**8th Grade Physical Science Project:**

**3D Atom Model**

Due on Monday, **May 13, 2013**

**Atom Model Project Directions**

1. Select your element. Choose carefully. Keep in mind larger atoms will be more difficult and require more time and effort. You must choose an element that has an atomic number of at least 3.

2. Determine the electron configuration. The electron configuration (number of electrons in each energy level).

This information can be found at the following web site:
[www.chemicalelements.com](http://www.chemicalelements.com/)

3. Construction of 3-Dimensional model.

\* The 3D model needs to be lightweight and hang by itself.  There should be a string or fishing line with a loop at the top. We’ll use a paper clip to attach them to the ceiling.
\* Size should not exceed 18 inches wide or high.
\* It is encouraged to use cheap, easy to find materials such as wire, Styrofoam balls, or beads; no perishable food, but hard candy is acceptable.
\* The protons, neutrons, and electrons should be color coded, and a key should be included on the index card (see below).
\* Build the nucleus showing the actual number of protons and neutrons for smaller atoms. For atoms with a large number of protons and neutrons, you don't need to use the exact number. You may glue protons and neutrons onto the surface of a Styrofoam or other type of ball to give the appearance of a larger nucleus. The protons should be evenly mixed with the neutrons.
\* Your model should have the correct number of energy levels, and the correct number of electrons in each energy level. Electrons repel each other, so the electrons in each energy level should be **evenly distributed**.

4. Labels

Neatly label the nucleus and each energy level. Attach a label (a 5 x 7 index card works well for this) neatly written or typed that includes the following information:

a) name, symbol, and mass number of element (e.g., Oxygen, O, 16)
b) atomic number (eg. 8 for Oxygen).
c) number of protons, neutrons and electrons
d) electron configuration - # of atoms at each level (e.g., 2, 6 for Oxygen)
e) classification (metal, non-metal or metalloid)
f) melting point, boiling point and density
g) color-coded key for the protons, neutrons, and electrons

Of course, the index card should have your name and period number. If you work with a partner, both names should be on the index card.

**Atom Model Project Rubric**

This assignment is worth a total of 200 points, which will be awarded as follows:

Scientific content 80 points

\_\_\_\_\_ (10) Element name and symbol
\_\_\_\_\_ (10) Atomic number (# of protons)
\_\_\_\_\_ (10) Numbers of protons and neutrons
\_\_\_\_\_ (10) Mass number (sum of protons and neutrons)
\_\_\_\_\_ (10) Number of electrons
\_\_\_\_\_ (10) Electron configuration
\_\_\_\_\_ (10) Classification (metal, non-metal, metalloid)
\_\_\_\_\_ (10) Physical description (melting point, boiling point and density).

Workmanship 120 points

\_\_\_\_\_ (30) Nucleus with protons and neutrons color coded with key on label, correct number of protons and neutrons in nucleus, or appearance of larger nucleus.
\_\_\_\_\_ (40) Correct number of electrons in each energy level, color coded with key on label
\_\_\_\_\_ (30) Spatial relationships correct (nucleus in center, energy levels in different planes surrounding nucleus)

\_\_\_\_\_(20) Size requirements fulfilled. Hangs from ceiling like a mobile.

**3D Atom Model examples:**



