Units	HSCEs	Vocabulary	Pacing
Introduction to Science 1. The Nature of Science 2. The Way Science Works 3. Organizing Data	**C1.1A** Generate new questions that can be investigated in the laboratory or field. **C1.1B** Evaluate the uncertainties or validity of scientific conclusions using an understanding of sources of measurement error, the challenges of controlling variables, accuracy of data analysis, logic of argument, logic of experimental design, and/or the dependence on underlying assumptions. **C1.1C** Conduct scientific investigations using appropriate tools and techniques (e.g., selecting an instrument that measures the desired quantity—length, volume, weight, time interval, temperature—with the appropriate level of precision). **C1.1D** Identify patterns in data and relate them to theoretical models. **C1.1E** Describe a reason for a given conclusion using evidence from an investigation. **C1.2A** Critique whether or not specific questions can be answered through scientific investigations. **C1.2C** Develop an understanding of a scientific concept by accessing information from multiple sources. Evaluate the scientific accuracy and significance of the information. **C1.2D** Evaluate scientific explanations in a peer review process or discussion format. **C1.2E** Evaluate the future career and occupational prospects of science fields. **P1.2A** Critique whether or not specific questions can be answered through scientific investigations. **P1.2B** Identify and critique arguments about personal or societal issues based on scientific evidence. **Assessments:** Work Sheets, Vocabulary, Quizzes, Projects/Labs, Chapter Tests and Home Work	**Section1.1-1.3** Science Technology Scientific Law Scientific Theory Critical Thinking Scientific Method Variables Length Mass Volume Weight Scientific Notation Precision Significant Figures Accurate	12 days

Units	HSCEs	Vocabulary	Pacing
Matter 1. What is Matter 2. Properties of Matter 3. Changes of Matter	**C2.2B** Describe the various states of matter in terms of the motion and arrangement of the molecules (atoms) making up the substance. **P4.p2A** Distinguish between an element, compound, or mixture based on drawings or formulae. *(prerequisite)* **P4.p2B** Identify a pure substance (element or compound) based on unique chemical and physical properties. *(prerequisite)* **P4.p2C** Separate mixtures based on the differences in physical properties of the individual components. *(prerequisite)* **P4.p2D** Recognize that the properties of a compound differ from those of its individual elements. *(prerequisite)*	**Section 2.1-2.3** Molecules Chemical Formula Pure Substance Mixture Melting Point Boiling Point Density Reactivity Flammability Physical Change Chemical Change	11 days
	Assessments: Work Sheets, Vocabulary, Quizzes, Projects/Labs, Chapter Tests and Home Work		

Units	HSCEs	Vocabulary	Pacing
States of Matter 1. Matter and Energy 2. Fluids 3. Behavior of Gases	**P2.2B** Use the change of speed and elapsed time to calculate the average acceleration for linear motion. **P2.p1A** Describe energy changes associated with changes of state in terms of the arrangement and order of the atoms (molecules) in each state. *(prerequisite)* **P2.p1B** Use the positions and arrangements of atoms and molecules in solid, liquid, and gas state to explain the need for an input of energy for melting and boiling and a release of energy in condensation and freezing. *(prerequisite)* **P3.p1A** Explain that the amount of energy necessary to heat a substance will be the same as the amount of energy released when the substance is cooled to the original temperature. *(prerequisite)* **P4.p1A** For a substance that can exist in all three phases, describe the relative motion of the particles in each of the phases. *(prerequisite)* **P4.p1B** For a substance that can exist in all three phases, make a drawing that shows the arrangement and relative spacing of the particles in each of the phases. *(prerequisite)* **C4.3A** Recognize that substances that are solid at room temperature have stronger attractive forces than liquids at room temperature, which have stronger attractive forces than gases at room temperature. **C4.3B** Recognize that solids have a more ordered, regular arrangement of their particles than liquids and that liquids are more ordered than gases. **P5.p1A** Draw a picture of the particles of an element or compound as a solid, liquid, and gas. *(prerequisite)*	**Section 3.1-3.3** Plasma Energy Thermal Energy Evaporation Sublimation Condensation Fluids BBuoyant Force Pressure Archimedes' Principle Pascal Pascal's Principle Viscosity Boyle's Law Charles's Law Guy-Lussac's Law	9 days
	Assessments: Work Sheets, Vocabulary, Quizzes, Projects/Labs, Chapter Tests and Home Work		

