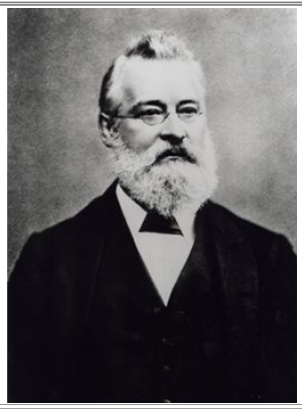
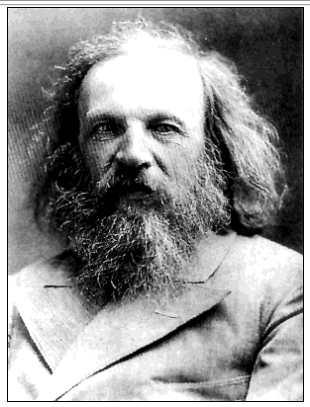
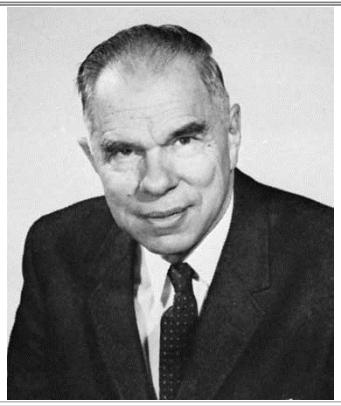
Name _____ Honors Chemistry ___/___/___

Development of the Periodic Table

Hennig Brand (c.1630-1692)		• **1st discovery of an element** (phosphorus) by distilling urine in 1669 • Brand was an alchemist in search of philosopher's stone, which reportedly could turn base metals into gold.
Johann Dobereiner (1780-1849)		• In 1829 he developed the **Law of Triads** where he stated that in a group of three elements with similar properties, the weight of the middle element was the average of the mass of the lightest and heaviest elements. • Ca, Sr & Ba (40, 88, 137) = (40 + 137) ÷2 = 88 • Li, Na & K (7, 23, 39) = (7 +39) ÷2 = 23 • Cl, Br & I (35, 80, 127) = (35 + 127) ÷2 = 81
Alexander E. Beguyer de Chancourtois (1820-1886)		• In 1862 he **published the first periodic table** which was a list of all known elements wrapped around a cylinder so that elements with similar properties lined up in a vertical column.

John Newlands (1837-1898)		• After arranging 56 known elements by increasing atomic mass he noted that the physical & chemical properties of the elements began to repeat every eight elements. • He was the first to formulate the concept of periodicity in the chemical elements. • He compared the chemical periodicity to the notes on a musical scale and called his theory the **Law of Octaves**.
Dimitri Mendeleev (1834-1907)		• He arranged the elements by increasing atomic weight, grouping elements with similar properties. Mendeleev changed atomic weights for some elements. • Published his first periodic table in 1869 which had 17 columns & 4 periods. • Mendeleev's periodic table left spaces for yet undiscovered elements. He predicted the properties of 10 elements, 7 were actually discovered. • Known as the **Father of the Periodic Table.**
Julius Lothar Meyer (1830-1895)		• He produced similar results to Mendeleev, while working separately, but he published his table after Mendeleev.
Henry Moseley (1887-1915)		• Student of Ernest Rutherford (discoverer of the proton). • Moseley **arranged the elements of the periodic table by increasing atomic number** (instead of increasing atomic weight). • After being killed at age 28 during World War I, Britain adopted the policy of exempting scientists from fighting in wars.

Glenn T. Seaborg (1912 – 1999)		• **Involved in the discovery (creation) of elements 94-102 and 106.** • He reconfigured the periodic table by placing **the lanthanides & actinides at the bottom of the table**. • **Element 106 (Seaborgium)** is named in honor of Seaborg.

At the completion of this assignment you will be prepared to take the following Chapter 3 on-line quizzes:

- periodic table scientist quiz
- chapter 3 scientist matching quiz

Homework: For each of the following statements, write the scientist's name that best applies.

