

Name: \_\_\_\_\_ Block: \_\_\_ Date: \_\_\_\_\_

**Atomic Structure and Periodicity Project**

**"It's Elementary, My Dear!"**

**The project will involve three choices that are designed around atomic structure and periodicity. Once created the projects can be used again in May to help review for the SOL. The project is designed to be an alternative to the re-take for the chapters 3 and 5 test. It is due by January 15, 2015.**

**Option Chosen:** \_\_\_\_\_

**Elements Chosen:** \_\_\_\_\_

**Option 1:** Imagine you are the element \_\_\_\_\_. If you wrote your autobiography what sort of things would you like to tell people about yourself? Be sure to include the following items:

1. What is your atomic number?
2. What is your atomic mass?
3. What is the most common isotope, and give the number of protons, neutrons and electrons for that isotope?
4. How many naturally occurring isotopes do you have?
5. What is your charge when you become an ion?
6. What is your first ionization energy value?
7. What is your electronegativity?
8. What is your atomic radius?
9. What type of element are you? (metal, non-metal, semi-metal)
10. What is your phase of matter at room temperature?
11. Who discovered you?
12. When compared to Francium, how do your size compare?
13. When compared to Fluorine, how does your ionization compare?
14. What is your boiling point and boiling point?
15. What is your electron configuration?
16. What is your density?
17. How many electrons do you have in your valence?
18. When compared to Calcium, how does your electronegativity compare?
19. Where are you most likely found or used in?
20. What makes you important to the world?

The autobiography must be 300-500 words long and be accompanied by a picture of your personal license plate. The template for the license plate is attached. The license plate must creatively associate your element symbol with one of your unique properties or uses. (\*Please remember you must create a works cited page that includes all sources for your information and you must have used more than 3 resources.)

**Option 2:** Produce an icosahedron (20-sided structure) displaying information about an element. You must put your name, block and date on triangle #1. The remaining triangles must include 19 of the following facts about the element

1. Student name, block and date.
2. What is your atomic number and atomic mass?
3. What is the most common isotope, and give the number of protons, neutrons and electrons for that isotope?
4. How many naturally occurring isotopes do you have?
5. What is your charge when you become an ion?
6. What is your first ionization energy value?
7. What is your electronegativity?
8. What is your atomic radius?

9. What type of element are you? (metal, non-metal, semi-metal)
10. What is your phase of matter at room temperature?
11. Who discovered you?
12. When compared to Francium, how do your size compare?
13. When compared to Fluorine, how does your ionization compare?
14. What is your boiling point and boiling point?
15. What is your electron configuration?
16. What is your density?
17. How many electrons do you have in your valence?
18. When compared to Calcium, how does your electronegativity compare?
19. Where are you most likely found or used in?
20. What makes you important to the world?

The ball needs to be visually attractive and well put together. Please use construction paper or card stock to build the element ball. The template and instructions for the icosahedron are attached. (\*Please remember you must create a works cited page that includes all sources for your information and you must have used more than 3 resources.)

**Option 3:** Produce a foldable(s) that can be used to help anyone study atomic structure and periodicity. The design of the foldable, and number of foldables is up to you but it must include the following information:

1. Define atomic number.
2. Illustrate how to use the periodic table to find atomic number.
3. Define atomic mass.
4. Define isotope, and give 3 examples.
5. Illustrate or diagram how to determine average atomic mass.
6. Discuss how to determine the charge that an atom will have if it becomes an ion.
7. Define ionization energy, list which element is highest and which is lowest.
8. Define electronegativity, list which element is highest and which is lowest.
9. Define atomic radius, list which element is largest and which is smallest.
10. Describe metal, non-metal, and semi-metal.
11. Describe the three phases of matter, solid, liquid and gas.
12. Describe how to determine the number of valence electrons.
13. Illustrate where to find the energy levels (n) for an element using the periodic table.
14. Illustrate how to determine the sublevels (l) for an element using the periodic table.
15. Describe alpha and beta decay.
16. Illustrate an alpha decay reaction.
17. Illustrate a beta decay reaction.
18. Define half life.
19. Illustrate a half life problem. (you may use either the math formula or table form)
20. Make sure your name and block are on all foldables.

You may choose the design of your foldables. Some options for foldables can be found at the following links:

[http://www.csun.edu/~krowlands/Content/Academic\\_Resources/Foldables/Basic%20Foldables.pdf](http://www.csun.edu/~krowlands/Content/Academic_Resources/Foldables/Basic%20Foldables.pdf)

<http://foldables.wikispaces.com/Foldables>

<http://cmase.pbworks.com/f/Foldables.pdf>

Or create a foldable of your own. (\*Please remember you must create a works cited page that includes all sources for your information and you must have used more than 3 resources.)

