



High School Science Virtual Learning

Chemistry

Kinetic Molecular Theory and Gases

May 4th, 2020

Chemistry
Lesson: May 4th 2020



Objective/Learning Target:

The learner will be able to describe the assumptions of the Kinetic Theory as Gases and Gas Pressure and Define the relationship between Kelvin Temperature and Average Kinetic Energy (KE)



Bell Ringer

1. How do the three states of matter compare in terms of temperature for a given substance.
2. What is Kinetic Energy?



Bell Ringer Answers:

1. Temperature from lowest to highest: solid < liquid < gas.
2. Kinetic energy is the energy of motion, in terms of a sample of matter it refers to the motion of the particles in the sample.



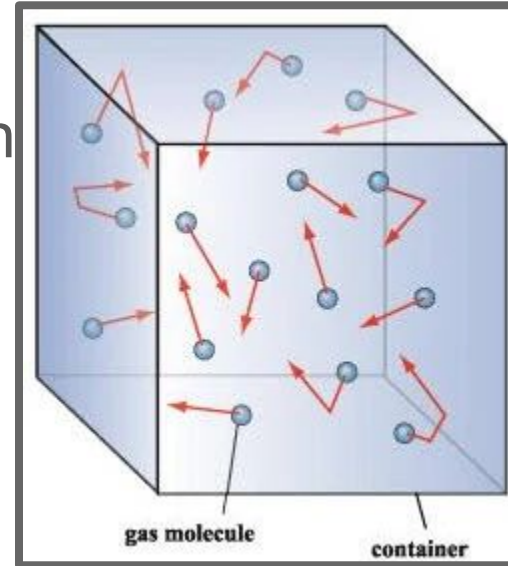
Kinetic-Molecular Theory of Matter

Broadly stated the **Kinetic-Molecular Theory of Matter** states that all matter is made of small particles (atoms, ions, or molecules) that are in constant random motion. Since gases are free to move about this is of particular importance to gas behavior. Following are the basic tenets of the Kinetic Theory of Gases.

1. Gases are composed of tiny particles that are in constant random motion.

Cont.

- Gas particles are so small compared to the volume occupied by the gas and the distance between particles that the particles themselves can be thought to occupy no volume.
 - Gas particles are constantly colliding with each other and the sides of their container, this results in gas pressure. These collisions are completely elastic, meaning no energy is lost.
- Cont.





4. There are no interactive forces (attractive or repulsive) between particles in a gas. (intermolecular and gravitational forces can be ignored)
5. The average kinetic energy (KE) of gas particles is proportional to the temperature of the gas on the Kelvin scale. All gases at the same temperature have the same Average KE.



Watch this video that further explains the Kinetic Molecular theory. In this video they talk about the gas laws, we will address those in later lessons.

[Kinetic molecular theory and its postulates- Professor Dave Explains \(6:59\)](#)



Questions

1. Use the Kinetic molecular theory to describe gas pressure.
2. Use the Kinetic Theory to explain why a gas fills its container.
3. Use the Kinetic Theory to explain why a gas is considered compressible while liquids and solids aren't.



Answers

1. Pressure is force over an area, like pushing on an object. Gas pressure is caused by the collisions, or bombardment, of the container walls by the particles. Compare it to the collisions on a roof during a hail storm.
2. Gases are in constant motion and collide elastically. They will keep going in a straight line until they hit another object, particle or container wall. Therefore they will keep spreading out until they fill their container. Think of kindergarteners let loose on a playground.



Answers

3. Since there is so much room between particles in a gas you can compress the gas. It would technically reduce the space between, but since the molecules takes up no space, theoretical you can continue to compress the gas infinitely.



More practice

[Quizizz KE Theory of Gases \(9 questions\)](#)

[Quizizz KE Theory of gases 2 \(6 questions\)](#)