

Mass, Volume & Pressure Memorandum

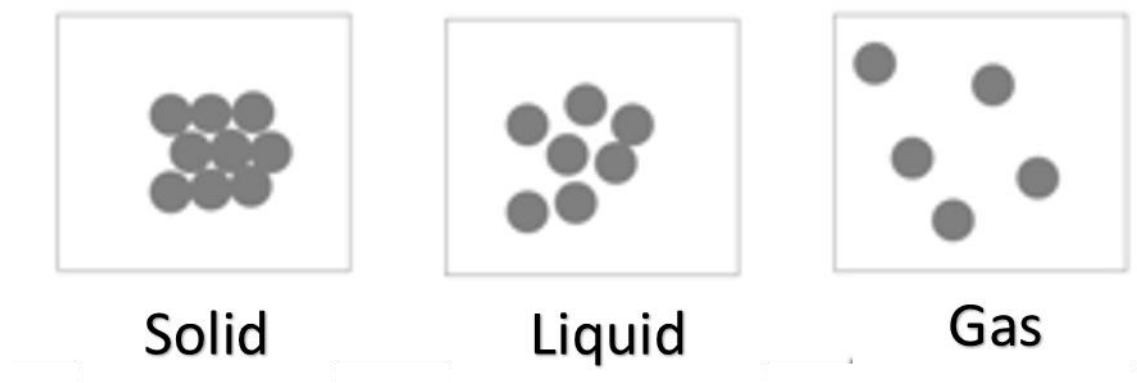
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QUESTION 1:

- 1.1 Mass is the amount of matter an object consists of.
- 1.2 g or kg
- 1.3 Place water in a measuring cup. Take the reading of the water. Cover the object with water (enough to cover the entire object). Take another reading. Determine the difference between the two readings. Convert ml to g. Now you have the mass of the object. (1ml = 1g)
- 1.4 Density is the ratio between the mass and the volume of an object.
- 1.5



- 1.6 $\text{g} \cdot \text{dm}^{-3}$ or $\text{kg} \cdot \text{m}^{-3}$.
- 1.7 The density of ice is less than the density of water.

QUESTION 2:

- 2.1 Powder or foam.
- 2.2 Oil floats on water.
- 2.3 Vibrates.
- 2.4 The temperature of the molecules increase. Thus the kinetic energy of the molecules increase and the molecules start moving faster as the temperature increases. The temperature will increase until the liquid boils.
- 2.5 The particles of a liquid are visible but those of a gas are not. The particles of liquid move slower than those of a gas. Thus liquid has less kinetic energy than that of a gas. The volume of a gas is larger than that of a liquid.
- 2.6 Loses volume (shrinks)
- 2.7 The volume will expand until it converts into a liquid.
- 2.8 Train track. There are spaces between the iron rods so they can expand in the summer.

QUESTION 3:

- 3.1 Pressure is exercised due to the collisions between particles. Gas will exercise pressure onto the container when the particles collide with one another as well as against the edge of the container the gas is in.
- 3.2 Decreases the volume of the container or increases the temperature of the gas in the container.
- 3.3 Explain what the scattering of particles will look like if there are:
- 3.3.1 Particles will take on the form of the container and will change into a liquid or a solid if the gravitational forces between the particles are strong enough. However, the volume of the substance is smaller, because the particles will be closer together and move around less. The pressure will decrease as well as the temperature.
- 3.3.2 The particles will move further apart. The pressure on the container will increase. Particles will move faster and the temperature will rise.
- 3.4 .
- 3.4.1 The forces between the particles are very big in a solid.
In liquids the forces between the particles are smaller.
In gases the forces between the particles are the weakest.
- 3.4.2 Solids: almost no movement. The particles vibrate in one position.
Liquids: more free movement and the molecules glide over one another.
Gases: molecules move around freely.
- 3.4.3 Solids: spaces between the particles are very small.
Liquids: spaces between the particles are bigger.
Gases: particles are very far apart.
- 3.5 The atmospheric pressure in Cape Town is much higher than in Johannesburg. Thus the pressure on the ball will be higher and it needs to be pumped at a higher pressure.

QUESTION 4:

- 4.1 Mass is the amount of matter an object consists of.
- 4.2 m^3 or cm^3
- 4.2 Place water in a measuring cup (enough to cover the entire object). Measure the volume of the water. Place the irregular object in the water. Now measure the volume.
- 4.3 Density is the mass per volume.
- 4.4



Solid



Liquid



Gas

4.5 g/cm^3

QUESTION 5:

- 5.1 Cream floats on top of milk. Thus it can be easily separated from the milk.
- 5.2 Particles in a solid vibrate in one fixed position.
- 5.3 The particles start to vibrate faster. If the solid is heated enough the particles will break away from the crystal and move around freely in a liquid.
- 5.4 The forces between the liquid particles are relatively strong. The molecules will glide over one another. In a gas the particles move around freely, because the forces between the gas particles are very weak.
- 5.5 If a solid is heated, the particles will vibrate intensely. As the solid cools down, the kinetic energy will decrease as well as the vibration.
- 5.6 Train tracks are directly exposed to the sun. In the summer the tracks expand and in the winter they shrink. When the tracks are laid there must therefore be spaces between the tracks for expansion and shrinking.

QUESTION 6:

- 6.1 Pressure is the amount of collisions of particles as well as the speed of the collisions; with one another and the edge of the container.
- 6.2 The pressure on the container is caused by the collisions of particles with one another and against the container. The speed of the collisions exercised onto the container also plays a role in the pressure on the edge of the container.
- 6.3 Increases temperature and amount of particles in the container.
- 6.4 .
- 6.4.1 If there are strong forces between particles, they will be in solid form and the substance will take on its own form. The particles will vibrate in one spot.
- 6.4.2 If there are weak forces between the particles, they will move around freely within the container in gas form.