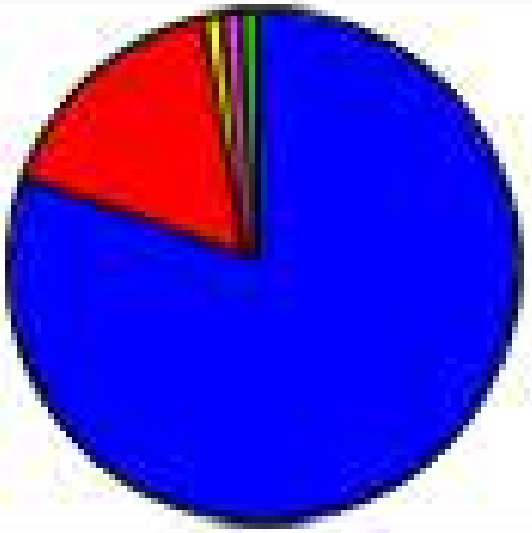
a. describe the layers of the atmosphere.
b. differentiate the layers of the atmosphere based on variation of temperature.
c. explain the significance of the layers and the boundaries between them.

LAYERS OF THE EARTH'S ATMOSPHERE

Dry Air Expressed in Volumes

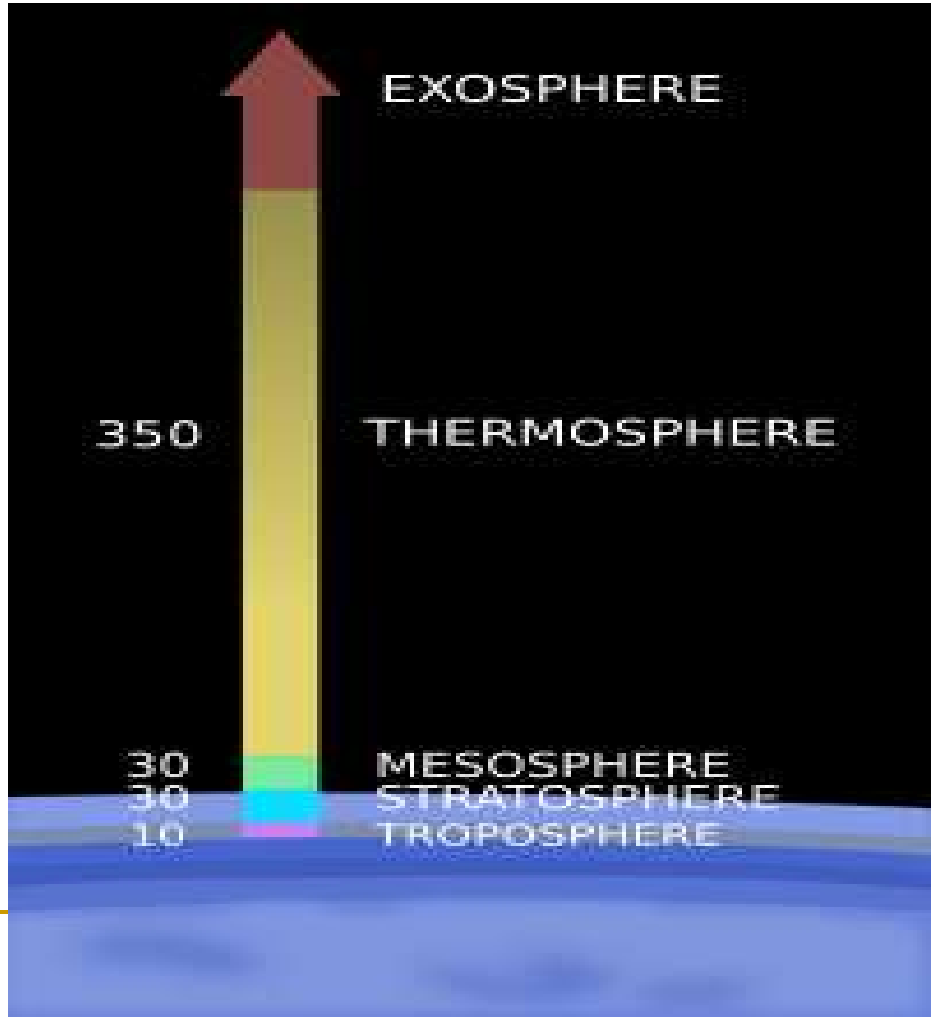
Nitrogen (N_2)	78.1%
Oxygen (O_2)	20.9%
Argon (A)	0.9%
Carbon dioxide (CO_2)	0.035%
Others	0.065%

