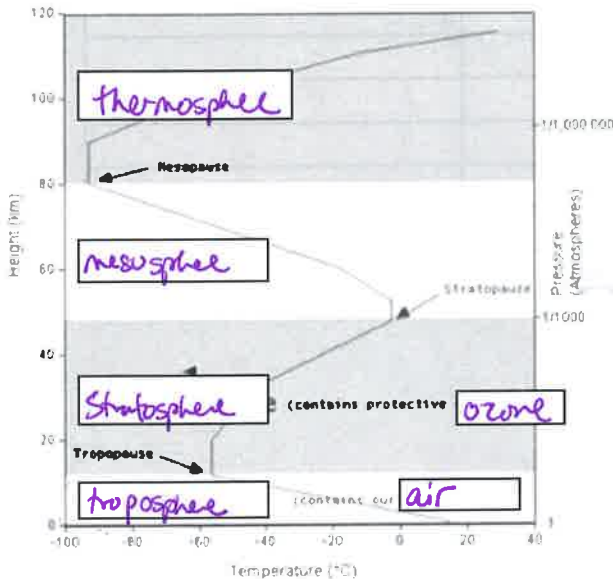


Chapter 17 Review

1. List and describe the 6 layers of the atmosphere

Layer name	Height	Temperature	Defining characteristics
Troposphere			all matter
Stratosphere			Ozone layers
mesosphere			
thermosphere		hot up to 2000°	
exosphere			space

2. Label the diagram with the layers of the atmosphere and their characteristics (in the blanks only).



3. List 3 characteristics of an area with high air pressure.

- warm
- sunny
- no clouds

4. Explain how clouds warm the earth and cool it down. Use Albedo in your explanation.

Warm	Cool
Hold heat (IR) absorbs & re-emt like a blanket	Reflect IR/Light bc. white cl/ albedo

5. Define the coriolis effect. Then, explain which direction the clouds go in the northern and southern hemisphere.

Coriolis effect air curves bc. earth rotates	
Northern clockwise	Southern counter clockwise

6. Explain what happens to each of the following things in an El Nino year or ENSO year.

Trade winds	
Thermocline	
Weather in South America	
Weather in Australia and southeast Asia	Drought/Fires
Weather in Canada	

7. Describe the Clean Air Act. Set pollution limits

8. What are the 6 main pollutants it regulates?

1. CO 2. Pb 3. SO<sub>2</sub> 4. Ozone 5. PM<sub>10</sub> 6. NO<sub>x</sub>

NO → CO<sub>2</sub>

9. Identify 3 major secondary pollutants.

1. Ozone

2. H<sub>2</sub>SO<sub>4</sub>

3. HNO<sub>3</sub> or PAN's

10. Write the chemical equations for the formation of photochemical smog. Then, write the names of the products.

Equation	Product name
<u>car engine</u> $N_2 + O_2 \rightarrow 2NO$	<u>Nitrogen monoxide</u>
$2NO + O_2 \rightarrow 2NO_2$	<u>Nitrogen dioxide</u>
$NO_2 + UV \rightarrow NO + O$	
$O + O_2 \rightarrow O_3$	<u>Ozone</u>
$NO + VOC \rightarrow PAN's$	<u>Paraacetyl nitrates</u>

11. What is the cause of photochemical smog? high heat combustion of fossil fuels

12. Write the chemical equations for the formation of industrial smog. Then, write the names of the products.

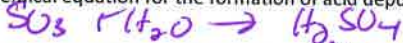
Equation	Product name
$C + O_2 \rightarrow CO_2 / CO$	
$S + O_2 \rightarrow SO_2$	
$2SO_2 + O_2 \rightarrow 2SO_3$	
$SO_3 + H_2O \rightarrow H_2SO_4$	
$H_2SO_4 + NH_3 \rightarrow (NH_4)_2SO_4$	

13. What is the main cause of industrial smog? burning coal

14. List 3 types of technology used to reduce air pollution.

- Scrubbers
- electrostatic precipitators
- Catalytic converter

15. Write out the chemical equation for the formation of acid deposition.



16. What is added to lakes to reduce acidification? limestone

17. Human health depends on having

- low amounts of ozone in the troposphere and stratosphere.
- enough ozone in the stratosphere and little ozone in the troposphere.
- high amounts of ozone in the troposphere and low amounts in the stratosphere.
- high amounts of ozone in the stratosphere.
- high amounts of ozone in the troposphere.

18. The most harmful forms of suspended particulate matter (SPM) are typically

- fine particles (PM-10) and ultra fine particles (PM-2.5)
- coarse particles (PM-15) and fine particles (PM-10)
- aerosols
- sea salt nuclei
- wild fire particles

19. All of the following are volatile organic compounds (VOCs)

- except*
- methane.
  - chlorofluorocarbon.
  - carbon monoxide.
  - benzene.
  - propane.

20. Environmentalists criticize the Clean Air Act of 1990 for all of the following *except*

- failing to establish primary ambient air quality standards.
- failing to increase the fuel-efficiency standards for cars and light trucks.
- doing too little to reduce emissions of greenhouse gases.
- relying primarily on pollution cleanup rather than pollution prevention.
- not adequately regulating emissions from inefficient, two-cycle gasoline engines.

21. Which of the following areas would be *least* likely to have a temperature inversion?

- an area near the coast
- an area in the central plains
- a valley surrounded by mountains
- the leeward side of a mountain range
- None of these answers.

22. Radon-222 is

- a nauseating gas.
- a product of organic decomposition.
- particularly concentrated in underground deposits of limestone and sandstone.
- basically a problem in confined spaces and underground wells over radon-containing deposits.
- not dangerous because it is easily seen and smelled.

23. Years of smoking and exposure to air pollutants can contribute to the incidence of

- emphysema.
- chronic bronchitis.
- lung cancer.
- asthma.
- All of these answers.

1. Explain or draw how ozone is created in the stratosphere.

2. What radiation does ozone absorb in the stratosphere? UV-C

3. Create a **double bubble map** comparing and contrasting ground level ozone with stratospheric ozone.

Both O<sub>3</sub>  
Both absorb  
UV/IR

4. List 5 effects of UV radiation.

1. Skin cancer
2. cataracts
3. Reduced photosynthesis of plants & productivity
4. Damage algae
5. disrupt ocean food webs

6. What are the 2 types of molecules that are responsible for destroying the ozone layer? CFCs and

HCPs / Halons

7. Explain or draw how these molecules destroy the ozone layer.

8. What are the 2 main sources of these molecules? condens refrigerators and

aerosols

9. What is the treaty signed to reduce these gasses?

Montreal protocol

10. Why is this treaty groundbreaking?

1st international cooperation

11. Identify 2 ways to reduce the hole in the ozone layer.

1. BAU ODS

2. use altmaki

12. Where is the "hole" in the ozone layer? Antarctic What time of year (month) is the "hole" appearing? Sept/Oct

