

# Thinking (Electro)Negatively

## Electronegativity Scale

Name \_\_\_\_\_

Date \_\_\_\_\_ Period \_\_\_\_\_

### Purpose

To explore numerical values for electronegativity and to learn how to use them to compare atoms and bonds.

### Questions

Use the handout Electronegativity Scale to answer these questions.

1. What happens to the electronegativity values across each period from left to right?
2. What happens to the electronegativity values of each group from bottom to top?
3. If you have a bond between a metal atom and a nonmetal atom, which of the two is more electronegative? Explain your thinking.
4. Where are the atoms with the greatest electronegativity values located? Are they metals, nonmetals, or metalloids?
5. Where are the atoms with the lowest electronegativity values located? Are they metals, nonmetals, or metalloids?
6. Metals often are referred to as electropositive. Explain why.
7. Why do you think the noble gases do not have electronegativity values?
8. Circle the atom in each pair below that will attract shared electrons more strongly.  
**a.** C or Cl   **b.** Rb or Br   **c.** I or In   **d.** Ag or S   **e.** As or Na   **f.** H or Se
9. Which two atoms in the periodic table form the most polar bond?

10. List at least three examples of pairs of atoms with nonpolar covalent bonds.
11. If the difference in electronegativity between two bonded atoms is greater than 2.1, then the bond is considered ionic. List three examples of pairs of atoms with ionic bonds.
12. If the difference in electronegativity between two bonded atoms is less than 2.1, then the bond is considered polar covalent. List three examples of pairs of atoms with polar covalent bonds.
13. Metal atoms tend to form cations with positive charges. Is this consistent with the electronegativity of metal atoms? Why or why not?
14. Provide two explanations for why nonmetals tend to form anions.
15. Sulfur forms both ZnS and SF<sub>2</sub>. Is sulfur the most electronegative element in both compounds? Why or why not?
16. Arrange these bonded pairs in order of increasing polarity from the least polar to the most polar: C–H, H–O, N–H, and H–F.
17. **Making Sense** Explain how you would use the electronegativity scale to determine both the direction and the degree of polarity of a bond between two different atoms.
18. **If You Finish Early** Which of these pairs of atoms would result in the most electronegative bond? The least electronegative bond? Arrange them in order from the least polar to the most polar.

C–H    C–S    H–F    C–N    C–O    H–Br