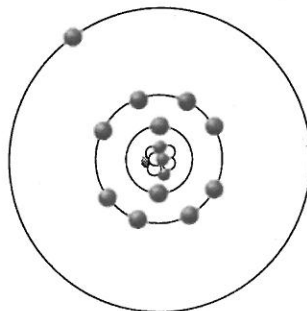


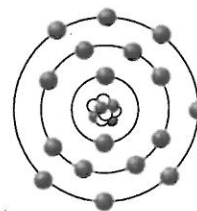
5-3 Apply

Two Trendy Elements

You can compare the sizes and chemical reactivity of two atoms by looking at their location on the periodic table. The two diagrams at the right show the relative sizes of a sodium atom and a chlorine atom. Use your knowledge of periodic trends to answer the following questions.



Sodium Atom



Chlorine Atom

- Both sodium and chlorine are in the same period on the periodic table. Explain the difference in their sizes.

- Predict the charge that an ion of each element would have. Explain your answer.

- Compare the amount of ionization energy required to remove the first electron from each of these atoms.

- Compare the electron affinities of these atoms.

- Draw the ion for each atom. Be sure to represent accurately their sizes relative to the original atoms.

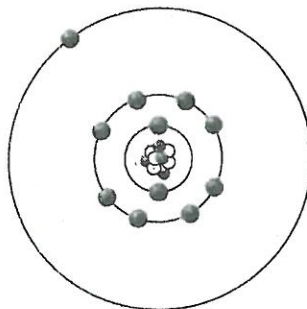
- Explain the ions you have drawn. How do these two elements compare in size now?

5-3 Apply

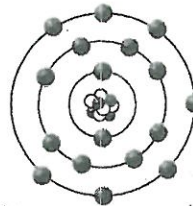
+6

Two Trendy Elements

You can compare the sizes and chemical reactivity of two atoms by looking at their location on the periodic table. The two diagrams at the right show the relative sizes of a sodium atom and a chlorine atom. Use your knowledge of periodic trends to answer the following questions.



Sodium Atom

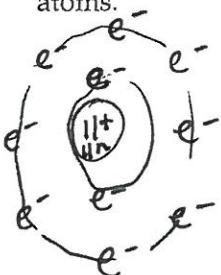


Chlorine Atom

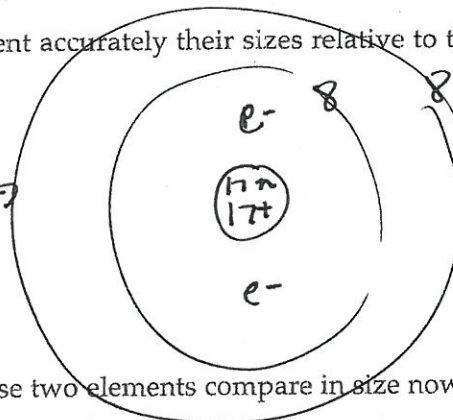
- +1 Both sodium and chlorine are in the same period on the periodic table. Explain the difference in their sizes.
Cl is smaller than Na because the ↑ charge of Chlorine's nucleus exerts a stronger pull on the e⁻, shrinking their orbitals.
- +1 Predict the charge that an ion of each element would have. Explain your answer.
Na will have a 1⁺ charge + Cl will have a 1⁻ charge.
- +1 Compare the amount of ionization energy required to remove the first electron from each of these atoms.
Ionization energy of Cl is ↑ since it only needs 1 e⁻ to fill its valence shell.
- +1 Compare the electron affinities of these atoms.
Cl has the greater e⁻ affinity (greater e⁻ attraction)

- +1 Draw the ion for each atom. Be sure to represent accurately their sizes relative to the original atoms.

Na⁺



Cl⁻



- +1 Explain the ions you have drawn. How do these two elements compare in size now?
Na smaller since it lost an e⁻
Cl larger since it gained an e⁻