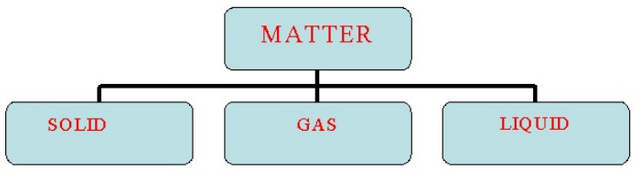
Intermediate Science 7
Unit 3: Mixtures and Solutions
Topic 1: How Are Mixtures Different from Pure Substances

Student Name_____

Chemistry: is the study of matter, its properties, and the changes or chemical reactions that matter can undergo

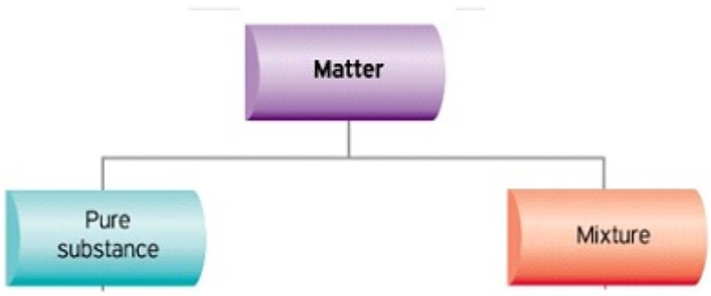
Matter: anything that occupies space and has mass. Things that are not matter gravity, light, electricity, and heat.



The Particle Theory:

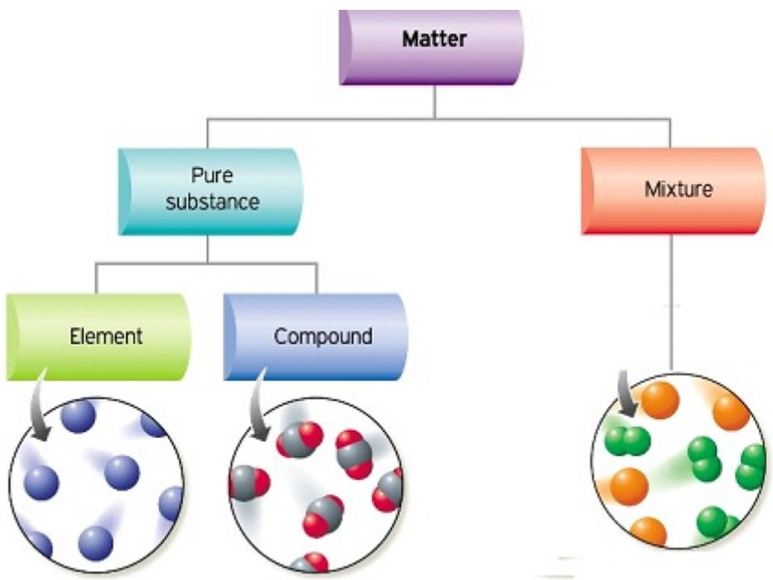
- All matter is made up of tiny particles.
- All particles in a thing are the same
- The particles of one substance differ from the particles of other substances.
- These particles are always moving… they have energy.
- There are spaces among particles.
- There are attractive forces between the particles.

Another way that scientists classify matter is by its composition:



PURE SUBSTANCE	MIXTURE
• contains only one kind of particle and are the same throughout • ALWAYS appear as uniform throughout • don't usually occur in their pure form in nature, so in order to obtain pure substances, people must refine raw materials. • Examples of Pure Substances -sugar ($C_{12}H_{22}O_{11}$) -copper (Cu) -distilled water (H_2O) -carbon dioxide (CO_2) -oxygen (O_2) • Elements are pure substances that cannot be broken down into simpler substances • Compounds are pure substances that contain two or more elements combined in fixed proportions. Compounds not easily separated from each other ex: water, CO2	• is a combination of two or more pure substances - that are NOT chemically combined • MAY have distinct visible components. • Six of the possible kinds of mixtures are 1. a mixture of gases 2.a mixture of liquids 3.a mixture of gases in a liquid 4.a mixture of solids 5.a mixture of solids in a liquid 6.a mixture of solids and gases • Examples of Mixtures -kool-aid -chocolate chip cookie -concrete -salad dressing -Air -Bread

SUMMARY:



PART A: MULTIPLE CHOICE

Instructions: Shade the letter of the correct answer on the computer scorable answer sheet provided.

