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| *Name:* | *Grade Level:* | *Subject Area/Course* |
| **Scott Brever** | **9th** | **Physical Science** |

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| ***Q & W*** | | ***CONTENT & SKILLS*** | ***STRATEGIES & RESOURCES*** | ***ASSESSMENTS/***  ***ACTIVITIES*** | ***STATE / National Standards*** |
| Q1  W1 | Chapter 1.1 – “Activities of Science”   * List and illustrate some activities of science * Distinguish among observations, inferences, scientific laws, hypotheses and theories * Relate the branches of physical science   Chapter 2.1 – “Collecting Data”   * The student will understand the nature of scientific ways of thinking and that scientific knowledge changes and accumulates over time. | * Direct Vocabulary Instruction (Vocabulary Term Sheet) * Inference Chart (Observation and Inference) * Reciprocal Teaching (Measurement Lab) | * **Observations and Inference Worksheet** * **Vocabulary Term Sheet** * **Measurement Lab** | **The Nature of Science and Engineering**  9.1.1.1.6 - Describe how changes in scientific knowledge generally occur in incremental steps that include and build on earlier knowledge.  9.1.1.1.2 - Understand that scientists conduct investigations for a variety of reasons, including: to discover new aspects of the natural world, to explain observed phenomena, to test the conclusions of prior investigations, or to test the predictions of current theories.  9.1.1.2.3 - Identify the critical assumptions and logic used in a line of reasoning to judge the validity of a claim. |
| Q1  W2 | Chapter 2.2 – “Presenting and Analyzing Data”   * Construct graphs to present results of experiments * Interpret graphs to extend information   Chapter 2.3 – “The Scientific Method”   * The student will design and conduct a scientific investigation. * List and explain the steps of the scientific method * Identify the roles of trials, controls, and variables in a controlled experiment | * Reciprocal Teaching (Which Hand is Quicker Lab) * Higher Order Questioning (Looper Airplane Lab) * Reciprocal Teaching (Calorie Lab) | * **“Which Hand is Quicker” Lab** * **Looper Airplane Lab** * **Calorie Lab and Lab Report** | **The Nature of Science and Engineering**  9.1.1.2.1 - Formulate a testable hypothesis, design and conduct an experiment to test the hypothesis, analyze the data, consider alternative explanations and draw conclusions supported by evidence from the investigation.  9.1.1.2.3 - Identify the critical assumptions and logic used in a line of reasoning to judge the validity of a claim.  **The Nature of Science and Engineering**  9.1.3.3.2 - Communicate, justify and defend the procedures and results of a scientific inquiry or engineering design project using verbal, graphic, quantitative, virtual or written means. |
| Q1  W3 | Chapter 2.3 – “The Scientific Method”   * The student will design and conduct a scientific investigation. * List and explain the steps of the scientific method * Identify the roles of trials, controls, and variables in a controlled experiment * Perform an experiment using the scientific method | * Direct Vocabulary Instruction (Vocabulary Quiz) * Inference Chart (Metric Conversions Lab Report) * Reciprocal Teaching (Metric Conversions Lab) | * **Obscertainer Lab** * **Metric Conversions Lab and Report** * **Vocabulary Quiz #1** * **Unit 1 (Part I) Test** | **The Nature of Science and Engineering**  9.1.1.2.2 - Evaluate the explanations proposed by others by examining and comparing evidence, identifying faulty reasoning, pointing out statements that go beyond the scientifically acceptable evidence, and suggesting alternative scientific explanations.  9.1.1.2.4 - Use primary sources or scientific writings to identify and explain how different types of questions and their associated methodologies are used by scientists for investigations in different disciplines. |
| Q1  W4 | Chapter 3.1 – “Motion and Speed”   * The student will understand the nature of force and motion. * Describe the relationship between velocity and acceleration | * Venn Diagram (Velocity vs. Acceleration) * Reciprocal Teaching (Acetone and Pulse Lab) * Higher Order Questioning (Usain Bolt Lab) | * **Velocity and Frame of Reference Worksheet** * **Velocity Quiz** * **Acetone Lab** * **Pulse Lab** * **Usain Bolt Lab** | **Motion**  9.2.2.2.1 - Recognize that inertia is the property of an object that causes it to resist changes in motion.  **The Nature of Science and Engineering**  9.1.1.2.1 - Formulate a testable hypothesis, design and conduct an experiment to test the hypothesis, analyze the data, consider alternative explanations and draw conclusions supported by evidence from the investigation.  9.1.1.2.3 - Identify the critical assumptions and logic used in a line of reasoning to judge the validity of a claim. |