1. _____ He wrote the Law of Octaves.
2. _____ He wrote the first Periodic Table.
3. _____ He is the Father of the Periodic Table.
4. _____ He wrote the Law of Triads.
5. _____ He was the first to arrange the elements by increasing atomic number.
6. _____ He is responsible for creating elements 94-102 and 106.
7. _____ He made a table similar to Mendeleev, but published it a year later.
8. _____ He was the first to show the concept of perioidicity between the elements.
9. _____ He made the first discovery of an element.
10. _____ Element 106 is named after this scientist.
11. _____ Element 101 is named after this man.
12. _____ He was first to note similarities between groups of three elements and their atomic weights.
13. _____ He noticed that the physical & chemical properties of the elements began to repeat every eight elements in his periodic table.
14. _____ He was killed at 28 years old during World War I.
15. _____ In what year was the first periodic table written?
16. _____ On his periodic table, he left spaces for yet to be discovered elements.
17. _____ He reconfigured the periodic table by placing the lanthanides and actinides at the bottom of the periodic table.

The Elements Song - By Tom Lehrer

There's antimony, arsenic, aluminum, selenium,
And hydrogen and oxygen and nitrogen and rhenium,
And nickel, neodymium, neptunium, germanium,
And iron, americium, ruthenium, uranium,
Europium, zirconium, lutetium, vanadium,
And lanthanum and osmium and astatine and radium,
And gold, protactinium and indium and gallium,
And iodine and thorium and thulium and thallium.

There's yttrium, ytterbium, actinium, rubidium,
And boron, gadolinium, niobium, iridium,
And strontium and silicon and silver and samarium,
And bismuth, bromine, lithium, beryllium and barium.

There's holmium and helium and hafnium and erbium,
And phosphorus and francium and fluorine and terbium,
And manganese and mercury, molybdenum, magnesium,
Dysprosium and scandium and cerium and cesium.
And lead praseodymium, and platinum, plutonium,
Palladium, promethium, potassium, polonium,
And tantalum, technetium, titanium, tellurium,
And cadmium and calcium and chromium and curium.

There's sulfur, californium, and fermium, berkelium,
And also mendelevium, einsteinium, nobelium,
And argon krypton, neon, radon, xenon, zinc, and rhodium,
And chlorine, carbon, cobalt, copper, tungsten, tin, and sodium.

These are the only ones of which the news has come to Harvard,
And there may be many others, but they haven't been discovered.

Mendeleev Song

He was born in Russia in 1834.
Hard work as a youth opened up the college doors.
He always tried to be the best that he could be,
And chose to make his mark in chemistry.

Who told the elements where to go? Mendeleev!
Who put them in columns and in rows? Mendeleev!
Who was ready, who was able to make a periodic table?
Who was that chemist? Mendeleev!

He wondered if nature really had a master plan,
If the elements had a pattern that one could understand,
So he bought a bunch of cards and on each one wrote the name,
Of an element and its weight, and then he played the game.
He put them all in order by their atomic weights,
Used their chemical properties to differentiate.
Groups began to form and despite some question marks,
He managed to produce a simple periodic chart.

Who told the elements where to go? Mendeleev!
Who put them in columns and in rows? Mendeleev!
Who was ready, who was able to make a periodic table?
Who was that chemist? Mendeleev!

At first in 1869 the chart was not a hit,
But that young Russian chemist was not the kind to quit.
He revised atomic weights and staked his whole career,
Predicting that several new elements would appear.
A few years passed and sure enough they came,
Gallium, scandium, germanium were their names.
Chemists everywhere were impressed with what they saw,
There really must be something to this periodic law.

Who told the elements where to go? Mendeleev!
Who put them in columns and in rows? Mendeleev!
Who was ready, who was able to make a periodic table?
Who was that chemist? Mendeleev!

So they call him the father of the periodic table,
And his work gave rise to another kind of label.
It's the name for element number 101,
In honor of this man they call it Mendelevium.

Who told the elements where to go? Mendeleev!
Who put them in columns and in rows? Mendeleev!
Who was ready, who was able to make a periodic table?
Who was that chemist? Mendeleev!