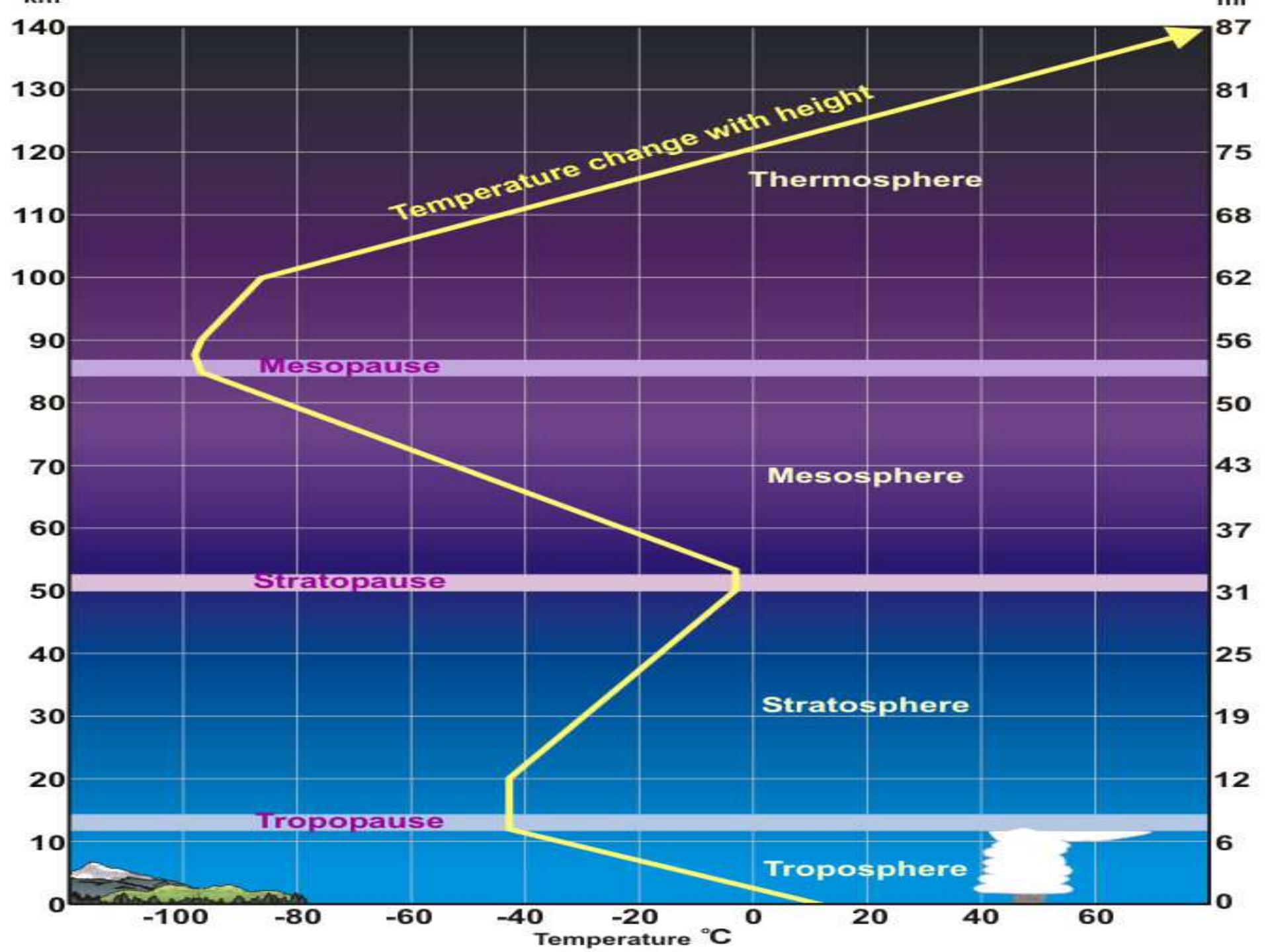
Others : Neon (Ne)
Helium (He)
Krypton (Kr)
Hydrogen (H_2)
Xenon (Xe)
Ozone (O_3)
Radon (Rn)



Layers of the Earth's Atmosphere From top to Bottom

- Thermosphere
  - Mesopause
- Mesosphere
  - Stratopause
- Stratosphere
  - Tropopause
- Troposphere

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Temperature change with height
Thermosphere
Mesopause
Mesosphere
Stratopause
Stratosphere
Tropopause
Troposphere
-100
-80
-60
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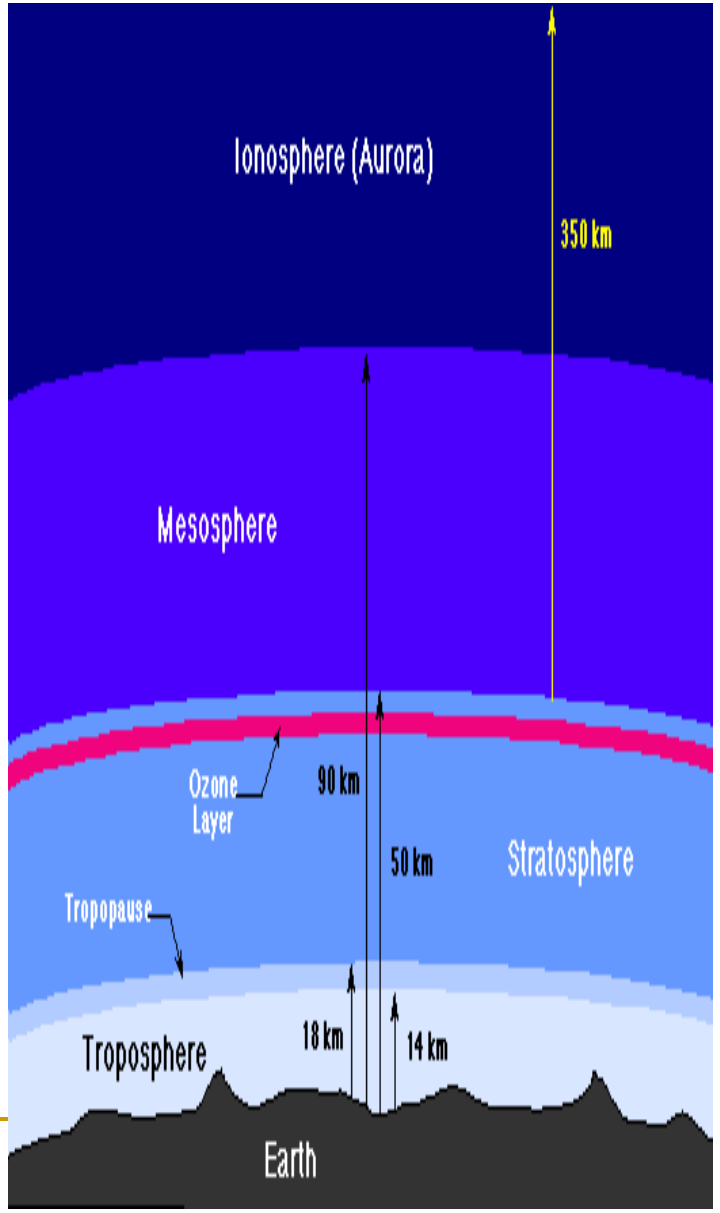
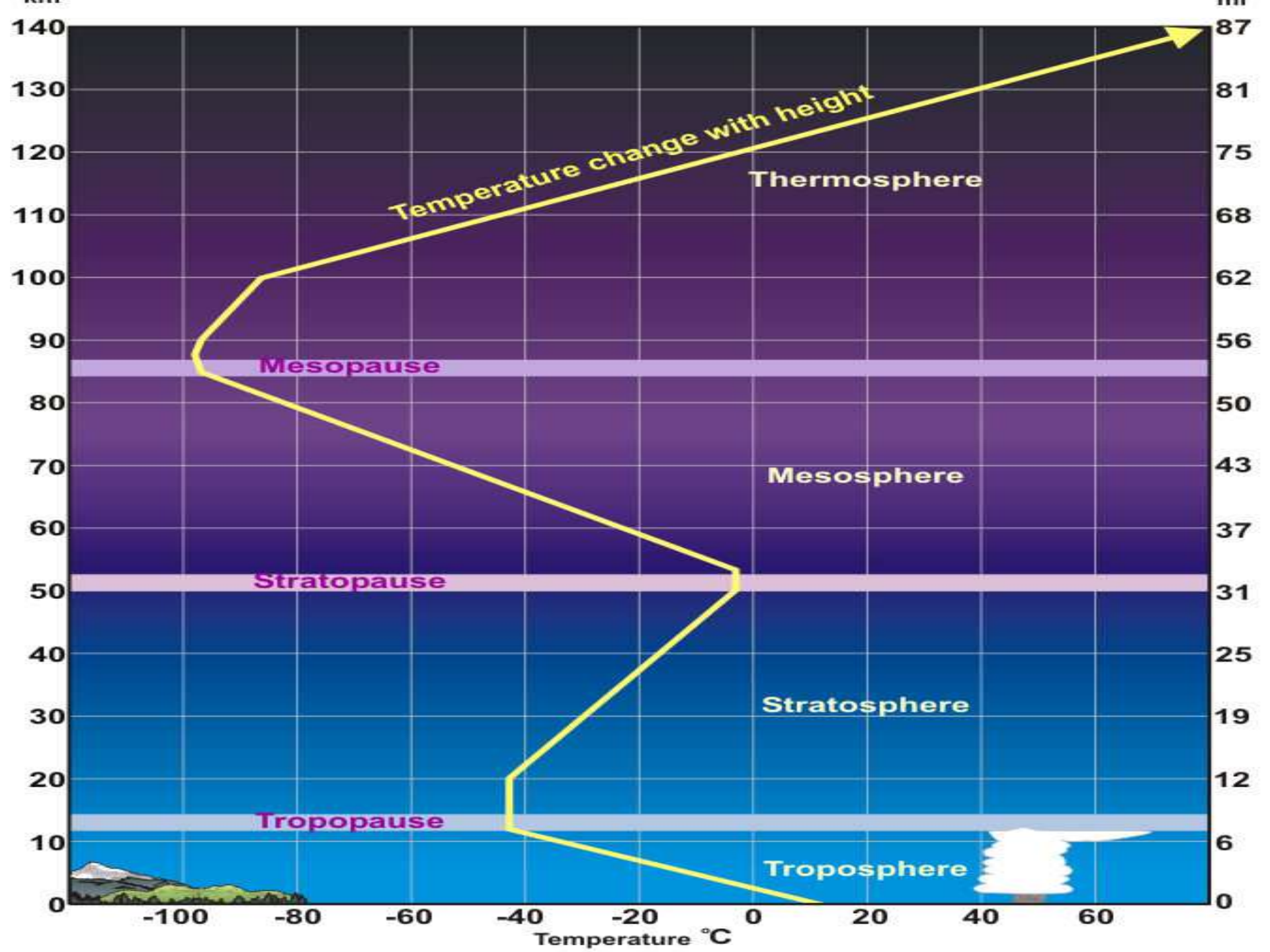
Temperature °C