| Q1  W5 | Chapter 3.2 – “Acceleration and Deceleration”   * Calculate the acceleration of an object given the change in velocity and time * Identify a motion that is the same for all falling objects * Understand terminal velocity   Chapter 4.1 – “Forces”   * Students will define what a force is * Define the SI measurement for a force * Measure and estimate forces | * Attribute Wheel (Newton’s three laws) * Direct Vocabulary Instruction (Vocabulary Quiz) * Reciprocal Teaching (Speed Lab) * Inference Chart   (Acceleration Worksheet) | * **Speed Lab and Report** * **Acceleration Worksheet** * **Vocabulary Quiz #2** * **5th Avenue Car Calculations and Report** | **Motion**  9.2.2.2.1 - Explain and calculate the acceleration of an object subjected to a set of forces in one dimension (F=ma).  **The Nature of Science and Engineering**  9.1.1.2.1 - Formulate a testable hypothesis, design and conduct an experiment to test the hypothesis, analyze the data, consider alternative explanations and draw conclusions supported by evidence from the investigation.  9.1.1.1.2 - Understand that scientists conduct investigations for a variety of reasons, including: to discover new aspects of the natural world, to explain observed phenomena, to test the conclusions of prior investigations, or to test the predictions of current theories. |
| Q1  W6 | Chapter 4.2 - “Balanced Forces (Newton’s 1st Law)   * Identify balanced forces * State Newton’s first law * Name a force that slows down or stops objects   Chapter 4.3 - “Unbalanced Forces”   * Contrast balanced forces with unbalanced forces * State Newton’s second law of motion | * Graphic Organizer (Newton’s three laws) * Compare and Contrast (Newton’s three laws) * Reciprocal Teaching (Friction Lab) | * **Friction Lab and Report** * **Interactive forces video w/questions** * **Forces Worksheet** | **Motion**  9.2.2.3 - Demonstrate that whenever one object exerts force on another, a force equal in magnitude and opposite in direction is exerted by the second object back on the first object.  **The Nature of Science and Engineering**  9.1.1.2.1 - Formulate a testable hypothesis, design and conduct an experiment to test the hypothesis, analyze the data, consider alternative explanations and draw conclusions supported by evidence from the investigation. |
| Q1  W7 | Chapter 4.4 – “Interacting Forces”   * State Newton’s third law of motion * Explain rocket motion using Newton’s third law   Chapter 4.5 – “Gravity and other Forces”   * Describe the force of gravity * Describe how gravitational force depends on mass and distance * Contrast weight and mass * Understand the four fundamental forces in nature | * Inference Chart (Gravity and Motion Lab) * Reciprocal Teaching (Gravity Lab and Report) * Compare and Contrast Analysis (Motion and Forces) | * **Gravity Lab** * **Interactive gravity video w/questions** * **Motion and Forces Review Packet** * **Motion and Force Test** | **Motion**  9.2.2.2.4 - Use Newton’s universal law of gravitation to describe and calculate the attraction between massive objects based on the distance between them.  **The Nature of Science and Engineering**  9.1.1.2.1 - Formulate a testable hypothesis, design and conduct an experiment to test the hypothesis, analyze the data, consider alternative explanations and draw conclusions supported by evidence from the investigation. |
| Q1  W8 | Chapter 3.4 – “Energy”   * Identify the two forms of energy that moving objects can have * Describe energy changes in moving objects * Explain the concept of energy conservation * Describe the relationship between height and gravitational potential energy | * Compare / Contrast Analysis (Potential Energy vs. Kinetic Energy) * Higher Order Questioning (Pendulum Lab) * Reciprocal Teaching (PE / KE Lab) * Venn Diagram (Two Kinds of Energy) | * **Interactive PE/KE Filmstrip with questions** * **Forms of Energy Worksheet** * **Energy Changes Packet** * **PE / KE Changes Lab** * **Gravitational Potential Energy Lab** * **Pendulum Lab** | **Energy**  9.2.3.2.1 - Identify the energy forms and explain the transfers of energy involved in the operation of common devices.  **The Nature of Science and Engineering**  9.1.1.2.1 - Formulate a testable hypothesis, design and conduct an experiment to test the hypothesis, analyze the data, consider alternative explanations and draw conclusions supported by evidence from the investigation.  9.1.1.2.3 - Identify the critical assumptions and logic used in a line of reasoning to judge the validity of a claim.  9.1.3.3.2 - Communicate, justify and defend the procedures and results of a scientific inquiry or engineering design project using verbal, graphic, quantitative, virtual or written means. |
| Q1  W9 | Chapter 5.1 - “Energy and Work”   * Define Work * Relate changes in motion to work * Calculate the amount of work done by a force * Understand that work is measured in Joules | * Direct Vocabulary Instruction (Vocabulary Term Sheet) * Attribute Wheel (Energy/Work) | * **Unit 2 Vocabulary Term Sheet** * **Quantitative Work Problems** * **“What is Work” Worksheet** | **Energy**  9.2.3.2.2 - Calculate and explain the energy, work and power involved in energy transfers in a mechanical system.  **The Nature of Science and Engineering**  9.1.1.2.3 - Identify the critical assumptions and logic used in a line of reasoning to judge the validity of a claim. |
