

Name _____
Period _____

Unit 3 Elements

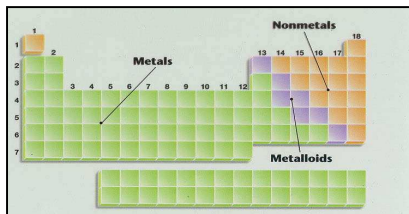
Made up of only one type of particle called an *Atom*.

Any substance that is made up of one type of particle is called a *pure substance*.

An element *cannot* be separated into simpler substances by chemical or physical means



Gold (Au) is an element. Each particle is the same. Anywhere gold is found, the particles that make it up will always be alike.



The periodic table is color-coded: Metals are green, Nonmetals are orange, and Metalloids are purple. A zigzag line separates the metals from the nonmetals, with metalloids in between.

All Elements can be found on the periodic table of elements. There are 92 naturally occurring elements and the rest are synthetic or man made in particle accelerators.

Characteristic Properties

Every element has a set of special properties. These are called *characteristic properties* and many of them can be found near the element on the periodic table. We *can* use these properties to *identify* elements. Characteristic properties do NOT depend on the amount of substance present.

Characteristic Properties Include:

Melting point, Boiling point, density, Reactivity with acid, Hardness, atomic number

3 Main Categories

Elements are also grouped into *categories* that are determined by general properties. These properties help determine where elements can be found on the periodic table.

If you know the category you know many *properties* of an element.

There are 3 main categories of elements on the periodic table.

List them here: 1. _____ 2. _____ 3. _____

Physical Properties of Metals

- Luster (shine)
- Good conductors of heat and electricity
- High density (heavy for their size)
- High melting point
- Ductile (most can be drawn out into thin wires)
- Malleable (most can be hammered into thin sheets)

Chemical Properties of Metals

- Easily lose electrons
- Corrode easily. Corrosion is a gradual wearing away. (rust, Tarnish)



Metalloids Elements on both sides of the zigzag line have properties of both metals and nonmetals.

Physical Properties of Metalloids

- Solids
- Also called semiconductors
- Can be shiny or dull
- Ductile
- Malleable
- Conduct heat and electricity better than nonmetals but not as well as metals

Examples:



Name _____
Period _____

Unit 3 Elements Continued

Physical Properties of Nonmetals

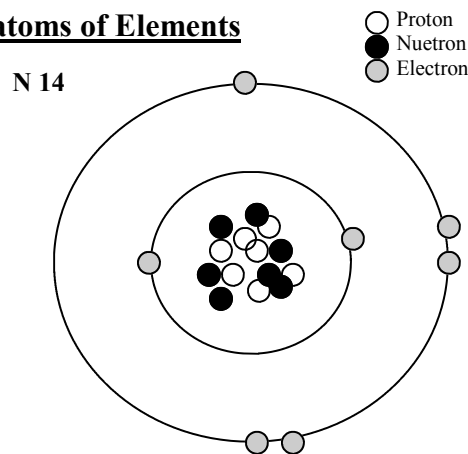
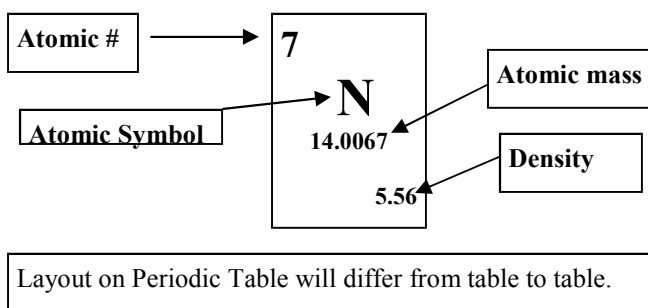
- No luster (dull appearance)
- Poor conductor of heat and electricity
- Brittle (breaks easily)
- Not ductile
- Not malleable
- Low density
- Low melting point



Chemical Properties of Nonmetals

- Tend to gain electrons

Reading & Modeling atoms of Elements



**Each of the elements in the categories have some similar physical properties.
Can you separate the categories based on their Property?**

1. Malleability
2. Ductility
3. Shiny
4. Dull
5. Thermally conductive
6. Electrically conductive
7. Semiconductors
8. Both shiny and dull
9. Brittle
10. Gas at room temp

• Metal _____

• Nonmetal _____

• Metalloid _____

***Explain what a pure substance is:

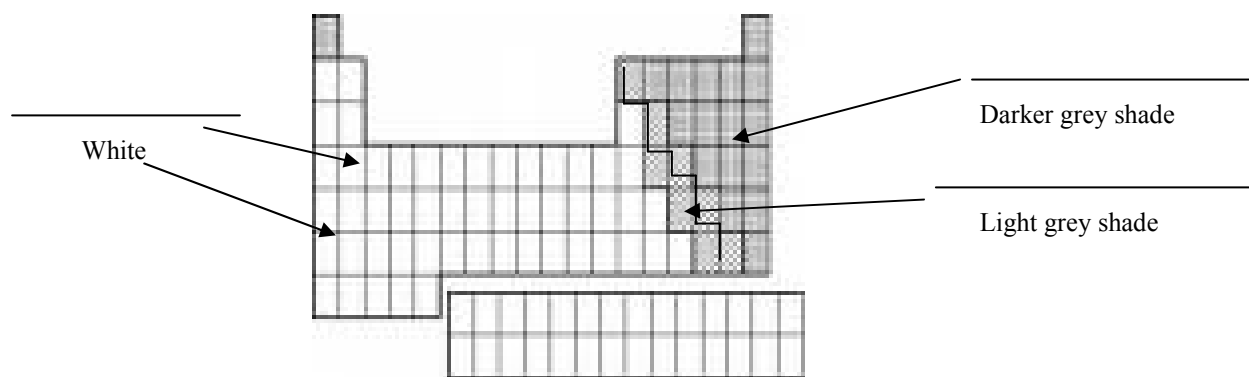
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Period _____

Fill in the blank:

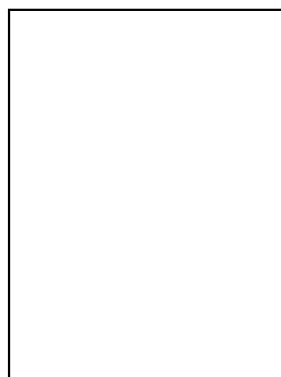
1. A pure substance is a substance that contains only one type of _____.
2. Characteristic properties can be used to _____ substances.
3. Helium filled balloons float because helium has less _____ than _____.
4. A chemical property of non metals is they have a tendency to _____ electrons when bonding with other nonmetals.
5. A chemical; property of metals is they have tendency to lose _____ when Bonding with other elements.
6. Elements are categorized as _____, _____ and _____ elements.
7. The property that would be the opposite if brittle is called _____.
8. Luster would be a measure of an objects _____.
9. The smallest part of an element that still has all the properties of that element is called a(n) _____.

Make a note on the image below where each main category of elements are found on the table.



Make a period table Tile and a model of an atom for any element 1-17

Tile



Model