TROPOSPHERE

- Lowest and thinnest layer
  - —16 km at equator, 8 km at poles
- 90% of the atmosphere's mass
- Temperature **decreases** with altitude
  - —6°C per kilometer
  - —Top of troposphere averages
  - —–50°C
- Where weather occurs
- Boundary between the troposphere, and the stratosphere is called the **tropopause**

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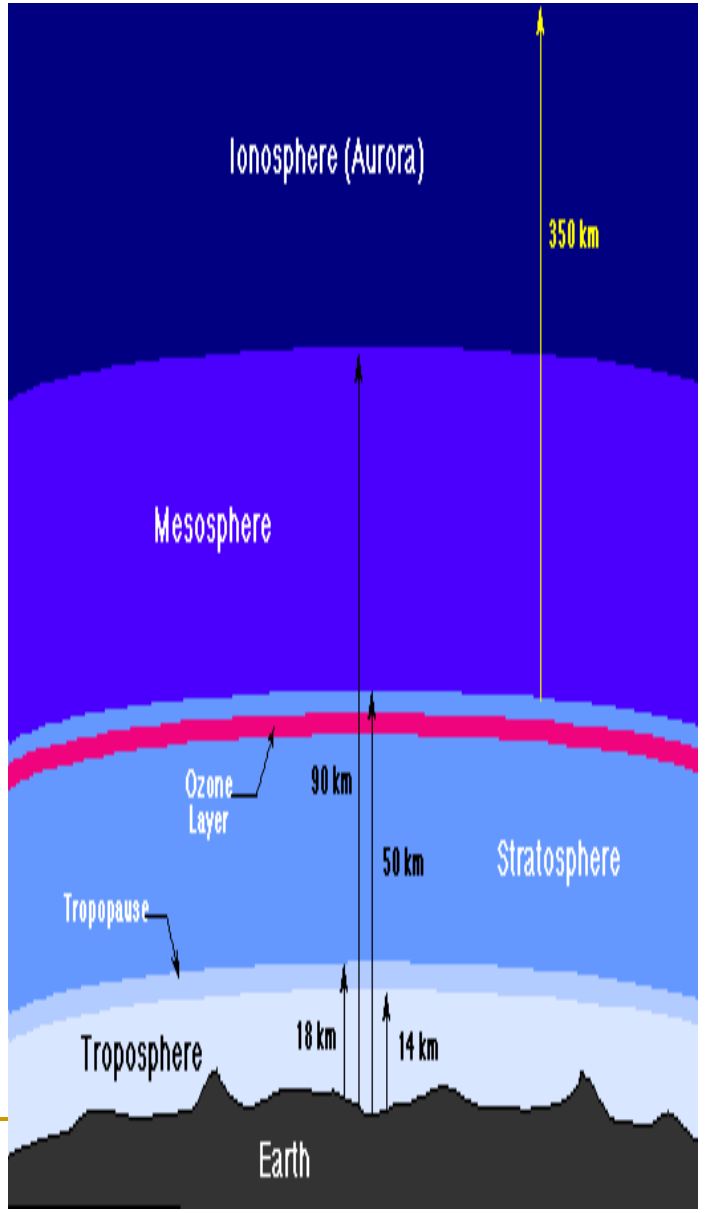
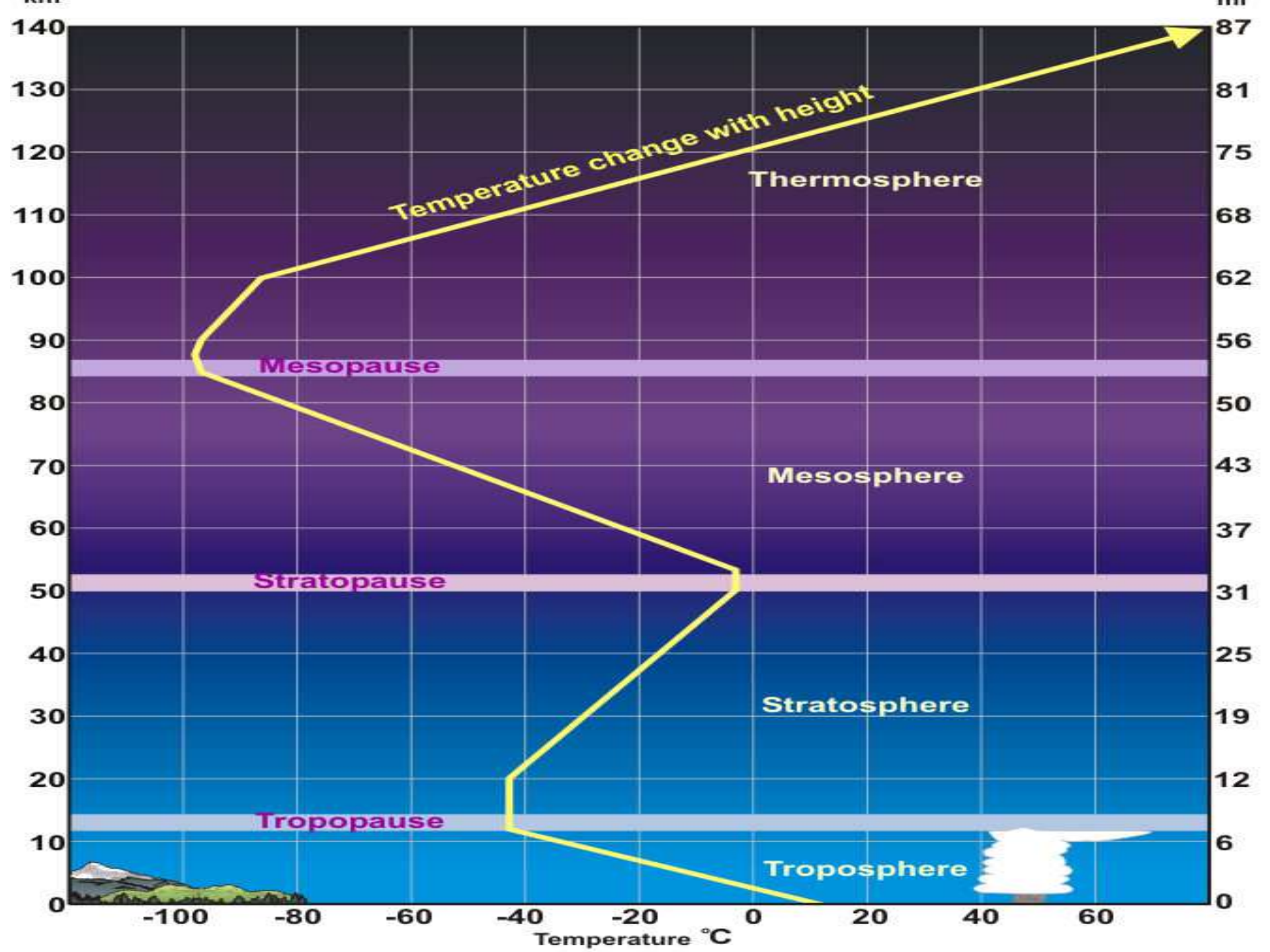
Temperature °C

STRATOSPHERE

- Extends from 10 km to 50 km above the ground
- Less dense (less water vapor)
- Temperature **increases** with altitude
- Almost no weather occurrence
- Contains high level of ozone

