

## Concept Review

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### Section: Characteristics of Gases

Complete each statement below by underlining the correct word or phrase in brackets.

1. Gases have unique properties because the distance between gas particles is much [greater than, smaller than] the particles of a liquid or a solid. In contrast to solids and liquids, gases [partially, completely] fill their containers.
2. Gases are considered [liquids, fluids] because their particles [can, cannot] move past each other easily and are thus able to flow. Gas particles can be forced closer together by applying pressure to them, thus [decreasing, increasing] their volume.
3. Gases have much [higher, lower] densities than do liquids and solids. Because of the [large, small] distance between gas particles, much of the space occupied by a gas is [vibrating, empty].
4. According to the kinetic-molecular theory, gas particles travel relatively [long, short] distances before colliding with each other. These collisions with each other and with the walls of their container result in [pressure, fluid]. These collisions are perfectly elastic; that is, energy is [completely, inversely] transferred from one particle to another.
5. Although gases [are, are not] dense, they [do, do not] have mass, therefore in a gravitational field they also [have, do not have] weight. As gas particles are attracted by Earth's gravity, they collide with each other and with Earth's surface, creating [the atmosphere, air pressure]. Pressure is the amount of force exerted per unit area of [volume, surface].
6. Air is [less dense, denser] as you move closer to Earth's surface because the weight of atmospheric gases at any elevation compresses the gases below them. At high altitudes, less dense air exerts [more, less] pressure.
7. The kinetic-molecular theory states that particles of matter are in constant rapid, random motion. The average kinetic energy of random motion is [proportional, inversely proportional] to temperature in kelvins. This means that heat [decreases, increases] the energy of random motion of a gas.

**Concept Review** *continued*

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**In the space provided, write the letter of the description that best matches the term or phrase.**

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| _____ 8. pressure                                 | a. the force that will increase the speed of a 1 kg mass by 1 m/s each second that the force is applied   |
| _____ 9. newton (N)                               | b. a unit of pressure equal to a force of 1 N on an area of 1 m <sup>2</sup>                              |
| _____ 10. pascal (Pa)                             | c. force exerted per unit area  |
| _____ 11. one standard atmosphere (atm)           | d. at sea level, the pressure necessary to maintain a mercury column in a barometer at a height of 760 mm |
| _____ 12. standard temperature and pressure (STP) | e. standard conditions for a gas at 0°C and 1 atm   |

**Solve the following problem and write your answer in the space provided.**

- 13.** Convert the pressure of 750 mm Hg to atmospheres.