1. An element is a substance that (CAN/CANNOT) be broken down to other substances by ordinary chemical reactions.

2. Label the atom by drawing a line from the words to the correct structure (5pts).

   Proton
   Neutron
   Electron
   Nucleus
   Orbital

3. It is the _______________ orbital of atoms that is involved in chemical reactions.

4. A stable atom has the same number of _______________, ______________, and ______________.

5. An _________________ is an atom that has a different number of neutrons than protons in the nucleus.

6. Isotopes may be stable, but many are unstable in that the spontaneously lose protons and/or neutrons from the nucleus. Such isotopes are said to be _________________.

7. Atoms or groups of atoms with unequal numbers of protons and electrons, thus having a non-zero charge, are called __________.

8. Make a drawing of a Calcium atom (5pts).

9. _______________ bonds occur between atoms that transfer their electrons in their outer orbitals, and _______________ bonds occur between atoms that share their electrons in their outer orbitals.

10. ________________ is the most abundant atom in Earth's crust, making up _____% by volume and ______% by weight of all the atoms on the Earth.

11. When oxygen and silicon bond together, a _________________ is formed. These represent the most abundant _________________ on the Earth.

12. What is the natural geometric shape for minerals containing O and Si?

13. A _________________ is a naturally occurring, inorganic, crystalline solid, which is physically and chemically distinctive, and has an exact chemical _________________.

14. Two or more minerals chemically bonded together are called ___________.

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15. The following are non-silicate mineral types. In the blank next to each type, write the chemical formula that classifies minerals into these groups.

Carbonates _________  Oxides _________
Sulfates _________  Sulfides _________

16. _______ minerals have a commercial value, and _____________ are valued because of their beauty and often their hardness.

17. Match the following mineral properties with their correct definition.

_____Color   A. Fizzes in the presence of dilute HCl
_____Streak   B. Visible hue of a mineral
_____Luster   C. Color left behind when a mineral is scratched on porcelain
_____Hardness   D. Attracted to a magnet
_____Crystal form   E. Breakage along flat planes
_____Cleavage   F. Density relative to that of water
_____Fracture   G. Scratch-resistance
_____Specific gravity   H. Manner in which light reflects off the surface of a mineral
_____Magnetism   I. External geometric form
_____Chemical reaction   J. Irregular breakage

18. Minerals with one direction of cleavage will form _______________.

19. Explain the general public’s confusion with the term mineral (5pts).

20. How might it be argued that ice is actually a mineral (5pts)?

21. 5. How can graphite and carbon have the same composition (5pts)?

22. Is plastic a mineral? Why or why not (5pts)?

23. Why are silicates the most common minerals in the Earth’s crust (5pts)?
24. Write the minerals found in Moh's Hardness Scale.

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