Atoms and The Periodic Table

1. Conservation of Matter - matter is not created or destroyed during a chemical reaction.

2. Mixture - two or more substances that are mixed together but not chemically combined.

3. Pure substance - a homogeneous composition that cannot be broken down or separated using physical means.

Atoms and The Periodic Table

4. Matter - anything that has mass and takes up space.

5. Metalloids - an element that has some characteristics of both metals and nonmetals.

6. Homogeneous Mixture – Two or more substances not chemically combined. CANNOT see individual parts of the mixture.

7. Heterogeneous Mixture- Two or more substances not chemically combined. Individual parts of the mixture are visible.

8. Valence electrons - are the electrons in the outermost energy level of an atom, they determine how atoms will combine with other atoms.

Atoms and The Periodic Table

9. Approximately how many elements have we discovered or created in labs? 120

10. Give two examples of a Heterogeneous mixture.
    Vegetable soup and chocolate chip ice cream.

11. Name four things that are not matter. Thoughts, light, heat, and emotions.

12. All matter is made of atoms.

13. Where are the metals, metalloids, and nonmetals located on the periodic table? Metals are on the left, Metalloids are between the metals and nonmetals, and the nonmetals are on the right.

14. All substances are either atoms, elements, molecules, or compounds.

15. Is air matter? Explain your answer. Air is matter because it has mass and takes up space.

16. Explain why atoms in their natural state are neutral. Atoms in their natural state are neutral because they have the same number of protons (+) and electrons (-).

17. Does every atom of the same element have the same number of protons? Why or Why not? Yes, every atom of the same element has to have the same number of protons. The number of protons determines the type of atom. Example, all hydrogen atoms have 1 proton and all helium atoms have 2 protons.

18. Which element is the only metal that is not a solid at room temperature? Mercury

19. Compare and contrast properties of metals and non-metals.

Metals	Nonmetals
Malleable	Brittle instead of malleable
Shiny	Dull
Solid at room temperature (except mercury)	Gas at room temperature (except bromine)
Good conductors of electricity	Poor conductors of electricity

20. Find the names of each of the following elements on the periodic table and classify as either metal, nonmetal, or metalloid: Ca, Cl, I, Ir, Si, and Ti.

Metals	Nonmetals	Metalloids
Ca-calcium	Cl-chlorine	Si-silicon
Ir-iridium	I-iodine	
Ti-titanium		

21. A mixture is created when two pure substances are combined so that each of the pure substances retains its own properties.

22. Where is the majority of the mass of an atom located? In the nucleus.

23. If an atom loses electron's, will it have a positive or negative charge? Explain. Positive charge, because atoms on the periodic table are neutral. That means they have an equal number of protons and electrons. If it loses one negative electron, then the charge of the atom will be positive 1.

24. What element has 31 electrons, 31 protons, and 39 neutrons? Gallium

25. Give the chemical formula for each of the following elements or compounds:

a. Carbon – C
b. Water – H_2O
c. Carbon monoxide – CO
d. Carbon dioxide – CO_2
e. Sodium Chloride – NaCl
f. Oxygen (molecule) – O_2

26. Use the periodic table to complete the data chart below:

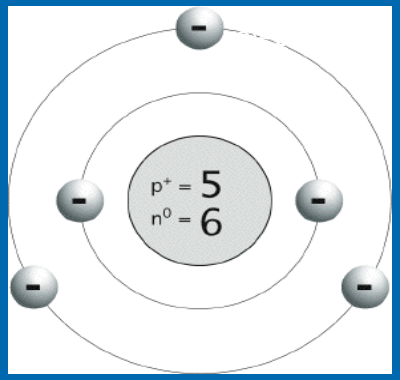
Symbol	Name	Atomic Number	Average Atomic Mass
Si	**Silicon**	14	28.086
Ar	Argon	18	39.948
Mg	Magnesium	**12**	24.305
Ne	Neon	10	**20.179**

27. What element is in Group 1, Period 3? Sodium

28. What element is in Group 2, Period 3? Magnesium

29. Draw and label the atomic structure of Boron (label the protons, neutrons, and electrons).

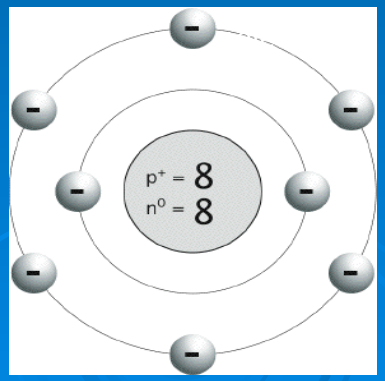
Bohr →



Lewis Dot

30. Draw and label the atomic structure of Oxygen (label the protons, neutrons, and electrons).

Bohr →



Lewis Dot

31. List the characteristics of elements in each of the following groups and the groups location on the periodic table:

Alkali Metals – Group 1, most reactive metals, one valence electron, many are salt forming elements, soft,

Alkaline Earth Metals – Group 2, slightly reactive metals, two valence electrons, many are minerals

Halogens – Group 17, most reactive nonmetals, have 7 valence electrons many are used as disinfectants

Noble Gases – Group 18, least reactive elements, full outer electron cloud, many are used in neon signs.

Boron Family – Group 13, have 3 valence electrons

Transition Metals – Groups 3-12, hard metals with high melting points,

Extra Review for Your Test

How many molecule, total atoms, and different types of elements?

1. C_2H_6
2. $2MgO$
3. $4P_4O_{10}$
4. NH_3
5. $3\ Al(OH)_3$
6. $2\ H_2O_2$

Law of Conservation of Matter

- Are these chemical equations balanced?

1. $P + O_2 \longrightarrow P_4O_{10}$

2. $Mg + O_2 \longrightarrow MgO$

- How are balanced chemical equations and the Law of Conservation of Matter Related?