

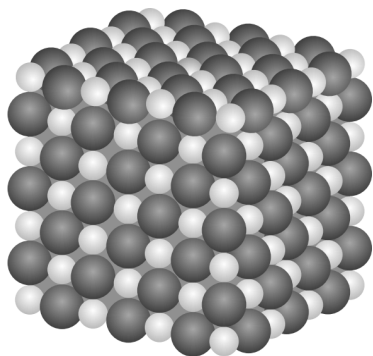
## RQ Chemical Bonds

Name: \_\_\_\_\_

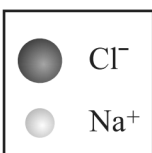
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- Which is a unique characteristic of the bonding between metal atoms?
  - Atoms require additional electrons to reach a stable octet.
  - Atoms must give away electrons to reach a stable octet.
  - Atoms share valence electrons only with neighboring atoms to reach a stable octet.
  - Delocalized electrons move among many atoms creating a sea of electrons.
- The model below shows the crystalline structure of sodium chloride.

**Sodium Chloride**



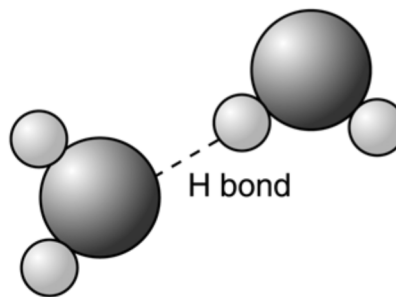
**Key**



Which statement *best* describes the behavior of the valence electrons as they form chemical bonds?

- Each sodium and chlorine atom shares one electron between both atoms.
- Each sodium and chlorine atom shares two electrons between both atoms.
- One electron from each sodium atom is transferred to each chlorine atom.
- Two electrons from each chlorine atom are transferred to each sodium atom.

3.



**Water Molecules**

The model illustrates hydrogen bonding found in water. This attraction between water molecules is the result of water's—

- ionic bonding.
  - polar covalent bonding.
  - positively charged atoms.
  - negatively charged atoms.
- How can two different nonmetals form a compound?
    - by sharing protons
    - by sharing electrons
    - by transferring protons
    - by transferring electrons
  - Which type of bond is responsible for atoms of pure gold to remain bonded?
    - covalent
    - hydrogen
    - ionic
    - metallic

6. In a water molecule, the oxygen atom has a slightly negative charge and the hydrogen atoms have a slightly positive charge.

This charge difference gives rise to which type of bonds between water molecules?

- A. Ionic bonds
- B. Hydrogen bonds
- C. Single covalent bonds
- D. Double covalent bonds

7. Which compound is *most likely* formed using covalent bonds?

- A. CO<sub>2</sub>
- B. K<sub>2</sub>O
- C. KBr
- D. CaBr<sub>2</sub>

8.

**Periodic Table of Elements**

Group																		18
1																	2	
1	<b>H</b> Hydrogen 1.01																2 <b>He</b> Helium 4.00	
2	<b>Li</b> Lithium 6.94	<b>Be</b> Beryllium 9.01											<b>B</b> Boron 10.81	<b>C</b> Carbon 12.01	<b>N</b> Nitrogen 14.01	<b>O</b> Oxygen 16.00	<b>F</b> Fluorine 19.00	<b>Ne</b> Neon 20.18
3	<b>Na</b> Sodium 22.99	<b>Mg</b> Magnesium 24.31	3	4	5	6	7	8	9	10	11	12	<b>Al</b> Aluminum 26.98	<b>Si</b> Silicon 28.09	<b>P</b> Phosphorus 30.97	<b>S</b> Sulfur 32.07	<b>Cl</b> Chlorine 35.45	<b>Ar</b> Argon 39.95
4	<b>K</b> Potassium 39.10	<b>Ca</b> Calcium 40.08	<b>Sc</b> Scandium 44.96	<b>Ti</b> Titanium 47.88	<b>V</b> Vanadium 50.94	<b>Cr</b> Chromium 52.00	<b>Mn</b> Manganese 54.94	<b>Fe</b> Iron 55.85	<b>Co</b> Cobalt 58.93	<b>Ni</b> Nickel 58.69	<b>Cu</b> Copper 63.55	<b>Zn</b> Zinc 65.39	<b>Ga</b> Gallium 69.72	<b>Ge</b> Germanium 72.61	<b>As</b> Arsenic 74.92	<b>Se</b> Selenium 78.96	<b>Br</b> Bromine 79.90	<b>Kr</b> Krypton 83.80
5	<b>Rb</b> Rubidium 85.47	<b>Sr</b> Strontium 87.62	<b>Y</b> Yttrium 88.91	<b>Zr</b> Zirconium 91.22	<b>Nb</b> Niobium 92.91	<b>Mo</b> Molybdenum 95.94	<b>Tc</b> Technetium 98.00	<b>Ru</b> Ruthenium 101.07	<b>Rh</b> Rhodium 102.91	<b>Pd</b> Palladium 106.42	<b>Ag</b> Silver 107.87	<b>Cd</b> Cadmium 112.41	<b>In</b> Indium 114.82	<b>Sn</b> Tin 118.71	<b>Sb</b> Antimony 121.76	<b>Te</b> Tellurium 127.60	<b>I</b> Iodine 126.91	<b>Xe</b> Xenon 131.29
6	<b>Cs</b> Cesium 132.91	<b>Ba</b> Barium 137.33	<b>La</b> Lanthanum 138.91	<b>Hf</b> Hafnium 178.49	<b>Ta</b> Tantalum 180.95	<b>W</b> Tungsten 183.85	<b>Re</b> Rhenium 186.21	<b>Os</b> Osmium 190.20	<b>Ir</b> Iridium 192.22	<b>Pt</b> Platinum 195.08	<b>Au</b> Gold 196.97	<b>Hg</b> Mercury 200.59	<b>Tl</b> Thallium 204.38	<b>Pb</b> Lead 207.20	<b>Bi</b> Bismuth 208.96	<b>Po</b> Polonium 208.98	<b>At</b> Astatine 210.00	<b>Rn</b> Radon 222.00
7	<b>Fr</b> Francium 223.00	<b>Ra</b> Radium 226.00	<b>Ac</b> Actinium 227.03	<b>Rf</b> Rutherfordium (261)	<b>Db</b> Dubnium (262)	<b>Sg</b> Seaborgium (263)	<b>Bh</b> Bohrium (264)	<b>Hs</b> Hassium (265)	<b>Mt</b> Meitnerium (268)									

Leroy combines magnesium (Mg) and fluorine (F).

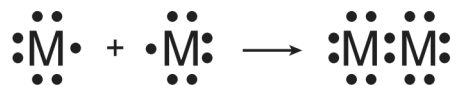
Based on the periodic table, which statement describes the interaction of these two elements?

- A. Mg is a metal and F is a nonmetal that forms an ionic bond.
- B. Mg is a nonmetal and F is a metal that forms an ionic bond.
- C. Mg is a metal and F is a metal that forms a covalent bond.
- D. Mg is a metalloid and F is a nonmetal that forms a covalent bond.

9. Which of the following occurs in an ionic bond?

- A. Two ions share protons.
- B. Two ions share electrons.
- C. Similarly charged ions attract.
- D. Oppositely charged ions attract.

10. The illustration below shows two atoms of a fictitious element (M) forming a diatomic molecule.



What type of bonding occurs between these two atoms?

- A. covalent
- B. ionic
- C. nuclear
- D. polar