

By Mr. Chu
5th Grade, Room 29
Tuesday, November 22nd, 2005

I. Content Standards

Physical Science (5th Grade)

1. Elements and their combinations account for all the varied types of matter in the world. As a basis for understanding this concept:
 - b. Students know all matter is made of atoms, which may combine to form molecules.
 - d. Students know that each element is made of one kind of atom and that the elements are organized in the periodic table by their chemical properties.

II. Anticipatory Set

- A. Show students pictures of our Solar System (or use a globe as an illustration). An atom is like a miniature solar system. The center of the Solar System, the Sun, is like the neutron and the protons. The orbiting planets are the negative charge electrons. The gravitation force that keeps planets in orbit is similar to the subatomic force that keeps the electrons orbiting the neutron and protons.

III. Objective

- A. Students will review what the parts of an atom, learn how to determine how many neutrons, protons and electrons an element have based on the atom number, and determine the number of electrons residing on each orbiting shell with 80% accuracy.

IV. Purpose

- A. Knowing the parts of an atom and the properties of the electron orbital shells is important because it provides a foundation for further learning in

Physical Science while fulfilling the California Standards for Science in fifth Grade.

V. Instructional Input

- A. KWL - Students will be asked to use their white boards to write down what they know about an atom.
- B. Students will review the parts of an atom through comparing an atom to a solar system.
- C. Students will learn how the atomic number provides information about the number of neutrons, protons and electrons an atom has.
- D. Students will take part in guided practice doing 'Name the Element' Worksheet.
- E. Students will do 'This is an Atom of the Element' worksheet as independent practice (Boron Atom).

VI. Modeling

- A. Students will watch as the teacher models on the white board how to determine the number of neutrons, protons & electrons in an atom as well as how to determine the number of electrons residing on each orbital shell.
- B. Students will be asked to get out of their seats and stand next to a wall. Once at the tables are empty, I will start asking students to sit down at a particular table until it is full. The overflow students will sit at a second table until that is full. This will continue until all the tables in the room are full. This kinesthetic activity will give students prior knowledge to relate to the electron orbitals in an atom. Ask the students what happens to the overflow students when one table gets full? Students will respond that the overflow students would naturally go to the next open table and fill that. Tell the students that the same can be said of the electron orbitals that surround an atom. The first inner shell can hold a maximum of two electrons. Any extra electrons will have to go into the second inner shell. The second inner shell can only hold eight electrons. Any overflow electrons will have to go to the third electron shell which can hold eight electrons.

VII. Checking for Understanding

- A. Students will use their white boards to write down their answers to the 'Name the Element' worksheet. Teacher will check for understanding by seeing if students are writing the correct answers.
- B. Students will use their white boards to explain how electrons fill the orbitals in an atom and what the maximum number of electrons each orbital shell can hold.

VIII. Independent Practice.

- A. Students will do 'This is an Atom of the Element' worksheet as independent practice (Boron Atom). This worksheet contains a picture of an atom with three electron orbitals. You can create your own worksheet by drawing in the number of neutrons, protons and electrons a boron atom has or pick a different atom. Students need to identify what element this atom is based on the number of neutrons and/or electrons. You can also create an empty atom template where you ask a student to draw in the correct number of neutrons, protons and electrons for a particular element of your choosing.