**The Missing Family Member**

Going through some archival records discovered in an attic, you find some pictures of a unique family. You are able to match all of the family members and their pictures except one. There is one family member whose picture is missing whose name is Al. Following the procedure below, predict what this missing family member should look like.

**Procedure**

1. Make observations of the pictures. See question 1.

2. Arrange the family in columns and rows based on their physical features and clothing.

3. When you think you have correctly lined up the pictures of the family, you should notice a gap where the one person should be located. Ask your teacher if you’re not sure if everything is lined up properly. Then, identify what this person should look like based on the patterns.

**Questions**

1. What did you observe about the physical features (hair, arms, fingers, expression) of the people as you arranged their pictures from smallest to the largest?

2. What can the increase in the size of the people be compared to on the periodic table?

3. The number of arms each person has relates to the number of electron energy levels that exist for specific atoms. People in the second row have \_\_\_\_\_\_ number of arms; therefore elements in period 2 of the periodic table have \_\_\_\_ energy levels.

4. The number of fingers on the hands represents the number of electrons. Look at period 3 of the people. How do the numbers of fingers change as you look from left to right? What is the significance of fingers on each of the hands?

5. Compare the number of hairs on the heads of the cousins to valence electrons. How does this observation relate to Mendeleev’s work?

Why are some people smiling while others are frowning? (*Hint*: Some atoms need only to gain or lose one or two, or three electrons to have a full outer energy shell. The number of hairs on the head represent the number of electrons in the outer shell). People who are frowning need to \_\_\_\_\_ electrons, while smiling people will \_\_\_\_\_\_\_ electrons.

7. Describe everything you know about the missing person known as Al.

What is his/her atomic number?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How many electrons does he/she have?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Draw what this missing person would look like. Include the correct number of arms, hands, fingers, the presence or absence of a smile or frown, as well as hairs on their head. Also, be sure to dress them correctly:

8. You soon find out there was another missing person known as Cal (calcium). Include the correct number of arms, hands, fingers, the presence or absence of a smile or frown, as well as hairs on their head. Also, be sure to dress them correctly.

9. Describe some of the limitations of this activity with regards to trends in the periodic table. What is missing based on what you know now?

10. Think of some ways you could add the features that you listed in question 9 as missing into the people in this activity.

