

Match each example below with the appropriate gas property it illustrates.

- |  |                                 |
|--|---------------------------------|
| _____ 1. the fragrance of perfume spreads through the room           | a. compressibility              |
| _____ 2. smog forms over Atlanta during summer days                  | b. diffuses through other gases |
| _____ 3. a cylinder of oxygen used in a hospital                     | c. exerts pressure              |
|  | d. fills container              |
| _____ 4. a balloon is inflated with helium                           | e. has mass                     |
| _____ 5. a balloon filled with air weighs more than an empty balloon |                                 |

Match the variables used to describe gases to the correct unit.

- |              |                             |                |
|--------------|-----------------------------|----------------|
| _____ 7. kPa | _____ 11. mm Hg             | a. pressure    |
| _____ 8. °C  | _____ 12. atmospheres (atm) |                |
| _____ 9. mL  | _____ 13. L                 | b. temperature |
| _____ 10. K  | _____ 14. °F                | c. volume      |

Complete the following statements by writing “decreases,” “increases,” or “remains the same” on the line provided.

As a gas is compressed in a cylinder,

15. its mass \_\_\_\_\_.
16. the number of gas molecules \_\_\_\_\_.
17. its pressure \_\_\_\_\_.
18. its volume \_\_\_\_\_.
19. the distance between gas molecules \_\_\_\_\_.
20. its density \_\_\_\_\_.

**Complete the following statements about the nature of gases as presented in the kinetic molecular theory by filling in the appropriate word (s) from the list below.**

kinetic energy  
pressure

no force  
random motion

perfectly elastic  
zero

22. Gas particles exert \_\_\_\_\_ on one another.
23. Gas molecules are said to be in \_\_\_\_\_.
24. The volume of gas particles themselves is said to be \_\_\_\_\_.
25. The collisions between gas particles are \_\_\_\_\_.
26. The temperature of a gas is a measure of the average \_\_\_\_\_ of the gas particles.

### **Math Problems**

27. A 7.0 liter balloon at room temperature ( $22^{\circ}\text{C}$ ) contains hydrogen gas. If the balloon is carried outside to where the temperature is  $-3.0^{\circ}\text{C}$ , what volume will the balloon occupy?
28. A 5.0 liter tank of oxygen gas is at a pressure of 3 atm. What volume of oxygen will be available if the oxygen is used at standard pressure?
29. A 500 liter volume of helium gas is at a pressure of 750 mm Hg and has a temperature of 300K. Assuming the volume is kept constant, what is the pressure exerted by this gas at standard temperature?
30. Nitrogen (80 kPa), oxygen (21.0 kPa), carbon dioxide (0.03 kPa), and water vapor (2.0 kPa) are the usual atmospheric components.
- What is the total atmospheric pressure in kPa?
  - Which gas (nitrogen, oxygen, carbon dioxide, or water vapor) molecules would you expect to be moving the fastest? Why?