

Alien Periodic Table

Imagine that scientists have made radio contact with life on a distant planet. The planet is composed of many of the same elements as are found on Earth. But the inhabitants of the planet have different names and symbols for the elements. The radio transmission gave data on the known chemical and physical properties of 30 elements that belong to Groups 1, 2, 13, 14, 15, 16, 17, and 18. You need to place the elements into a blank periodic table based on these properties.

◆ Problem

Where do the alien elements fit in the periodic table?

◆ Materials

ruler
periodic table from text for reference

◆ Procedure

- Record your data in the blank periodic table on page 94.
- 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.
 - 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.
 - 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.
 - 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.
 - The metalloids are ernst (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. Yizzer (Yz) touches the zigzag line, but it's a metal, not a metalloid.
 - 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.

SKILLS LAB *(continued)*

Alien Periodic Table

	1						18		
1		2		13	14	15	16	17	
2									
3									
4									
5									

- ◆ The element doggone (D) has only 4 protons in its atom.
- ◆ 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 rhaatrap is less reactive than doadeer.
- ◆ Magnificon (M), goldy (G), and sississ are all members of Group 15. Goldy has fewer total electrons than magnificon.
- ◆ 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 than urrp.
- ◆ 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 in flashbulbs.

SKILLS LAB *(continued)*

◆ Analyze and Conclude

Write your answers on the back of this sheet or on a separate sheet of paper.

1. List the Earth names for the 30 alien elements in order of atomic number.
2. Were you able to place some elements within the periodic table with just a single clue? Explain using examples.
3. Why did you need two or more clues to place other elements? Explain using examples.
4. Why could you use clues about atomic mass to place elements, even though the table is now based on atomic number?
5. **Think About It** Which groups of elements are not included in the alien periodic table? Do you think it is likely that an alien planet would lack these elements? Explain.

◆ More to Explore

Notice that Period 5 is incomplete on the alien periodic table. Create names and symbols for each of the missing elements. Then, compose a series of clues that would allow another student to identify these elements. Make your clues as precise as possible.