

states of Matter

Viscosity
Ductility
Hardness

Physical Properties

malleability

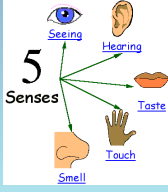
Melting and Boiling Points

Density
Solubility
Crystal form

Physical Properties

One of the physical properties of matter is its state.

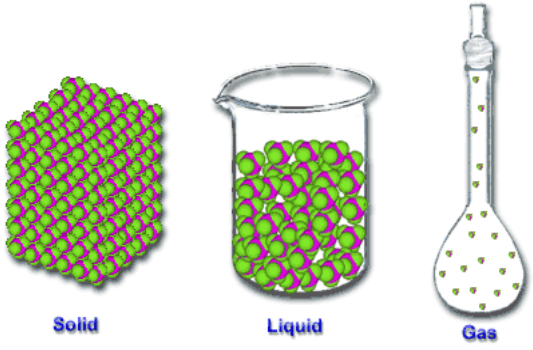
Another way to describe physical properties is using our senses.



What could we observe from each of the 5 senses?

- Sight:** color, bright, dull
- Hearing:** Bubbling, crackling, snapping
- Taste:** sweet, salty, bitter
- Touch:** Rough, soft, slimy,
- Smell:** Sweet, rotten,

1) **State**



Solid **Liquid** **Gas**


2) **Hardness**

The measure of the resistance of a solid to being scratched or dented.



Cool Fact: The Millenium Star (above) is the second largest flawless diamond at 203 carats. These types of diamonds are considered the rarest and the most valuable set of diamonds created. One of these only 10 carat diamonds cost in excess of 10 million dollars.

Rank the following substances by how hard you think they are
1 being soft
4 being hard



steel nails

glass

chalk

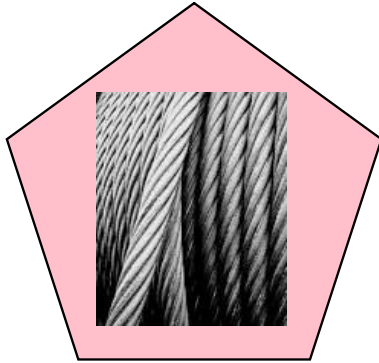
diamond

Malleability: ability of a substance to be hammered or bent into different shapes.



Cool Fact:
Older generations used to call aluminum foil, tin foil, because well... it was made of tin. In 1910, manufacturers started to use aluminum instead. Tin left a metallic taste on food, mmm.

Ductility: the ability to be pulled into wire.



Melting and Boiling Points

melting point = the temperature a substance changes from a solid to a liquid



boiling point = the temperature a substance changes from liquid to a gas



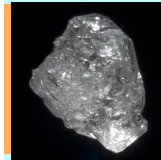
Does anyone know the melting point or boiling point of water?

Melting Point and Boiling Point of substances

<http://worldearth.hubpages.com/hub/Freezing-Melting-and-Boiling-Points-of-Solids-Liquids-and-Gases-in-general-use-today>

The Boiling Point and Melting Point are constants for a substance at a standard temperature and pressure (STP).

The standard temperature is 273 K (0°Celsius or 32°Fahrenheit) and the standard pressure is 1 atmospheric pressure.



Crystal form (another form of a solid)
A solid mineral structure with a regular pattern of 3-D shapes. Salt crystals are cubic, plastic has no crystal form



Solubility- The ability to dissolve in a solvent such as water. Salt is **soluble** in water, pepper/copper are **insoluble** in water.



Viscosity



A measure of how easily a liquid flows.

The thicker the liquid the less it flows therefore it is more viscous.

Maple syrup is more **viscous** than water.

What do you think would be more viscous water or tomato juice?

Cool Fact: The largest pancake ever made and flipped measured 15 m, was 2.5 cm deep and weighed three tonnes! Just imagine how much syrup you would need!

The saying

"Slower than cold molasses"

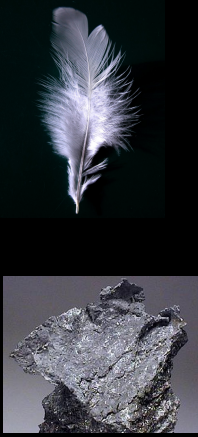
Has science behind it



Density- The amount of matter (mass) per unit of volume of a substance.

Lead is denser than feathers or some may say lead is heavier than feathers.

For example: Density of water is 1.0 g/cm³.



Chemical Properties

In nature, substances combine or react with each other.

When one substance can interact with another, that characteristic behaviour can be called a chemical property. (The ability to react is known as a chemical property)

For example, dynamite explodes because it combines with oxygen. The reaction produces new substances.




Chemical Properties

Combustibility- The ability of a substance to react rapidly with oxygen and release heat and light energy.

Gasoline is **combustible** or **flammable**.

Water is **nonflammable**.




