

Objective:

This activity is designed as a summative assessment to test the student's understanding of the formation of ions through the gain or loss of electrons.

Target student audience:

All levels of chemistry students

ChemSense User Level:

Beginning

ChemSense Tools used:

Animation

Specialized Tools needed:

None

Classroom Implementation

Time: ChemSense animation: _ to 1 hour

Student Grouping: Individual

Activity Type: Reinforcement of concepts

Chemistry Concepts in Activity:

California State Standards in Chemistry 1.d Knows how to use the periodic table to determine the number of electrons available for bonding.

ChemSense Theme: Geometry. Geometry centers on the shape-related aspects of molecules. Molecular geometries are used when describing the arrangement of atoms in space for both stable (ground state) and unstable situations that prospectively give observable differences in reactivity.

Pre-requisite Chemistry Concepts:

The students must be able to use the periodic table to determine the charge on the ion formed by the gain and loss of electrons from an atom of an element. The students must be familiar with the terms *atomic number*, *number of protons*, *number of electrons*, and *ionic charge*.

**ACTIVITY
FORMATION OF AN ION**

Purpose:

The student will visualize and represent the gain or loss of an electron to an atom to create an ion.

Goal:

The student will be able to accurately show the correlation of a gain of electrons to the formation of a negatively charged ion or the loss of electrons to form a positively charged ion.

California State Standard:

Atomic and Molecular Structure 1. The student understands the periodic table displays the elements in increasing atomic number and shows how periodicity of the physical and chemical properties of the elements relates to atomic structure.

Procedure:

1. Copy the following data table into your laboratory notebook.

Name	Symbol of the neutral atom	Number of electrons in the neutral atom	Charge it will form	Symbol of the ion	Number of electrons in the ion

2. Select an atom to ionize from the following list: sodium, lithium, oxygen, or boron.
3. Write the name, symbol, and number of electrons in the neutral atom in your data table.
4. Use the periodic table to determine the charge that atom can form.
5. Write the symbol for the ion and the number of electrons in the ion in your data table.
6. Log onto ChemSense and under your group name select Build On.
7. Create an animation that represents your neutral atom gaining or losing electrons to create its charged ion. Label the element with its symbol and label the electrons.
8. Show your work to your instructor.
9. Save your work to your account folder using "Ion Formation by MY NAME" as the title.
10. Log out and record your work time in your laboratory notebook.

Rubric for scoring:

Grading Rubric:

Rubric Score	Level of Competence	Expectation Level
4	Mastery	The number of electrons for the atom and the ion it forms is accurate. The symbol for the element is given; the electrons are labeled. Animation has smooth transitions between frames.
3	Skilled	The number of electrons for the atom and the ion it forms is accurate. The symbol for the element or electrons may not be labeled. Animation may appear choppy.
2	Proficient	The number of electrons for the atom and the ion it forms is accurate. The symbol for the element or electrons may not be labeled. Animation is not smooth.
1	Introductory	Either the number of electrons for the atom or ion it forms is incorrect. The symbol for the element or the electrons may not be labeled. Animation may not be smooth.
0	Incomplete	The number of electrons for the atom and the ion are incorrect. The symbol for the element or the electrons may not be labeled. Animation may have smooth transitions between frames, but it is not complete.

Links:

None

Integrated Uses:

None