| Q2  W1 | Chapter 5.4 – “Power and Efficiency”   * Compare and contrast work and power * Calculate the power of a machine * Define efficiency * Determine the efficiency of a machine | * Compare and Contrast Analysis (Work and Power) * Direct Vocabulary Instruction (Vocabulary Quiz) * Inference Chart (What is Power Worksheet) * Reciprocal Teaching (Power Lab) | * **Unit 2 (Part 1) Vocabulary Quiz** * **Quantitative Power problems** * **Power Lab** * **“What is Power” worksheet** * **Energy, Work & Power Review Packet** * **Unit 2 (Part 1) Test** | **Energy**  9.2.3.2.2 - Calculate and explain the energy, work and power involved in energy transfers in a mechanical system.  **The Nature of Science and Engineering**  9.1.1.2.1 - Formulate a testable hypothesis, design and conduct an experiment to test the hypothesis, analyze the data, consider alternative explanations and draw conclusions supported by evidence from the investigation.  9.1.1.2.2 - Evaluate the explanations proposed by others by examining and comparing evidence, identifying faulty reasoning, pointing out statements that go beyond the scientifically acceptable evidence, and suggesting alternative scientific explanations. |
| Q2  W2 | Chapter 5.2 – “Simple Machines and Mechanical Advantage”   * Explain how machines do work * Recognize that machines do not reduce the amount of work done * Determine the mechanical advantage of a machine * Calculate the Mechanical advantage of machines | * Higher Order Questioning (Mechanical Advantage Worksheet) * Direct Vocabulary Instruction (Vocabulary Quiz) | * **Unit 2 (Part 2) Vocabulary Quiz** * **Calculating out mechanical advantage worksheet** * **Parts of a simple machine packet** | **Energy**  9.2.3.2.1 - Identify the energy forms and explain the transfers of energy involved in the operation of common devices.  9.2.3.2.2 - Calculate and explain the energy, work and power involved in energy transfers in a mechanical system. |
| Q2  W3 | Chapter 5.3 –“Types of Simple Machines”   * Apply the principle that explains the operation of a simple machine * Describe the uses of the six simple machines * Contrast force and pressure * Conduct experiments of the simple machines and determine the mechanical of each | * Higher Order Questioning (Inclined Plane, Lever and Gear Labs) * Reciprocal Teaching (Inclined Plane, Lever and Gear Labs) * Inference Chart (Lab Reports) | * **Inclined Plane Lab with Lab Questions and Report** * **Lever Lab Questions and Report** * **Gear Lab with Lab Questions and Report** | **Energy**  9.2.3.2.1 - Identify the energy forms and explain the transfers of energy involved in the operation of common devices.  9.2.3.2.2 - Calculate and explain the energy, work and power involved in energy transfers in a mechanical system.  **The Nature of Science and Engineering**  9.1.1.2.1 - Formulate a testable hypothesis, design and conduct an experiment to test the hypothesis, analyze the data, consider alternative explanations and draw conclusions supported by evidence from the investigation. |
| Q2  W4 | Chapter 5.3 –“Types of Simple Machines”   * Apply the principle that explains the operation of a simple machine * Describe the uses of the six simple machines * Contrast force and pressure * Conduct experiments of the simple machines and determine the mechanical of each | * Higher Order Questioning (Pulley Lab) * Reciprocal Teaching (Pulley Lab) * Inference Chart (Simple Machines Review Packet) | * **Pulley Lab with Lab Questions and Report** * **Simple Machines Lab Quiz** * **Simple Machines Review Packet** | **Energy**  9.2.3.2.1 - Identify the energy forms and explain the transfers of energy involved in the operation of common devices.  9.2.3.2.2 - Calculate and explain the energy, work and power involved in energy transfers in a mechanical system.  **The Nature of Science and Engineering**  9.1.1.2.1 - Formulate a testable hypothesis, design and conduct an experiment to test the hypothesis, analyze the data, consider alternative explanations and draw conclusions supported by evidence from the investigation. |
| Q2  W5 | Chapter 5.3 –“Types of Simple Machines”   * Apply the principle that explains the operation of a simple machine * Describe the uses of the six simple machines * Contrast force and pressure * Conduct experiments of the simple machines and determine the mechanical of each | * Higher Order Questioning (Catapult Lab) * Reciprocal Teaching (Catapult Lab) * Inference Chart (Lab Report) * Attribute Wheel (Simple Machines) | * **Catapult Lab with Lab Questions and Report** * **Simple Machines Test Review** * **Unit 2 (Part 2) Test** | **Energy**  9.2.3.2.1 - Identify the energy forms and explain the transfers of energy involved in the operation of common devices.  9.2.3.2.2 - Calculate and explain the energy, work and power involved in energy transfers in a mechanical system.  **The Nature of Science and Engineering**  9.1.1.2.1 - Formulate a testable hypothesis, design and conduct an experiment to test the hypothesis, analyze the data, consider alternative explanations and draw conclusions supported by evidence from the investigation. |