  > **ozone layer**
- Upper boundary is called **stratopause**

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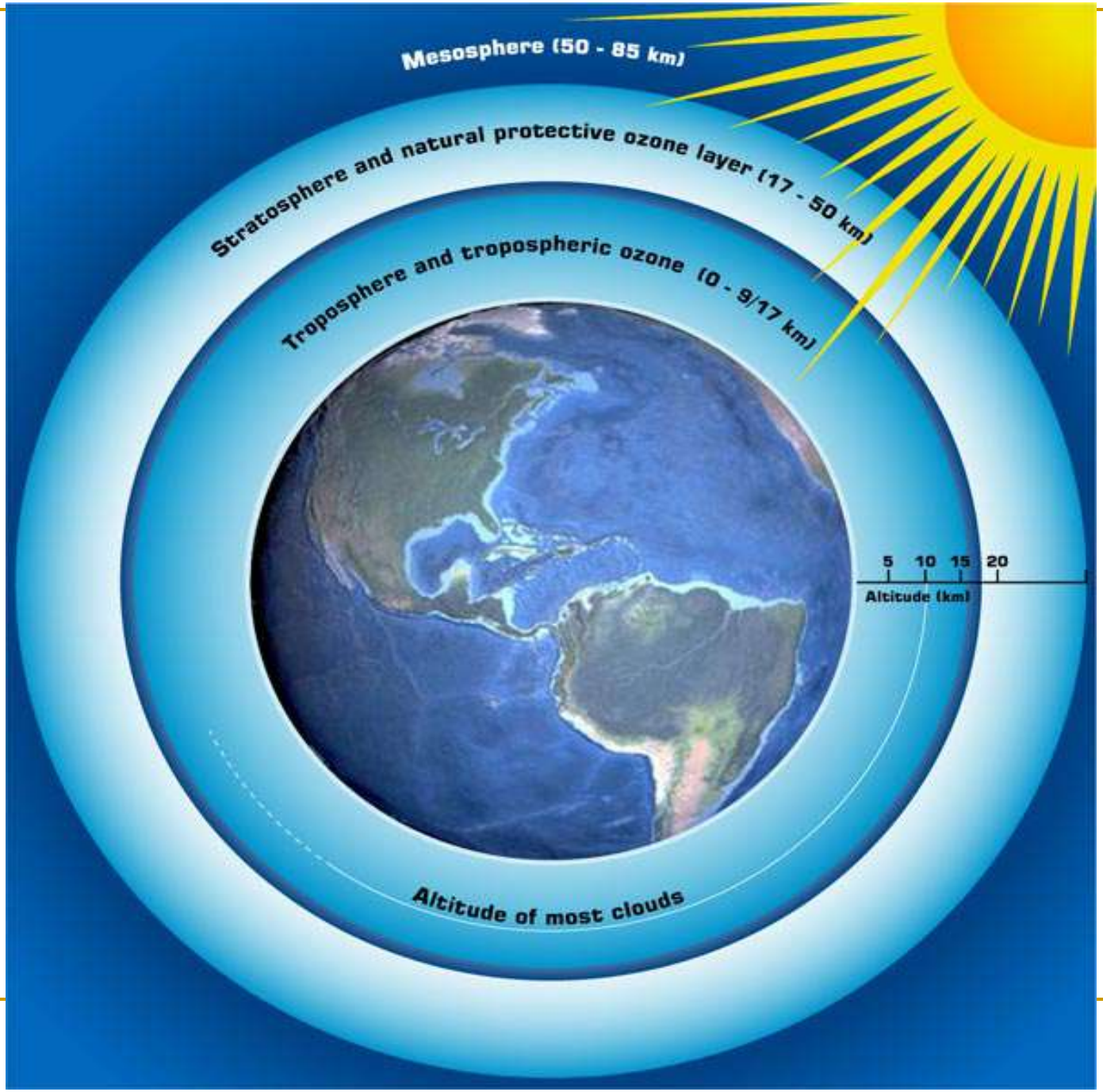
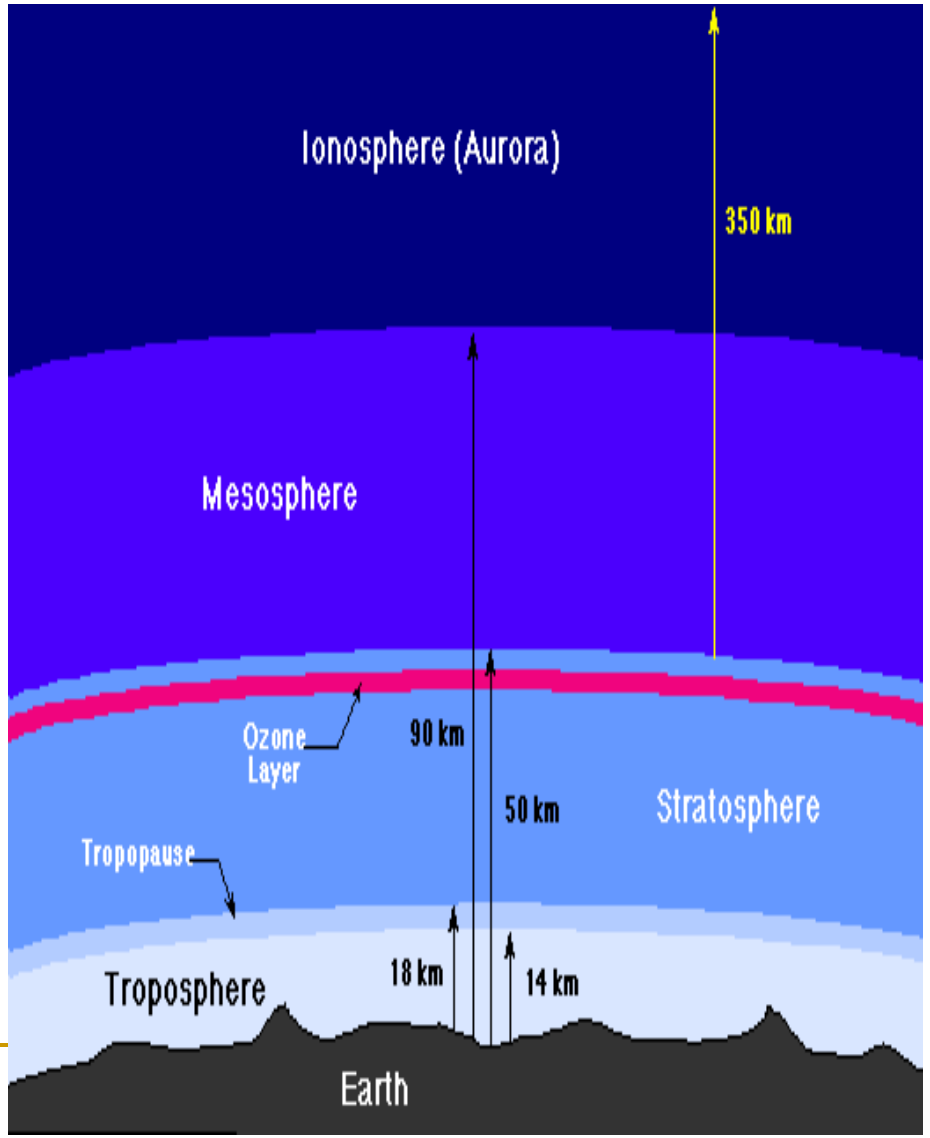
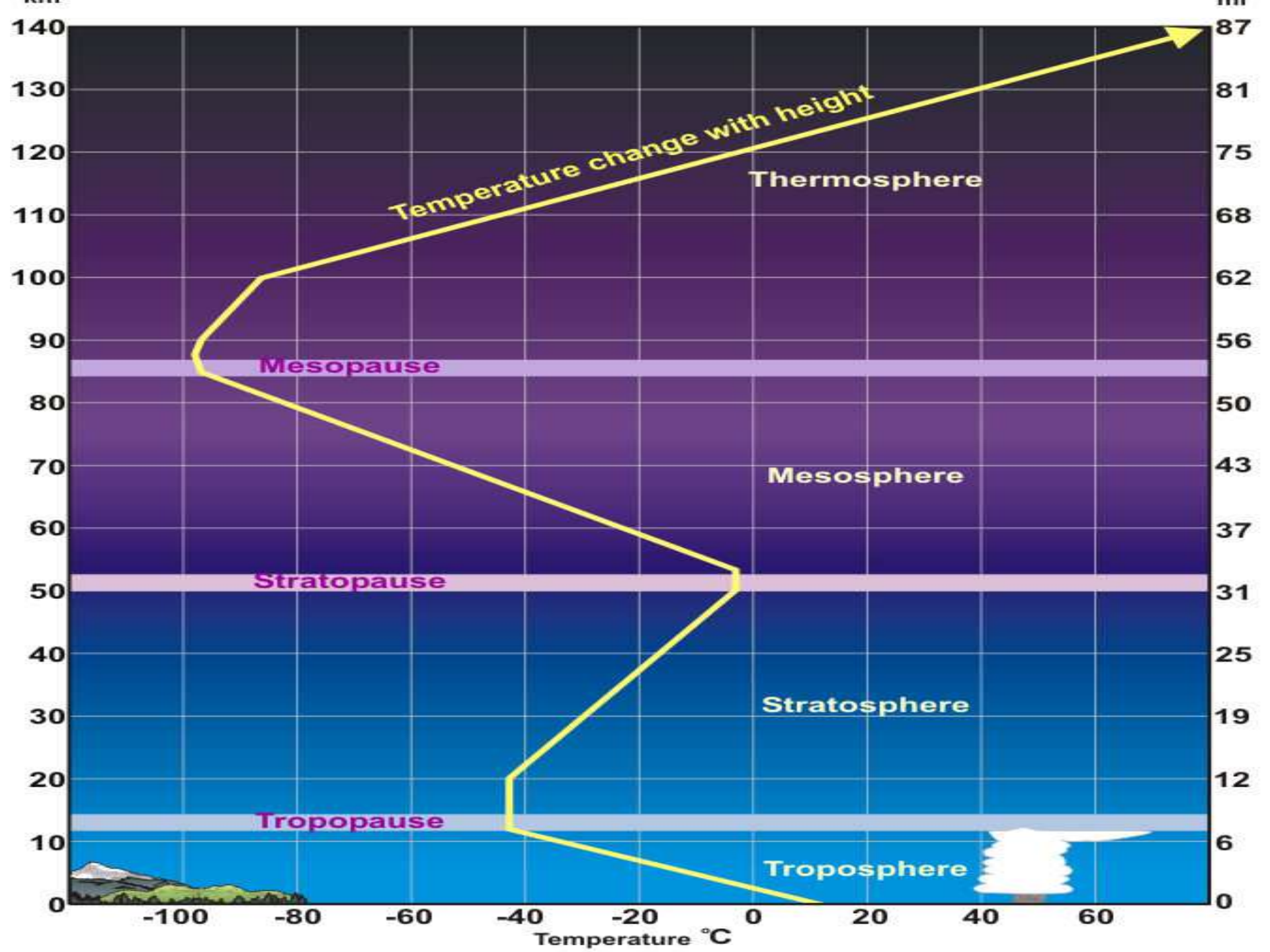

