

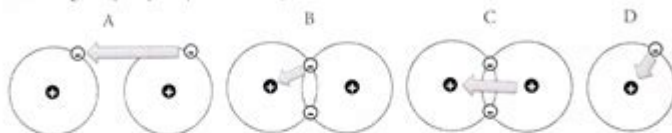
Periodic Trends Pogil

Key P.T.

Read This!

Electronegativity is a measure of the ability of an atom's nucleus to attract electrons from a different atom within a covalent bond. A higher electronegativity value correlates to a stronger pull on the electrons in a bond. This value is only theoretical. It cannot be directly measured in the lab.

12. Using the definition stated in the *Read This!* box above, select the best visual representation for electronegativity. Explain your reasoning.



13. Locate the electronegativity values in Model 1.

- a. What is the trend in electronegativity going down a group in Model 1?

Electronegativity decreases as you go down a group (vertical column).

- b. Explain the existence of the trend described in part a in terms of atomic structure and Coulombic attraction.

The ability to attract electrons is based upon attractive force. The greater the distance between the nucleus and valence electrons, the less the attractive force. Less force means a lower electronegativity.

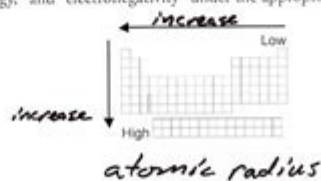
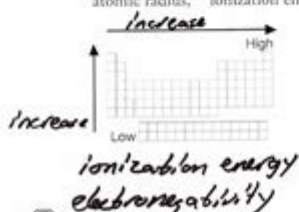
- c. What is the trend in electronegativity going across a period in Model 1?

Electronegativity increases from left to right across a period (horizontal row).

- d. Explain the existence of the trend described in part c in terms of atomic structure and Coulombic attraction.

The greater the number protons in an atom, in a particular period, the greater the attractive force between the nucleus and valence electrons. The greater attractive force means a higher electronegativity.

14. The two diagrams below can summarize each of the three trends discussed in this activity. Write "atomic radius," "ionization energy," and "electronegativity" under the appropriate diagram.



Mastering Periodic Trends: A Deep Dive into POGIL Activities

Are you struggling to grasp the complexities of periodic trends? Do you find yourself overwhelmed by the sheer volume of information surrounding electronegativity, ionization energy, and atomic radius? This comprehensive guide provides a detailed exploration of POGIL (Process Oriented Guided Inquiry Learning) activities designed to help you master periodic trends. We'll delve into why POGIL is effective, explore specific examples of how it's applied to periodic trends, and offer strategies for maximizing your learning through these interactive exercises. Get ready to transform your understanding of the periodic table!

Understanding the Power of POGIL for Periodic Trends

POGIL activities are a game-changer for science education. Unlike traditional lectures, POGIL fosters active learning by placing the responsibility of understanding on the student. Instead of passively receiving information, students collaboratively work through carefully structured activities, prompting critical thinking and problem-solving skills. This approach is particularly beneficial when tackling the nuances of periodic trends, which require a deep understanding of underlying atomic structure and electron configuration.

By working through POGIL activities on periodic trends, you'll:

Develop a deeper conceptual understanding: POGIL encourages you to analyze data, draw conclusions, and predict behaviors, resulting in a more robust understanding than simply memorizing facts.

Improve critical thinking skills: The collaborative nature of POGIL encourages discussion and debate, refining your ability to evaluate information and form reasoned judgments.

Enhance problem-solving abilities: POGIL activities often present challenging scenarios that require you to apply your knowledge to unfamiliar situations.

Build collaborative skills: Working effectively in groups is a key skill in science and beyond; POGIL provides valuable practice in this area.

Key Periodic Trends Explored Through POGIL

POGIL activities on periodic trends typically cover a range of crucial concepts, including:

Atomic Radius: Across and Down the Table

POGIL exercises often present data tables of atomic radii for various elements. By analyzing this data, students discover the trends: atomic radius generally increases down a group (due to added electron shells) and decreases across a period (due to increased nuclear charge). Students may be asked to explain these trends using principles of electron shielding and effective nuclear charge.

Ionization Energy: The Energy to Lose an Electron

Understanding ionization energy – the energy required to remove an electron from an atom – is crucial. POGIL activities might involve predicting ionization energies based on position on the periodic table. Students learn to relate ionization energy to atomic radius and effective nuclear charge, explaining why ionization energy generally increases across a period and decreases down a group.

Electronegativity: The Battle for Electrons

Electronegativity, the tendency of an atom to attract electrons in a chemical bond, is another key trend. POGIL activities might involve predicting the polarity of bonds based on electronegativity differences between atoms. This helps students understand concepts like polar and nonpolar molecules and their properties.

Electron Affinity: The Attraction to Gain an Electron

While less frequently emphasized than other trends, electron affinity (the energy change when an atom gains an electron) also exhibits periodic trends. POGIL activities can explore the exceptions and irregularities within this trend, leading to a more nuanced understanding of atomic behavior.

Effective Strategies for Tackling POGIL Periodic Trends Activities

To maximize the benefits of POGIL, employ these strategies:

Engage actively: Don't just passively read; actively participate in discussions and contribute your ideas.

