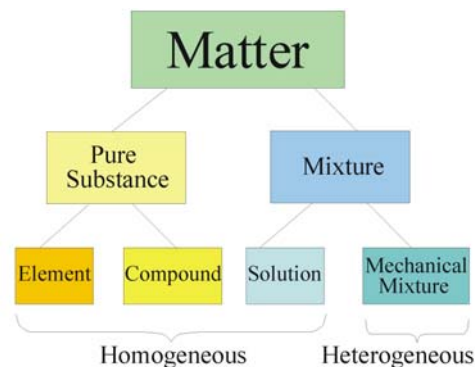


## Test Review No 2

**Scientific Notation.** When numbers are very large or very small, they are easier to interpret when written in scientific notation. Scientific notation also makes it easier to show the number of significant digits. Numbers written in scientific notation have two parts: the first part is a number between 1 and 10; the second part is 10 raised to any whole number exponent. The two parts are multiplied by each other. Numbers are converted to scientific notation by moving the decimal point of the original number to get a number between 1 and 10. Keep track of the number of places the decimal has been moved and the direction to get the exponent. Addition and subtraction in scientific notation follow a few simple rules: (1) numbers must be a multiple of the same power of 10; (2) the first factor can then be added or subtracted; and (3) the power of 10 is not affected. Multiplication follows a different set of rules: (1) multiply the first factors; and (2) add the exponents. Division follows still a third set of rules: (1) divide the first factors; and (2) subtract exponents. See the examples on the next page.

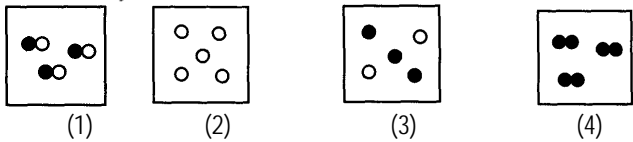
<u>Addition</u>	<u>Multiplication</u>	<u>Division</u>
<p><i>Example</i></p> $1.35 \times 10^5 + 2.9 \times 10^4$	<p><i>Example</i></p> $(2.0 \times 10^4) \times (1.5 \times 10^3)$	<p><i>Example</i></p> $\frac{3.0 \times 10^5}{2.0 \times 10^3}$
<p><i>Procedure</i></p> $\begin{array}{r} \textcircled{1} 2.9 \times 10^4 = 0.29 \times 10^5 \\ \textcircled{2} 0.29 \times 10^5 \\ + 1.35 \times 10^5 \\ \hline 1.64 \times 10^5 \end{array}$	<p><i>Result</i></p> $3.0 \times 10^7$	<p><i>Result</i></p> $1.5 \times 10^2$

**Matter.** Matter is anything that has mass and takes up space. Pure matter can be classified as elements or compounds. Elements are simple substances that can't be broken down by chemical means. Gold is an example. Compounds are composed of two or more elements chemically combined. The properties of elements are not retained when they combine to form a compound. Mixtures are composed of two or more substances blended together. A solution is a homogeneous mixture. A mechanical mixture has two or more phases. The properties of the substances in a mixture are retained. This fact is useful for separating a mixture. For example, a mixture of iron and sand can be separated using a magnet, because the iron is still magnetic.



**Element Symbols.** In 1814 Jöns Berzelius, a Swedish chemist, devised the system of symbols used by scientists. The goal of his symbols was to make it easy to write chemical observations in shorthand that could be easily understood. Many symbols are just the first letter of the element's name, upper case. Carbon, for example is C. Other symbols have two letters from the element's name, with the first being upper case and the second being lower case. Examples include calcium, Ca, and cadmium, Cd. Some element's symbols are based on the Latin name such as copper (Cu = cuprum) and lead (Pb = plumbum)

**Answer the questions below by circling the number of the correct response**

- Which of the following is written in proper scientific notation?  
(1)  $0.25 \times 10^3$  (2)  $2.5 \times 10^2$  (3)  $25 \times 10^1$  (4) 250
- What is the value of the expression below in proper scientific notation?  
$$\frac{1.3 \times 10^3}{6.5 \times 10^4}$$
  
