

*Using the mouse, click on an atom in the row of atoms above the periodic table and drag them to their respective location in the periodic table.

*Select one of the Groups (1, 2, 16, or 17) and complete the following table:

Table 1: Group data

(a) Element symbol	(b) Atomic Radius	(c) # of protons	(d) Total # of electrons	(e) Electron configuration	(f) # of inner core electrons	(g) # of valence electrons	(h) Energy level occupied by valence electrons

Use Table 1 to assist in answering the following questions.

- 1) Which column (c-h) in Table 1 cannot explain the trend of atomic radii observed in your group and why?
- 2) Which columns (c-h) in Table 1 can explain the trend in atomic radii observed in your group and why?(put an asterisk next to the column that you believe best explains the trend)
- 3) Explain how atomic radius changes as you go down a Group and why it changes. You must reference electron shielding in your response.

*Select one of the Periods and complete the following table:

Table 2: Period data

(a) Element symbol	(b) Atomic Radius	(c) # of protons	(d) Total # of electrons	(e) Electron configuration	(f) # of inner core electrons	(g) # of valence electrons	(h) Energy level occupied by valence electrons

Use Table 2 to assist in answering the following questions.

- 4) Which columns (c-h) in Table 2 cannot explain the trend in atomic radii observed in your period and why?

- 5) Which column (c-h) in Table 2 best explains the trend in atomic radii observed in your period and why?

- 6) Explain how atomic radius changes as you go across a period and why it changes.

*You will need to switch back and forth between ion view and atom view to collect the data for the last table

Table 3: ions and atoms

(a) Element symbol	(b) Atomic Radius	(c) # of protons	(d) Total # of electrons	(e) Electron configuration	(f) # of inner core electrons	(g) # of valence electrons	(h) Energy level occupied by valence electrons
Na							
Na ⁺							
Mg							
Ne							
Cl							
Cl ⁻							

Use Table 3 to assist in answering the following questions.

7) There is only 1 proton and electron difference between Ne and Na yet their atomic radii are very different. Explain (making sure to reference different amount of energy levels or electron shells).

8) Explain why Na and Mg have a similar atomic radius. (make sure to reference amount of electron shells)

9) Explain why Mg is smaller than Na.

10) Explain why Na is bigger than Cl.

11) Which is bigger, Na or Na^+ ? Explain why there is a change in atomic radius for the same element when it becomes an ion.

12) Which is bigger, Cl or Cl^- ? Explain why there is a change in atomic radius for the same element when it becomes an ion.

13) Which is bigger, Na^+ or Cl^- ? Explain.

Connecting Atomic Radius to the other trends

- 14) Define electronegativity

- 15) Define electron shielding

- 16) Explain why as you go down a group electronegativity decreases. (make sure to reference electron shielding/electron shells)

- 17) Explain why electronegativity increases as you go across a period. (make sure to reference protons and shells of electrons)

- 18) Define ionization energy

- 19) Explain why ionization energy is low when a metal is very reactive

- 20) Explain why ionization energy decreases as you go down a group. (make sure to reference electron shielding/electron shells)

- 21) Explain why ionization energy increases as you go across a period. Make sure to reference protons and shells of electrons)