Units 1			
Measurement & Unit Conversion			
Duration	2 weeks		**Assessed**
Priority Standard(s)	3.A	All forces share certain common characteristics when considered by observers in inertial reference frames.	
Supporting Standard(s)	4.A.1.1	The student is able to use representations of the center of mass of an isolated two-object system to analyze the motion of the system qualitatively and semiquantitatively. [SP 1.2, 1.4, 2.3, 6.4]	

Units 2			
Experimental Design			
Duration	2 weeks		**Assessed**
Priority Standard(s)	3.A	All forces share certain common characteristics when considered by observers in inertial reference frames.	
Supporting Standard(s)	3.A.1.3	The student is able to analyze experimental data describing the motion of an object and is able to express the results of the analysis using narrative, mathematical, and graphical representations. [SP 5.1]	
	4.A.1.1	The student is able to use representations of the center of mass of an isolated two-object system to analyze the motion of the system qualitatively and semiquantitatively. [SP 1.2, 1.4, 2.3, 6.4]	

Unit 3			
Uniform Motion			
Duration	4 weeks		**Assessed**
Priority Standard(s)	3.A	All forces share certain common characteristics when considered by observers in inertial reference frames.	
Supporting Standard(s)	3.A.1.1	The student is able to express the motion of an object using narrative, mathematical, and graphical representations. [SP 1.5, 2.1, 2.2]	
	3.A.1.2	The student is able to design an experimental investigation of the motion of an object. [SP 4.2	
	3.A.1.3	The student is able to analyze experimental data describing the motion of an object and is able to express the results of the analysis using narrative, mathematical, and graphical representations. [SP 5.1]	

Unit 4			
Acceleration			
Duration	2 weeks		**Assessed**
Priority Standard(s)	4.A	The acceleration of the center of mass of a system is related to the net force exerted on the system, where a=F/m	
	3.A	All forces share certain common characteristics when considered by observers in inertial reference frames.	
Supporting Standard(s)	3.A.1.1	The student is able to express the motion of an object using narrative, mathematical, and graphical representations. [SP 1.5, 2.1, 2.2]	
	3.A.1.2	The student is able to design an experimental investigation of the motion of an object. [SP 4.2	
	3.A.1.3	The student is able to analyze experimental data describing the motion of an object and is able to express the results of the analysis using narrative, mathematical, and graphical representations. [SP 5.1]	
	4.A.2.1	The student is able to make predictions about the motion of a system based on the fact that acceleration is equal to the change in velocity per unit time, and velocity is equal to the change in position per unit time. [SP 6.4]	
	4.A.2.3	The student is able to create mathematical models and analyze graphical relationships for acceleration, velocity, and position of the center of mass of a system and use them to calculate properties of the motion of the center of mass of a system. [SP 1.4, 2.2]	

Unit 5			
Energy			
Duration	5 weeks		**Assessed**
Priority Standard(s)	Big Idea 4	Interactions between systems can result in changes in those systems.	
	Big Idea 5	Changes that occur as a result of interactions are constrained by conservation laws.	
Supporting Standard(s)	3.E	A force exerted on an object can change the kinetic energy of the object.	
	4.A	Interactions with other objects or systems can change the total energy of a system.	
	5.A	Certain quantities are conserved, in the sense that the changes of those quantities in a given system are always equal to the transfer of that quantity to or from the system by all possible interactions with other systems.	
	5.B	The energy of a system is conserved.	

Unit 6			
Forces & Newton's Laws			
Duration	5 weeks		**Assessed**
Priority Standard(s)	Big Idea 3	The interactions of an object with other objects can be described by forces.	
	Big Idea 4	Interactions between systems can result in changes in those systems.	
Supporting Standard(s)	1.A	The internal structure of a system determines many properties of the system.	
	1.C	Objects and systems have properties of inertial mass and gravitational mass that are experimentally verified to be the same and that satisfy conservation principles.	
	2.B	A gravitational field is caused by an object with mass.	
	3.A	All forces share certain common characteristics when considered by observers in inertial reference frames.	
	3.B	Classically, the acceleration of an object interacting with other objects can be predicted by using a=F/m.	
	3.C	At the macroscopic level, forces can be categorized as either long-range (action-at-adistance) forces or contact for	

