***The Material World What is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_???***

* ***Matter is anything that has \_\_\_\_\_\_­­­­\_\_\_\_\_\_\_, and takes up \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .***
* ***examples:*** 
  + ***bowling balls have lots \_\_\_\_\_\_\_\_- they are \_\_\_\_\_\_\_\_\_\_ - so they are made of \_\_\_\_\_\_\_\_\_\_***
  + ***you have \_\_\_\_\_\_\_\_\_\_\_, and you take up \_\_\_\_\_\_\_\_\_\_\_\_\_, so you are made \_\_\_\_\_\_\_\_\_\_\_\_\_\_.***
  + ***air has only a little \_\_\_\_\_\_\_\_, but it has some, and takes up \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, so air is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.***
  + ***any kind of material, \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_, or \_\_\_\_\_\_\_\_\_ is made of matter.***
* ***The Particle Theory of Matter***
  + ***Matter (of any kind) is made up of extremely \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.***
  + ***These particles are constantly in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.***
  + ***At higher temperatures, these particles move \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. They would only stop moving at -273 degrees C. This is called absolute zero.***
  + ***These particles are held together by \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, but never actually \_\_\_\_\_\_\_\_\_\_\_\_\_\_each other.***
* ***The States (or Phases) of Matter***
  + ***Solids***
    - ***solids have definite \_\_\_\_\_\_\_\_\_\_ and definite \_\_\_\_\_\_\_\_\_\_\_\_\_***
    - ***the particles in solids are held \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, usually in some geometrical pattern Like a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.***
    - ***the particles in a solid only move by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - they can't leave their positions***
  + ***Liquids***
    - ***liquids have definite volume, but***

***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.***

* + - ***the particles in a liquid are held closely together, but are free***

***to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***

* + - ***the particles have enough \_\_\_\_\_\_\_\_\_\_\_ so that they are***

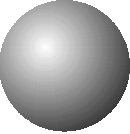
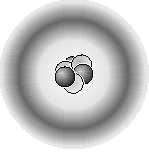
***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in position.***

* + ***Gases***
    - ***Gases have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.***
    - ***They will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_to \_\_\_\_\_\_\_\_\_\_\_any container that they are in.***
    - ***the particles of a gas are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and are***

***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_at all***

* + - ***the particles of a gas are flying around very rapidly, at about***

***\_\_\_\_\_\_\_\_\_\_\_\_***

* ***Atoms and Molecules***
  + ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_are the Particles described in the*** [***Particle Theory of Matter***](http://www.scitec3.esmartstudent.com/what_is_matter.html)
  + ***An \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the \_\_\_\_\_\_\_\_\_ particle of matter***
  + ***Atoms cannot be \_\_\_\_\_\_\_\_\_\_\_\_into simpler parts by any physical or chemical method***
  + ***This is what John Dalton thought that an atom looked like:***
  + ***This is what we now think an atom looks like:***
* ***Molecules***
  + ***A Molecule is made up of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, combined chemically.***
  + ***By combining together different arrangements of the slightly more than***

***\_\_\_\_\_\_different kinds of atoms which are known to exist, every kind of substance in***

***the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_can be made. (Certain special rules determine which atoms***

***can or cannot be combined together)***

* + ***This is what a model of a water molecule looks like, with \_\_\_\_\_\_ oxygen atom, and***
  + ***\_\_\_\_ hydrogen atoms:  ***

****** ***A Bit of History*** 

* ***Democritus, a philosopher in ancient \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, over \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ years ago,***

***figured out that matter must be made of particles, and he called the smallest of these***

***particles, the atom***

* ***About 1800 year later, an Englishman, John Dalton, came up with more or less the same idea.***
* ***He said that atoms were:***
  + ***extremely \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,***
  + ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,***
  + ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.***
  + ***all the atoms of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_had the same \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***
  + ***He also said that different kinds \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_were made up of atoms of different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.***

***Dalton lived 200 years ago and we know a lot more about atoms now but his ideas are still good and***

***make it easy for us to understand how elements fit together into compounds.***

***Elements and Compounds***

***Elements***

* ***Elements are substances made up of only \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.***
* ***Elements, therefore, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_down into any simpler substances by physical or chemical methods.***
* ***Examples of commonly-known elements are \_\_\_\_\_\_\_\_\_\_\_\_\_, carbon,***

***hydrogen, \_\_\_\_\_\_\_\_\_\_\_, copper, \_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_.***

* ***The four most important elements in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are***

***carbon (\_\_), oxygen (\_\_), hydrogen (\_\_), and nitrogen (\_\_)***

* ***The letters in the brackets in the line above are called \_\_\_\_\_\_\_\_\_\_\_\_\_.***

***These are the correct, official, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for the names of these elements.***

* ***Here are some more symbols: iron is \_\_\_\_, copper is \_\_\_\_, silver is \_\_\_\_,***

***gold is \_\_\_\_, sodium is \_\_\_\_, and chlorine is \_\_\_\_ .***

* ***The \_\_\_\_\_\_\_letter in any element's symbol is always \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***
* ***The second letter (if there is one) is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ capitalized.***

***Compounds***

* ***Compounds are substances made up of \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_different kinds***

***of elements, combined \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.***

* ***Compounds cannot be broken down by physical methods, but they can be***

***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ methods.***

* ***Commonly-known compounds are \_\_\_\_\_\_\_\_\_\_\_\_ (H20),*** 
* ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(NaCl)*** 

***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (C12H22O11)*** 

* ***In brackets in the line above, are shown the\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of each of those compounds. A formula is the correct, official abbreviation for the name of a compound, which also shows***

***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***

* ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***
* ***You can recognize the symbols of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that make up those compounds.***
* ***The small, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_number after an element's symbol in the***

***formula tells how \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of that element there are,***

***in one molecule of that compound.***