| Q2  W6 | Chapter 11.1 – “Types of Waves”   * Define the term wave * Distinguish between a transverse and longitudinal wave * Describe how waves transfer energy * Describe the influence of water waves on matter | * Direct Vocabulary Instruction (Vocabulary Term Sheet) * Attribute Wheel   (Types of Waves) | * **Unit 3 Vocabulary Term Sheet** * **Waves in Motion Video with Worksheet** | **Energy**  9.2.3.2.3 - Describe how energy is transferred through sound waves and how pitch and loudness are related to wave properties of frequency and amplitude. |
| Q2  W7 | Chapter 11.2 – “Characteristics of a Wave”   * Identify crest, trough, amplitude and length of a wave * Relate wave amplitude to wave energy * Define frequency * Determine the wave speed when given frequency and wavelength | * Graphic Organizer (Parts of a Wave) * Higher Order Questioning   (Wave Lab)   * Non-Linguistic Representation   (Wave Drawings) | * **Wave filmstrip with study guide worksheet** * **Wave study guide** * **Wave Lab and Report** | **Energy**  9.2.3.2.3 - Describe how energy is transferred through sound waves and how pitch and loudness are related to wave properties of frequency and amplitude.  **The Nature of Science and Engineering**  9.1.1.2.1 - Formulate a testable hypothesis, design and conduct an experiment to test the hypothesis, analyze the data, consider alternative explanations and draw conclusions supported by evidence from the investigation. |
| Q2  W8 | Chapter 11.3 – “Waves in Action”   * Relate angle of reflection to angle of incidence * Define wave diffraction * Explain wave refraction * Compare constructive and destructive interference | * Direct Vocabulary Instruction (Vocabulary Quiz) * Reciprocal Teaching (Sound Lab) * Inference Chart (Sound Quiz) | * **Unit 3 Vocabulary Quiz #1** * **Unit 3 Reading Assignment** * **Sound Lab** * **Sound Quiz** | **Energy**  9.2.3.2.3 - Describe how energy is transferred through sound waves and how pitch and loudness are related to wave properties of frequency and amplitude.  **The Nature of Science and Engineering**  9.1.1.2.1 - Formulate a testable hypothesis, design and conduct an experiment to test the hypothesis, analyze the data, consider alternative explanations and draw conclusions supported by evidence from the investigation. |
| Q2  W9 | Chapter 12.1 – “Sound Waves”   * Describe how sound waves are produced and classify sound waves as longitudinal * Explain two factors that determine the speed of sound * Relate sound intensity and loudness and explain how intensity is measured * Compare frequency and pitch   Chapter 13.1 – “Electromagnetic Waves”   * Describe the actions that produce electromagnetic waves * Distinguish between sound and light waves * Compare and contrast the different sections of the electromagnetic spectrum | * Direct Vocabulary Instruction (Vocabulary Quiz) * Non-Linguistic Representation   (Electromagnetic Spectrum)   * Graphic Organizer (Electromagnetic Spectrum) * Compare and Contrast Analysis (Longitudinal and Transverse Waves) * Venn Diagram (Light and Sound Waves) | * **Unit 3 Vocabulary Quiz #2** * **Making Sound “Vibration Creation”** * **Wave test review packet** * **Wave TEST** * **Electromagnetic Spectrum Diagram Drawing/Label** * **Chapter 13 Vocabulary Term Sheet** | **Energy**  9.2.3.2.3 - Describe how energy is transferred through sound waves and how pitch and loudness are related to wave properties of frequency and amplitude.  9.2.3.2.7 - Describe the properties and uses of forms of electromagnetic radiation from radio frequencies through gamma radiation.  **The Nature of Science and Engineering**  9.1.1.2.1 - Formulate a testable hypothesis, design and conduct an experiment to test the hypothesis, analyze the data, consider alternative explanations and draw conclusions supported by evidence from the investigation.  9.1.3.3.2 - Communicate, justify and defend the procedures and results of a scientific inquiry or engineering design project using verbal, graphic, quantitative, virtual or written means. |
| Q2  W10 | 13.2 – “Reflection”   * Describe how flat-mirror reflections differ from the objects they represent * Compare and contrast light reflection from smooth and uneven surfaces * Explain how a properly curved surface can gather light * Discuss why objects have different colors   13.3 – “Refraction”   * Discuss light refraction and the production of mirages * Explain the separation of light from prisms and rainbows * Apply total internal reflection to describe optical fibers   13.4 – “Diffraction and Polarization”   * Compare and contrast refraction and diffraction * Explain how a polarizing filter works | * Compare and Contrast   (Smooth vs. Uneven surfaces)   * Venn-Diagram   (Sound vs. Light)   * Direct Vocabulary Instruction (Vocabulary Quiz) * Graphic Organizer (Light Properties) * Compare and Contrast Analysis (Refraction and Diffraction) * Attribute Wheel   (Light and Colors) | * **Chapter 13 Vocabulary Quiz** * **Filmstrip with Interactive Worksheet** * **Chapter 13 Review Packet** * **Bill Nye “Light”** * **Chapter 13 TEST** | **Energy**  9.2.3.2.7 - Describe the properties and uses of forms of electromagnetic radiation from radio frequencies through gamma radiation.  **The Nature of Science and Engineering**  9.1.1.2.3 - Identify the critical assumptions and logic used in a line of reasoning to judge the validity of a claim. |
