

Name: _____

Date: _____

Trends in the Periodic Table

Homework Unit 7 - Topic 4 (IB)

Answer the following questions and, using your iPads and Keynote, create a presentation that you and your group will present a part of to the class. Each table group will be assigned a trend in the table. Use the questions listed here to take notes of your peers' presentations. Use EMD-PTE, your Reference Tables, and your book.

General Trends

1. What happens to the number of valence electrons as you go down a group on the periodic table?
2. What happens to the number of valence electrons as you go from left to right across a period?
3. What happens to the number of energy levels as you go down a group on the periodic table?
4. What happens to the number of energy levels as you go from left to right across a period?
5. Draw lewis structures for the Na atom and the Cl atom.
6. Draw lewis structures for the Na ion and the Cl ion.
7. Define periodic:
8. Define trend:
9. What scientist created the first periodic table, which arranged the elements according to their atomic masses?
10. What scientist developed the periodic table as we know it today, with elements arranged according to their atomic numbers?

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Atomic Radius

1. Define atomic radius:
2. What is the unit used for atomic radius? _____ How many of these are in a meter? _____
3. Where in your reference tables can you find information about an element's atomic radius?
4. Look at the graph above. Compare it to the periodic table. What do you notice about the location on the periodic table of the elements that represent the high points?
5. What do you notice about the location on the periodic table of the elements that represent the low points?
6. Look up the elements on the graph that make up period 3 of the periodic table. What do you notice about atomic radius as you move from left to right across a period?
7. Explain, in terms of atomic structure and forces, why atomic radius decreases from left to right across a period.

State the Trend

ATOMIC RADIUS _____ as you go down a group and _____ as you go from left to right across a period.

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Reactivity

1. When METALS react, they (gain / lose) electrons.
2. Look at Group 1 on the Periodic Table, the Alkali Metals.
 - a) What is similar about their atomic structure? _____
 - b) Why does Hydrogen fit into this group? _____
 - c) Why does Hydrogen NOT fit into this group? _____
 - d) Which metal is the most reactive of the group (loses electrons most easily)?
Why? _____

 - e) Group 2, the Alkaline Earth Metals, follow similar trends. Which element is more reactive, barium or magnesium? _____
3. When NON-METALS react, they (gain / lose) electrons.
4. Look at Group 17 on the Periodic Table, the Halogens.
 - a) what is similar about their atomic structure? _____
 - b) Which non-metal is the most reactive of the group (gains electrons most easily)?
Why? _____

 - c) State the relationship between reactivity and size for non-metals. _____

5. Group 18, the NOBLE GASES, are not reactive at all. Why? _____

State the Trend

For METALS, REACTIVITY _____ as you down a group. For
NON-METALS, REACTIVITY _____ as you down a group.

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Electronegativity

Use the App EMD-PTE, your Reference Tables, or your textbook to answer the following questions about electronegativity man.

1. Define electronegativity: _____

2. Why would an atom want to gain electrons? _____
3. When looking at the elements in the same period, from which group does the element come from that has the highest electronegativity value in every case?
_____ The lowest? _____
4. Which has higher electronegativity, metals or non-metals? Why? _____

5. What is the electronegativity trend from top to bottom in the same group?

6. What is the electronegativity trend from left to right across a period?

7. Based on the definition of electronegativity, why don't the noble gases have any electronegativity values? _____

8. Which element has the highest electronegativity of all? Why? _____

State the Trend

ELECTRONEGATIVITY _____ as you go down a group and
_____ as you go from left to right across a period.

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Ionization Energy

Use the App EMD-PTE, your Reference Tables, or your textbook to answer the following questions about ionization energy.

1. Define ionization energy: _____

2. Why is it easier to remove an electron from Na than it is from Cl? _____

3. Why is ionization energy related to, but not the same as, electronegativity?

4. Describe the trend in ionization energy as you go left to right across a period.

5. Describe the trend in ionization energy as you go down a group. _____

6. Why do noble gases have the highest ionization energy values? _____

7. Why do metals have low ionization energy values? _____

8. Why do nonmetals have high ionization energy values? _____

State the Trend

IONIZATION ENERGY _____ as you go down a group and
_____ as you go from left to right across a period.

Name: _____

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Do you get it?

1. Explain what the trend is for the following properties for elements in the same GROUP. Explain why the trends exist in terms of **atomic size**:

Reactivity

Metallic character

Electronegativity

Ionization energy

2. Explain what the trend is for the following properties for elements in the same PERIOD. Explain why the trends exist in terms of **nuclear charge**:

Reactivity

Metallic character

Electronegativity

Ionization energy