1. Describe the contributions of Newlands, Mendeleev, Meyer, and Moseley to the development of the periodic table.

2. What are the representative elements?

3. Distinguish between core electrons and valence electrons.

4. Explain what it means to be isoelectronic. Why are the ions of N, O, F, Na, Mg, and Al all isoelectronic?

5. When would the ion of a representative element not be isoelectronic with a noble gas?

6. Write electron configurations for P3-, Ca2+, Sn2+, Sn4+, I-.

7. Predict reasonable cations for iron. Why would these ions be the most stable?

8. Explain the role of the shielding constant  in determining effective nuclear charge.

9. Approximate Zeff for Si, S, K, and Ca.

10. Describe the trends in atomic radius on the periodic table and explain why they happen.

11. Describe the periodic trends in first ionization energy and explain them. Discuss any expected exceptions.

12. Explain why first, second, third, etc., ionization energies increase. Why is the increase not linear?

13. Why does melting point tend to decrease going down a group on the periodic table?

14. Does electron affinity follow the same trend as ionization energy or atomic radius? Why?

15. Define diagonal relationships and discuss why they happen.

16. Why do the alkalai metals become more reactive going down the column?

17. Why are group IB metals much less reactive than group IA metals?

18. Describe the trends in acid/base behavior of oxides reading across a period. Explain why.