

Name\_\_\_\_\_ Date\_\_\_\_\_

### Section 5.3 – Compounds and Elements

- 1) Define Compounds. **Compounds are pure substances that are made up of two or more elements chemically combined together.**
- 2) Are compounds pure substances? **Yes**
- 3) How many types of atoms are in an element? **One**
- 4) What is the smallest unit of a compound called? **Molecule**
- 5) What is the difference between a molecule and an atom? **A molecule is composed of more than one element and an atom is composed of a single element.**
- 6) What is the difference between an element and a compound? **An element is composed of one type of atom and a compound is composed of two or more atoms.**
- 7) Give two examples of an element and two examples of a compound?  
**Element: Gold and Silver.**  
**Compound: Water (H<sub>2</sub>O) and Carbon Dioxide (CO<sub>2</sub>)**
- 8) How did ancient Greek Philosophers think about matter?  
**According to the Greek four-element theory, all matter consisted of some combination of just four elements; Earth, Water, Air and Fire.**
- 9) Where did most scholars think that wisdom came from? **They thought that wisdom came from thinking, not from experimenting.**
- 10) Who were alchemists? **They were people who carried out hands-on investigations of matter.**

11) List 4 characteristics about them. **They were from Europe and Middle East. They tried to turn cheap metals into gold. They developed distillation. They were secretive about their findings. They believed they could find a substance that would give them eternal life. They believed they could produce a universal solvent that would dissolve all substances.**

12) When did the current view of the elements begin to develop? **It began to develop in the early seventeenth century.**

13) Who made a very important contribution with his use of a scientific method to investigate the physical world? **His name was Sir Francis Bacon (1561-1626).**

14) What did Bacon's book argue about the nature of science? **It argued that science should be built on the basis experimental evidence rather than philosophical speculation only.**

15) What was Robert Boyle's contribution? **He expressed skepticism about four-element theory of the ancient philosophers. Boyle also recognized that elements could be combined into compounds**

16) Who defined elements as pure substances that cannot be decomposed (broken down) into simpler substances by means of a chemical change? **His name was Antoine Lavoisier (1743-1794)**

17) How many pure substances did he define as elements? **He defined 23 substances as elements.**

18) What was Lavoisier's most successful technique as an experimenter? **It was careful measurement of mass.**