

Matter and Energy Study Guide

1. Describing Matter and Energy

- a. Define Matter and Energy
 - i. Matter
 - ii. Energy
 - iii. Chemistry
- b. Classifying Matter
 - i. Physical Properties
 1. Define
 2. Examples
 - ii. Chemical Properties
 1. Define
 2. Examples
- c. Kinds of Matter
 - i. Elements
 1. Define
 2. Examples
 - ii. Compounds
 1. Define
 2. Examples
 - iii. Mixtures
 1. Define
 2. Examples
 - iv. Differentiate between elements, compounds, and mixtures
- d. Changes in Matter
 - i. Physical Change
 1. Define
 2. Examples
 - ii. Chemical Change

1. Define

2. Examples

- iii. Differentiate between physical and chemical changes

e. Energy and Matter

- i. Describe the 6 types of energy
- ii. Give examples of each
- iii. Identify energy transformations

2. Measuring Matter

a. Mass

- i. Define Mass
- ii. Tell the difference between mass and weight
- iii. Know the proper units for mass

b. Volume

- i. Define Volume
- ii. Know and use the proper units for liquid and solid volume
- iii. Describe displacement and its uses

3. Particles of Matter

a. Define Atom

b. Dalton's Atomic Theory

- i. Describe main ideas of Dalton's Theory
- ii. Describe which parts are no longer true

c. Modern Atomic Theory

- i. Sub-atomic Particles
 1. Know the three types
 2. Describe their location and charge

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- ii. Periodic Table
 - 1. Know how to read and use the periodic table to identify
 - a. Atomic number
 - b. Atomic mass
 - c. Numbers of sub-atomic particles
 - d. Whether an element is a metal, non-metal or metalloid
 - 2. Use the periodic table to draw a model of an atom with the correct number and location of sub-atomic particles
- 4. States of Matter**
- a. Solids
 - i. Describe the behavior of the particles in a solid (How are they packed and how do they move?)
 - ii. Types of Solids
 - 1. Crystalline Solids
 - 2. Amorphous Solids
 - 3. Describe the difference between crystalline and amorphous solids
 - b. Liquids
 - i. Describe the behavior of the particles in a liquid (How are they packed and how do they move?)
 - ii. Viscosity
 - 1. Define
 - 2. Give examples of liquids with high and low viscosities
- c. Gases- Describe the behavior of the particles in a gas (How are they packed and how do they move?)
 - d. Describe the relative thermal energy of each state of matter
 - e. Describe the relative movement of particles of each state of matter
- 5. State Changes**
- a. Define and give examples of states changes
 - i. Between Liquid and Solid
 - 1. Melting
 - 2. Freezing
 - ii. Between Liquid and Gas
 - 1. Vaporization
 - a. Boiling
 - b. Evaporation
 - 2. Condensation
 - iii. Between Solid and Gas
 - 1. Deposition
 - 2. Sublimation
 - b. Describe the state changes as increases or decreases in thermal energy
 - c. Contrast the motion and arrangement of the particles before and after the state change
- 6. Conservation of Mass**
- a. Describe the law and what it means for a chemical reaction
 - b. Determine if a chemical equation is balanced