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**Classifying Matter: Atoms, Elements, & Compounds
Learning Targets**

**(Book pages: 42-51, 102-104, 114-119)**

**Make and study flashcards for these vocabulary terms. Page numbers are in parentheses.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Target** | **With Help** | **On My Own** | **Teach It** |
| 1. I can describe the difference between an element and a compound.
 |  |  |  |
| 1. I can find an element’s symbol on the periodic table and can write it correctly.
 |  |  |  |
| 1. I can describe the difference between an element’s symbol and a compound’s formula.
 |  |  |  |
| 1. I can recognize the limited number of elements that make up Earth’s crust, oceans, atmosphere, and living matter.
 |  |  |  |
| 1. I can explain the general properties of metals.
 |  |  |  |
| 1. I can explain the general properties of metalloids (semi-metals.)
 |  |  |  |
| 1. I can explain the general properties of nonmetals.
 |  |  |  |
| 1. I can identify where metals, nonmetals and metalloids are located on the periodic table.
 |  |  |  |
| 1. I can use the physical property of density to identify an unknown element.
 |  |  |  |

**Substances and Mixtures**1. Matter (42) **anything that has mass and takes up space**
**2. Atom** – **a small particle that is the building block of matter, made up of protons and neutrons in a nucleus with electrons orbiting the nucleus**3. Element (44) **is a pure substance made of only one kind of atom**
4. Molecule (44) **two or more atoms that are held together by chemical bonds and act as a unit**
5. Compound (45) **a substance made of two or more elements that are chemically joined in a specific combination**
**6. Mixture** -**matter that can vary in composition, made from 2 or more substances that are not chemically combined**

**Metals, Nonmetals and Metalloids**

7. Metal (103) ) **an element that is generally shiny and is easily pulled into wires or hammered into thin sheets, is a good conductor of electricity and thermal energy.**
8. Luster (104) **describes the ability of a metal to reflect light, shiny**
9. Ductility (104) **the ability of a substance to be pulled into thin wires**
10. Malleability (104) **the ability of a substance to be hammered or rolled into thin sheets**
**11. Conductor** **– a substance that allows heat or electricity to pass through it; conductivity is a physical property of metals**
12. Nonmetal (114) **elements that have no metallic properties. Most are gases at room temperature, have a dull surface, poor cinductors of electricity and thermal energy, good insulators.**
**13. Insulator** – **a substance that does not allow heat or electricity to pass through it; a physical property of non-metals**14. Metalloid (118) **an element that has physical and chemical properties of both metals and nonmetals, act as a semiconductor**
**15. Semi-metal** – **another term for metalloid**
16. Semiconductor (118) **conducts electricity at high temperatures, but not at low temperatures**

**Target 1**

|  |  |
| --- | --- |
| **Elements** | **Compounds** |
| Pure substance made of one type of atom | Substance made of 2 or more different elements chemically combined |
| All atoms of elements are alike | Properties are different from the properties of the elements that make up the compound |
| Organized on the periodic table | Represented by chemical formulas which consist of all the element symbols that make up the compound, with subscripts |
| Can be represented by a symbol (capital first letter, lowercase other letters) |  |

 **Target 2

Hg**  Mercury **At** Astatine **Sb** Antimony **I** Iodine

**Target 3**

What is the difference between No and NO?

**No is a symbol of the element nobelium (#102); NO is a formula for a compound containing 1 atom of nitrogen and 1 atom of oxygen.**

Identify the following as element symbols or compound formulas:

**symbol**  Au **formula** H2O **formula** H2SO4

**formula** NO **symbol** No **symbol** Pb

**Target 4**

List the major (not trace) elements in the human body.

**oxygen, carbon, hydrogen, nitrogen, calcium, phosophorus**

List the major (not trace) elements in Earth’s crust:

**oxygen, silicon, aluminum, iron, calcium**

List the major elements in Earth’s oceans:

**chlorine, sodium, magnesium, sulfur, calcium**

List the major elements in Earth’s atmosphere:

**nitrogen, oxygen, argon**

Go back to the lists above and highlight one element in the body, crust, and oceans that is unique to that list and isn’t in any other list above.

**Target 5 – 8**

|  |  |  |
| --- | --- | --- |
| **Metals** | **Metalloids** | **Nonmetals** |
| **Luster is shiny** | **some shiny, some dull** | **Luster is dull** |
| **Ductile** | **Conduct electricity at high temperatures** | **Brittle** |
| **Malleable** | **Do not conduct electricity at low temperatures** | **Insulator** |
| **Conductor** | **Known as semiconductors** | **Lower densities** |
| **Higher densities** | **Also called semi-metals** | **Lower boiling/melting points** |
| **Higher boiling/melting points** | **Separates metals from nonmetals** | **Right side of table** |
| **Left side of table** | **Silicon is most abundant in this group** | **Many are gases** |
| **Most are solid** |  |  |

**Target 9**

|  |  |
| --- | --- |
| **Name** | **Density (g/cm3)** |
| Copper | 8.3-9.0 |
| Gold | 19.8 |
| **Aluminum** | **2.69** |
| Cedar | .5 |
| Iron | 7.8 |

Calculate the density of the unknown block to identify which element it is.



Mass: 7206.21g

Volume: 2669cm3

**Aluminum**

(name of object)

**Mass ÷ Volume = D**

**7206.21g ÷ 2669cm3 = 2.69g/cm3**