

Appendix 6 - Teacher's Notes

Project Division Chart:

Group	Elements	Team (Name and Color)
Group 1 - Alkali Earth Metals and Hydrogen	H, Li, Na, K, Rb, Cs, Fr	Dark Blue
Group 2 - Alkaline Earth Metals	Be, Mg, Ca, Sr, Ba, Ra	Blue
Groups 3 and 4 - Transition Metals	Sc, Y, La, Ac, Ti, Zr, Hf, Rf	Sky Blue
Groups 5 and 6 - Transition Metals	V, Nb, Ta, Db, Cr, Mo, W, Sg	Bright Green
Groups 7 and 8 - Transition Metals	Mn, Tc, Re, Bh, Fe, Ru, Os, Hs	Dark Yellow
Groups 9 and 10 - Transition Metals	Co, Rh, Ir, Mt, Ni, Pd, Pt, Uun	Green
Groups 11 and 12 - Transition Metals	Cu, Ag, Au, Uuu, Zn, Cd, Hg, Uub	Dark Green
Group 13 - Transition metals	B, Al, Ga, In, Tl	Brown
Group 14 - Non metals and Metalloids	C, Si, Ge, Sn, Pb	Orange
Group 15 - Transition Metals, Metalloids and Non metals	N, P, As, Sb, Bi	Pink
Group 16 - Non metals and Metalloids	O, S, Se, Te, Po	Red
Group 17 - Halogens	F, Cl, Br, I, At	Dark Red
Group 18 - Noble Gases	He, Ne, Ar, Kr, Xe, Rn	Black
Lanthanide and Actinide Series	Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Fm, Md, No, Lr	Violet

** Lanthanide and Actinide Series can be omitted and completed together as a class or as a bonus project for any student interested.

**The specified colors above can be found in Microsoft Word font color; just hover over the color to find your specific one.

This project is intended to take approximately 10 days, when students are working to full capacity for 9 one-hour periods, plus one period devoted to the introduction of the project. This project should act both as a review of material already covered, as well as a discovery of new, more in-depth material.

Day 1:

Use the following information when discussing the project with the class:

Science Background: What is a Periodic Table?

The periodic table is a table or chart, in which the elements are arranged so that those with similar characteristics are grouped in ways that help us predict their properties as they interact with one another. Everything in the world is made up of these few elements, which combine in different ways. Understanding this table is the key foundation to understanding chemistry and why things react the way that they do.

How did it get its name?

A pattern that is repeated in a regular way is called periodic. Since the elements are organized in a table, or chart, we call it the **Periodic Table of the Elements**.

How was the table created?

In 1889, Dimitri Mendeleev published the first periodic table. He realized that if elements were arranged in the order of increasing atomic mass, in a grid similar to how days on a calendar are organized, patterns appeared.

Periodic Law states that, "if elements are arranged in order of increasing atomic number, a periodic repetition of physical and chemical properties occurs. (Science Museum of Virginia)

What is a chemical family or group?

Student Definition of Chemical Family:

- ✓ A group of elements with similar chemical properties.
- ✓ A vertical (up and down) column in the periodic table of elements.

The chemical families are numbered 1 to 18, and include metals, nonmetals, metalloids, transition metals, halogens and noble gases.

Glossary of Terms:

Alkali metals - any of the elements in group 1 of the Periodic table

Alkaline Earth metals - the family of elements belonging to group 2; they are directly beside the Alkali metals.

Atomic mass - the mass of an average atom of an element.

Atomic number - the number of protons in one atom of an element.

Chemical families - a vertical column of elements with similar chemical properties.

Metals - a group of elements that have a shiny (lustrous) surface and are good conductors of heat and electricity.

Metalloids - a group of elements that have some properties of metals. For example, silicon is an excellent conductor of electricity, but is not lustrous.

Non metals - a group of elements that do not have the properties of metals (non lustrous, poor conductors).

Once the above material has been reviewed, and students have recorded all pertinent information, the teacher can spend the rest of the period introducing the assignment (with student handout) and determining partnerships (record name in "Project Division Chart"). The teacher should also discuss information about copyright law with students, and from which sites pictures can be taken.

Days 2 - 8:

Students begin researching, preferably in a computer lab, or in a room with access to multiple computers. The teacher should remember to consistently "check in" with students and monitor their progress. It is their responsibility to show the teacher what they have produced at the end of each class in order to receive their daily points.

Days 9-10:

Groups will present their projects to the class. This should be done in the order of the chemical families, beginning with group 1, so that students may begin to observe patterns in the behaviors of elements. The teacher should use the "Power Point Presentation Rubric " (Appendix 5) to evaluate students as they present.

The final grade for the overall project shall be calculated upon the receipt of both the element cards and the class notes, as well as based on the group work evaluations that were ongoing, all of which should be according to the supplied