

Name: \_\_\_\_\_ Date: 22 Jan 20

## Student Exploration: Ionic Bonds

**Vocabulary:** chemical family, electron affinity, ion, ionic bond, metal, nonmetal, octet rule, shell, valence electron,  $\alpha$ heavy metal  $\alpha$

**Prior Knowledge Questions** (Do these BEFORE using the Gizmo.)

1. Nate and Clara are drawing pictures with markers. There are 8 markers in a set. Nate has 9 markers and Clara has 7. What can Nate and Clara do so that each of them has a full set?

**Nate gives one to Clara**

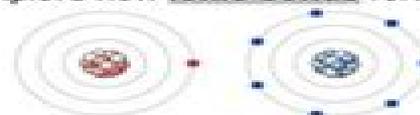
2. Maggie is sitting at a table with Fred and Florence. Maggie has 10 markers, but Fred and Florence each have only 7 markers. How can they share markers so each has 8?

**Maggies gives Fred one marker and Maggie gives Florence one marker.**

### Gizmo Warm-up

Just like students sharing markers, atoms sometimes share or swap electrons. By doing this, atoms form bonds. The Ionic Bonds Gizmo™ allows you to explore how **ionic bonds** form.

To begin, check that **Sodium (Na)** and **Chlorine (Cl)** are selected from the menus at right. Click **Play** () to see electrons orbiting the nucleus of each atom. (Note: These atom models are simplified and not meant to be realistic.)



1. Each atom consists of a central **nucleus** and several **shells** that contain electrons. The outermost electrons are called **valence electrons**. (Inner electrons are not shown.)

How many valence electrons does each atom have? Sodium: 1 Chlorine: 7

2. Click **Pause** (). Elements can be classified as **metals** and **nonmetals**. Metals do not hold on to their valence electrons very tightly, while nonmetals hold their electrons tightly. **Electron affinity** is a measure of how tightly the valence electrons are held.

A. Try pulling an electron away from each atom. Based on this experiment, which atom is a metal? Sodium Which is a nonmetal? Chlorine

B. Try moving an electron from the metal to the nonmetal. What happens?

# Explore Learning Student Exploration Ionic Bonds Key

**L Reisser**



**Explore Learning Student Exploration Ionic Bonds Key:**

*Multimedia and Videodisc Compendium ,1995*

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