Mesosphere (50 - 85 km)
Stratosphere and natural protective ozone layer (17 - 50 km)
Troposphere and tropospheric ozone (0 - 9/17 km)
5 10 15 20
Altitude (km)
Altitude of most clouds

MESOSPHERE

- Extends to almost 80 km high
- Gases are less dense.
- Temperature **decreases** as altitude increases.
- Gases in this layer absorb very little UV radiation.

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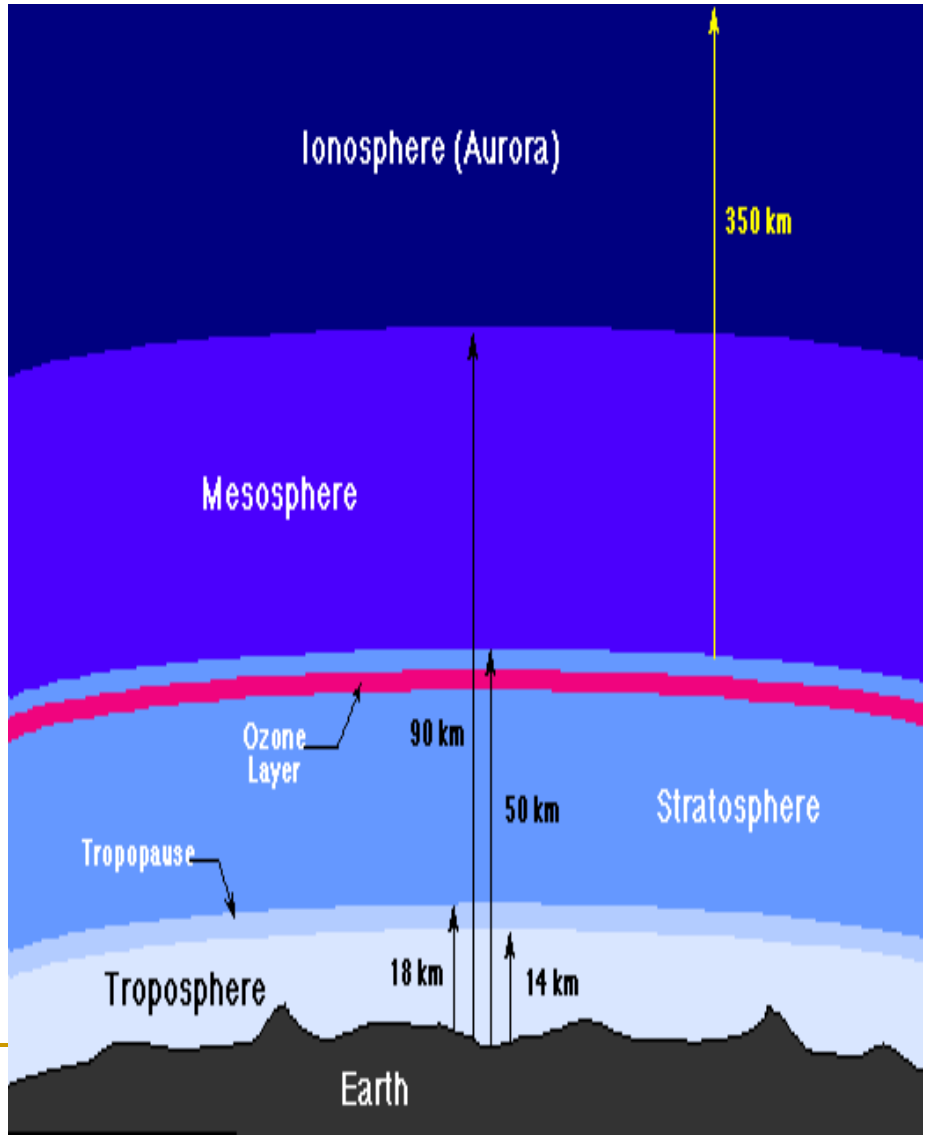