Units	HSCEs	Vocabulary	Pacing
Atoms and the Periodic Table 1. Atomic Structure 2. A Guided Tour of the Periodic Table 3. Families of Elements	**P4.p2A** Distinguish between an element, compound, or mixture based on drawings or formulae. *(prerequisite)* **C4.8A** Identify the location, relative mass, and charge for electrons, protons, and neutrons. **C4.8B** Describe the atom as mostly empty space with an extremely small, dense nucleus consisting of the protons and neutrons and an electron cloud surrounding the nucleus. **C4.8C** Recognize that protons repel each other and that a strong force needs to be present to keep the nucleus intact. **C4.8D** Give the number of electrons and protons present if the fluoride ion has a -1 charge. **C4.9A** Identify elements with similar chemical and physical properties using the periodic table. **C4.10B** Recognize that an element always contains the same number of protons. **Assessments:** Work Sheets, Vocabulary, Quizzes, Projects/Labs, Chapter Tests and Home Work	**Section 4.1-4.3** Nucleus Neutrons Protons Electrons Orbitals Valence Electrons Periodic Law Periods Groups Ion Atomic Number Mass Number Isotopes Atomic Mass Unit Average Atomic Mass Metals Nonmetals Semiconductors Alkali Metals Alkaline Metals Transition Metals Halogens Noble Gas	13 days

Units	HSCEs	Vocabulary	Pacing
The Structure of Matter 1. Compounds and Molecules 2. Ionic and Covalent Bonding 3. Compound Names and Formulas 4. Organic and Biochemical Compounds	**P4.p1C** For a simple compound, present a drawing that shows the number of particles in the system does not change as a result of a phase change. *(prerequisite)* **P4.p2B** Identify a pure substance (element or compound) based on unique chemical and physical properties. *(prerequisite)* **P4.p2C** Separate mixtures based on the differences in physical properties of the individual components. *(prerequisite)* **P4.p2D** Recognize that the properties of a compound differ from those of its individual elements. *(prerequisite)* **C4.2A** Name simple binary compounds using their formulae. **C4.2B** Given the name, write the formula of simple binary compounds. **C4.10A** List the number of protons, neutrons, and electrons for any given ion or isotope. **C4.8A** Identify the location, relative mass, and charge for electrons, protons, and neutrons. **C4.8B** Describe the atom as mostly empty space with an extremely small, dense nucleus consisting of the protons and neutrons and an electron cloud surrounding the nucleus. **C4.8C** Recognize that protons repel each other and that a strong force needs to be present to keep the nucleus intact.	**Section 5.1-5.4** Chemical Bonds Chemical Structure Bond Length Bond angle Ionic Bonds Metallic Bonds Covalent Bonds Polyatomic Ions Empirical Formula Molecular Formula Organic Compound Polymers Carbohydrate Proteins Amino Acids	11 days
	Assessments: Work Sheets, Vocabulary, Quizzes, Projects/Labs, Chapter Tests and Home Work		

Units	HSCEs	Vocabulary	Pacing
Chemical Reactions 1. The Nature of Chemical Reactions 2. Reaction Types 3. Balancing Chemical Equations 4. Rates of Change 5.	**C3.4A** Use the terms endothermic and exothermic correctly to describe chemical reactions in the laboratory. **C3.4B** Explain why chemical reactions will either release or absorb energy. **C5.r1a** Predict how the rate of a chemical reaction will be influenced by changes in concentration, and temperature, pressure. *(recommended)* **C5.r1b** Explain how the rate of a reaction will depend on concentration, temperature, pressure, and nature of reactant. *(recommended)* **C5.2A** Balance simple chemical equations applying the conservation of matter. **C5.2B** Distinguish between chemical and physical changes in terms of the properties of the reactants and products. **C5.2C** Draw pictures to distinguish the relationships between atoms in physical and chemical changes. **Assessments:** Work Sheets, Vocabulary, Quizzes, Projects/Labs, Chapter Tests and Home Work	**Section 6.1-6.4** Reactants Products Chemical Energy Exothermic Reaction Endothermic Reaction Synthesis Reaction Decomposition Reactions Electrolysis Combustion Reaction Single Replacement Double Displacement Oxidation-Reduction Radicals Chemical Equation Mole Ratios Catalysis Enzymes Substrate Chemical Equilibrium	12 days

