

Gas Systems

System 1

Investigate the relationship between the volume and temperature of a gas sample at constant pressure and amount.

System 2

Investigate how the number of gas particles affects the pressure of a gas sample.

System 3

Compare and interpret pressure vs. volume relationships of gas samples at different temperatures.

System 4

Investigate the average speed (distance per unit time) of particles in a gas as a function of pressure, volume, amount, or temperature.

System 5

Investigate the average number of collisions between particles or with the container walls in a gas sample as a function of pressure, volume, amount, or temperature.

System 6

Investigate any of the above systems using different kinds of particles or combinations of particles.

System 7

Investigate any other gas system or investigate a modification of any of the above systems.

Research Statements

Use evidence from the MoLE simulation to prove or disprove the following statements.

1. The total pressure of a combination of gases is equal to the sum of the individual pressures exerted by each gas.
2. If you increase the pressure on a gas sample by decreasing the volume, the gas particles will speed up.
3. The pressure exerted by a gas depends on its molar mass.
4. The speed of a gas particle depends on its molar mass.
5. The kinetic energy of a gas particle depends on its molar mass.
6. Gas particles slow down when they collide with the walls of a container.
7. The speeds of gas particles are not affected by collisions with other gas particles.
8. The average speed of two like gas particles before a collision is equal to the average speed after the collision.
9. The average speed of two unlike gas particles before a collision is equal to the average speed after the collision.