| Q3  W1 | Chapter 15.1 – “Properties of Matter”   * Identify ways of distinguishing between matter and energy * Describe and recognize some physical properties of matter * Explain why the ability to rust is a chemical property of metal * Contrast physical and chemical changes * Classify changes as chemical or physical | * Directed Vocabulary Instruction (Vocabulary Term Sheet) * Compare and Contrast Analysis (Physical and Chemical Changes) * Higher Order Thinking (Baking Soda Lab) | * **Chapter 15 Vocabulary Term Sheet** * **Physical and Chemical Changes Quiz** * **“Baking Soda” Chemical Reactions LAB** * **Changes Filmstrip and follow along worksheet** | **Matter**  9.2.1.2.2 - Explain how the rearrangement of atoms in a chemical reaction illustrates the law of conservation of mass.  9.2.1.2.4 - Relate exothermic and endothermic chemical reactions to temperature and energy changes.  **The Nature of Science and Engineering**  9.1.3.4.4 - Relate the reliability of data to consistency of results, identify sources of error, and suggest ways to improve data collection and analysis.  9.1.3.4.5 - Demonstrate how unit consistency and dimensional analysis can guide the calculation of quantitative solutions and verification of results. |
| Q3  W2 | Chapter 15.2 – “Physical States and Properties”   * Contrast an amorphous solid with a crystal * Describe matter with no clear distinction between the solid and liquid states * Understand models to describe why solids are rigid and gases and liquids are fluid * Explain the difference between the density of gases and the density of solids and liquids | * Venn Diagram (Physical vs. Chemical Changes) * High Order Questioning (Chemical and Physical Changes Lab and Report) * Non-Linguistic Representation (Particle Model) | * **Density Lab and Quiz** * **Chemical & Physical Changes LAB (Procedures #1-6)** * **15.1/15.2 Review Worksheet** | **Matter**  9.2.1.2.2 - Explain how the rearrangement of atoms in a chemical reaction illustrates the law of conservation of mass.  **Matter**  9.2.1.2.4 - Relate exothermic and endothermic chemical reactions to temperature and energy changes.  **The Nature of Science and Engineering**  9.1.1.2.3 - Identify the critical assumptions and logic used in a line of reasoning to judge the validity of a claim. |
| Q3  W3 | Chapter 15.3 – “Effects of Pressure and Temperature on Matter”   * Explain the compressibility of gas using the particle model of matter * Predict the effect on the volume of a gas if the pressure or temperature changes * Describe the effect of pressure changes on the boiling point of freezing water | * High Order Questioning (Chemical and Physical Changes Report) * Reciprocal Teaching (Chemical and Physical Changes Lab) * Inference Chart (Review Packet) * Direct Vocabulary Instruction (Vocabulary Quiz) | * **Chemical & Physical Changes LAB (Procedures #7-12)** * **Chapter 15 Vocabulary Quiz** * **Chapter 15 Review Packet** * **Bill Nye “Chemical Changes and Phases of Matter”** * **Chapter 15 TEST** | **The Nature of Science and Engineering**  9.1.1.2.1 - Formulate a testable hypothesis, design and conduct an experiment to test the hypothesis, analyze the data, consider alternative explanations and draw conclusions supported by evidence from the investigation.  9.1.3.4.3 - Select and use appropriate numeric, symbolic, pictorial, or graphical representation to communicate scientific ideas, procedures and experimental results.  **Matter**  9.2.1.2.2 - Explain how the rearrangement of atoms in a chemical reaction illustrates the law of conservation of mass.  9.2.1.2.4 - Relate exothermic and endothermic chemical reactions to temperature and energy changes. |
| Q3  W4 | Chapter 16.1 – “Introduction to Elements”   * Describe elements as unique particles called atoms * Distinguish between elements and compounds * Give examples of elements that exist in the solid, liquid, and gas states at room temperature * Identify certain elements that are considered to be essential for life | * Direct Vocabulary Instruction (Vocabulary Term Sheet) * Attribute Wheel (Essential Elements) * Venn Diagram (Elements and Compounds) | * **Filmstrip on Elements with follow along Worksheet** * **Vocabulary Term Sheet** * **Introduction to Elements Review Packet** | **Matter**  9.2.1.1.3 - Explain the arrangement of the elements on the Periodic Table, including the relationships among elements in a given column or row.  **Matter**  9.2.1.1.1 - Describe the relative charges, masses, and locations of the protons, neutrons, and electrons in an atom of an element. |