(1)  $0.2 \times 10^{-1}$  (2)  $2.0 \times 10^{-2}$  (3)  $0.2 \times 10^7$  (4)  $2.0 \times 10^6$
- What is the product of  $1.5 \times 10^2$  and  $2.0 \times 10^3$ ? (1)  $3.0 \times 10^5$   
(2)  $3.5 \times 10^5$  (3)  $3.0 \times 10^6$  (4)  $3.5 \times 10^6$
- What is the sum of  $1.5 \times 10^4$  and  $1.0 \times 10^3$ ? (1)  $1.5 \times 10^7$   
(2)  $2.5 \times 10^7$  (3)  $1.6 \times 10^7$  (4)  $1.6 \times 10^4$
- What is the difference between  $4.1 \times 10^3$  and  $2.1 \times 10^2$ ?  
(1)  $2.0 \times 10^1$  (2)  $3.9 \times 10^1$  (3)  $2.0 \times 10^3$  (4)  $3.9 \times 10^3$
- Which of the following is NOT matter? (1) a chair (2) air (3) light  
(4) water
- Which of the following is NOT a property of matter? (1) inertia  
(2) occupies space (3) composed of elements (4) weightlessness
- Which of the following may be heterogeneous? (1) elements only  
(2) compounds only (3) mixtures only (4) elements or compounds
- Which of the following is pure? (1) elements only (2) compounds  
only (3) mixtures only (4) either elements or compounds
- Which of the following consists of more than one substance?  
(1) elements only (2) compounds only (3) mixtures only (4) either  
elements or compounds
- Which of the following are types of matter? (1) elements only  
(2) compounds only (3) mixtures only (4) all of these
- Which of the following is a type of mixture? (1) elements only  
(2) compounds only (3) solutions only (4) elements or compounds
- Which of the following is matter? (1) love (2) ideas (3) rock  
(4) heat
- The tendency of matter to maintain its state of motion is known as  
(1) density, (2) inertia, (3) mass, (4) volume.
- Which of the following is NOT composed of two or more types of  
atoms? (1) element (2) compound (3) solution (4) mechanical  
mixture
- Which represents a homogeneous mixture? (1)  $\text{CuSO}_4(\text{s})$   
(2)  $\text{NaCl}(\text{aq})$  (3)  $\text{Br}_2(\text{l})$  (4)  $\text{CO}_2(\text{g})$
- Which substance can be decomposed by a chemical change?  
(1) ammonia (2) iron (3) argon (4) helium
- The symbol for potassium is (1) P, (2) K, (3) Sn, (4) Po.
- The symbol for lead is (1) Li, (2) Le, (3) Pb, (4) Fe
- The symbol for gold is (1) Ag, (2) Au, (3) Ga, (4) Na.
- Sb is the symbol for (1) antimony, (2) sulfur, (3) mercury, (4) tin.
- The matter in a container is composed of hydrogen and oxygen.  
When the contents of the container are added to a fire, the fire goes  
out. This shows that the hydrogen and oxygen in the container are  
(1) mixed to form a solution, (2) mixed to form an emulsion,  
(3) chemically combined to form a compound, (4) separate elements.
- A bottle of green food coloring, which was left standing on a shelf for  
a long time, separated into distinct blue and yellow layers. The food  
coloring was most likely (1) an element, (2) a compound, (3) a  
mixture, (4) changing phase.
- A light that is shined through the material in a container is reflected  
in such a way that it forms a visible ray or beam. The material in the  
container could be (1) an element, (2) a compound, (3) a solution  
(4) a mechanical mixture
- Material left in a container separates into two phases. The material  
in the container could be a (1) compound, (2) solution, (3) element,  
(4) mechanical mixture.
- Given: ● = particle X ○ = particle Y Which diagram represents a mixture?  


20.	2	10
19.	3	9
18.	2	8
17.	1	7
16.	2	6
15.	1	5
14.	2	4
13.	3	3
12.	3	2
11.	4	1

**Answers**