Objective:

This activity is designed to provide a systematic way for students to represent the electron configuration for the element boron.

Target student audience:

All levels of chemistry students

ChemSense User Level:

Beginning

ChemSense Tools used:

Animation, Peer-feedback

Specialized Tools needed:

None

Classroom Implementation

Time: ChemSense animation: _ to 1 hour
Student Grouping: Pairs
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: State. The electronic configuration of a set of molecular orbitals might be used to define a photo-excited state.

Pre-requisite Chemistry Concepts:

The students must be able to use the periodic table to write electron configurations.

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 atom	Electron configuration for the atom
Boron			

2. Complete the chart using the periodic table.
3. Sketch the orbital diagram for the neutral atom in your laboratory notebook. Use a 3-Dimensional axis system. Include all levels of electrons.
4. Log onto ChemSense and under your group name select Build On.
5. Create an animation that represents boron filling its orbitals beginning from the level closest to the nucleus. Label each orbital with is level and shape, for example *1s*. When complete, it should look like a flipbook.
6. Show your work to your instructor.
7. Save your work to your account folder using "Orbital Diagram by MY NAME" as the title.
8. Invite another lab team to view and comment on your animation. Comments should address two areas: Is the number of electrons correct? Does the method of orbital filling by the electrons begin at the level closest to the nucleus?
9. Record the comments made about your artwork in your laboratory notebook.
10. View the work of another lab team and use the same criteria to critique their animation. Record your comments in your laboratory notebook.
11. 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 order in which they fill the orbitals is accurate. The symbol for the element is given; the orbitals and the electrons are labeled. Animation has smooth transitions between frames.
3	Skilled	The number of electrons for the atom and the order in which they fill the orbitals is accurate. The symbol for the element, the orbitals, or electrons may not be labeled. Animation may appear choppy.
2	Proficient	The number of electrons for the atom and the order in which they fill the orbitals is accurate. The symbol for the element, the orbitals, or electrons may not be labeled. Animation is not smooth.
1	Introductory	Either the number of electrons for the atom or the order in which they fill the orbitals is incorrect. They symbol for the element, the orbitals, or the electrons may not be labeled. Animation may not be smooth.
0	Incomplete	The number of electrons for the atom and the order in which they fill the orbitals are incorrect. They symbol for the element, the orbitals, or the electrons may not be labeled. Animation may have smooth transitions between frames, but it is not complete.

Links:

None

Integrated Uses:

None