

EXAMGEN PHYSICAL SCIENCE (8th Grade)

Chapter 1: MEASUREMENT & SCIENTIFIC METHOD

TOPIC A: Laboratory Measurement

PART 1: SI and Metric Units

PART 2: Length

PART 3: Volume

PART 4: Mass

PART 5: Density

PART 6: Temperature

Section a: Temperature Scales

Section b: Converting Between Celsius and Fahrenheit

Section c: Converting Between Celsius and Kelvin

PART 7: Significant Figures

PART 8: Scientific Notation

TOPIC B: Laboratory Process, Safety, and Equipment

TOPIC C: Scientific Method

PART 1: What is the Scientific Method?

PART 2: Steps in the Scientific Method

TOPIC D: Experimental Design: Variables and Controls

TOPIC E: Data Analysis and Formulating Models

PART 1: Graphs and Graphing Techniques

PART 2: Interpreting Data

PART 3: Theories, Projections, and Conclusions

PART 4: Formulating Models

TOPIC F: Science and Technology

TOPIC G: Chapter Knowledge

PART 1: Matching Questions

PART 2: Fill-in-the-Blank Questions

PART 3: True/False Questions

Chapter 2: INTRODUCTION TO MATTER & STATES OF MATTER

TOPIC A: Introduction to Matter

PART 1: What is Matter?

PART 2: Mass and Weight

PART 3: Volume

PART 4: Density

PART 5: Buoyancy

PART 6: Temperature

TOPIC B: Atoms and Elements

PART 1: Atoms

PART 2: Elements

TOPIC C: Molecules and Compounds

PART 1: Molecules

PART 2: Compounds

PART 3: Polymers

TOPIC D: Substances and Mixtures

PART 1: Substances

PART 2: Homogenous Mixtures (Pure Solutions)

PART 3: Alloys

PART 4: Heterogenous Mixtures

Section a: Mechanical Mixtures

Section b: Colloids

PART 5: Separation of Mixtures

TOPIC E: Chemistry of Solutions

PART 1: Solutes and Solvents

PART 2: Conductivity

PART 3: Concentration

PART 4: Factors Affecting Rate of Dissolution (Solubility)

TOPIC F: Properties of Matter

PART 1: Theories of Matter

PART 2: Phases of Matter

Section a: Solids

Section b: Liquids

Section c: Gases

Section d: Plasmas

PART 3: Introduction to Phase Changes

Section a: Freezing (Liquid to Solid)

Section b: Melting (Solid to Liquid)

Section c: Condensation (Gas to Liquid)

Section d: Boiling/Evaporation/Vaporization (Liquid to Gas)

Section e: Sublimation (Solid to Gas)

Section f: Deposition (Gas to Solid)

PART 4: Particle Motion, Energy, and Bonding During Phase Changes

Section a: Particle Motion

Section b: Energy and Energy Diagrams

Section c: Bonding

PART 5: Pressure Laws

PART 6: Physical/Chemical Properties and Changes

TOPIC G: Chapter Knowledge

PART 1: Matching Questions

PART 2: Fill-in-the-Blank Questions

PART 3: True/False Questions

Chapter 3: ATOMS, ELEMENTS, & THE PERIODIC TABLE

TOPIC A: Atomic Structure

PART 1: Composition of an Atom

Section a: Historical Models of the Atom [Thomson, Dalton, Bohr, Rutherford]

Section b: Nucleus (Protons, Neutrons, Quarks)

Section c: Outer Region (Electron Shells)

PART 2: Atomic Mass

PART 3: Electron Charges and Ions

PART 4: Electron Configurations (Valence, Lewis Dot, Transitions)

PART 5: Nuclear Forces

TOPIC B: Periodic Table and Properties of Elements

PART 1: Development and General Structure of the Periodic Table

Section a: Development and Elemental Properties

Section b: Period

Section c: Group/Family

PART 2: Metals, Nonmetals, and Metalloids

Section a: Metals

Section b: Nonmetals

Section c: Metalloids

PART 3: Special Families

Section a: Noble Gases (Group VIIIA)

Section b: Alkali Metals (Group IA) and Alkali Earth Metals (Group IIA)

Section c: Halogens (Group VIIA)