Units	HSCEs	Vocabulary	Pacing
Acids, Bases, and Salts 1. Acids, Bases and pH 2. Reactions of Acids with Bases	**C5.7A** Recognize formulas for common inorganic acids, carboxylic acids, and bases formed from families I and II. **C5.7B** Predict products of an acid-base neutralization. **C5.7C** Describe tests that can be used to distinguish an acid from a base. **C5.7D** Classify various solutions as acidic or basic, given their pH. **C5.7E** Explain why lakes with limestone or calcium carbonate experience less adverse effects from acid rain than lakes with granite beds.	**Section 8.1-8.2** Acid Indicators Electrolyte Bases pH Neutralization Reaction Salt	12 days
	Assessments: Work Sheets, Vocabulary, Quizzes, Projects/Labs, Chapter Tests and Home Work		

Units	HSCEs	Vocabulary	Pacing
Nuclear Changes 1. What is Radioactivity 2. Nuclear Fission and Fusion 3. Nuclear Radiation Today	**P4.12A** Describe peaceful technological applications of nuclear fission and radioactive decay. **P4.12B** Describe possible problems caused by exposure to prolonged radioactive decay. **P4.12C** Explain how stars, including our Sun, produce huge amounts of energy (e.g., visible, infrared, ultraviolet light). **Assessments:** Work Sheets, Vocabulary, Quizzes, Projects/Labs, Chapter Tests and Home Work	**Section 9.1-9.3** Radioactivity Nuclear Radiation Alpha Particles Beta Particle Gamma Ray Half-Life Fission Nuclear Chain Reaction Critical Mass Fusion Background Radiation Rems Radioactive Tracers	10 days

Units	HSCEs	Vocabulary	Pacing
Motion 1. Measuring Motion 2. Acceleration 3. Motion and Forces	**P2.1A** Calculate the average speed of an object using the change of position and elapsed time. **P2.1B** Represent the velocities for linear and circular motion using motion diagrams (arrows on strobe pictures). **P2.1C** Create line graphs using measured values of position and elapsed time. **P2.1D** Describe and analyze the motion that a position-time graph represents, given the graph. **P2.1E** Describe and classify various motions in a plane as one dimensional, two dimensional, circular, or periodic. **P2.1F** Distinguish between rotation and revolution and describe and contrast the two speeds of an object like the Earth. **P2.2A** Distinguish between the variables of distance, displacement, speed, velocity, and acceleration. **P2.2B** Use the change of speed and elapsed time to calculate the average acceleration for linear motion. **P2.2C** Describe and analyze the motion that a velocity-time graph represents, given the graph. **P2.2D** State that uniform circular motion involves acceleration without a change in speed. **P3.1A** Identify the force(s) acting between objects in "direct contact" or at a distance. **P3.2A** Identify the magnitude and direction of everyday forces (e.g., wind, tension in ropes, pushes and pulls, weight). **P3.2C** Calculate the net force acting on an object. **P3.4A** Predict the change in motion of an object acted on by several forces.	**Section 10.1-10.3** Motion Displacement Speed Velocity Acceleration Force Static Friction Kinetic Friction Friction	12 days
	Assessments: Work Sheets, Vocabulary, Quizzes, Projects/Labs, Chapter Tests and Home Work		

