Chp 2: Lect 1 & 2 : The Properties of Matter : Student Copy

2 pts ec printing

What do the following objects have in common?

Give up? They are all made up of atoms and molecules, which means, they are all types of _____
So basically, everything in the universe is matter. Cupcakes are matter, baby elephants are matter, 8th graders are matter. Matter is everything around you. Matter is anything made of atoms and molecules. As of 1995, scientists have identified _____ states of matter - we will talk about these later. Matter is also anything that has _____ and _____
Let's take this carrot: Let's get closer and closer to the smaller parts of the carrot-carrot atoms! These small parts of the carrot are called _____Anything you see and can feel is made of atoms. All atoms are too small to be seen with the naked eye or even a microscope, although there are some new types of microscopes that are now able to see larger atoms such as gold. Matter is made up of atoms! All matter is the same because all _____
Matter is also different because objects can be made up of different kinds of atoms. Gold is made of one kind of atom-gold atoms. Salt is made up of two different kinds of atoms-sodium atoms and chloride atoms.

_____

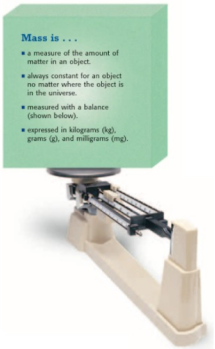
Mass is how much there is of an object. Mass is related to how much something weighs. Mass and weight are two different things. The unit for mass is a gram. A nickel has the mass of about one gram. Objects that take up space and have mass are called _____ Everything around you is made up of matter. Chocolate cake is made up of matter. You are made of matter. If you are having trouble understanding matter, look all around you. You can see matter makes up the walls of your house and your classroom. Matter is large and matter is small.

M is for Mass

Mass is the _____in an object. Mass is also affected by gravity. _____ is a force of attraction between two objects. This force causes all objects to "pull" towards each other.The more mass two objects have; the stronger the pull. The closer the objects are to each other; the stronger the pull.

How are mass & weight different?

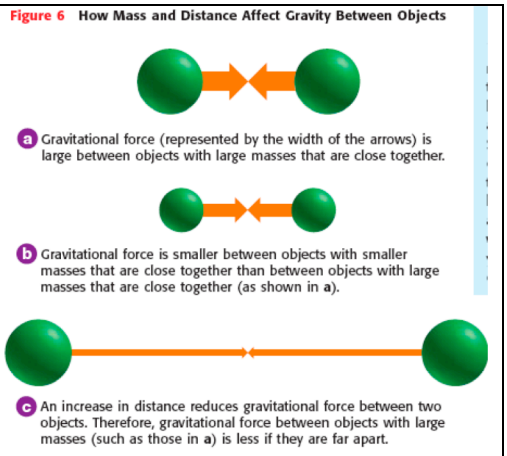
_____
A measurement of the amount of matter in a object (grams).



_____
A measurement of the gravitational force of attraction of the earth acting on an object.

What about weight?

Weight is the measure of _____ on an object. Compare a brick to a sponge.The brick has mass. Earth has mass. Therefore, the brick and Earth are attracted to one another.The weight of the brick is a measure of this attraction by Earth. Now look at the sponge. It is the same ***size*** as the brick, but its ***mass*** is less.



Therefore, the sponge's attraction to Earth is less. It's weight is also less than the brick.

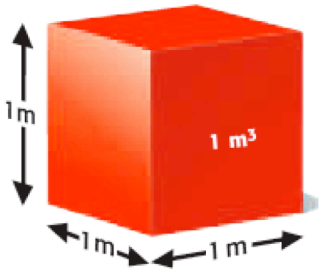
Massive Confusion

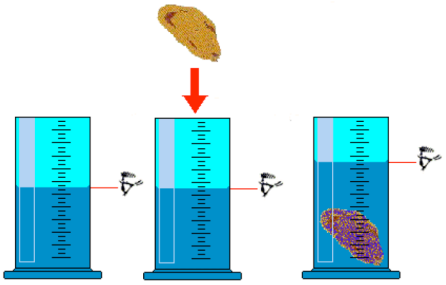
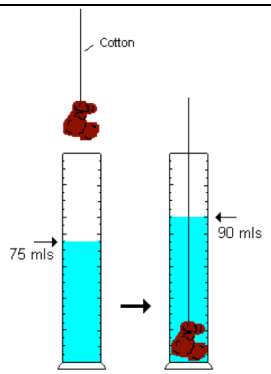
On Earth, gravity is the same everywhere. Sooo…. On Earth, mass and weight are the same thing. BUT, if you were to go to the moon, they would be different.The moon has less gravitational pull, so the attraction between you and the moon would be less. On the moon, your weight is less.Your mass remains the same though.

