Name: _____ Block: _____ Date: _____

SCIENCE TEST STUDY GUIDE: Atoms, Elements, the Periodic Table, and Earth's Atmosphere

1. Every object is made up of matter. The smallest amount of any element is exactly one atom.

2. An atom is made up of three subatomic particles:

    1) proton (charge = positive; mass = 1 AMU)

    2) neutron (charge = neutral; mass = about 1 AMU)

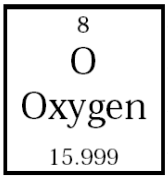
    3) electron (charge = negative; mass = almost zero)

3. The mass of subatomic particles are measured in AMU's, which stands for atomic mass unit.

4. The nucleus is the dense central region of the atom, which contains the protons and neutrons, and (by itself) has an overall positive charge.

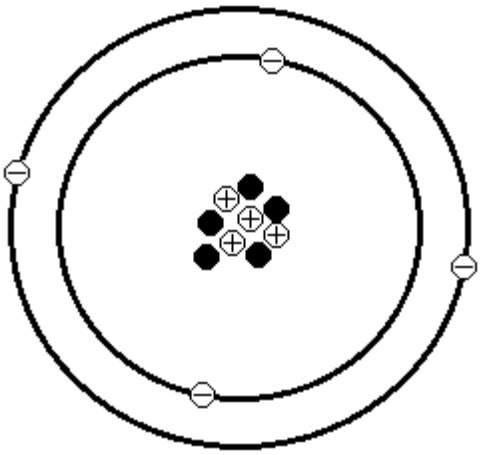
5. The electron cloud (shell) is the large, negatively-charged outer region of an atom containing the electrons, and is made up mostly of empty space.

6. Label the parts of a box on the periodic table:

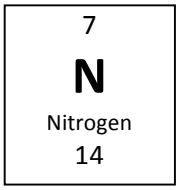


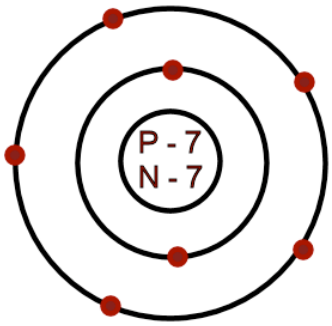
← atomic number (represents: the number of protons; same as the number of electrons)
← element symbol
← element name
← atomic mass (represents: the number of protons plus the number of neutrons)

7. Identify the following element: Beryllium (4 protons)



6. Draw & label the following element below:



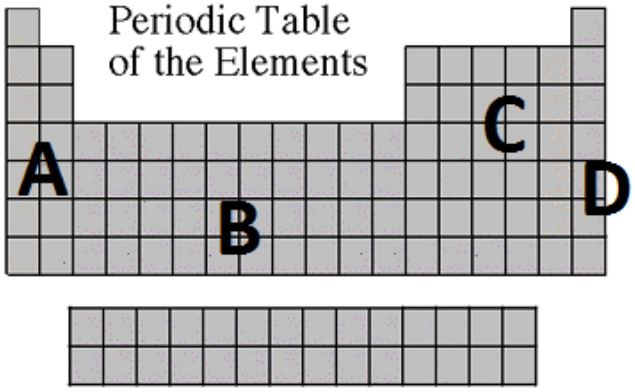


7. Potassium (K) has an atomic number of 19, a mass of 39 AMU. How many neutrons does it have? 39 – 19 = 20 neutrons

8. Beryllium (Be) has a mass of 9 AMU and an atomic number of 4. How many neutrons does it have? 9 – 4 = 5 neutrons

9. When an element has more or less ***electrons*** than normal, it is called a/an ion.

10. When an element has more or less ***neutrons*** than normal, it is called a/an isotope.
11. The periodic table is organized in order of increasing atomic number.
12. We can divide the periodic table into three categories: metals, non-metals, and metalloids.
13. Metals located are to the right of the "zigzag line" on the periodic table, and most have the following properties: shiny, malleable, ductile, good conductors of heat and electricity.
14. Most metals are solid at room temperature, and typically have higher boiling points than nonmetals.
15. List the chemical symbol for each of the *alkali metals*: Li, Na, K, Rb, Cs, and Fr; the whole first column minus Hydrogen.
16. Properties of alkali metals include highly reactive, 1 electron in the valence shell.
17. If an element is malleable, it means that it can be shaped/bent, while being ductile means it can be stretched into wires.
18. List the names of the three *alkali earth metals* with the greatest atomic masses: Strontium, Barium, and Radium.
19. Fluorine (9), Chlorine (17), Bromine (35), Iodine (53), Astatine (85), and Uus (117) are a group of elements called halogens, which are known to be highly reactive.
20. Based on the diagram, label the following items (A – D) as either More Reactive, Less Reactive, or Least Reactive:



    A. More Reactive
    B. Less Reactive
    C. More Reactive
    D. Least Reactive

21. The far right group of elements on the periodic table are called the noble gases (not reactive – 8 valence electrons).
22. Rows on the periodic table are called periods. The columns on a periodic table are called families, and these elements share physical and chemical properties.
23. Are highly reactive elements (like alkali metals or alkaline earth metals) likely to found in their pure form in nature? No
    Explain why or why not: They are very reactive and want to bond with other elements until they have 8 valence electrons.
24. The majority (78%) of Earth's atmosphere is made up of nitrogen. The next most abundant gas is oxygen, less than 1% of Earth's atmosphere is made up of other gasses, which include Argon, Carbon Dioxide, Neon, Helium, Methane, Hydrogen, and Carbon Monoxide.