

Periodicity introduction

The periodic table is a very useful way of arranging all the different elements.

Go to: <http://www.rsc.org/periodic-table/>

Explore some of the features of this visual database to remind you of what we have studied in topics 2 and 12 in terms of links between the periodic table (group, period and block) and the electronic configuration of the atoms of the different elements.

Questions

1. In the periodic table, elements are arranged in order of
2. Use your IB periodic table to complete the table below. Once you have completed it check your answer using the Royal Society of Chemistry periodic table.

element	symbol	block	group in block	valence electrons in highest occupied sub-level	period	highest occupied principal main energy level	short electronic configuration
Indium							
Lanthanum							
Cadmium							
Barium							
Holmium							

3. Name the following groups of the periodic tables

- Group 1 =
- Group 17 =
- Groups 3 to 12 =
- Group of metallic elements from atomic number 57 to 71 =
- Group of 15 metallic elements from atomic number 89 to 10 =

4. Research a definition of the term periodicity – use any website.

Examples of periodic trends i.e. repeated trends.

When explaining trends, use the sheet “Explaining periodicity”. If links don’t work use the RSC periodic table, your data booklet or any other interactive periodic table – see chemisthompson.com for links.

	atomic radius
1.	Using your textbook or internet, find out how the different ways in which the atomic radius is measured.
2.	Go to http://group.chem.iastate.edu/Greenbowe/sections/projectfolder/flashfiles/matters/periodicTbl2.html
3.	Click on ‘atomic radius’ and describe the trends across period 3 and down group 1 and 7. Are trends repeated?
4.	Go to http://www.rsc.org/Education/Teachers/Resources/ptdata/table/index.htm to check if it shows the same trends. You need to click on the visualization box. What other terms do they use instead of atomic radius. Why?
5.	What unit is used for atomic radius in Table 9 in your data booklet?
6.	Using the sheet “explaining trends”, explain the trends you have identified in questions 2, 3 and 4.

	ionic radius
Go to	http://group.chem.iastate.edu/Greenbowe/sections/projectfolder/flashfiles/matters/periodicTbl2.html
1.	Click on ionic radius and compare the radius of the positive ions to the radius of the atom it was made from. Do the same for the negative ions. Write down your findings in your book.

2. Explain your findings – using the ‘explaining trends sheet’.
3. What is the trend in ionic radius as you down groups 1 and 7? Is this a repeated trend?
4. Go to Table 9 in your data booklet. What do you think the number and sign in brackets indicates in each element box? Does that data in the table still support your answer to question 1?

electronegativity

Go to <http://www.rsc.org/periodic-table/>

1. Research the term electronegativity.
2. What scale is used to indicate electronegativity?
3. Describe the trend down a group (try different groups) and across a period.
4. Which element has the highest value? Lowest value? Does that make sense? How?
5. Explain these trends.
6. Why are there no values for the noble gases?

Go to <http://www.rsc.org/Education/Teachers/Resources/ptdata/table/index.htm> to view a different way of showing the trends.

first ionization energy

Go to http://ibchem.com/root_swf/pt1.swf

1. Describe the trends down groups 1 and 7 and across period 3.
2. Explain these trends.

electron affinity

Go back to <http://www.webelements.com/periodicity/>

1. Find a definition of electron affinity and an equation.
2. Describe the trend in affinity down groups 1 and 7 and across period 3.
3. Suggest explanations for these trends.