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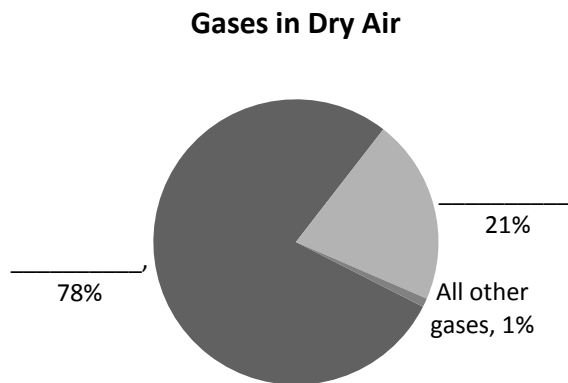
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Guided Reading Chapter 16: The Atmosphere

Section 16-1: The Air Around You

1. The condition of Earth's atmosphere at a particular time and place is called _____.
2. How does Earth's atmosphere make conditions on Earth suitable for living things?
3. Label the two larger pieces of the graph with the gases they represent.



4. Circle the letter of each sentence that is true about nitrogen.
 - a. It is essential to living things.
 - b. It is found in proteins.
 - c. It is needed for growth and repair of cells.
 - d. It is obtained directly from the air by all living things.
5. Circle the letter of each sentence that is true about oxygen.
 - a. It is needed by animals but not plants.
 - b. It is needed to release energy from food.
 - c. It is released by fuels when they burn.
 - d. It forms ozone when it interacts with lightning.

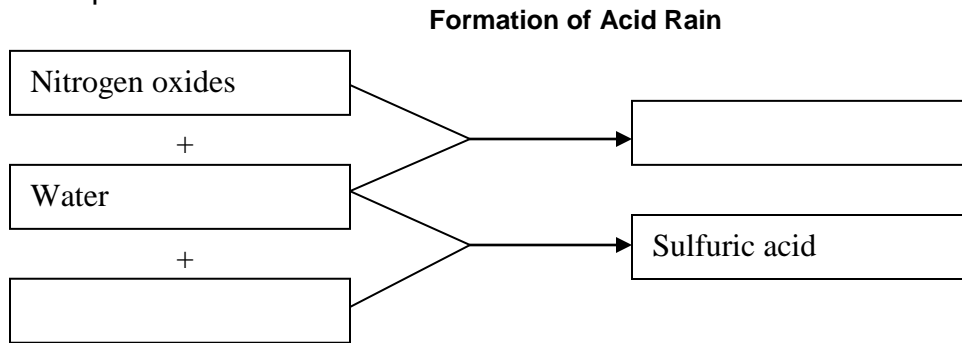
6. Circle the letter of each sentence that is true about carbon dioxide.
 - a. It is essential to life.
 - b. It is given off by animals as a waste product.
 - c. It is used by animals to digest food.
 - d. It is needed by fuels to burn.
7. Is the following sentence true or false? Carbon dioxide alone makes up almost 1 percent of dry air.
8. Water in the form of a gas is called _____.
9. Is the following sentence true or false? Water vapor is the same as steam.
10. What role does water vapor play in Earth's weather?
11. What particles does air contain?

Section 16-2: Air Quality

1. Harmful substances in the air, water, or soil are known as _____.
2. How can air pollution affect human health?
3. Circle the letter of each sentence that is true about the causes of air pollution.
 - a. Some air pollution occurs naturally.
 - b. Much of air pollution is caused by human activities.
 - c. Motor vehicles cause almost half the air pollution from human activities.
 - d. Factories and power plants cause a little more than half of all air pollution.
4. What are some natural sources of particles in the atmosphere?
5. The average number of pollen grains in a cubic meter of air is known as the _____.
6. The particles in smoke that give it its dark color are _____.

7. The brown haze that forms over sunny cities like Los Angeles is called _____.
8. Circle the letter of each sentence that is true about photochemical smog.
- It is caused by the action of sunlight on chemicals.
 - It forms when particles in smoke combine with water droplets in air.
 - It forms when nitrogen oxides and hydrocarbons react with each other.
 - It is a mixture of ozone and other chemicals.
9. What effects does ozone have on people and things?
10. Is the following sentence true or false? One result of air pollution is acid rain.

11. Complete the flow chart.



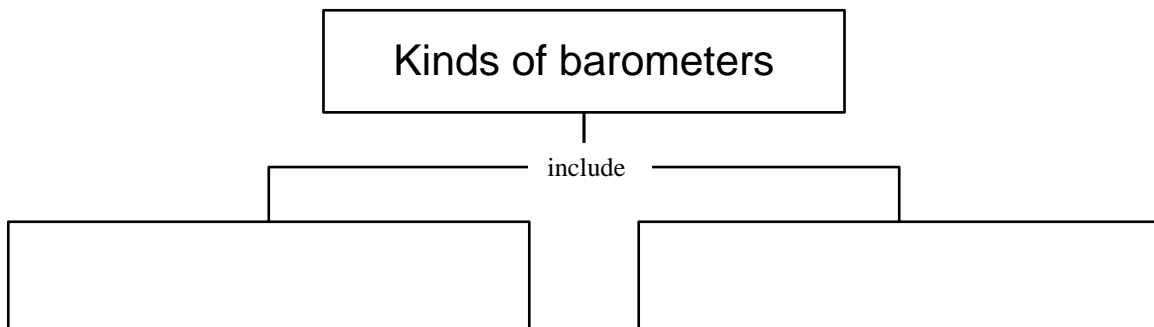
12. Is the following sentence true or false: Burning coal that is low in sulfur produces sulfur oxides.
13. Rain that contains more acid than normal is known as _____.
14. How can acid rain affect trees such as pines and spruce?
15. How can acid rain harm lakes and ponds?
16. What are some laws and regulations that have been passed to reduce air pollution?
17. Is the following sentence true or false? Air quality in this country has worsened over the past 30 years.
18. Is the following sentence true or false? The air in many American cities is still polluted.

