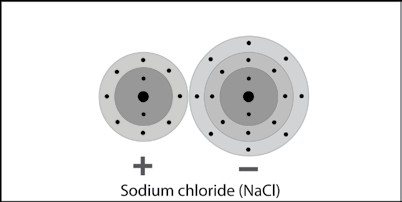
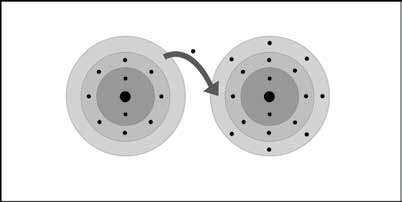
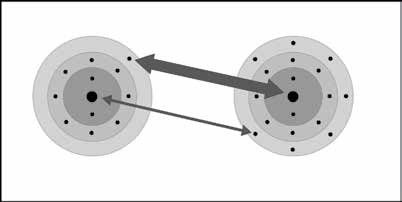
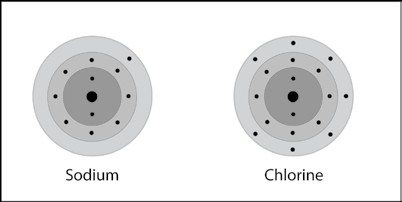
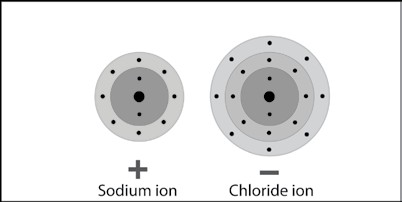
**Activity Sheet Name Chapter 4, Lesson 5**

**Energy Levels, Electrons, and Ionic Bonding Date**

# EXPLAIN IT WITH ATOMS & MOLECULES

1. **What is the basic difference between covalent and ionic bonding?**
2. **Write a short caption beside each picture to describe the process of ionic bonding.**



Sodium and chlorine atoms are near each other.

# ACTIVITY

## Question to investigate

Why are salt crystals cube-shaped?

## Materials for each group

* + Black paper
  + Salt
  + Cup with salt from evaporated saltwater
  + Magnifier
  + Permanent marker

## Materials for each student

* + 2 small Styrofoam balls
  + 2 large Styrofoam balls
  + 2 toothpicks

## Procedure, Part 1

*Observe sodium chloride crystals.*

1. Place a few grains of salt on a piece of black paper. Use your magnifier to look closely at the salt.
2. Use your magnifier to look at the salt crystals in the cup.

## Procedure, Part 2

*Make NaCl units.*

3. Use the marker to put a “–” on the large balls, which represent chloride ions.

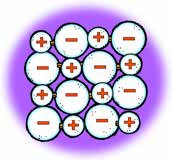
4. Use the marker to put a “+” on the small balls, which represent sodium ions.

5. Break two toothpicks in half. Use one of the half-toothpicks to connect the centers of the small and large ions together to make a unit of sodium chloride (NaCl). Do the same thing with the other small and large ball.

6. Use another half-toothpick to connect the two NaCl units in a straight line as shown.

*Put NaCl ions together to make one layer of ions.*

7. Contribute your line of ions to your group and arrange them to make a 4×4 square of ions.



8. Use half-toothpicks to attach the ends of each line to hold the ions together. You only need to place toothpicks in the balls at the end of each line.



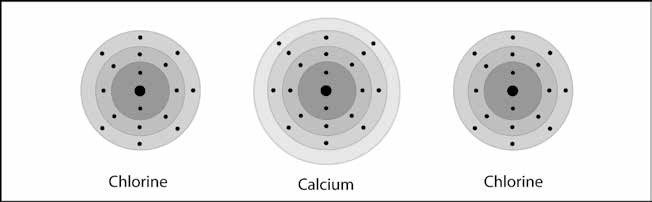
*Build a class sodium chloride crystal.*

9. Give your group’s layer of ions to your teacher. Your teacher will stack these to build a model of a sodium chloride crystal.

**3. Knowing what you do about sodium and chloride ions, why are salt crystals cube-shaped?**

# TAKE IT FURTHER

**4. Write a short caption beneath each picture below and on the next page to describe the process of ionic bonding. The first one is done for you below.**



One calcium and two chlorine atoms are near each other.