Section d: Other Special Groups

TOPIC C: Chapter Knowledge

PART 1: Matching Questions

PART 2: Fill-in-the-Blank Questions

PART 3: True/False Questions

Chapter 4: CHEMISTRY OF MATTER

TOPIC A: Chemical Bonding

PART 1: Lending and Borrowing Electrons

PART 2: Covalent Bonds

PART 3: Ionic Bonds

PART 4: Metallic Bonds

PART 5: Polar Attractions

TOPIC B: Chemical Formulas

PART 1: Types of Formulas

PART 2: Number of Atoms in Compounds

PART 3: Writing and Naming Formulas

TOPIC C: Chemical Reactions

PART 1: General Features of Chemical Reactions

PART 2: Types of Chemical Reactions

PART 3: Writing and Balancing Chemical Equations

PART 4: Chemical Energy

PART 5: Reaction Rates

TOPIC D: Acid-Base Chemistry

PART 1: Acids

PART 2: Bases

PART 3: Salts

PART 4: pH and Indicators

TOPIC E: Chemistry of Carbon

PART 1: Types of Carbon

PART 2: Characteristics of Carbon and Bonding

PART 3: Food Chemistry

TOPIC F: Chapter Knowledge

PART 1: Matching Questions

PART 2: Fill-in-the-Blank Questions

PART 3: True/False Questions

Chapter 5: FORCE, WORK, & POWER

TOPIC A: Force

PART 1: Concepts of Force

PART 2: Frictional Force

PART 3: Gravitational Force

PART 4: Combinations of Force

TOPIC B: Work

TOPIC C: Simple Machines and Structures

PART 1: Simple Versus Compound Machines

PART 2: Types of Simple Machines

TOPIC D: Power

TOPIC E: Chapter Knowledge

PART 1: Matching Questions

PART 2: Fill-in-the-Blank Questions

PART 3: True/False Questions

Chapter 6: MOTION (Kinematics)

TOPIC A: Historical Theories of Motion

TOPIC B: Linear Motion

PART 1: Speed and Velocity

PART 2: Acceleration

PART 3: Momentum and Impulse

TOPIC C: Newton's Laws of Motion

PART 1: Mass and Newton's First Law

PART 2: Forces and Newton's Second Law

PART 3: Newton's Third Law

TOPIC D: Non-linear Motion

TOPIC E: Chapter Knowledge

PART 1: Matching Questions

PART 2: Fill-in-the-Blank Questions

PART 3: True/False Questions

Chapter 7: ENERGY

TOPIC A: Introduction to Energy

TOPIC B: Components of Mechanical Energy

PART 1: Kinetic Energy

PART 2: Potential Energy

PART 3: Mechanical Energy

TOPIC C: Conservation of Energy

PART 1: Law of Conservation

PART 2: KE increases = PE decreases

TOPIC D: Transformations of Energy

TOPIC E: Thermal Energy and Thermal Dynamics

PART 1: Temperature vs. Heat

PART 2: Heat Transfer (Conduction, Radiation, Convection)

PART 3: Conductors and Insulators

***COMING TOPIC F: Natural Sources of Energy

TOPIC G: Chapter Knowledge

PART 1: Matching Questions

PART 2: Fill-in-the-Blank Questions

PART 3: True/False Questions

Chapter 8: WAVES & SOUND

TOPIC A: Understanding Waves

PART 1: Introduction to Waves

PART 2: Properties of Waves

TOPIC B: Types of Waves and Wave Motion

TOPIC C: Wave Speed

TOPIC D: Propagation of Waves

TOPIC E: Sound

PART 1: Wave Nature of Sound

PART 2: Mechanisms of Hearing (Auditory System)

PART 3: Musical Sounds

TOPIC F: Light and the Electromagnetic Spectrum

PART 1: Wave Nature of Light

PART 2: Color

PART 3: Transmission of Light Through Different Media

PART 4: Photons and Energy Levels

PART 5: Mirrors and Lenses

PART 6: Mechanisms of Vision

TOPIC G: Information Technologies and Instrumentation

TOPIC H: Chapter Knowledge

PART 1: Matching Questions

PART 2: Fill-in-the-Blank Questions

PART 3: True/False Questions

Chapter 9: ELECTRICITY & MAGNETISM

TOPIC A: Static Electricity and Electric Charge

TOPIC B: Electron Flow (Current)

PART 1: Current

PART 2: Resistance

PART 3: Voltage

PART 4: Ohm's Law

PART 5: Electric Circuits

TOPIC C: Difference of Potential Energy

PART 1: Electrical Power and Energy

PART 2: Electrical Devices

PART 3: Insulators and Conductors

TOPIC D: Magnets and Magnetic Fields

PART 1: Magnetism and Magnets

PART 2: Domains

TOPIC E: Electromagnetism

TOPIC F: Chapter Knowledge

PART 1: Fill-in-the-Blank Questions

PART 2: True/False Questions

Chapter 10: RADIOACTIVITY & NUCLEAR REACTIONS

TOPIC A: Atomic Nuclei (Fusion vs. Fission)

PART 1: Fusion

PART 2: Fission

TOPIC B: Alpha, Beta, and Gamma Radiation

PART 1: Radioactivity

PART 2: Radioactive Decay

PART 3: Penetrating Powers of Radiation Particles

TOPIC C: Half-life

TOPIC D: Nuclear Reactors: Practical Applications and Related Problems

TOPIC E: Chapter Knowledge

PART 1: Matching Questions

PART 2: Fill-in-the-Blank Questions

PART 3: True/False Questions