| Q3  W5 | Chapter 16.2 – “Classifying Elements”   * Describe the properties of metals, nonmetals, metalloids and noble gases * Identify elements by their symbols, names, and atomic numbers using the periodic table * Classify elements as metals, nonmetals, and metalloids using the periodic table | * Graphic Organizer (Periodic Table) * Compare and Contrast Analysis (Compounds and Elements) * Direct Vocabulary Instruction (Vocabulary Quiz) | * **Make a Periodic Table Activity (Label and Categories)** * **Vocabulary Quiz Part #1** * **Compounds Worksheet** * **Identify Substances Worksheet** | **Matter**  9.2.1.1.3 - Explain the arrangement of the elements on the Periodic Table, including the relationships among elements in a given column or row.  **The Nature of Science and Engineering**  9.1.1.2.3 - Identify the critical assumptions and logic used in a line of reasoning to judge the validity of a claim. |
| Q3  W6 | Chapter 16.3 – “Compounds”   * Explain the difference between compounds and mixtures of elements * Be able to write and interpret chemical formulas for compounds | * Non-Linguistic Representation (Ball and Stick Models) * Higher Order Questioning (Ball and Stick Model Lab) | * **Compound Notes** * **Ball and Stick Model Lab** * **Compounds filmstrip with follow along worksheet** * **Test Review** * **Chapter 16 Test** | **Matter**  9.2.1.1.3 - Explain the arrangement of the elements on the Periodic Table, including the relationships among elements in a given column or row.  9.2.1.1.1 - Describe the relative charges, masses, and locations of the protons, neutrons, and electrons in an atom of an element.  **The Nature of Science and Engineering**  9.1.3.4.3 - Select and use appropriate numeric, symbolic, pictorial, or graphical representation to communicate scientific ideas, procedures and experimental results. |
| Q3  W7 | Chapter 17.3 – “The Nucleus”   * Be able to calculate the number of protons, neutrons and electrons in an atom * List properties of elements based on their position on the periodic table | * Non-Linguistics Representation (Atomic Structure) * Direct Vocabulary Instruction (Vocabulary Term Sheet) | * **Vocabulary Term Sheet** * **Atomic Structure Worksheet** | **Matter**  9.2.1.1.2 - Describe how experimental evidence led Dalton, Rutherford, Thompson, Chadwick and Bohr to develop increasingly accurate models of the atom  9.2.1.1.1 - Describe the relative charges, masses, and locations of the protons, neutrons, and electrons in an atom of an element. |
| Q3  W8 | Chapter 17.1 – “Classifying Elements”   * Understand the format of the periodic table * List some properties of an element from its location on the periodic table * Predict chemical and physical properties of an element based on its location on the periodic table | * Reciprocal Teaching (Mixture Lab and Report) * Inference Chart (Naming Compounds Worksheet) | * **Molecular Weight Quiz** * **Naming Compounds worksheet** * **Mixture Lab and Report** | **Matter**  9.2.1.1.3 - Explain the arrangement of the elements on the Periodic Table, including the relationships among elements in a given column or row.  9.2.1.2.3 - Describe a chemical reaction using words and symbolic equations. |
| Q3  W9 | Chapter 17.2 – “The Atom”   * Summarize how the model of the atom looks * Understand the components of an atom and in contents | * Inference Chart (Chemical Equations Quiz) * Explicit Feedback (Counting Atoms) * Direct Vocabulary Instruction (Vocabulary Quiz) | * **Chemical Equations Quiz** * **Unit 2 Vocabulary Quiz #2** * **Counting Atoms Worksheet** | **Matter**  9.2.1.1.1 - Describe the relative charges, masses, and locations of the protons, neutrons, and electrons in an atom of an element.  9.2.1.2.3 - Describe a chemical reaction using words and symbolic equations. |
| Q3  W10 | Chapter 21.1 – “Types of Chemical Reactions”   * Give examples of signs that indicate a chemical reaction * Classify reactions as endothermic or exothermic * Classify the four general types reactions * Predict types of reactions | * Reciprocal Teaching (Ion Experiment) * Compare and Contrast Analysis (Reactions) * High Order Questioning (Reaction Predictions) | * **Ion Experiment** * **Chemical Equation Balancing Activity** * **Test Review** * **Unit 2 Test** | **Matter**  9.2.1.2.1 - Describe the role of valence electrons in the formation of chemical bonds.  **Matter**  9.2.1.2.3 - Describe a chemical reaction using words and symbolic equations.  **The Nature of Science and Engineering**  9.1.1.2.3 - Identify the critical assumptions and logic used in a line of reasoning to judge the validity of a claim. |
| Q4  W1 | Chapter 18.1 –“Combining Atoms”   * Explain how compounds differ from their elements * Determine the number of valance electrons in an element * Perform electron dot structures | * Non-Linguistic Representation (Binary and Ternary Compound Equations) * Inference Chart (Practice Sheet) | * **Binary Compounds Practice Sheet** * **Ternary Compound Practice Sheet** | **Matter**  9.2.1.2.1 - Describe the role of valence electrons in the formation of chemical bonds.  9.2.1.2.2 - Explain how the rearrangement of atoms in a chemical reaction illustrates the law of conservation of mass. |
