Periodic Table Puzzle Lab 80/1200 Name: _____

Purpose: To better understand the thinking process of Dmitri Mendeleev when making the first real periodic table.

Safety: For this lab it cannot be overstated how easy it will be to become frustrated and totally annoyed with both the lab process and the teacher as well.

Please write a sentence in your own hand writing where by you promise not to curse, cry, freak out, or throw the puzzle pieces around.

_____.

Procedure: You will work with assigned partners of 2 people only. You will be given a random bag of puzzle pieces. Each bag has 24 cards total, but for each bag 2 cards will have been removed. Make sure you have 22 cards before you start. Each card has six properties, which you must list below 1-6, before you are allowed to proceed and "solve" the puzzle. The bags are all different from each other, and each card is numbered to keep the sets of cards together. You can't help anyone else and they can't help you, please let everyone suffer in peace.

Once you have the six properties and your teacher says you have them correct, you may solve the puzzle. The only hint that you get is that the puzzle ends up in a regular shape that is not in a straight line. With 24 cards the puzzle will end up 2 x 12, or 3 x 8, or 4 x 6, or 6 x 4, or 8 x 3, or even 12 x 2 in dimension. The missing 2 cards have to be accounted for.

The Puzzle only fits together one way properly. When you figure out the proper form, you will be able to determine what the characteristics of the missing 2 pieces are. WRITE these down in the spaces below, and check with your teacher to see if you figured them out correctly. Imagine how hard it was for Mendeleev, who had no idea of the shape of the table, the number of atoms in the table, or what properties were important enough to group together, and which were the ones to overlook!

6 Properties of all cards		Teacher checks your work	Missing card #1 Properties	Missing Card #2 Properties
1		Did you get all six properties correct? _____		
2				
3				
4				
6				
7				

Questions - On Loose Leaf Paper

Mendeleev predicted an element that he felt was missing on his table. He called it "Eka-aluminum" because it had properties similar to aluminum. He determined these particular values and properties:

Atomic mass = 68.0 amu Density = 6.00 g/cm^3

When combining with oxygen it should combine as Ea_2O_3

1. The element he predicted was later named gallium.
   Compare the actual atomic mass to his prediction and calculate the % error.

2. Then compare the actual and predicted densities and do another percent error.

3. Write out the correct chemical formula for gallium oxide.

4. Write out the correct chemical formula for gallium chloride

5. List the symbols of the alkali metals

6. List the symbols of the alkaline earth metals

7. List the symbols of the halogens

8. List the symbols of ALL the non - metals

9. List the symbols of the noble gases

10. List the symbols of the metalloids

11. List the groups of transitional metals, then write the symbols of the additional ten metals that also could be called the "other metals".

12. What GROUP are the inner transitional metals in? What periods are they in?

This Lab	SHOULD INCLUDE	points
cover	Title and intro	1 + 2
Page 1	The dozen questions above	12
Page 2	Extended conclusion, not specifically about the puzzle, rather all about the periodic table, the trends that we examined, what exceptions are, etc.	10
Due	Total points:	25