1. Which area of science studies the properties and the changes which matter may undergo?

   (A) Chemistry
   (B) Ecology
   (C) Meteorology
   (D) Physics

2. Which of the following refers to a substances that have unique, identifying properties?

   (A) Chemical
   (B) Liquid
   (C) Mixtures
   (D) Pure substances

3. What are the two types of pure substances?

   (A) Elements and mixtures
   (B) Elements and compounds
   (C) Compounds and mixtures
   (D) Two types of mixtures

4. Which of the following is a way in which elements and compounds are similar?

   (A) Elements and compounds are both pure substances.
   (B) Elements and compounds are both listed on the periodic table.
   (C) Elements and compounds are both made up of different kinds of atoms.
   (D) Elements and compounds can both be broken down by physical changes.

5. Element is a pure substance, what is it composed of?

   (A) One type of particle
   (B) Mixture of particles
   (C) Different type of particles
   (D) Contain two or more different particles combined in fixed proportions

6. A compound is a pure substance, what is composed of?

   (A) Two or more component substances which retain their own identifying properties.
   (B) More than one type of element.
   (C) Only one type of atom.
   (D) Only one type of element.

7. Which of these substances is a compound?

   (A) Carbon
   (B) Chlorine
   (C) Gold
   (D) Acetic acid

8 A water molecule is made up of one oxygen and two hydrogen atoms. Why is water considered a pure substance?

(A) Water can be broken down by physical means.
(B) Water can be combined with other substances by physical means.
(C) Each water molecule is identical.
(D) Water molecules are made up of different types of atoms.

9. When matter is composed of two or more component substances which retain their own identifying properties,

(A) The matter is classified as a compound.
(B) The matter is classified as a pure substance.
(C) The matter is classified as a mixture.
(D) The matter is classified as a molecular compound.

10. The four items below were part of a dinner. Which of the following is not a mixture?

(A)  Salad dressing	(B)  Gelatin
(C)  Apple juice	(D) 

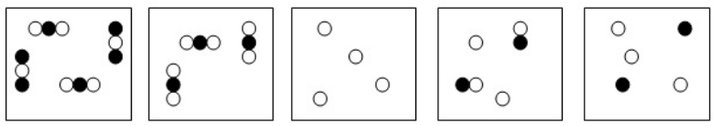
PART B : MATCHING **[5]**

Match each thermometer on the left with the best Descriptor on the right. Each Descriptor may be used only once. Place your answer on the scantron

Term	**Descriptor**
11.___ Element	A. It is a combination of two or more pure substances - that are NOT chemically combined.
12.____ Compound	B. It is used to classify an element or compound.
13.___ Pure Substance	C. A pure substances that contain two or more elements combined in fixed proportions.
14.___ Chemistry	D. It is the study of matter, its properties, and the changes or chemical reactions that matter can undergo.
15.___ Mixture	E. A pure substances that cannot be broken down into simpler substances.

PART C : MATCHING **[5]**

Match each diagram with its correct description. Diagrams will be used once



A B C D E

16. ____Pure Element - only one type of atom present.

17. ___Mixture of two elements - two types of uncombined atoms present.

18. ____Pure compound - only one type of compound present.

19. ____Mixture of two compounds - two types of compounds present.

20. _____Mixture of a compound and an element.

PART D : FILL IN THE BLANK

Part 1: Read the following information on elements, compounds and mixtures. Fill in the blanks where necessary.

Elements:

1. A pure substance containing only one kind of _____.

2. Over 100 existing elements are listed and classified on the _____.

Compounds:

3. A pure substance containing two or more kinds of _____.
4. The atoms are _____combined in some way" The properties of a compound are usually different than the properties of the elements it contains.

Mixtures:

5. Two or more _____ or _____ NOT chemically combined.

PART E : FILL IN THE BLANK

Classify each of the following as elements (E), compounds (C) or Mixtures (M). Write the letter X if it is none of these.

Diamond	_____	Sugar ($C_6H_{12}O_6$)	____
Milk	_____	Iron (Fe)	____
Air	_____	Sulfuric Acid (H_2SO_4)	____
Gasoline	_____	Electricity	____
Krypton (K)	_____	Bismuth (Bi)	____
Uranium (U)	_____	Popcorn	____
Water (H_2O)	_____	Alcohol (CH_3OH)	____
Pail of Garbage	_____	A dog	____
Ammonia (NH_3)	____	Salt (NaCl)	____
Energy	_____	Gold (Au)	____

PART F: WRITTEN RESPONSE

1. What is a mixture?

2. Use the particle theory of matter to explain what a pure substance is.

3. What are two examples of pure substance?

4. Use the particle theory of matter to explain how a pure substance is different from a mixture.