| Q4  W2 | Chapter 18.2 – “Ionic Bonds”   * Summarize how ionic bonds form * Describe the forces that hold ionic bond together * Write formulas for ionic compounds | * Non-Linguistic Representation (Dot Structures) * Inference Chart (Acid Worksheet) | * **Dot Structures** * **Valance Electron Practice Sheet** * **Acid Filmstrip and Worksheet** | **Matter**  9.2.1.2.1 - Describe the role of valence electrons in the formation of chemical bonds.  9.2.1.2.3 - Describe a chemical reaction using words and symbolic equations. |
| Q4  W3 | Chapter 22.1 – “Recognizing Acids and Bases”   * Classify acids and bases according to their properties * Recognize acids as proton acceptors * Compare and contrast the strength of an acid or base with its concentration * Describe the properties of an acid and base | * Direct Vocabulary Instruction (Vocabulary Term Sheet) * Venn Diagram (Acids vs. Bases) * Compare and Contrast Analysis (Acid and Bases) * Reciprocal Teaching (Base Lab and Report) | * **Acid Lab and Report** * **Chapter 22 Vocabulary Term Sheet** * **Base Lab and Report** * **Acids and Bases Worksheet** * **Base Filmstrip and Worksheet** | **Matter**  9.2.1.2.1 - Describe the role of valence electrons in the formation of chemical bonds.  9.2.1.2.3 - Describe a chemical reaction using words and symbolic equations.  **The Nature of Science and Engineering**  9.1.1.2.1 - Formulate a testable hypothesis, design and conduct an experiment to test the hypothesis, analyze the data, consider alternative explanations and draw conclusions supported by evidence from the investigation. |
| Q4  W4 | Chapter 22.2 – “Neutralization and pH   * Describe the process of neutralization * Classify a salt as neutral, acidic, or basic depending on it properties * Explain how antacids work to reduce acidity * Describe how indicators can be used to classify a solution as acidic or basic * Classify substances as acids or bases, using pH   Chapter 22.3 – “Acid Rain”   * List the causes of acid rain and its effects | * Attribute Wheel (Acids, Bases and Salts) * Graphic Organizer (Acids, Bases and Salts) * Inference Chart (pH Scale Worksheet) * Higher Order Questioning (Wine into Water Lab) * Attribute Wheel (Acid Rain) | * **Hydrolysis Lab and Report** * **pH Lab and Report** * **pH Worksheet** * **Chapter 22 Vocabulary Quiz** * **Neutralization Worksheet** * **“Water into Wine” pH Lab** * **Chapter 18/22 Review Worksheet** * **Chapter 18/22 Test** | **Matter**  9.2.1.2.1 - Describe the role of valence electrons in the formation of chemical bonds.  9.2.1.2.3 - Describe a chemical reaction using words and symbolic equations.  **The Nature of Science and Engineering**  9.1.1.2.1 - Formulate a testable hypothesis, design and conduct an experiment to test the hypothesis, analyze the data, consider alternative explanations and draw conclusions supported by evidence from the investigation.  9.1.1.2.3 - Identify the critical assumptions and logic used in a line of reasoning to judge the validity of a claim.  9.1.1.1.2 - Understand that scientists conduct investigations for a variety of reasons, including: to discover new aspects of the natural world, to explain observed phenomena, to test the conclusions of prior investigations, or to test the predictions of current theories. |
| Q4  W5 | Chapter 20.1 – “Carbon Chemistry”   * Differentiate between organic and inorganic compounds * Draw structural formulas for the isomers of simple hydrocarbons * Explain how fractional distillation is used to separate the components of a mixture * Recognize how the structure of a hydrocarbon affects its physical properties * Compare and make models to represent isomers of hydrocarbons | * Direct Vocabulary Instruction (Vocabulary Term Sheet) * Non-Linguistic Representation (Condensed Formula Writing) * Higher Order Questioning (Isomer Molecule Building Lab) | * **Carbon Video and Worksheet** * **Vocabulary Term Worksheet** * **Condensed Formula Writing** * **Isomer Molecule Building Lab** * **20.1 Carbon Compounds Review Worksheet** | **Matter**  9.2.1.2.3 - Describe a chemical reaction using words and symbolic equations.  **The Nature of Science and Engineering**  9.1.2.1.1 - Understand that engineering designs and products are often continually checked and critiqued for alternatives, risks, costs and benefits, so that subsequent designs are refined and improved.  9.1.2.1.3 - Explain and give examples of how, in the design of a device, engineers consider how it is to be manufactured, operated, maintained, replaced and disposed of. |