Units	HSCEs	Vocabulary	Pacing
Forces 1. Laws of Motion 2. Gravity 3. Newton's Third Law	**P3.3A** Identify the action and reaction force from examples of forces in everyday situations (e.g., book on a table, walking across the floor, pushing open a door). **P3.4B** Identify forces acting on objects moving with constant velocity (e.g., cars on a highway). **P3.4C** Solve problems involving force, mass, and acceleration in linear motion (Newton's second law). **P3.4D** Identify the force(s) acting on objects moving with uniform circular motion (e.g., a car on a circular track, satellites in orbit). **P3.6B** Predict how the gravitational force between objects changes when the distance between them changes. **P3.6C** Explain how your weight on Earth could be different from your weight on another planet.	**Section 11.1-11.3** Inertia Free Fall Terminal Velocity Projectile Motion Momentum	11 days
	Assessments: Work Sheets, Vocabulary, Quizzes, Projects/Labs, Chapter Tests and Home Work		

Units	HSCEs	Vocabulary	Pacing
Work and Energy 1. Work, Power, and Machines 2. Simple Machines 3. What is Energy 4. Conservation of Energy	**P3.2B** Compare work done in different situations. **P4.1B** Explain instances of energy transfer by waves and objects in everyday activities (e.g., why the ground gets warm during the day, how you hear a distant sound, why it hurts when you are hit by a baseball). **P4.2A** Account for and represent energy transfer and transformation in complex processes (interactions). **P4.2B** Name devices that transform specific types of energy into other types (e.g., a device that transforms electricity into motion). **P4.2C** Explain how energy is conserved in common systems (e.g., light incident on a transparent material, light incident on a leaf, mechanical energy in a collision). **P4.2D** Explain why all the stored energy in gasoline does not transform to mechanical energy of a vehicle. **P4.3A** Identify the form of energy in given situations (e.g., moving objects, stretched springs, rocks on cliffs, energy in food). **P4.3B** Describe the transformation between potential and kinetic energy in simple mechanical systems (e.g., pendulums, roller coasters, ski lifts). **P4.3C** Explain why all mechanical systems require an external energy source to maintain their motion.	**Section 12.1-12.4** Work Power Mechanical Advantage Simple Machines Compound Machine Potential Energy Kinetic Energy Mechanical Energy Efficiency	14 days
	Assessments: Work Sheets, Vocabulary, Quizzes, Projects/Labs, Chapter Tests and Home Work		

Units	HSCEs	Vocabulary	Pacing
Heat and Temperature 1. Temperature 2. Energy Transfer 3. Using Heat	**P4.1A** Account for and represent energy into and out of systems using energy transfer diagrams. **C5.4A** Compare the energy required to raise the temperature of one gram of aluminum and one gram of water the same number of degrees. **C5.4B** Measure, plot, and interpret the graph of the temperature versus time of an ice-water mixture, under slow heating, through melting and boiling. **C3.3A** Describe how heat is conducted in a solid. **C3.3B** Describe melting on a molecular level. **P3.p2A** Trace (or diagram) energy transfers involving various types of energy including nuclear, chemical, electrical, sound, and light. *(prerequisite)* **C2.2A** Describe conduction in terms of molecules bumping into each other to transfer energy. Explain why there is better conduction in solids and liquids than gases.	**Section 13.1-13.3** Temperature Thermometer Absolute Zero Heat Thermal Conduction Convection Convection Current Radiation Specific Heat Refrigerant Heat Energy	11 days
	Assessments: Work Sheets, Vocabulary, Quizzes, Projects/Labs, Chapter Tests and Home Work		

Units	HSCEs	Vocabulary	Pacing
Waves 1. Types of Waves 2. Characteristics of Waves 3. Wave Interactions	**P4.4A** Describe specific mechanical waves (e.g., on a demonstration spring, on the ocean) in terms of wavelength, amplitude, frequency, and speed. **P4.4B** Identify everyday examples of transverse and compression (longitudinal) waves. **P4.4C** Compare and contrast transverse and compression (longitudinal) waves in terms of wavelength, amplitude, and frequency. **P4.5A** Identify everyday examples of energy transfer by waves and their sources. **P4.5B** Explain why an object (e.g., fishing bobber) does not move forward as a wave passes under it. **P4.6C** Explain why there is a delay between the time we send a radio message to astronauts on the moon and when they receive it.	**Section 14.1-14.4** Wave Medium Mechanical Wave Electromagnetic Wave Transverse Wave Longitudinal Wave Crest Trough Amplitude Wavelength Period Frequency Doppler Effect Reflection Diffraction Refraction Interference Constructive Interference Destructive Interference Standing Wave	11 days
	Assessments: Work Sheets, Vocabulary, Quizzes, Projects/Labs, Chapter Tests and Home Work		

