Chapter Outlines for 9th Grade Physical Science

For each section in the chapter students should write a page of notes. These will be collected for a grade at the end of the chapter. Notes are graded on organization, completeness, and accuracy. Each section should include the following:

1. **Title** and **section** number
2. **Ideas:** What is the main idea in the section?
3. **Proof:** What proof or evidence is given for this idea? Do you believe it?
4. **Uses:** How is the idea useful to anyone?
5. **Questions:** What remains unclear to you about this section?

Chapter One Scientific Methods

Unit	Date	Objectives	Activities/Assessment
1		List and describe the branches of natural science Describe the roles of scientific laws, theories, models, and formulas.	11:1-9
2		Describe the scientific method as a loop. Use the SI system of measurement. Make unit conversions.	17:1-8 19:1-7
3		Interpret graphs: line, bar, and pie. Produce graphs from data. Use significant figures. Describe accuracy and precision. Calculate with scientific notation.	23:1-2 24:1-2 25:1-4 26:1-7
4		Chapter One review	28:1-24 Quiz 1 10 pts.
5		Measurement Lab	

Chapter Two Matter and Properties

Unit	Date	Objectives	Assessment
1		Explain the relationships among matter, atoms, and elements. Distinguish between elements and compounds Describe molecules and how they are formed. Write and interpret common chemical formulas.	44:1-8

		Distinguish between mixtures and pure substances.	
2		Describe chemical and physical properties of matter. Perform density calculations. Describe characteristic properties and give examples.	48:1-3 52:1-7
3		Explain physical changes. Explain chemical changes. Compare and contrast chemical and physical changes. Describe how to detect when a chemical change has occurred.	58:1-8
Lab		Density Lab	quiz
Lab		Separation of Substances Lab	quiz
Lab		Testing the Conservation of Mass	quiz
Review		Pages 60-61 problems 1-23	quiz

Chapter Three States of Matter

Unit	Date	Objectives	Assessment
1		Describe the main points of kinetic theory Relate temperature and kinetic energy Describe the four states of matter Describe how particles behave in changes of state State the laws of conservation of matter and energy Explain how they apply to changes of state	78; 1-9
2		Describe buoyant force Explain how the buoyant force keeps things afloat Explain Archimedes principle State and apply Pascal's principle State and apply Bernoulli's principle.	84; 1 86; 1-7
3		Describe how gases differ from solids and liquids State and apply Boyle's Law State and apply Charle's Law State and apply Gay-Lussac's Law Describe the relationship between gas pressure, temperature and volume.	91; 1-4 92; 1-9
Lab		Charle's Law	quiz
Lab		Boyle's Law	quiz
Lab		Pascal's Law	quiz
Review		Pages 94-95 problems 1-24	quiz

Chapter Four Atoms and Periodic Table

Unit	Date	Objectives	Assessment
1		**Atomic Structure** Explain Daltons atomic theory State the charge, mass, and location of the parts of the atom. Compare Bohr's model with the modern model of the atom	110:1-7
2		**Tour of the Periodic Table** Relate the table to the arrangement of the electrons in the atom. Explain why some atoms gain or lose electrons. Determine how many protons, neutron, and electrons an atom has, given its symbol, mass number and atomic number. Describe how isotopes affect an element's atomic weight.	119:1-8
3		**Families of Elements** Locate the alkali metals, alkali earths, transition metals, rare earths, non-metals, semiconductors, halogens and noble gases in the periodic table. Relate chemical properties to the electron arrangement in the atom.	128:1-8
4		**Using Moles to Count Atoms** Explain the relationship between a mole and Avogadro's # Find the molar mass of an element by using the periodic table Convert mass to moles and moles to mass.	132:1-3 133:1-4 134:1-8 134:6-9
Lab		Metal Properties	
Review		Pp 136-137 probs 1-26	

Chapter Five Atomic Structure of Matter

Unit	Date	Objectives	Assessment
1		**Compounds and mixtures** Distinguish compounds and mixtures Use formulas to determine number of atoms in a compound Use models of chemical structures. Describe some ways structure affects chemical properties.	150:1-6
2		**Ionic and covalent bonding** Explain why atoms sometimes form bonds Describe ionic, covalent, and metallic bonds. Compare the properties formed by these bonds. Explain why some bonds are ionic and some are covalent	158:1-8
3		**Compound names and formulas** Name simple ionic and covalent compounds	161:1-4 164:1-4,5-7

		Predict the charge of a transition metal ion in an ionic compound. Write chemical formulas for simple ionic compounds. Distinguish between empirical and molecular formulas	
4		**Organic and Biochemical Compounds** Describe carbon's covalent bonds Identify names and structures of groups of simple organic compounds. Identify what makes up the polymers essential to life.	172:1-6
5		Polymer Lab	
Review		Chapter Review pp174-175 prob 1-22	

Chapter Six Chemical Reactions

Unit	Date	Objectives	Assessment
1		**The Nature of Chemical Reactions** Recognize signs that a chemical reaction is occurring Explain chemical changes with motion and structure of molecules Describe the differences between endothermic and exothermic reactions Identify situations involving chemical energy.	189:1-6
2		**Reaction Types** Distinguish among the 5 general types of chemical reactions Predict the products of some reactions Describe reactions that transfer or share electrons between molecules, atoms, or ions.	197:1-8
3		**Balancing Chemical Equations** Balance chemical equations Use equations to determine mole ratios. Predict reactions amounts with the law of definite proportions. Calculate the relative masses of reactants and products from a chemical reaction.	202:1-3 204:1-5
4		**Rates of Change** Describe the factors affecting reaction rates. Explain the effect of a catalyst. Explain chemical equilibrium using forward and backward rates. Use Le Chatelier's principle to predict the effect of temperature, pressure and concentration on equilibrium	212:1-8
Lab		Ion Reactions	
Lab		Catalysts and Rates of Reactions	
Review		Chapter Review pp214 1-18	

Chapter Seven Solutions

Unit	Date	Objectives	Assessment
1		**Solutions and other mixtures** Describe heterogeneous and homogeneous mixtures. Compare suspensions, colloids, and solutions	231: 1-7
2		**How Substances Dissolve** Explain the action of polarity in molecules and dissolving. Relate dissolving to the forces between molecules. Describe three ways to increase the rate of dissolving. Describe what a solute does to the freezing and boiling point of a liquid.	238: 1-6
3		**Solubility and Concentration** Explain what solubility is. Describe dilute, concentrated, saturated and supersaturated solutions. Relate changes in temperature and pressure to solubility. Calculate concentrations are molarity.	243: 1a-d 244: 1-7
Lab			
Lab			
Review		Chapter Review pp246: 1-21, 23	

Chapter Eight Acids and Bases

Unit	Date	Objectives	Assessment
1		**Acids, Bases, and pH** Describe the ionization of acids and bases in water. Distinguish between strong acids and bases; and weak acids and bases. Relate pH to the concentration of hydronium ions and hydroxide ions in a solution.	262: 1-3 263 1-7
2		**Reactions of Acids with Bases** Write ionic equations for neutralization reactions. Identify the products of a reaction.	268: 1-5

		Describe the composition of a salt.	
3		**Acids, Bases, and Salts in the home** Describe the structures of soaps and detergents and how they work. Describe the composition of bleach and its uses. Describe how an antacid reduces stomach acid. Identify acidic and basic household products and their uses.	274: 1-7
Lab			
Lab			
Review		Chapter Review pp276: 1-23, 26	