# Fluids

## Matter



Monday, January 7, 2019

# Review

Lets see what you already know!

Get out phone for a game of kahoot!



 <u>Matter</u> – anything that takes up space <u>and</u> has mass.

## It's EVERYTHING!! \*









\* Except for light...and energy...and you know...dark matter...and of course....antimatter : )







### Particle Theory of Matter

You should have learned about the particle theory of matter last year. It is the basis of this unit as well, and so it is important to understand and review the 5 statements!





CO<sub>2</sub> Man was made from 28 molecules of carbon dioxide and measures just 5 millionths of a millimeter from head to toe

### Particle Theory of Matter

1. Everything is made of particles (atoms or molecules)





- <u>Particle Theory of Matter</u>
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- 2. These particles are always moving





- Particle Theory of Matter
- 1. Everything is made of particles (atoms or molecules)
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Tap Water



Distilled

Diamond [110]

Particle Theory of Matter

- 1. Everything is made of particles (atoms)
- 2. These particles are always moving
- 3. All particles in a pure substance are the same – different substances are made of different particles

Silicon [112]







- <u>Particle Theory of Matter</u>
- 1. Everything is made of particles (atoms)
- 2. These particles are always moving (the energy (heat) determines the speed)
- 3. All particles in a pure substance are the same – different substances are made of different particles
- 4. There is space between the particles

oxygen carbon oxygen carbon dioxide Na 1

## Particle Theory of Matter

- 1. Everything is made of particles (atoms or molecules)
- 2. These particles are always moving (the energy (heat) determines the speed)
- 3. All particles in a pure substance are the same – different substances are made of different particles
- 4. There is space between the particles
- 5. The particles in a substance are attracted to one another – the strength of the attraction depends on the type of particles.



## The States of Matter

Although modern science has allowed scientists to discover several states of matter, there are only four that occur naturally. The state at which you will find any bit of matter depends on the level of energy contained within it at the time.

increasing energy



#### Solid

The molecules that make up a solid are arranged in regular, repeating patterns. They are held firmly in place but can vibrate within a limited area.



### Liquid

The molecules that make up a liquid flow easily around one another. They are kept from flying apart by attractive forces between them. Liquids assume the shape of their containers.



#### Gas

The molecules that make up a gas fly in all directions at great speeds. They are so far apart that the attractive forces between them are insignificant.



### Plasma

At the very high temperatures of stars, atoms lose their electrons. The mixture of electrons and nuclei that results is the plasma state of matter.



# Fluids

- Of the four naturally occurring states of matter, we will look at two of them; liquids and gases. Combined we refer to these states of matter as "Fluids." A fluid is defined as any substance that is able to flow or will change shape continually under a constant force.
- In this unit we will study fluids, the properties of fluids, and how humans take advantage of these properties. Our list of topics will include:
- Viscosity
  - Buoyancy

- Flow Rate
- Pressure

- Density
- Compressibility

- Hydraulics
  - Pneumatics
- To conclude, you are going to answer this question: Is peanut butter a solid or a fluid?