Collaborate effectively: Work together with your group members, sharing ideas and perspectives.

Ask questions: Don't hesitate to ask your instructor or peers for clarification if you're stuck.

Reflect on your learning: Take time to review what you've learned and identify areas where you need further clarification.

Connect concepts: Try to link the concepts you're learning in POGIL to other areas of chemistry.

Conclusion

Mastering periodic trends is a cornerstone of success in chemistry. POGIL activities offer a powerful and engaging approach to learning these essential concepts. By actively participating in these collaborative exercises and employing effective learning strategies, you can achieve a deeper and more meaningful understanding of the periodic table and its underlying principles. Remember, the key is active engagement and thoughtful collaboration.

FAQs

1. Are there specific POGIL activities readily available for periodic trends? Many educational

resources and textbooks incorporate POGIL activities, and searching online for "periodic trends POGIL activities" will yield several options. Your instructor may also provide specific materials.

2. What if I struggle with a particular POGIL activity? Don't hesitate to seek help from your instructor, classmates, or online resources. The collaborative nature of POGIL means there's support readily available.

3. How can I best prepare for a POGIL activity on periodic trends? Review fundamental concepts like electron configuration, atomic structure, and basic periodic table organization before starting the activity.

4. Can POGIL activities be used for advanced periodic trends topics? Yes, POGIL's adaptable nature allows for its application to more advanced topics like effective nuclear charge calculations or the irregularities observed in ionization energies of transition metals.

5. Are there alternative learning methods that complement POGIL for periodic trends? Absolutely! Supplementing POGIL with videos, interactive simulations, and practice problems will further solidify your understanding. A multifaceted approach to learning is usually the most effective.

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full-length practice exams help you build your confidence, get comfortable with test formats, identify your strengths and weaknesses, and focus your studies. You'll discover how to Create and follow a pretest plan Understand everything you must know about the exam Develop a multiple-choice strategy Figure out displacement, combustion, and acid-base reactions Get familiar with stoichiometry Describe patterns and predict properties Get a handle on organic chemistry nomenclature Know your way around laboratory concepts, tasks, equipment, and safety Analyze laboratory data Use practice exams to maximize your score Additionally, you'll have a chance to brush up on the math skills that will help you on the exam, learn the critical types of chemistry problems, and become familiar with the annoying exceptions to chemistry rules. Get your own copy of AP Chemistry For Dummies to build your confidence and test-taking know-how, so you can ace that exam!

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understanding. Discipline-Based Education Research is based on a 30-month study built on two workshops held in 2008 to explore evidence on promising practices in undergraduate science, technology, engineering, and mathematics (STEM) education. This book asks questions that are essential to advancing DBER and broadening its impact on undergraduate science teaching and learning. The book provides empirical research on undergraduate teaching and learning in the sciences, explores the extent to which this research currently influences undergraduate instruction, and identifies the intellectual and material resources required to further develop DBER.

Discipline-Based Education Research provides guidance for future DBER research. In addition, the findings and recommendations of this report may invite, if not assist, post-secondary institutions to increase interest and research activity in DBER and improve its quality and usefulness across all natural science disciplines, as well as guide instruction and assessment across natural science courses to improve student learning. The book brings greater focus to issues of student attrition in the natural sciences that are related to the quality of instruction. Discipline-Based Education Research will be of interest to educators, policy makers, researchers, scholars, decision makers in universities, government agencies, curriculum developers, research sponsors, and education advocacy groups.

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tracks and wheel gauges, rail sections, alignments, speeds, and track moduli. The report includes chapters on vehicles, alignment, track structures, track components, special track work, aerial structures/bridges, corrosion control, noise and vibration, signals, traction power, and the integration of LRT track into urban streets.

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important step in the evolution of the periodic system since it represented the first clear statement that the properties of the elements repeated after intervals of 8. Mendeleev's predictions demonstrated in an impressive manner how the periodic table could be used to predict the occurrence and properties of new elements. Not all of his many predictions proved to be valid, but the discovery of scandium, gallium and germanium represented sufficient vindication of its utility and they cemented its enduring influence. Mendeleev's periodic table was based on the atomic weights of the elements and it was another 50 years before Moseley established that it was the atomic number of the elements, that was the fundamental parameter and this led to the prediction of further elements. Some have suggested that the periodic table is one of the most fruitful ideas in modern science and that it is comparable to Darwin's theory of evolution by natural selection, proposed at approximately the same time. There is no doubt that the periodic table occupies a central position in chemistry. In its modern form it is reproduced in most undergraduate inorganic textbooks and is present in almost every chemistry lecture room and classroom. This first volume provides chemists with an account of the historical development of the Periodic Table and an overview of how the Periodic Table has evolved over the last 150 years. It also illustrates how it has guided the research programmes of some distinguished chemists.

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challenges that arose along the way.--Provided by publisher.

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Phase Diagrams; Diffusion; Microstructure: Kinetics; Mechanical Behavior; Materials in the Environment; Electronic Behavior; Thermal Behavior; Materials Selection and Design.

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