Chemical Properties



Reaction with an acid- The ability of a substance to react with acid and produce gas.

Magnesium metal reacts with acid to produce gas bubbles.

Gold does not react with acid.



Combustibility

Cool Fact: Beaumont, Texas, the "Home of the World's Largest Fire Hydrant" erected a 24 foot fire hydrant to promote the re-release of the 101 Dalmations. The hydrant weighs 4500 lbs and could blast 1500 gallons of water a minute.

Reaction with Acid




Cool Fact: The strongest acid in the world is a million times stronger than concentrated sulfuric acid and about a billion times stronger than the acids found in your stomach. It is called a superacid.

Name That Property!!
Quiz
Take out a piece of paper
There will be 20 questions

1)

Please Choose the word that best describes this image



- a) State
- b) Viscosity
- c) Density
- d) Hardness
- e) Ductile

Ductility/ Malleability

2)

Please Choose the word that best describes this image



Boiling Point

- a) Soluble
- b) Malleable
- c) Boiling point
- d) Combustible
- e) Viscosity

3)

Please Choose the word that best describes this image



Malleability

- a) Soluble
- b) Malleable
- c) Hardness
- d) Combustible
- e) Crystal formation

4)

Please Choose the word that best describes this image



Hardness

- a) Hardness
- b) Malleable
- c) Ductile
- d) Combustible
- e) Viscosity

5)

Please Choose the word that best describes this image

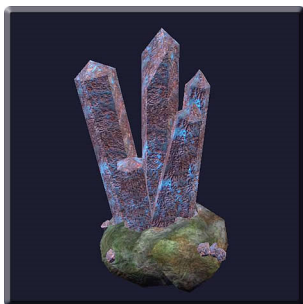


combustability

- a) Soluble
- b) Malleable
- c) Boiling point
- d) Combustible
- e) Viscosity

6)

Please Choose the word that best describes this image

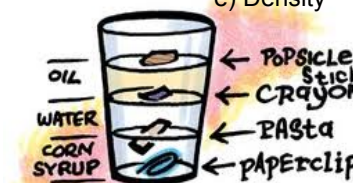


Crystal Form

- a) Soluble
- b) Malleable
- c) Hardness
- d) State
- e) Crystal formation

7)

Please Choose the word that best describes this image

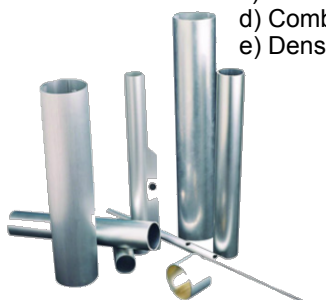


Density

- a) State
- b) Reaction with Acid
- c) Hardness
- d) Combustible
- e) Density

8)

Please Choose the word that best describes this image



Malleability/**Ductility**

- a) Soluble
- b) Malleable
- c) Hardness
- d) Combustible
- e) Density

9)

Please Choose the word that best describes this image



Melting point

- a) Melting Point
- b) Malleable
- c) Hardness
- d) Density
- e) Crystal Formation

10)

Please Choose the word that best describes this image



Solubility

- a) Soluble
- b) Malleable
- c) Hardness
- d) Density
- e) Melting point

11)

Please Choose the word that best describes this image



Viscosity

- a) State
- b) Malleable
- c) Density
- d) Soluble
- e) Viscosity

12) Please Choose the word that best describes this image



States

- a) Soluble
- b) State
- c) Density
- d) Hardness
- e) Viscosity

13) Please Choose the word that best describes this image



Density

- a) State
- b) Malleable
- c) Density
- d) Soluble
- e) Viscosity

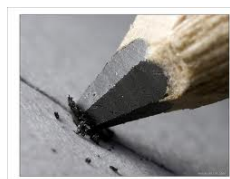
14) Please Choose the word that best describes this image



Corrosive

- a) Reaction with acid
- b) Combustible
- c) Density
- d) Corrosive
- e) Hardness

15) Please Choose the word that best describes this image



Hardness

- a) State
- b) Melting point
- c) Density
- d) Corrosive
- e) Hardness

16) Please Choose the word that best describes this image



Solubility

- a) Reaction with acid
- b) Soluble
- c) Density
- d) Ductile
- e) Crystal formation

17) Please Choose the word that best describes this image



Reaction with acid

- a) Reaction with acid
- b) Combustible
- c) Density
- d) Corrosive
- e) Hardness

18)

Please Choose the word that best describes this image



- a) State
- b) Viscosity
- c) Density
- d) Hardness
- e) Ductile

Ductility

19)

Please Choose the word that best describes this image



- a) State
- b) Corrosive
- c) Viscosity
- d) Combustible
- e) Boiling point

Combustibility

20)



- a) Soluble
- b) Malleable
- c) Hardness
- d) Combustible
- e) Density

Malleability

Classwork

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Questions 1 and 3