Chp 2: Lect 2 : Properties of Matter: V is for Volume Student copy

Briefly, volume is the _____something takes up. Whether it's a speck of dust or Jupiter, all matter takes up space.

Measuring the volume of…

_____ Graduated cylinder Displacement method Measured in liters (L) & milliliters (mL)		_____ Length x width x height		_____ Since a gas expands to fill its container, if you know the volume of the container, you know the volume of the gas.	

_____ The mass of a substance divided by its volume. Density is an important physical property. Density is the mass of a substance per unit volume. Volume is the amount of space an object occupies.		_____ Properties that do depend on the amount of matter present. _____ A measurement of the amount of space a substance occupies. _____	

Physical Properties

Investigate: Paper Bag Secrets **List your observations without looking in the bag.** **What do you think the object is?** _____	**Did you properly identify the object? If so, how? If not, why not?**

How can you describe them if you didn't know what they were? Describing objects by using : _____ _____uses an object's _____ It doesn't matter what your object was, everyone used similar descriptions. What were some of the "properties" you listed about your object? Size, Weight & Mass, Shape, Odor, Sound, etc. After opening your bag, you were able to list even more properties such as color, texture, etc.

Common Physical Properties

Physical properties can be observed or measured _____changing the identity of the matter. Basically, properties you notice when using one of your five senses: Feel - **mass, volume, texture** Sight – **color**, Hear, Smell, Taste

Physical properties of matter are categorized as either: _____

_____Properties that do not depend on the amount of the matter present.

_____ _____

_____How shiny a substance is.

_____- The ability of a substance to be beaten into thin sheets.

_____- The ability of a substance to be drawn into thin wires.

_____- The ability of a substance to allow the flow of energy or electricity**.**

_____- How easily a substance can be scratched.

_____The temperature at which the solid and liquid phases of a substance are in equilibrium at atmospheric pressure.

_____- The temperature at which the vapor pressure of a liquid is equal to the pressure on the liquid (generally atmospheric pressure).

Density is a very important property. It is the amount of matter in a given volume. _____

$$D = \frac{m}{V}$$

Density (g/mL or g/cm³) — Mass (kg or g) — Volume (mL or cm³)

_____

Properties of all objects : _____All objects take up space. Your computer is taking up space on the desk. You are taking up space on the chair. Remember all objects take up space and have mass. You use your sense of taste and smell to tell the difference between spinach and an orange.
The measurement of mass and other characteristics that can be seen without changing how that object looks are its physical properties. When you look at oranges, you know that they are oranges because of their color, shape, and smell. Mass, color, shape, volume, and density are some physical properties. The answers to the question about the present are physical properties. **A property describes how an object** _____
Properties are constantly changing... Matter is constantly changing. Ice in your soda melts, glass breaks, paper is ripped. When ice in your soda melts where does it go? What does it become?

Physical vs. Chemical Properties:

Physical properties:
observe without changing the identity of the substance
Chemical properties:
observe only when the identity changes
How do you know if it is chemical or physical?
If it CHanges, it's Chemical

Chemical properties
A common chemical property is _____.
Reactive to oxygen. Reactive to air. Reactive to water…
Notice that chemical properties aren't EASY to observe, unlike physical properties.