Units	HSCEs	Vocabulary	Pacing
Sound and Light 1. Sound 2. The Nature of Light 3. Reflection and Color 4. Refraction, Lenses, and Prisms	**P4.6D** Explain why we see a distant event before we hear it (e.g., lightning before thunder, exploding fireworks before the boom). **P4.5E** Explain why everyone in a classroom can hear one person speaking, but why an amplification system is often used in the rear of a large concert auditorium. **P4.6A** Identify the different regions on the electromagnetic spectrum and compare them in terms of wavelength, frequency, and energy. **P4.6B** Explain why radio waves can travel through space, but sound waves cannot. **P4.8A** Draw ray diagrams to indicate how light reflects off objects or refracts into transparent media. **P4.8B** Predict the path of reflected light from flat, curved, or rough surfaces (e.g., flat and curved mirrors, painted walls, paper). **P4.9A** Identify the principle involved when you see a transparent object (e.g., straw, piece of glass) in a clear liquid. **P4.9B** Explain how various materials reflect, absorb, or transmit light in different ways. **P4.9C** Explain why the image of the Sun appears reddish at sunrise and sunset.	**Section 15.1-15.4** Sound Wave Pitch Infrasound Ultrasound Resonance Sonar Photons Intensity Radar Light Ray Virtual Image Real Image Total Internal Reflection Lens Magnification Prism Dispersion	12 days
	Assessments: Work Sheets, Vocabulary, Quizzes, Projects/Labs, Chapter Tests and Home Work		

Units		HSCEs	Vocabulary	Pacing
	Electricity 1. Electric Charge and Force 2. Current 3. Circuits	**P3.7A** Predict how the electric force between charged objects varies when the distance between them and/or the magnitude of charges change. **P3.7B** Explain why acquiring a large excess static charge (e.g., pulling off a wool cap, touching a Van de Graaff generator, combing) affects your hair. **P4.10A** Describe the energy transformations when electrical energy is produced and transferred to homes and businesses. **P4.10B** Identify common household devices that transform electrical energy to other forms of energy, and describe the type of energy transformation. **P4.10C** Given diagrams of many different possible connections of electric circuit elements, identify complete circuits, open circuits, and short circuits and explain the reasons for the classification. **P4.10D** Discriminate between voltage, resistance, and current as they apply to an electric circuit.	**Section 16.1-16.3** Electrical Charge Conductors Insulators Electric Force Electric Field Electrical PE Potential Difference Electric Cell Current Resistance Electric Circuit Schematic Diagram Series Parallel Electrical Energy Fuses Circuit Breakers	11 days
		Assessments: Work Sheets, Vocabulary, Quizzes, Projects/Labs, Chapter Tests and Home Work		

Units	HSCEs	Vocabulary	Pacing
Magnetism 1. Magnets and Magnetic Fields 2. Magnetism from Electric Currents 3. Electric Currents from Magnetism	**P3.p8A** Create a representation of magnetic field lines around a bar magnet and qualitatively describe how the relative strength and direction of the magnetic force changes at various places in the field. *(prerequisite)* **P4.2B** Name devices that transform specific types of energy into other types (e.g., a device that transforms electricity into motion). **P4.2C** Explain how energy is conserved in common systems (e.g., light incident on a transparent material, light incident on a leaf, mechanical energy in a collision).	**Section 17.1-17.3** Magnetic Poles Magnetic fields Solenoid Electromagnet Galvanometers Electric Motor Electomagnetic Induction Generator Alternating Current Transformer	9 days
	Assessments: Work Sheets, Vocabulary, Quizzes, Projects/Labs, Chapter Tests and Home Work		

Units		HSCEs	Vocabulary	Pacing

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