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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. |
| Q1W2 | 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. |
| Q1W3 | 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. |
| Q1W4 | 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. |
| Q1W5 | 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. |
| Q1W6 | 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. |
| Q1W7 | 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. |
| Q1W8 | 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. |
| Q1W9 | 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. |
| Q2W1 | 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. |
| Q2W2 | 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. |
| Q2W3 | 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. |
| Q2W4 | 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. |
| Q2W5 | 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. |
| Q2W6 | 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. |
| Q2W7 | 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. |
| Q2W8 | 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. |
| Q2W9 | 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. |
| Q2W10 | 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. |
| Q3W2 | 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. |
| Q3W3 | 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. |
| Q3W4 | 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. |
| Q3W5 | 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. |
| Q3W6 | 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. |
| Q3W7 | 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 atom9.2.1.1.1 - Describe the relative charges, masses, and locations of the protons, neutrons, and electrons in an atom of an element. |
| Q3W8 | 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.  |
| Q3W9 | 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.  |
| Q3W10 | 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. |
| Q4W1 | 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. |
| Q4W2 | 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.  |
| Q4W3 | 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. |
| Q4W4 | 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. |
| Q4W5 | 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. |
| Q4W6 | 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. |
| Q4W7 | 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. |
| Q4W8 | 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.  |
| Q4W9 | 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.  |
| Q4W10 | 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. |