Section 16-3: Air Pressure

- Circle the letter of each sentence that is true about air?
 - Air has mass because it is composed of atoms and molecules.
 - Because air has mass, it has density and pressure.
 - The more molecules in a given volume of air, the greater its density.
 - The greater the density of air, the less pressure it exerts.
- Complete the table.

Properties of Air	
Property	Definition
	Amount of mass in a given volume of air.
	Weight of the air pushing down on an area.

- Why doesn't air pressure crush your desk?
- Is the following sentence true or false? Falling air pressure usually indicates that a storm is approaching.
- An instrument that is used to measure change in air pressure is a(n) _____.
- Complete the concept map.

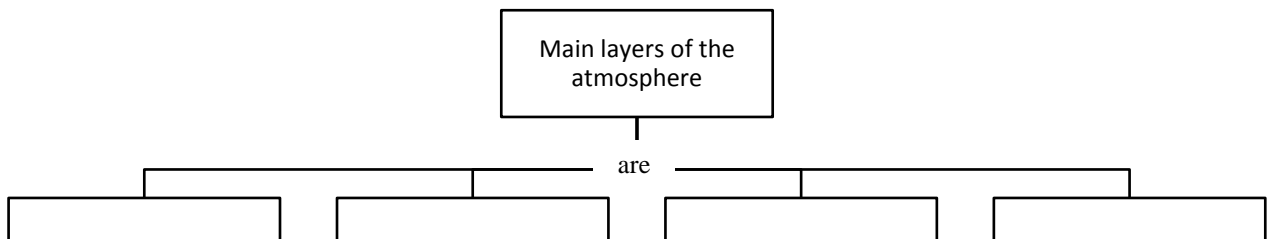


- Is the following sentence true or false? The first barometers invented were aneroid barometers.
- Why are aneroid barometers often more practical than mercury barometers?
- Two different units used to measure air pressure are _____ and _____.

10. If the air pressure is 30 inches, how many millibars of air pressure are there?
11. Another word for elevation, or distance above sea level, is _____.
12. Is the following sentence true or false? Air pressure increases as altitude increases.
13. Is the following sentence true or false: As air pressure decreases, so does air density.
14. Why is air pressure greater at sea level than at the top of a mountain?
15. Explain why mountain climbers sometime bring tanks of oxygen along with them on their climbs.
16. Is the following sentence true or false? As altitude increases, so does air density.
17. Circle the letter of the sentence that helps explain why you would have more difficulty breathing at high altitudes than at sea level.
 - a. Air pressure is higher at high altitudes.
 - b. Density of the air is greater at high altitudes.
 - c. The percentage of oxygen in the air is lower at high altitudes.
 - d. The amount of oxygen in each breath is less at high altitudes.

Section 16-4: Layers of the Atmosphere

1. The four main layers of the atmosphere are classified according to changes in _____.
2. Complete the concept map.



3. Circle the letter of each sentence that is true about the troposphere.
 - a. It is the lowest layer of Earth's atmosphere.
 - b. It has less variable conditions than other layers.
 - c. It is where Earth's weather occurs.
 - d. It is the shallowest layer of the atmosphere.
4. Is the following sentence true or false? The troposphere contains almost all of the mass of the atmosphere.
5. Is the following sentence true or false? As altitude increases in the troposphere, temperature also increases.
6. How does the depth of the troposphere vary?
7. Is the following sentence true or false? At the top of the troposphere, the temperature stays constant.
8. How far does the stratosphere extend above the Earth's surface?
9. Circle the letter of each sentence that is true about the stratosphere.
 - a. The temperature of the lower stratosphere is about -60°C .
 - b. The upper stratosphere is colder than the lower stratosphere.
 - c. The upper stratosphere contains a layer of ozone.
 - d. The ozone in the stratosphere reflects energy from the sun.
10. Why does a weather balloon keep increasing in volume as it rises through the stratosphere?
11. Where does the mesosphere begin?
12. Circle the letter of each sentence that is true about the mesosphere.
 - a. It is the middle layer of the atmosphere.
 - b. It is very cold, with temperatures near -90°C .
 - c. It protects the Earth's surface from being hit by most meteoroids.
 - d. It ends at 320 kilometers above sea level.
13. Circle the letter of each sentence that is true about the thermosphere.
 - a. It is the outermost layer of the atmosphere.
 - b. Its air is very thin.
 - c. It has no definite outer limit.
 - d. It starts at 320 kilometers above sea level.
14. Why is the thermosphere so hot?

15. Why would an ordinary thermometer show a low temperature in the thermosphere?

16. Complete the table.

Layers of the Thermosphere	
Layer	Distance Above Sea Level
	80-550 kilometers
	Above 550 kilometers

17. Brilliant light displays that occur in the ionosphere are called the _____.

18. Is the following sentence true or false? Satellites orbit Earth in the exosphere.