

INTRODUCTION

The periodic table was developed as a way to quickly identify groups of elements that share some characteristics. By learning how the periodic table is organized, characteristics of elements become easier to understand.

Activity Overview

In this activity we will

- determine the trend in atomic radius for the periodic table
- determine the trend in first ionization energy for the periodic table
- determine the trend in electronegativity for the periodic table

Approximate Total Time: 15 minutes

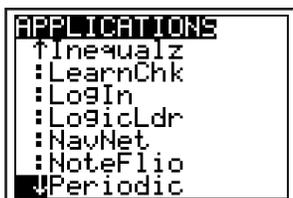
Science Objective

Students use the Periodic App to explore the structure of the periodic table and determine trends in it.

PROCEDURE

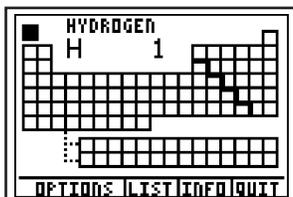
1

Turn the calculator on and press **[APPS]**. Use the arrow keys to move down to PERIODIC, and press **[ENTER]**. Your applications menu may look different from the one shown. That's OK; just scroll down until PERIODIC is highlighted.



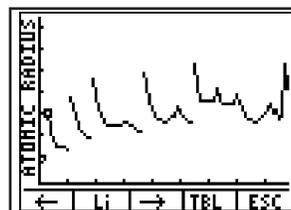
2

Press **[Y=]** or **[WINDOW]** to select OPTIONS. Use the arrow keys to highlight GRAPH PROPERTIES. Press **[ENTER]**. ATOMIC RADIUS should be highlighted. Press **[Y=]** for OK.



3

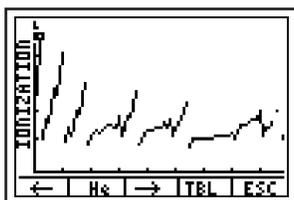
The graph should look like the one shown below. Use the arrow keys to move the cursor along the points in the graph. The element corresponding to each point is displayed between the **[◀]** and **[▶]** symbols at the bottom of the screen. Use the arrow keys to move the cursor through the elements. In the row for atomic radius in the data table, record the symbols of the element at the top (T) and at the bottom (B) of each of the first five curved lines in the graph. For example, lithium (Li) is the element at the top of the first curved line.



Setting the Trend

4

When you finish step 3, press **[GRAPH]** to return to the menu. Use the arrow keys to highlight **1ST IONIZATION ENERGY**. Press **[ENTER]**. Move the cursor to locate the elements found at the top and at the bottom of each of the first five lines. Write the symbols of the elements in the row for first ionization energy in the data table.



5

When you finish step 4, press **[GRAPH]** to return to the menu. Use the arrow keys to highlight **ELECTRONEGATIVITY**. Press **[ENTER]**. Move the cursor to locate the elements found at the top and at the bottom of each of the first four lines. Write the symbols of the elements in the row for electronegativity in the data table.



DATA TABLE

Graph	Element Line 1		Element Line 2		Element Line 3		Element Line 4		Element Line 5	
	T	B	T	B	T	B	T	B	T	B
Atomic radius	Li									
First ionization energy										
Electronegativity									N/A	N/A

Setting the Trend

DATA ANALYSIS AND QUESTIONS

(Hint: You may need to look at a copy of the periodic table to answer some of the questions below.)

1. What do the elements at the tops of the lines in the atomic radius graph have in common? What do the elements at the bottoms of the lines in the atomic radius graph have in common?
2. As you move from left to right across the periodic table, what is the trend in element radius? As you move down a column in the periodic table, what is the trend in the radii of elements?
3. What do the elements at the tops of the lines in the first ionization energy graph have in common? What do the elements at the bottoms of the lines in the first ionization energy graph have in common?
4. As you move from left to right across the periodic table, what is the trend in the first ionization energies of elements? As you move down a column in the periodic table, what is the trend in the first ionization energies of elements?
5. What do the elements at the tops of the lines in the electronegativity graph have in common? What do the elements at the bottoms of the lines in the electronegativity graph have in common?
6. As you move left to right across the periodic table, what is the trend in the electronegativities of elements? As you move down a column in the periodic table, what is the trend in the electronegativities of elements?

TI-NAVIGATOR™ SYSTEM EXTENSION

Do your students still need to install the Periodic App? Save time by sending Apps and other class materials directly to your students' calculators with TI-Navigator™ System. It's easy! For details on sending files, refer to **Appendix C**.