Unit 7			
Kinetic Theory & States of Matter			
Duration	4 weeks		**Assessed**
Priority Standard(s)	HS-PS1-4	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy. [Clarification Statement: Emphasis is on the idea that a chemical reaction is a system that affects the energy change. Examples of models could include molecular-level drawings and diagrams of reactions, graphs showing the relative energies of reactants and products, and representations showing energy is conserved.] [Assessment Boundary: Assessment does not include calculating the total bond energy changes during a chemical reaction from the bond energies of reactants and products.]	
	HS-PS3-1	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. [Clarification Statement: Emphasis is on explaining the meaning of mathematical expressions used in the model.] [Assessment Boundary: Assessment is limited to basic algebraic expressions or computations; to systems of two or three components; and to thermal energy, kinetic energy, and/or the energies in gravitational, magnetic, or electric fields.]	
Supporting Standard(s)	PS3.B	Conservation of energy means that the total change of energy in any system is always equal to the total energy transferred into or out of the system. Energy cannot be created or destroyed, but it can be transported from one place to another and transferred between systems. Mathematical expressions, which quantify how the stored energy in a system depends on its configuration (e.g. relative positions of charged particles, compression of a spring) and how kinetic energy depends on mass and speed, allow the concept of conservation of energy to be used to predict and describe system behavior. The availability of energy limits what can occur in any system.	

Unit 8			
Composition of Matter & Atomic Structure			
Duration	4 weeks		**Assessed**
Priority Standard(s)	9-12.PS1.C.1	Use symbolic representations to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay. [Clarification Statement: Emphasis is on simple qualitative models, such as pictures or diagrams, and on the scale of energy released in nuclear processes relative to other kinds of transformations.]	
	9-12.PS4.B.2	Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter. [Clarification Statement: Emphasis is on the idea that photons associated with different frequencies of light have different energies, and the damage to living tissue from electromagnetic radiation depends on the energy of the radiation. Examples of published materials could include trade books, magazines, web resources, videos, and other passages that may reflect bias.]	
Supporting Standard(s)	9-12.ESS1.A.3	Communicate scientific ideas about the way stars, over their life cycle, produce elements. [Clarification Statement: Emphasis is on the way nucleosynthesis, and therefore the different elements created, varies as a function of the mass of a star and the stage of its lifetime.]	
	9-12.PS2.B.2	Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.	
	9-12.PS4.B.1	Communicate technical information about how electromagnetic radiation interacts with matter. [Clarification Statement: Examples could include solar cells capturing light and converting it to electricity; medical imaging; and communications technology.]	

Unit 9			
The Periodic Table & Electron Configuration			
Duration	4 weeks		**Assessed**
Priority Standard(s)	9-12.PS1.A.1	Use the organization of the periodic table to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms. [Clarification Statement: Examples of properties that could be predicted from patterns could include reactivity of metals, types of bonds formed, numbers of bonds formed, and reactions with oxygen.]	
Supporting Standard(s)	9-12.PS4.A.2	Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other. [Clarification Statement: Emphasis is on how the experimental evidence supports the claim and how a theory is generally modified in light of new evidence. Examples of a phenomenon could include resonance, interference, diffraction, and photoelectric effect.]	

Unit 10			
Bonding, Compounds, & Molecules			
Duration	4 weeks		**Assessed**
Priority Standard(s)	9-12.PS1.A.4	Apply the concepts of bonding and crystalline/molecular structure to explain the macroscopic properties of various categories of structural materials, i.e. metals, ionic (ceramics), and polymers. [Clarification Statement: Emphasis is on the attractive and repulsive forces that determine the functioning of the material. Examples could include why electrically conductive materials are often made of metal, flexible but durable materials are made up of long chained molecules, and pharmaceuticals are designed to interact with specific receptors.]	
Supporting Standard(s)			

Unit 11			
Balancing Equations & Moles			
Duration	4 weeks		**Assessed**
Priority Standard(s)	9-12.PS1.B.3	Use symbolic representations and mathematical calculations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction. [Clarification Statement: Emphasis is on conservation of matter and mass through balanced chemical equations, use of the mole concept and proportional relationships.]	
	9-12.PS1.B.2	Refine the design of a chemical system by specifying a change in conditions that would alter the amount of products at equilibrium. [Clarification Statement: Emphasis is on the application of Le Chatelier's Principle and on refining designs of chemical reaction System, including descriptions of the connection between changes made at the macroscopic level and what happens at the molecular level. Examples of designs could include different ways to increase product formation including adding reactants or removing products.]	
Supporting Standard(s)			