Name of Course: CP Physical Science

Course Overview:
Physical Science is aligned with the Next Generation Science Standards (NGSS) performance indicators to introduce students to the four sections of science, including Physics, Chemistry, Astronomy, and Earth Science. **Performance Indicators:** ● Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration. (HS-PS2-1) ● Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system. (HS-PS2-2) ● Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known. (HS-PS3-1) ● Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy. (HS-PS3-3) ● Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics). (HS-PS3-4) ● Use mathematical representation to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media. (HS-PS4-1) ● Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms. (HS-PS1-1) ● Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials. (HS-PS2-6) ● Use mathematical or computational representations to predict the motion of orbiting objects in the solar system. (HS-ESS1-4) ● Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems (HS-ESS2-2) ● Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks. (HS-ESS1-5)

Unit of Study	Essential Question(s)	Content/Skill/Concept	Instructional Strategies	Assessment Practices
Physics ● Motion	How can one explain the ideas of relative motion and frame of reference?	Calculating velocity & speed Calculating acceleration Using distance vs. time graphs to represent speed and being able to interpret them.	Direct instruction, interpreting distance vs. time graphs card sort activity, calculation practice, PhET motion and forces simulation lab, Speed Challenge Lab , Friction Lab Page Keeley's formative assessment probes, Quizlet and kahoot reviews	Speed challenge lab, PhET motion and Forces Simulation Lab , Rolling, sliding & static friction lab, Motion Test

Physics • Forces	Why do Newton's Laws play such a crucial role in physics? What is Newton's contribution to how we understand force and motion?	Applying Newton's Laws to everyday life. Calculating force, weight & momentum Be able to identify the total momentum after a collision.	Newton's laws of motion group slideshow project, Direct instruction, projectile motion demo, inertial coin flip quick lab, marble collision lab, Catapult Lab & Honors Challenge , Newton's laws activity stations, calculations practice, review	Forces Test, Catapult Lab, Marble Collision Lab, Newton's Laws of Motion Group Slideshow Project
Physics • Work and Energy	What is work and how does it relate to force and power?	Recalling relationships between work and power. Calculating work & Power Recall the difference between potential energy and kinetic energy. Calculate PE and KE	Direct instruction, calculations practice, human power lab, PhET Skate Park Lab , scavenger hunt and bucket challenge reviews	Human Power Lab , PhET Skate Park Lab, Work & Energy Test
Physics • Heat and Temperature	How is temperature different from heat?	Identify the relationship between temperature and energy through a multi-step Heat Transfer Lab, where students compare the specific heat of different materials	PhET molecules in motion simulation lab, direct instruct, calculations practice , heat transfer lab	Heat Transfer Lab
Physics • Waves	How do waves interact with other waves, and with other materials?	Calculating the speed, frequency and wavelength of a wave.	Tuning Fork Quick Lab , waves foldable, calculations practice, wave speed graphic organizer, videos, wave machine group activity, wave lab	Wave Lab
Chemistry • Matter	How does a substance change from one state of matter to another? How can you predict the effects of pressure, temperature, and volume changes on matter?	Calculate the density, mass & volume Identify the mystery cube by calculating the density and comparing. Complete Heating curve lab which allows students to observe changes of state and record data during the changes of state.	Scientist biography research, bookshare, card sort, classification of matter foldable, Mystery Mixture Quick Lab , classification of matter web, mystery mixture lab, direct instruction, calculations, Density Lab , Density Station Activity , physical and chemical changes lab, heating curve lab, quizlet review, scavenger hunt review	Scientist Biography Children's Book, Mystery Mixture Lab, Density Lab, Physical vs Chemical Changes Lab, Heating Curve Lab, Matter Test
Chemistry • Atoms	What role do electrons, protons, and neutrons play in an atom? How does the structure of an atom	Recall the differences between electrons, protons, and neutrons. Construct and manipulate the Bohr	Direct instruction, Bohr model practice, manipulatives activity, Beanium isotope lab	Atomic Structure Test

	determine chemical properties?	model Calculating atomic mass using isotopes through the use of beans to represent isotopes.		
Chemistry ● The Periodic Table	How are elements arranged in the modern periodic table? What does each element family have in common?	Identifying the different families of the periodic table. Color code the periodic table with the different families and properties.	Direct Instruction, Color Coding Periodic Table , Periodic Family Album Project, Alien Periodic Table , Sweet 16 Periodic Table , PT Scavenger Hunt,	Periodic Table & Bonding Test , Atomic Comic
Chemistry ● Chemical Bonding	Why do atoms form chemical bonds? How do ionic bonds differ from covalent bonds?	Practice pairing cations and anions Practice naming ionic and covalent bonds.	Direct Instruction, Ionic Bonding Lab	Periodic Table & Bonding Test, Atomic Comic
Astronomy ● The Solar System	How does the moon affect Earth? Why is the solar system organized the way it is?	Modeling eclipses and the relationship between the Sun, moon and Earth. Building a solar system which is a lab and students have to manipulate the mass and velocity of different objects in the Solar System.	Direct Instruction, COSMOS video, Phases of the Moon Activity, Solar System Webquest, Causes of the Seasons Foldable, Study Guide	Astronomy Test, Modeling Eclipses Lab , Solar System Builder Lab ,
Astronomy ● Stars	How are stars formed? What natural cycles do stars go through?	Recalling the major stages that a star goes through by moving it through an HR diagram Researching constellations	Direct instruction, Constellation Research Poster, When we Left Earth video series	Astronomy Test, H-R Diagram Lab
Earth Science ● Planet Earth	What is the physical makeup of the Earth, from interior to exterior. How has the appearance of Earth changed over time?	Manipulate the sea floor from Pangaea to present. Research the effects of a volcano on the ecological systems with the use of Claim, Evidence and Reasoning	Direct Instruction, Plate Tectonics, volcanoes and Earthquakes WebQuest, Predicting Plate Activity, Earthquake Tower Challenge	Sea Floor Spreading Lab, Eruption Disruption Project, Earth Science Test
Earth Science ● The Atmosphere, Weather, and Climate	What are the parts of the atmosphere? How is climate different from weather?	Draw and label Earth's Atmospheric layers. Research climates in different cities around the work. Identify the type of climate and the different plants and animals that make up that climate.	Direct Instruction, Label Earth's Atmosphere , Hurricanes vs. Tornadoes Reading & Analysis	World Climates Poster Project, Earth Science Test
Earth Science	What kinds of benefits do people get	Identify and label the different parts of a	Direct Instruction,	Renewable Energy Research Poster,

• Natural Resources and Renewable Energy	from natural resources? Why should energy consumers use alternative energy?	solar cell and recall why it takes a decade to make solar cells. Research other forms of alternative energy using clim, evidence & reasoning.	Energy WebQuest- Nonrenewable and Renewable Energy	Earth Science Test