Kinetic Molecular Theory

Read from **Lesson 4: Kinetic Molecular Theory** in the **Chemistry Tutorial Section, Chapter 10** of **The Physics Classroom**:
Part a: Characteristics of the Model Part b: Explaining Ideal Gas Behavior Part c: Get Real

1. According to the kinetic molecular theory, which of the following describes an ideal gas. Select all the correct options.
   a. Particles have no attractive forces between them.
   b. These gases have a high density.
   c. These gases create energy when their particles collide.
   d. The distance between particles is large compared to the size of the particle.
   e. These gases are diatomic.
   f. An increase in the temperature of the gas will cause particles' speed to increase.
   g. Particles move in constant but predictable paths.
   h. These gases have definite volumes but not definite shapes.

2. Answer these questions using the kinetic molecular theory as the basis for your answer.
   a. How would a gas respond if its container could decrease in size while still allowing the particles to move freely?

   b. Consider a gas in a sealed container. How would the pressure change if all the gas particles began moving at twice their normal speed?

   c. Why do gas particles in a crowded room collide randomly rather than gathering in the corners of the room?

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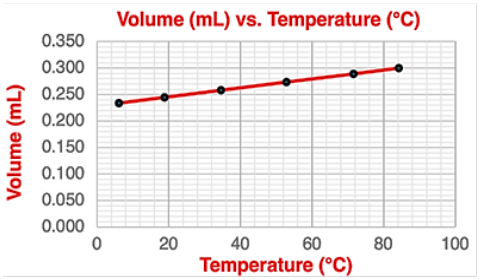
Gases and Gas Laws

3. A sample of an ideal gas is heated in a rigid container with a movable piston, maintaining constant pressure throughout the heating process. Data on the volume and temperature were recorded at various intervals during the experiment, with the results displayed to the left. Aaron Agin and Mollie Cule are debating the outcome. Aaron argues that there is an error in the data, claiming that the volume of a gas cannot change if the pressure remains constant. Mollie disagrees, asserting that the results are as expected. Who is correct, and why?



4. Answer the following questions about the kinetic molecular theory to obtain clues about the words hidden in the word search. Letters to spell out each word are used once. Words will zigzag around the puzzle and all letters will be used.
   a. What term measures the average kinetic energy of a gas?
   b. What kind of interaction is absent between particles in an ideal gas?
   c. Which Dutch scientist made distinctions between real gases and ideal gases?
   d. What type of gas particle collision occurs without any loss of energy?
   e. The kinetic form of this describes motion:
   f. What term refers to the interaction that occurs when gas particles come into contact?

S I L F O C

I A T L R E

O R L U O C

N E A R R E

P W A E G Y

M R N L E T

E E E A S I

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