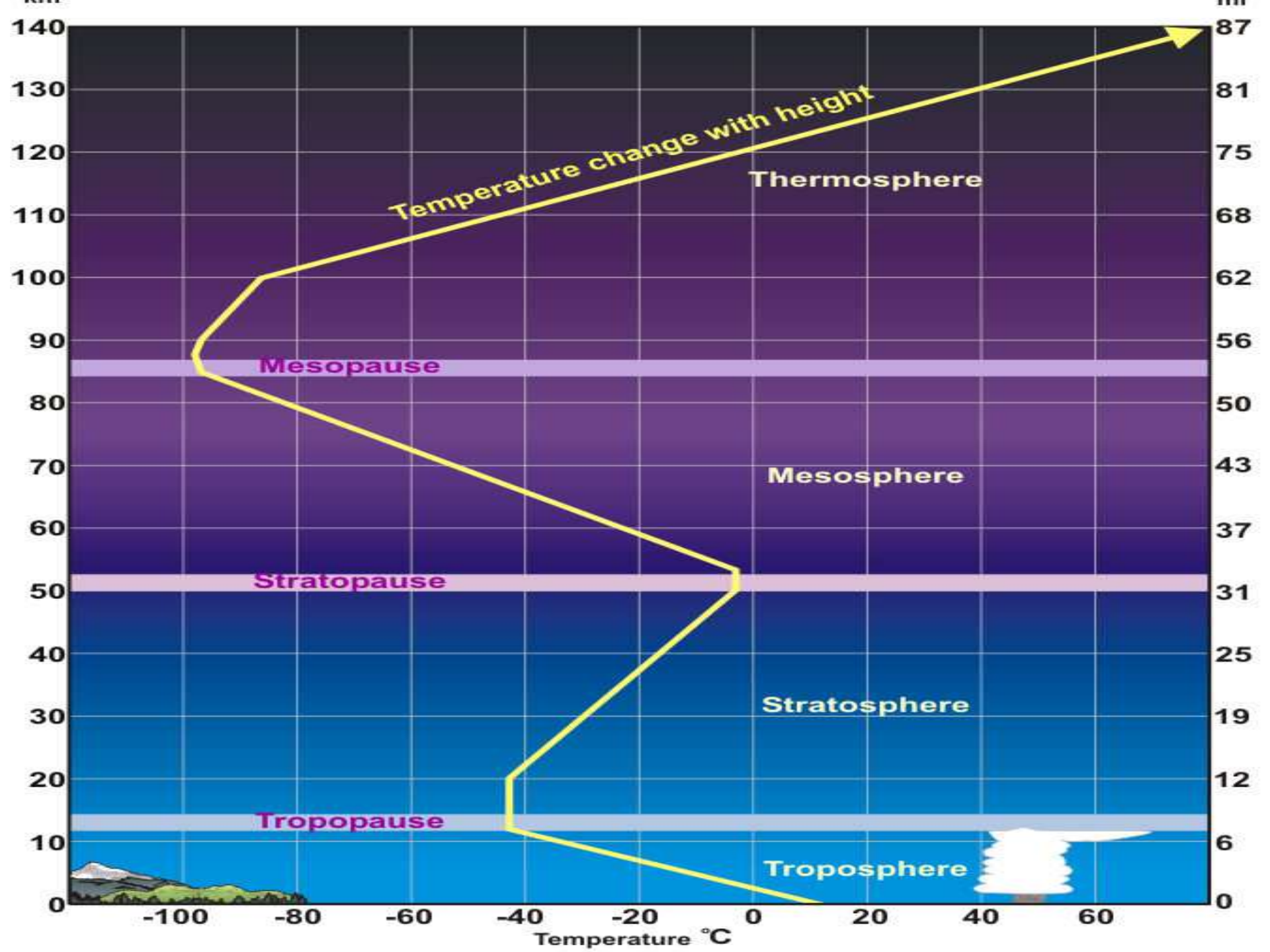
Temperature °C

THERMOSPHERE

- above the mesosphere and extends to almost 600 km high
- temperature **increases** with altitude
- readily absorbs solar radiation
- Temperature can go as high as 1,500 °C
- reflects radio waves

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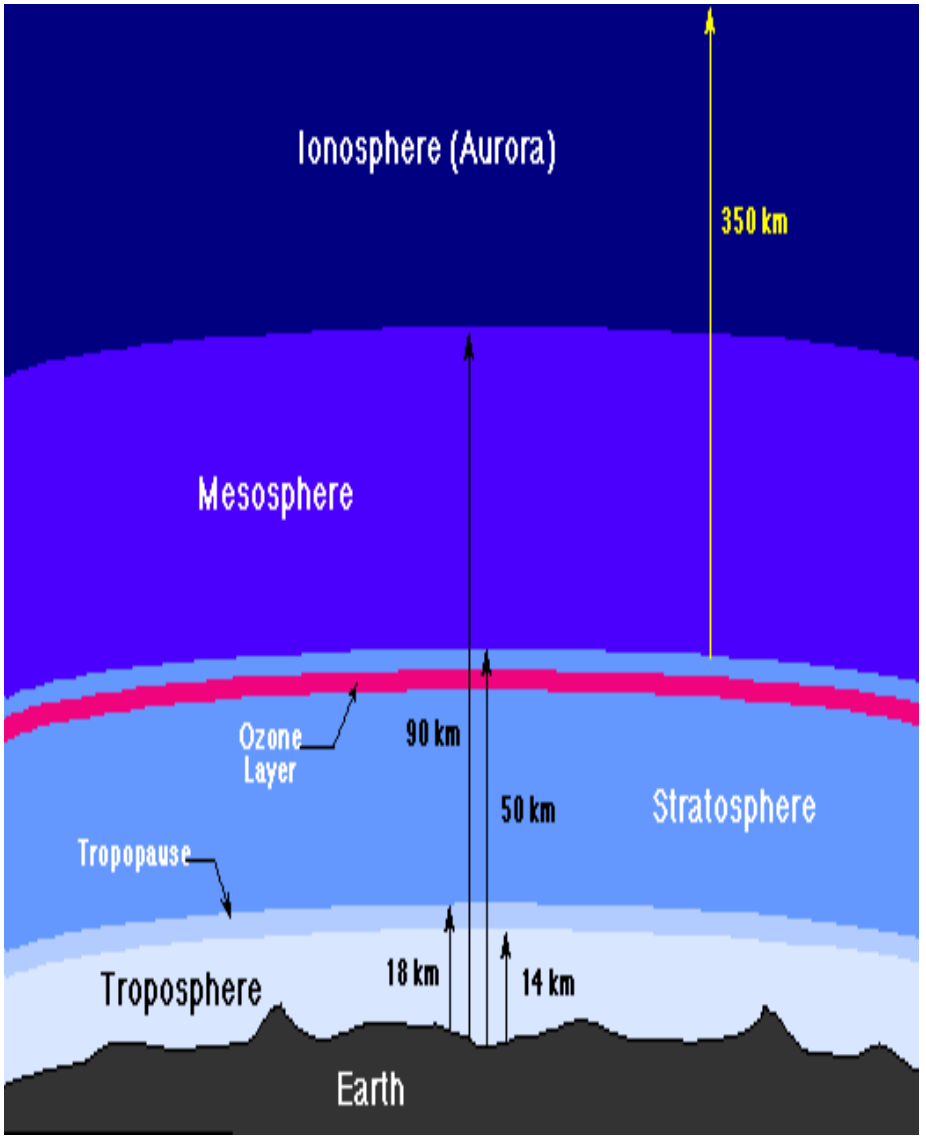
Temperature °C

