

Ms. Randall

Regents Chemistry

Lab activity: Alien Periodic Table

Background: Earth's scientists have announced that they have finally made radio contact with intelligent life on a distant planet dubbed 2-4-D-5. One of this alien planet's languages is being translated, and scientific information has begun to be exchanged!

Planet 2-4-D-5 seems to be composed of many of the **same elements** as Earth. However, the scientists from planet 2-4-D-5 have different names and symbols for them. The alien scientists do not know **our** names for the elements, or how to classify them, but they have radioed data on the known properties of their elements.

As a scientist who has been studying about chemistry, you have been asked to help sort out what is known about the alien elements and to arrange them onto a blank periodic table. Once this table is organized, scientists on both planets will understand each other better and will be able to work to share scientific information and make new discoveries.

Objective:

- To draw conclusions about the Earth names of the alien elements based on atomic number.
- To classify elements based on their properties.
- To infer the position of the elements on the periodic table.

Procedure:

Using your knowledge of Earth's periodic table, you will arrange the alien elements onto a blank periodic table. Be sure to complete 1-4 below.

1. Each alien element symbol should be located in the **same position** that Earth's corresponding element symbol would be located. (*Note: The symbol is given in parentheses after the element's name.*) Listed below are data on the chemical and physical properties of the 30 elements. Place the elements in their proper position in the blank periodic table.
2. Label the blank periodic table with each alien symbol.
3. Write the Earth names for the 30 alien elements on your table.
4. Label the names of each of the groups.
5. Color code each of the family/groups for the alien periodic table and include a key.

Materials:

- Blank periodic table

<p>A. The noble gases are bombal (Bo), wobble (Wo), jeptum (J), and logon (L). Among these gases, wobble has the greatest atomic mass and bombal the least. Logon is lighter than jeptum.</p>	<p>B. The most reactive group of metals are xtalt (X), byyou (By), chow (Ch), and quackzil (Q). Of these metals, chow has the lowest atomic mass. Quackzil is in the same period as wobble.</p>
<p>C. Apstrom (A), vulcania (V), and kratt (Kt) are nonmetals whose atoms typically gain or share one electron. Vulcania is in the same period as quackzil and wobble.</p>	<p>D. The metalloids are ernsst (e), highho (Hi), terriblum (T), and sississ (Ss). Sississ is the metalloid with the greatest atomic mass. Ernst is the metalloid with the lowest atomic mass. Highho and terriblum are in Group 14. Terriblum has more protons than highho. Yazzar (Yz) touches the zigzag line, but it's a metal, not a metalloid.</p>
<p>E. The lightest element of all is called pfsst (Pf). The heaviest element in the group of 30 elements is Eldorado (El). The most chemically active nonmetal is apstrom. Kratt reacts with byyou to form table salt.</p>	<p>F. The element doggone (D) has only 4 protons in its atoms.</p>
<p>G. Floxxit (Fx) is important in the chemistry of life. It forms compounds made of long chains of atoms. Rhaatrap (R) and doadeer (Do) are metals in the fourth period, but rhaarap is less reactive than doadeer.</p>	<p>H. Magnificon (M), goldy (G), and sississ are all members of Group 15. Goldy has fewer electrons than magnificon.</p>
<p>I. Urrp (Up), oz (Oz), and Nuutye (Nu) all gain 2 electrons when they react. Nuutye is found as a diatomic molecule and has the same properties as a gas found in Earth's atmosphere. Oz has a lower atomic number and urrp.</p>	<p>J. The element anatom (An) has atoms with a total of 49 electrons. Zapper (Z) and pie (Pi) lose two electrons when they react. Zapper is used to make lightweight alloys.</p>

Analyze and Conclude

1. **Classifying:** Were you able to place some elements within the periodic table with just a single clue? Explain using examples
2. **Interpreting Data:** Why did you need two or more clues to place other elements? Explain using examples.
3. **Inferring:** Why could you use clues about atomic mass to place elements, even though the table is now based on atomic numbers?
4. **Communicating:** Write a paragraph describing which groups of elements are not included in the alien periodic table. Explain whether or not you think it is likely that an alien planet would lack these elements.

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Lab Conclusion: Alien Periodic Table

1. Write a paragraph summarizing what you have learned about the scientific concept of the lab from doing the lab. Back up your statement with details from your lab experience.

2. Describe one chemical property of Group 1 metals that results from the atoms of each metal having only one valence electron.

3. Which element is malleable and conducts electricity?

A) iron

B) iodine

C) sulfur

D) phosphorus

4. Which characteristics describe most nonmetals in the solid phase?

A) They are malleable and have metallic luster.

B) They are malleable and lack metallic luster.

C) They are brittle and have metallic luster.

D) They are brittle and lack metallic luster.

5. The element arsenic (As) has the properties of

A) metals, only

B) nonmetals, only

C) both metals and nonmetals

D) neither metals nor nonmetals

Alien Periodic Table

	1							18
1								
2								
3								
4								
5								