Comparing Physical and Chemical Properties

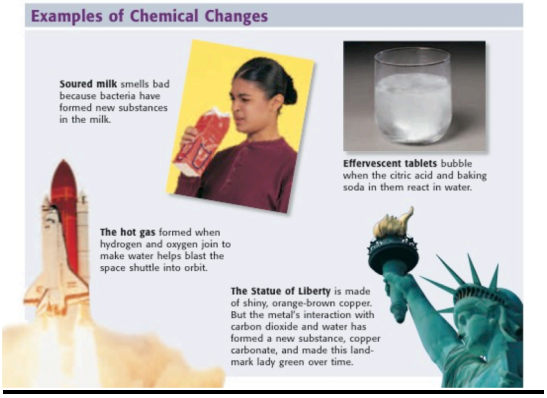
Substance	Physical property	Chemical property
Helium	less dense than air	nonflammable
Wood	grainy texture	flammable
Baking soda	white powder	reacts with vinegar to produce bubbles
Powdered sugar	white powder	does not react with vinegar
Rubbing alcohol	clear liquid	flammable
Red food coloring	red color	reacts with bleach and loses color
Iron	malleable	reacts with oxygen
Tin	malleable	reacts with oxygen

Physical Changes:

More Examples of Physical Changes

- Freezing water for ice cubes
- Sanding a piece of wood
- Cutting your hair
- Crushing an aluminum can
- Bending a paper clip
- Mixing oil and vinegar

Changes in matter that do not alter the identity of the matter itself. Changes that _____the identity of the substance.
You may or may not be able to undo a physical change.
For example: 1. Size 2. Shape 3. State - solid liquid gas
4. Dilutions The water doesn't turn into soil or macaroni. It remains water.
If it did change into soil or macaroni, your drink would taste terrible and you would have an example of a _____If you remember, ice is water in the solid state. When you drop the ice cube into the liquid, it begins to melt because the temperature is higher than that of the ice cube. It's like putting a snowman on your front lawn in July. The ice cube becomes liquid water. This is an example of a physical change. The solid water turned to liquid water.



Chemical Changes

Chemical changes *do* alter the identity of a substance. In other words, a chemical change is when something changes into an _____For example: Iron rusting, Wood burning, Copper turning to brass, Baking a cake, spoiled milk

Chemical properties-

These are properties that can only be observed by _____
A piece of paper burns and turns to a black substance. After the flame goes out you can no longer burn the new substance.
The chemical properties have been changed.
Milk needs to be in the refrigerator or else it will go bad. If you've ever seen or smelled spoiled milk, it is not a pretty sight. The milk gets a sour odor and becomes lumpy. Unlike physical changes, you cannot reverse chemical changes. You can melt ice to get water and freeze that water to get ice again. You cannot make milk unspoiled.

Common Errors:Ice melting, water freezing, water evaporating, and steam condensing are all examples of a state change. *These are _____changes, not chemical. Diluting a solution is a _____change, even if the color becomes more faint.

The Take Home Message

State changes, like melting, freezing, boiling, are all _____ changes.
The substance remains the same substance, it just changes what **STATE** it is in.

PROPERTY CHANGES

1 When water changes to ice, what kind of change has occured?

A A chemical change

B A physical change

C A train change

2 What type of change has occurred when a nail rusts?

A A nuclear change

B A physical change

C A chemical change

3 What does it mean when there is a physical change?

A Matter has changed from one substance into another

B Matter has changed size, shape or form

C Matter has morphed into anti-matter

4 What does it mean when there is a chemical change?

A There is a change in the size or shape of an object

B One substance has changed into another

C A solid changes into a chemical

5 What is an example of a chemical change that happens inside your body?

A Food being broken down by enzymes in your stomach

B Food being broken into small pieces by your teeth

C Your heart beating

6 What is an example of a physical change that happens inside your body?

A Food being broken down by enzymes in your stomach

B Food being broken into small pieces by your teeth

C Your heart beating

7 What type of change is weathering?

A A chemical change

B A physical change

C A seasonal changes

8 What chemical change produces table salt?

A Sodium and chlorine react with one another

B Pepper and sugar are mixed together

C A piece of salt cane is crushed into tiny pieces

9 Which of these is a chemical change that occurs over a long period of time?

A Adding chlorine to the pool

B Ice cream melting

C Metal rusting

10 What type of change has occurred when a glass breaks?

A A chemical change

B A physical change

C A psychological change

Video Notes: