



Name: _____ Group: _____

Activity: **3.2** Activity Name: **Development of theories and atomic models.**

Stage's Objectives:

- 1- The student relates the electron configuration of the elements with their location on the periodic table, in order to predict their behavior in the formation of compounds of importance in our daily lives
- 2- Identifies some elements through experimental evidences to develop skills in observation, analysis and handling laboratory equipment.

Instructions: Complete the following activities:

**Note: These pages must be delivered with the study cards and the periodic table.
The activity will be evaluated using this format**

1.- The evolution of the atom: Study cards

Your assignment is to complete 10 study cards for the following topics to cover the evolution of the atomic models, you will use these study cards in class for participation points following the instructions of your teacher. Using **index cards of size 5" x 8"** is desirable.

You can use both sides of each card. Arrangement of the content and creativity is up to you.

Your study cards should include at least the following:

Card 1:

The atomic model by John Dalton:

- ☐ Photograph of John Dalton
- ☐ Main contribution of John Dalton to our current understanding of the atom
- ☐ Principles of his atomic model
- ☐ The three laws of other scientists that were used by Dalton to propose his theory
- ☐ Visual representation of the atom according to Dalton
- ☐ How was Dalton wrong with his proposal

Card 2:

The atomic model by J.J. Thomson:

- ☐ Photograph of J.J. Thomson
- ☐ Main contribution of J.J. Thomson to our current understanding of the atom
- ☐ Experiment used by J.J. Thomson
- ☐ Description of the atomic model proposed by J.J. Thomson
- ☐ Visual representation of the atom according to J.J. Thomson
- ☐ How was J.J. Thomson wrong with his proposal

Card 3:

The atomic model by Ernest Rutherford:

- ☐ Photograph of Ernest Rutherford
- ☐ Main contribution of Ernest Rutherford to our current understanding of the atom
- ☐ Experiment performed by Ernest Rutherford
- ☐ Description of the theory proposed by Ernest Rutherford
- ☐ Visual representation of the atom according to Ernest Rutherford
- ☐ How was Ernest Rutherford wrong with his proposal

Card 4:

The atomic model by Niels Bohr:

- ☐ Photograph of Niels Bohr
- ☐ Main contribution of Niels Bohr to our current understanding of the atom
- ☐ The laws of other scientists that were used by Niels Bohr to propose his theory
- ☐ Visual representation of the atom according to Niels Bohr
- ☐ How was Bohr wrong with his proposal

Card 5:

The atomic model by Erwin Schrödinger:

- ☐ Photograph of Erwin Schrödinger
- ☐ Main contribution of Erwin Schrödinger to our current understanding of the atom
- ☐ The work of other scientists used by Erwin Schrödinger to develop its mathematical equations
- ☐ Visual representation of the atom according to Erwin Schrödinger

Card 6:

Subatomic particles

- ☐ Elaborate a chart that includes the name and properties (symbol, charge and mass) of the three main fundamental subatomic particles.
- ☐ At the back of the card add how were these particles discovered and by whom.



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Card 7:**Isotopes**

- ☐ Add what is an isotope
- ☐ Isotopic notation: how to write correctly an isotope.
- ☐ Define: atomic number, mass number, atomic mass.
- ☐ Examples of isotopes and how to calculate protons, neutrons and electrons from the isotopic notation.

Card 8:**Electron arrangement in atoms:**

- ☐ Energy level
- ☐ Sublevel
- ☐ Orbital
- ☐ Shapes and images for orbitals s, p, d and f.

Card 9:**Electron configurations and orbital diagrams:**

- ☐ Define electron configuration
- ☐ Orbital diagram
- ☐ Abbreviated configuration (noble gas notation)
- ☐ Basic steps to write the electron configuration of an element
- ☐ 2 examples of elements with the electron configuration, the orbital diagram and the abbreviated electron configuration.

Card 10:

- ☐ **Draw the diagonal rule.**

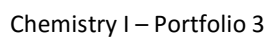
2.- The periodic table

Your assignment is to complete the blank periodic table attached at the end of this activity with the following information:

REQUIRED INFORMATION	CHECKMARK
1) Symbol of the elements	
2) Name of each family	
3) Group and period numbers	
4) S,p,d,f blocks	
5) Metals, non metals and Metalloids stair step line	
6) Identify Representative(red), transition(blue) inner transition(yellow) and noble gases (green)	
7) Oxidation number of each family	
8) Valence electrons of each family	
9) Periodic trends (Atomic radius, Ionization energy, Electronegativity, metallic character)	
10) Electron configuration	

MINI-RUBRIC FOR THE ACTIVITY

Excellent (10 PTS)	Very Good (7 POINTS)	Good (5 POINTS)	Fair (2 POINTS)
Appearance professional, neatness and colorful	Appearance professional, neatness and colorful	Appearance is neat, but needs only a little touch up.	Appearance is informal needs some overhaul for professional appearance.
Information required complete.	1 to 8 points of information in the study cards or in the periodic table are incomplete or missing.	8 to 15 points of information in the study cards or in the periodic table are incomplete or missing.	More than 15 points of information in the study cards or periodic table are incomplete or missing.
All data collected and information is correct.	The information in the study cards or the periodic table contains 1 to 3 mistakes.	The information in the study cards or the periodic table contains 4 to 7 mistakes.	The information in the study cards or the periodic table contains more than 3 mistakes.



Element	Symbol	Li
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3 — Atomic Number

Element Name — Lithium

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¹⁷These elements 113, 115, 117 have not been discovered yet.