

## THE BOHR MODEL

A **Bohr model** is a model of the atom developed by the passionate soccer player and physicist, Neils Bohr. The model shows the number of protons and neutrons in the nucleus of the atom. Outside of the nucleus, the model shows the atom's electrons in their **energy shells** or **energy levels**. The outermost energy level is called the **valence shell or level**. The electrons in the outermost shell are called **valence electrons**.

**Objective:** Describe the structure and parts of an atom

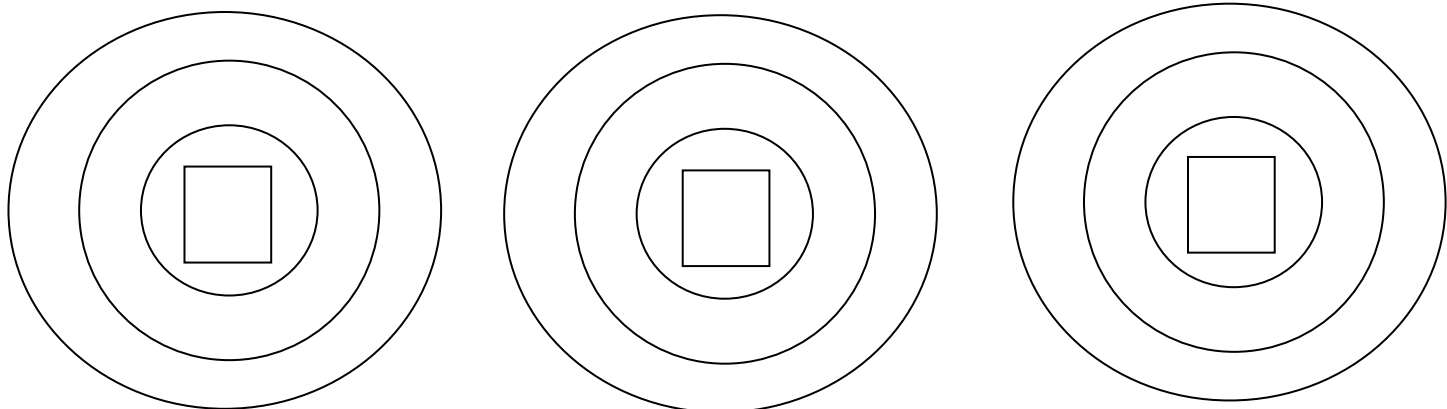
### Procedure:

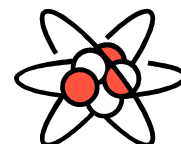
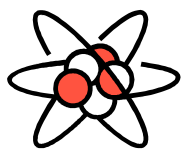
- Observe while your teacher demonstrates some Bohr models of different atoms. You may practice them on the Bohr models drawn below.
- Complete the Bohr Model Challenge by following the steps listed below. Remember to use your periodic table to help guide you!

### Steps for creating a Bohr Model:

1. Draw the nucleus and energy shells for the atom. Determine the correct number of energy shells by finding the atom's period number on the periodic table. (This is the same as the row number.) Record the period number in the table.
2. Write the number of **n**eutrons and **p**rotons in the nucleus. You may write the number followed by an '**n**' for neutron and a '**p**' for proton.
3. Determine the number of electrons for the atom. Place the electrons in the energy levels by using the following rules:
  - a. the first level (closest to the nucleus) holds 2 electrons
  - b. the second level holds 8 electrons
  - c. the third level holds 8 or more electrons
4. Write the number of valence electrons in the table.
5. Record the group number for the element in the table.
6. Determine if the element is a metal, non-metal or metalloid.
7. Answer the two questions at the end of the Bohr Model Challenge pages.

### Practice Bohr Models:





### Bohr Model Challenge

Draw a Bohr model for the first 20 elements and fill in the missing information.

Element Symbol	Bohr Model	# of valence electrons	Period	Group	Metal, nonmetal or metalloid
H					Metal Non-metal Metalloid
Li					Metal Non-metal Metalloid
Na					Metal Non-metal Metalloid
P					Metal Non-metal Metalloid
Be					Metal Non-metal Metalloid

Element Symbol	Bohr Model	# of valence electrons	Period	Group	Metal, nonmetal or metalloid
Mg					Metal Non-metal Metalloid
Ca					Metal Non-metal Metalloid
B					Metal Non-metal Metalloid
Al					Metal Non-metal Metalloid
C					Metal Non-metal Metalloid

Element Symbol	Bohr Model	# of valence electrons	Period	Group	Metal, nonmetal or metalloid
Si					Metal Non-metal Metalloid
N					Metal Non-metal Metalloid
P					Metal Non-metal Metalloid
O					Metal Non-metal Metalloid
S					Metal Non-metal Metalloid

Element Symbol	Bohr Model	# of valence electrons	Period	Group	Metal, nonmetal or metalloid
F					Metal Non-metal Metalloid
Cl					Metal Non-metal Metalloid
He					Metal Non-metal Metalloid
Ne					Metal Non-metal Metalloid
Ar					Metal Non-metal Metalloid

**Questions:**

1. What pattern do you notice in the number of protons as you move across the periodic table?
2. Compare the group number to the number of valence electrons? What do you notice?