

## Unit I – Matter & Measurement

## STUDY GUIDE

### *Chapter 2 – Matter & Change*

### *Chapter 3 – Scientific Measurement*

### Vocabulary

- Matter
- Substance
- Element
- Compound
- Homogeneous mixture
- Heterogeneous mixture
- Reactant
- Product
- Physical property
- Chemical property
- Physical change
- Chemical change
- Law of conservation of mass
- Significant figures
- Scientific notation
- Density

### Equations

$$\% \text{ composition} = \frac{\text{part}}{\text{whole}} * 100$$

$$\% \text{ error} = \frac{\text{experimental} - \text{actual}}{\text{actual}} * 100$$

$$D = \frac{M}{V}$$

$$K = ^\circ\text{C} + 273$$

### Core Concepts

- Classification of Matter (Substances – elements/compounds & Mixtures – homogeneous/heterogeneous)
- Physical and Chemical Changes/Properties of Matter
- States of Matter
- Signs of Chemical Reactions
- Law of Conservation of Mass
- Qualitative vs Quantitative observations
- Accuracy vs Precision
- Writing numbers in Scientific Notation
- Significant Figure rules and how to apply
- Rules for reading measuring instruments (how many numbers to record)
- Metric Units and Prefixes
- Dimensional Analysis/Unit Conversions (unit cancellation)
- Density
- **Honors:** Absolute Zero
- **Honors:** Atomic Theory – early models of the atom
- **Honors:** Structure of the Atom & determining protons, neutrons, and electrons
- **Honors:** Ions & Isotopes
- **Honors:** How to calculate average atomic mass

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