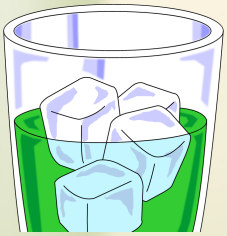
Solid, Liquid and Gases

Chapter 2



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Why does a substance change state?

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State of matter

Lesson 2:1

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How do you describe a solid?

How do you describe a liquid?

How do you describe a gas?

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How do you describe a solid

A solid has a definite shape and volume

examples: ice, wood, gold bar

Particles of a solid

packed very closely together

tightly fixed position

particles vibrate in place (still in motion)

packed arrangement of particles cause it to have a definite shape and volume

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Types of solids

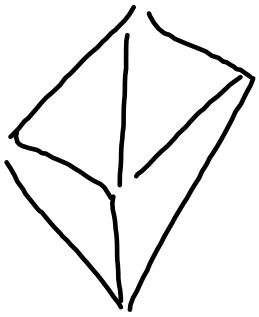
In many solids the particles form a regular repeating pattern

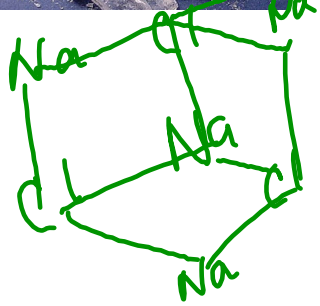
create crystals

solids made of crystals are called crystalline solids

ex. salt, sugar, ice, flourite

have distinct melting points





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Amorphous solids

particles not arranged in any regular pattern

doesn't melt at distinct temperatures

become softer or changes into another substance

ex. glass, rubber, plastic, wax

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How do you describe a liquid

A liquid has a definite volume but not shape of its own

takes the shape of whatever container it is in

causing a change in shape and not volume

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Particles of a liquid

packed together almost as closely as a solid

move around freely

because they are free to move= no definite shape

liquid can flow from one place to another

also called a fluid- meaning substance that flows

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Properties of a liquid

surface tension- an inward force or pull among the molecules on a liquid that brings the molecules on the surface closer together

ex. water droplets- water molecules attracted strongly

molecules on the surface pulled toward the ones beneath surface

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Viscosity

A liquid's resistance to flow

A liquid's viscosity depend on the size and shape of the particles and the attraction between particles

Some liquids flow more easily than others

high viscosity= slow moving= honey

low viscosity = fast moving = water, vinegar

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How do you describe a gas

A gas has neither a definite shape or definite volume

Particles will move to fill whatever container its in

As gas particles move, they spread apart, filling all available space

When working with gas, it is important to know its volume, temperature and pressure

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Volume

Amount of space matter fills up

measured in cm^3, m^3, mL or L

because particles move, the volume of a gas= volume of container

ex helium- compressed in a tank

expands in a balloon

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Pressure

The pressure of the gas is the force of its outward push divided by the area of the wall of the container

Because gas particles collide, they push on the walls of the container

Measured in pascals (Pa) or kilopascals (kPa)

Pressure = force/area

Firmness of gas filled objects comes from the pressure of the gas

ex. air inside an inflated ball is greater than air pressure

High pressure = high concentration of gas particles

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Temperature

Temperature is the measure of the average energy of random motion of particles in matter

faster particles= higher energy=higher temperatures

room temperature - 20^{o}C

particles move at about 500 m/s

(twice the cruising speed of a jet)

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Lesson 2:1 States of Matter

The fixed, closely packed arrangement of particles cause a solid to have a definite shape and volume

Because its particles are free to move, a liquid has no definite shape. However, it does have a definite volume

As gas particles move, they spread apart, filling all the space available. Thus a gas neither has a defitnie

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