

Chemistry Part I Unit Organizer

STATE AND DISTRICT STANDARDS

Standard: *Physical Science*

- I. Students know and understand common properties, forms, and changes in matter and energy.
- II. Know that matter has characteristic properties that are related to its composition and structure.
- III. Understand that interactions can produce changes in a system, although the total quantities of matter and energy remain unchanged.

Standard: *Science, technology, and human activity*

- IV. Understand the connections between science, technology, and human activity and their impact on the world.

CORE KNOWLEDGE UNIT

I. Atomic structure

- A. Describe the early theories of matter: Greek, Democritus, Alchemy
- B. Describe modern theories in chemistry: Lavoisier, Dalton, Mendeleev, Bohr
- C. Describe how the Periodic Table was developed and use it to construct models of atoms.
- D. Understand the following terms and concepts: atom, element, compound, electron, proton, neutron, nucleus, valence electrons, energy levels, stability, and bonding. Atomic number, mass number, atomic weight, and isotope.

II. Chemical bonding

- A. Understand how atoms form molecules using ionic bonds and draw models showing this process.
- B. understand metallic bonding and describe how this type of bonding provides metals with their characteristic properties.
- C. Understand and draw models of covalent bonding between atoms and describe why this type of bonding makes molecules very stable and unreactive.
- D. Write the names and chemical formulas for ionic and covalent compounds.

STANDARDS FOR ACHIEVEMENT AND PERFORMANCE

- Be able to classify and describe matter in terms of elements, compounds, mixtures, atoms, and molecules.
- Be able to separate mixtures of substances based on their chemical or physical properties such as solubility, boiling point, magnetic, density, and evaporation.
- Be able to describe, compare, measure, and classify elements based on their physical and chemical properties.
- Be able to describe, measure, and calculate quantities before and after a chemical or physical change (ex: mass, heat energy, etc.)
- Be able to describe solids, liquids, and gases using kinetic molecular theory and the particle model of matter.
- Be able to describe early theories of matter.
- Be able to describe how the Periodic Table was developed and use it to construct models of atoms.
- Be able to describe how atoms molecules using ionic bonds and draw Bohr models showing this process.
- Be able to draw a model of metallic bonding and describe how this type of bonding provides metals with their characteristic properties.
- Be able to draw Lewis Dot models showing covalent bonding and describe why this type of bonding makes molecules very stable and unreactive.
- Be able to write the names and chemical formulas for ionic and covalent compounds given to you in class.

HABITS OF MIND

- Organize information in simple tables and graphs and identify relationships they reveal.
- Seek better reasons for believing something than "Everybody knows that.." or "I just know" and discount such reasons when given by others.