| Q4  W6 | Chapter 20.2 – “Carbon Molecules as Builder Molecules”   * Classify hydrocarbons as saturated or unsaturated * Describe the structure of a benzene molecule * List the properties of compounds that belong to the alcohol and the halogenated hydrocarbon groups * Explain how soap works in removing dirt and grease * Describe how structure influences the properties of polymers * Observe how the addition of cross-links affects the nature of a polymer | * Reciprocal Teaching (Slime and Gak Lab) * Higher Order Questioning (C-60 Model and Polymer Lab) * Inference Chart (Review Worksheet) | * **C-60 Model Lab** * **Polymers Balloon Lab** * **Polymer slime and gak Lab** * **20.2 Review Worksheet** * **Dr. Dad Polymer Video and Worksheet Questions** | **Matter**  9.2.1.2.3 - Describe a chemical reaction using words and symbolic equations.  **The Nature of Science and Engineering**  9.1.3.1.2 - Identify properties of a system that are different from those of its parts but appear because of the interaction of those parts.  9.1.2.1.1 - Understand that engineering designs and products are often continually checked and critiqued for alternatives, risks, costs and benefits, so that subsequent designs are refined and improved.  9.2.4.1.2 - Describe the trade-offs involved when technological developments impact the way we use energy, natural resources, or synthetic materials. |
| Q4  W7 | Chapter 20.3 – “Food Chemistry”   * Classify compounds based on their chemical structures as carbohydrates, fats, or proteins * Contrast the chemical and nutritional differences between saturated and unsaturated fats * List the advantages and disadvantages of food additives * Observe patterns in food-package labeling and advertising | * Direct Vocabulary Instruction (Vocabulary Quiz) * Explicit Feedback (Food Chemistry) * Inference Chart (Review Packet) * Graphic Organizer (Food Chemistry) | * **Chapter 20.3 Food Chemistry Power point** * **Food Energy Video and Worksheet** * **Chapter 20 Vocabulary Quiz** * **Chapter 20 Review Packet** * **Chapter 20 Test** | **Matter**  9.2.1.2.3 - Describe a chemical reaction using words and symbolic equations.  **The Nature of Science and Engineering**  9.1.3.1.2 - Identify properties of a system that are different from those of its parts but appear because of the interaction of those parts. |
| Q4  W8 | Chapter 17.3 – “The Nucleus”   * Given the atomic number and mass number, calculate the number of protons, neutrons and electrons of an isotope * Contrast the behavior of radioactive isotopes with stable isotopes * Compare the three types of naturally occurring radioactive radiation * List the uses of radioisotopes and the risks associated with their use * Explain the rate of decay of a radioisotope using half-life | * Higher Order Questioning (Half-Life Lab) * Non-Linguistic Representation (Half-Life Graphing Activity) * Venn Diagram (Pros and Cons Radioactivity) * Compare and Contrast Analysis (Radioactivity) | * **Half – life Lab** * **Isotope Worksheet** * **Half-Life graphing activity** * **Pros and cons of radioactivity table** * **Chapter 17.3 Review Worksheet** | **Matter**  9.2.1.2.3 - Describe a chemical reaction using words and symbolic equations.  9.2.1.1.4 - Explain that isotopes of an element have different numbers of neutrons and that some are unstable and emit particles and/or radiation.  **The Nature of Science and Engineering**  9.1.1.2.1 - Formulate a testable hypothesis, design and conduct an experiment to test the hypothesis, analyze the data, consider alternative explanations and draw conclusions supported by evidence from the investigation.  9.1.2.1.2 - Recognize that risk analysis is used to determine the potential positive and negative consequences of using a new technology or design, including the evaluation of causes and effects of failures. |
| Q4  W9 | Chapter 24.2 – “Nuclear Fuels”   * Describe ways of obtaining and processing different fuels * Explain fission and how it is used to generate nuclear power * Compare and contrast the efficiency of fossil fuels and nuclear fuel | * Inference Chart (Fuel Amount Worksheet) * Non-Linguistic Representation (Fusion and Fission Drawings) * Compare and Contrast Analysis (Fission vs. Fusion) | * **Fuel amount comparison calculation problems worksheet** * **Fusion Video and worksheet** * **Nuclear reactor Poster** * **Chapter 24.2 Review Worksheet** * **Test** | **Energy**  9.2.3.2.6 - Compare fission and fusion in terms of the reactants, the products and the conversion from matter into energy.  **The Nature of Science and Engineering**  9.2.4.1.1 - Compare local and global environmental and economic advantages and disadvantages of generating electricity using various sources or energy.  9.1.3.1.1 - Describe a system, including specifications of boundaries and subsystems, relationships to other systems, and identification of inputs and expected outputs. |
| Q4  W10 | Global Warming   * Describe the theory, including pros and cons * Look at evidence that supports and evidence that disproves the theory. | * Compare and Contrast Analysis (Pros vs. Cons) * Attribute Wheel (Global Warming) | * **Global Warming Packet** * **Global Warming Video and Worksheet** * **Global Warming Presentation** * **Physical Science comprehensive FINAL!** | **The Nature of Science and Engineering**  9.1.3.1.3 - Describe how positive and/or negative feedback occur in systems.  9.1.3.1.1 - Describe a system, including specifications of boundaries and subsystems, relationships to other systems, and identification of inputs and expected outputs.  9.1.3.3.3 - Describe how scientific investigations and engineering processes require multi-disciplinary contributions and efforts. |