Your  
Name  
Period

Atomic mass  
#

**Materials:** Base material (construction paper, origami paper, printer paper), stapler or glue, pens markers, crayons, decorations, yarn and research information

**Procedure:**

1. Using the circle template, cut 20 circles from pieces of your base material (paper, etc.).  
 \*\*\* NOTE: You must follow the size of the circle template **exactly**.
2. Inside 19 of the triangles, write a piece of research information (fact, property, etc.). Be sure that all written information is **INSIDE** the triangular area. Decorate the circles or triangles, making them as colorful and unique as you can. Write your name, class period, and element inside the one remaining triangle.
3. Fold in an upright direction, the scalloped edges that extend beyond the sides of the triangle on each circle (Figure 1).
4. To begin assembly of the icosahedron, select five of the triangles and place them in a circle with the top points toward the center, like the five pieces of a sliced pie (Figure 2).
5. Staple the entire area of each pair of adjacent scalloped edges (edges must be facing out). Once all five triangles are secured, it should resemble a hat. This will form the top of the completed icosahedron.
6. Repeats steps 4 and 5 to form the bottom of the icosahedron.
7. To make the center of the icosahedron, place the remaining ten triangle in a straight row, with alternating points up and down (Figure 3). Staple each pair of adjacent scalloped edges.
8. Bring the two ends of the row of triangles together to form a ring and staple or glue the two scalloped edges.
9. Set the ring on a table and place the top on the ring, aligning the scalloped edges from the top with those on the ring. Staple each pair of aligned scalloped edges.
10. Turn the assembly over and attach the bottom in a similar fashion.

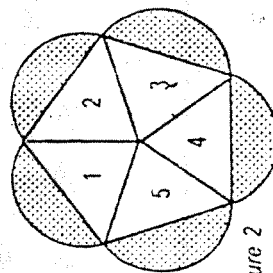
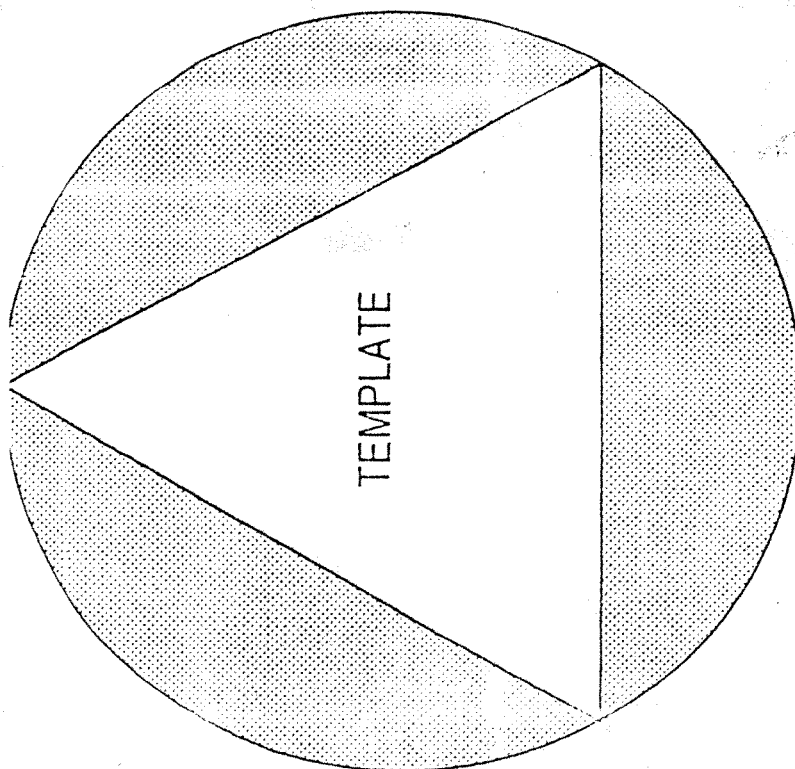


Figure 2

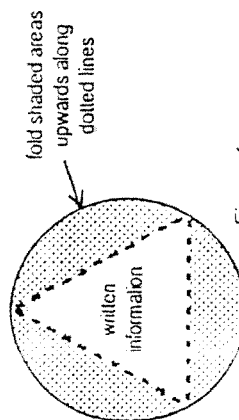


Figure 1

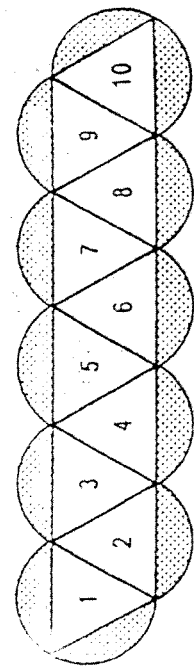


Figure 3

