

8th Grade Semester 1 Study Guide

General Overview

We will be review material in class. In order for the review to be most helpful for you it is necessary for you to work through the review questions and come to class prepared to ask questions for clarification and review. Working on a few questions every day will be much more beneficial than trying to sit down and finish all the questions at one time. In addition you should look over old tests, quizzes, and labs to help study!

Semester 1 Learning Objectives:

- ✓ *Describe the structure of the atom including energy levels and valence electrons.*
- ✓ *Identify the states of matter (solid, liquid, gas) and the properties of each state.*
- ✓ *Describe how matter goes through different changes of state and how this affects the molecules that make up the substance.*
- ✓ *Use Boyle's and Charles's laws to predict how a change in temperature or pressure will affect the volume of a gas.*
- ✓ *Distinguish between mass and weight.*
- ✓ *Identify physical and chemical properties of matter.*
- ✓ *Distinguish between examples of chemical and physical changes.*
- ✓ *Describe events that accompany chemical changes but not physical changes, e.g., color changes, temperature changes, or formation of gas.*
- ✓ *Calculate the density of substances (regular and irregular solids and liquids) from measurements of mass and volume.*
- ✓ *Use the concepts of density and buoyant force to evaluate which objects will float or sink in water.*
- ✓ *Compare and contrast elements, compounds, and mixtures.*
- ✓ *Recognize that combining two or more different elements forms compounds and that compounds have properties that are different from their constituent elements.*
- ✓ *Describe process that will separate the components of physical mixtures.*
- ✓ *Analyze a solution in terms of its solute, solvent, and concentration.*
- ✓ *Explain how a colloid differs from a solution or a suspension.*
- ✓ *Understand the basic structure of the periodic table and be able to use the table to identify elements in simple compounds.*
- ✓ *Identify chemical symbols, chemical formulas, and chemical equations.*

Vocabulary:

- Mass
- Density
- Meniscus
- Weight
- Inertia
- Physical property
- Chemical property
- Physical change
- Chemical change
- Pressure
- Boyle's law
- Charles's law
- Change of state
- Vaporization
- Condensation
- Sublimation
- Element
- Energy level
- Electron cloud
- Atomic mass unit
- Atomic number
- Mass number
- Atomic mass
- Valence electrons
- Ion
- Metals
- Nonmetal
- Metalloids
- Period
- Group
- Compound
- Mixture
- Solution
- Solute
- Solvent
- Concentration
- Solubility
- Suspension
- Colloid
- Atomic mass unit
- Isotopes
- Periodic law
- Alkali metals
- Alkaline earth metals
- Halogens
- Noble gases
- Transition metals
- Molecule
- Chemical reaction
- Chemical formula
- Chemical equation

DAY OF FINAL EXAM:

The science final exam is scheduled for Monday, December 10th from 10:30 –12:30. To be prepared for the exam you should have the following materials. **You will not be allowed to share materials during the exam.**

- Black or Blue Ballpoint Pens (bring an extra just in case)
- A basic calculator (NOT your TI-83)
- Your Holt Physical Science Textbook
- Whiteout (if you think you may need it)
- **A well rested, well nourished brain!!!!**

REVIEW QUESTIONS:

NATURE OF SCIENCE:

- 1.) Explain the difference between an observation and an inference. Give an example of each.
- 2.) How are observations and inferences used in science?
- 3.) Define the following words: hypothesis, controlled variable, independent variable, dependent variable.
- 4.) Explain why it is important to only change one variable in a good scientific investigation.
- 5.) Krusty thinks that Skin-So-Soft by Avon will repel mosquitoes. He takes 100 mosquitoes and puts them in a container, half the container contains a cloth soaked in skin-so-soft. After one hour he made observations, he found that 90 mosquitoes were on the half of the container without the rag and 10 were found near the rag. Krusty also put 100 mosquitoes into another container, half of this container contained a rag soaked in water. He observed this container an hour later and found the mosquitoes were evenly distributed across the container.
 - o Write a hypothesis for Krusty (remember If...then... format)
 - o What was the control group?
 - o What was the independent variable?
 - o What was the dependent variable?
 - o What should Krusty conclude?
- 6.) Explain the **tools *and* units** used in science for measuring length, mass, volume, and density.
- 7.) How do you find the volume of a liquid? (Hint: your answer should include the word *meniscus* and should explain how to read volume correctly!)

ATOMIC STRUCTURE (pp. 318-324):

- 8.) Identify and define the parts of an atom (protons, electrons, neutrons, nucleus, electron cloud, energy levels)
- 9.) Be able to draw a model of an atom showing the correct number of protons, neutrons, electrons, and placement in correct energy levels.
- 10.) Explain the 4 forces that act in an atom.
- 11.) Explain how atomic number and atomic mass are related to atomic structure.
- 12.) Complete the table:

Substance	Atomic Number	Atomic Mass	Protons	Neutrons	Electrons
13.) Rubidium	37	85.5			
14.) Oxygen			8	8	
15.) Zirconium		91.2		51	
16.) Bromine		80	35		
17.) Chlorine	17			18	

- 18.) Explain why fluorine is a more reactive than neon.
- 19.) Phosphorus is atomic number 15 and has an atomic mass of 30.97 amu. Draw a picture of a neutral phosphorus atom.

PROPERTIES OF MATTER (pp. 36-56)

- 20.) Identify at least 4 physical and 2 chemical properties of matter.
- 21.) Compare and contrast physical and chemical changes. Give an example of each.

- 22.) What are 4 signs you look for to determine if a chemical reaction took place?
- 23.) Explain the differences between mass and weight.
- 24.) What is the formula for density?
- 25.) Calculate the densities of the following substances to the nearest **hundredth!** Then determine if the substance will float or sink in water.

Material	Mass (g)	Volume (mL)	Density (g/mL)	Float or Sink in water?
Vegetable oil	11.4	12.3		
Graphite	70.6	32.7		
Rubber	54.2	35.9		
Paper	24.0	25.8		
Mahogany	15.8	22.3		
Mercury	700.2	51.6		
Ethyl alcohol	329.8	412.3		

- 26.) If you have a block of wood that measures 5.2 cm by 4.8 cm by 2.4 cm, what is its volume?

STATES OF MATTER (pp. 64-80)

- 27.) List the 4 phases of matter and give at least 3 properties of each phase.
- 28.) Draw a diagram showing the 4 states of matter and all of the phase changes that occur between each state.
- 29.) Explain the difference between endothermic and exothermic changes.
- 30.) Explain Boyles' and Charles' gas laws and give an example of each law from every day life.

ELEMENTS, MIXTURES, & COMPOUNDS (pp. 90-104)

- 31.) What is a pure substance?
- 32.) How can elements be identified?
- 33.) Compare the properties of metals, nonmetals, and metalloid's.
- 34.) Compare and contrast compounds and mixtures.
- 35.) How do solutions, suspensions, and colloids differ?
- 36.) Explain the relationship between solution, solute, solubility, solvent, and concentration.
- 37.) Describe at least 6 ways to separate mixtures.
- 38.) Describe a procedure to separate a mixture of salt, finely ground pepper, and pebbles.

THE PERIODIC TABLE (pp. 336-350):

- 39.) Explain the basic arrangement of the periodic table (what is the relationship between elements in families? In periods? What are the major properties of each family?)
- 40.) Explain why some elements are more reactive than others.
- 41.) Be able to use the periodic table to draw atoms and to predict chemical reactivity
- 42.) Be able to identify elements, compounds, chemical formulas, subscripts, coefficients, and chemical equations in a given reaction.