

**Unit Organizer**  
**5<sup>th</sup> Grade Science**  
**CHEMISTRY: MATTER AND CHANGE**

Colorado State Standards:

**Science Standard 1:** Students understand the process of scientific investigation and design as well as conduct, communicate about and evaluate such investigations.

**Science Standard 2.1:** Students know that matter has characteristic properties, which are related to its composition and structure.

**Science Standard 2.3:** Students understand that interactions can produce changes in a system, although the total quantities of matter and energy remain unchanged.

**Science Standard 6:** Students understand that science involves a particular way of knowing and understand common connections among scientific disciplines.

Thinking Framework Key: K=Knowledge, P=Patterns, M=Modeling, C=Creativity

Core Knowledge Unit:

**VI. Chemistry: Matter and Change**

**A. ATOMS, MOLECULES, AND COMPOUNDS**

- Basics of atomic structure: nucleus, protons (positive charge), neutrons (neutral), electrons (negative charge) *K*
- Atoms are constantly in motion, electrons move around the nucleus in paths called shells (or energy levels). *K, P, M*
- Atoms may join together to form molecules and compounds. *K, P*
- Common compounds and their formulas: *K*  
Water H<sub>2</sub>O  
Salt NaCl  
Carbon Dioxide CO<sub>2</sub>

**B. ELEMENTS**

- Elements have atoms of only one kind, having the same number of protons. There are a little more than 100 different elements. *K*
- The Periodic Table: organizes elements with common properties.  
Atomic Symbol and Number *K, P*
- Some well-known elements and their symbols: *K*

Hydrogen	H
Helium	He
Carbon	C
Nitrogen	N
Oxygen	O
Sodium	Na
Aluminum	Al
Silicon	Si
Chlorine	Cl
Iron	Fe

Copper	Cu
Silver	Ag
Gold	Au

- Two important categories of elements: metals and non-metals *K, P*  
Metals comprise about 2/3 of the known elements.  
Properties of metals: most are shiny, ductile, malleable, conductive.

### C. CHEMICAL AND PHYSICAL CHANGE

- Chemical change changes what a molecule is made up of and results in a new substance with a new molecular structure.  
Examples of chemical change: rusting of iron, burning of wood, milk turning sour *K, P, M*
- Physical change changes only the properties or appearance of the substance, but does not change what the substance is made up of.  
Examples of physical change: cutting wood or paper, breaking glass, freezing water *K, P, M*

Previous Unit: Science Skills and Processes

Next Unit: Cell Structure and Processes

### Standards for Achievement and Performance:

Can you...

- Define matter?
- Identify the three common states of matter: solids, liquids, and gases?
- Understand that all matter is made up of atoms?
- Describe the parts of an atom and their charges?
- Calculate the number of protons, electrons, and neutrons in an element using the periodic table?
- Identify 13 well-known elements and their symbols?
- Describe what the Periodic Table of the Elements is and how it is a useful scientific tool?
- Explain what atomic mass means and locate it on the Periodic Table of the Elements?
- Explain what atomic number means and locate it on the Periodic Table of the Elements?
- Identify where metals and non-metals are located on the Periodic Table?
- Identify the properties of metals and describe what each property means?
- Identify common compounds and their formulas?
- Compare and contrast elements using a chart?
- Name three chemical changes?
- Name three physical changes?

- Describe the difference between a physical and a chemical change?
- Describe where most elements are found?

Character Education:

*Responsibility* by taking care of microscopes and other lab equipment and following safety procedures

*Self-Control* by displaying appropriate and on-task behavior during experiments

*Cooperation* through working together during the chemistry labs and other group activities

Vocabulary

chemistry  
matter  
mass  
volume  
density  
vacuum  
solid  
liquid  
gas  
atom  
proton  
neutron  
electron  
element  
periodic  
compound