EXOSPHERE

- the interface between Earth and space
- atoms and molecules can escape to space



Structure of Atmosphere

Stratospheric ozone is good ozone

—protects Earth from harmful UV radiation

—depletion is detrimental to life

Tropospheric ozone is bad ozone

—In the troposphere, ozone is a pollutant .

- **CFCs** (pollutant)

Ozone Depletion

- main cause is CFC pollution
- radiation from the sun causes the CFCs to break down
- releases one chlorine atom
- Chlorine atom reacts with ozone (O_3) molecules forming chlorine oxide(ClO) and oxygen gas (O_2).

Global Warming

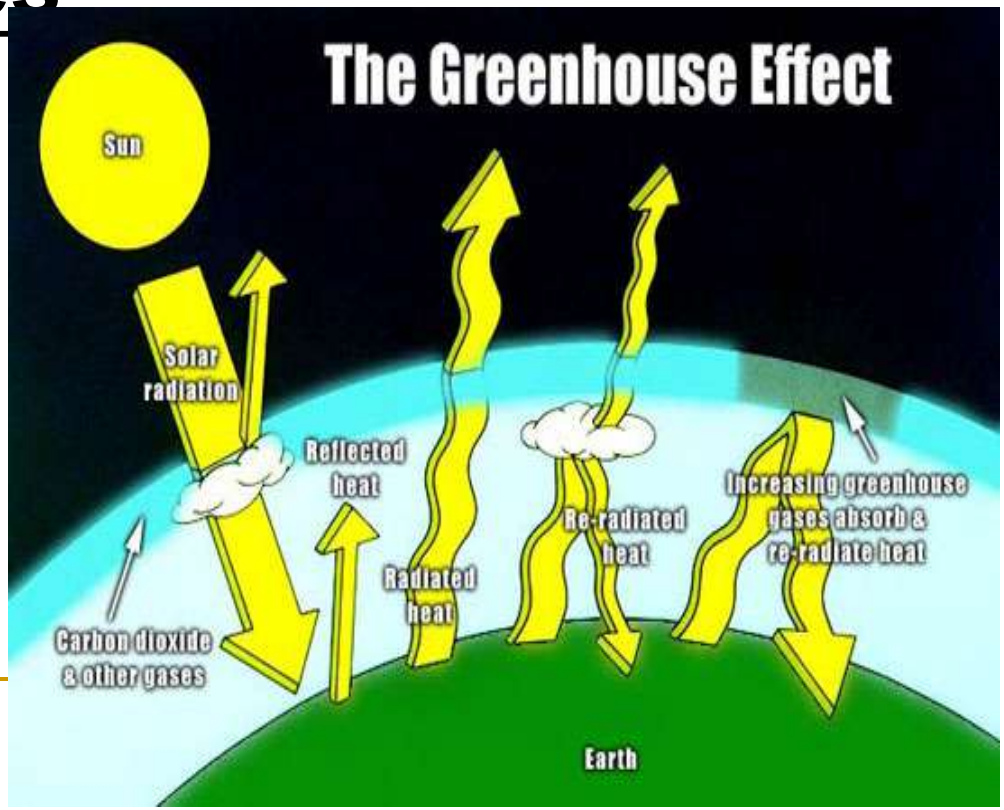
- An increase in Earth's average surface temperature caused by an increase in greenhouse gases.
- caused by Greenhouse Effect

Greenhouse Effect

- the trapping of heat by gases in the atmosphere

Greenhouse gases

> carbon dioxide
> sulfur dioxide
> ozone
> CFCs
> water vapor



Effects of Greenhouse Gas Pollution

- Global warming
  - > ice in polar caps will begin to melt
  - > water in the ocean expands
  - > flooding in lowlands and coastal areas
  - > changes in weather patterns

Recall

Identify the layers of the atmosphere based on the given descriptions.

1. the layer where weather occurs
2. the coldest layer
3. the ozone layer is part of this layer
4. the hottest layer
5. the layer above the troposphere

I. DIRECTIONS: Match the items in column A with those in column B. Write the letter of the correct answer on your size 2.

A	B
____1. Troposphere	A. reflects radio waves
____2. Stratosphere	B. lowest layer in the atmosphere
____3. Ionosphere	C. highest layer in the atmosphere
____4. Exosphere	D. layer where jets fly to minimize the effects of weather.
	E. keeps most of the UV radiation from the sun from reaching the earth's atmosphere.

II. DIRECTIONS: Choose the correct answer from the words inside the parenthesis.

1. Compared to warm air, cold air is (**more dense**, **less dense, about the same density**) for a given volume.
2. The layer closest to the earth , where all weather changes take place is called the (**stratosphere, troposphere, exosphere, ionosphere**).
3. The layer after the mesosphere where air is very thin is called the (**exosphere, stratosphere, thermosphere, troposphere**).
4. The layer in which the temperature drops as altitude increases is called the (**exosphere, thermosphere, stratosphere, troposphere**).

III. DIRECTIONS: Answer in not more than 5 sentences.

Air pollution due to suspended particulate matter in the air -----primarily dust and smoke pose a major health problem to city dwellers. This is a concern not only in Metro Manila but all over the world, where urban cities are becoming highly industrialized.

1. What can factories do or implement to control air pollution that reaches the most affected layer of the atmosphere?
2. Write down at least one latest/recent discovery or breakthrough in utilizing other energy sources that create less air pollution.