Unit 1A			
1D Motion			
Duration	4 weeks		**Assessed**
Priority Standard(s)	3.A	All forces share certain common characteristics when considered by observers in inertial reference frames.	
	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	
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.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]	
	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 1B			
2D Motion			
Duration	4 weeks		**Assessed**
Priority Standard(s)	3.A	All forces share certain common characteristics when considered by observers in inertial reference frames.	
	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	
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.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]	
	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 2			
Dynamics			
Duration	4 weeks		**Assessed**
Priority Standard(s)	Big Idea 1	Objects and systems have properties such as mass and charge. Systems may have internal structure.	
	Big Idea 2	Fields existing in space can be used to explain interactions.	
	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	
	4.A	The acceleration of the center of mass of a system is related to the net force exerted on the system, where .	

Unit 3			
Energy, Work, & Power			
Duration	4 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.	
	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.	
	5.D	The linear momentum of a system is conserved.	

Unit 4			
Momentum			
Duration	3 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.	
	Big Idea 5	Changes that occur as a result of interactions are constrained by conservation laws.	
Supporting Standard(s)	3.D	A force exerted on an object can change the momentum of the object.	
	4.B	Interactions with other objects or systems can change the total linear momentum 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.D	The linear momentum of a system is conserved.	

Unit 5			
Circular Motion & Gravity			
Duration	3 weeks		**Assessed**
Priority Standard(s)	Big Idea 1	Objects and systems have properties such as mass and charge. Systems may have internal structure.	
	Big Idea 2	Fields existing in space can be used to explain interactions.	
	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.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.A	A field associates a value of some physical quantity with every point in space. Field models are useful for describing interactions that occur at a distance (long-range forces) as well as a variety of other physical phenomena.	
	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 forces.	
	3.G	Certain types of forces are considered fundamental.	
	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.	
	4.C	Interactions with other objects or systems can change the total energy of a system.	

Unit 6			
Rotation			
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.	
	Big Idea 5	Changes that occur as a result of interactions are constrained by conservation laws.	
Supporting Standard(s)	3.A	All forces share certain common characteristics when considered by observers in inertial reference frames.	
	3.F	A force exerted on an object can cause a torque on that object.	
	4.D	A net torque exerted on a system by other objects or systems will change the angular momentum of the system.	
	5.E	The angular momentum of a system is conserved.	

Unit 7			
Oscillation			
Duration	2 weeks		**Assessed**
Priority Standard(s)	Big Idea 3	The interactions of an object with other objects can be described by forces.	
	Big Idea 5	Changes that occur as a result of interactions are constrained by conservation laws.	
Supporting Standard(s)	3.B	Classically, the acceleration of an object interacting with other objects can be predicted by using .	
	5.B	The energy of a system is conserved.	

Unit 8			
Waves			
Duration	2 weeks		**Assessed**
Priority Standard(s)	Big Idea 6	Waves can transfer energy and momentum from one location to another without the permanent transfer of mass and serve as a mathematical model for the description of other phenomena.	
Supporting Standard(s)	6.A	A wave is a traveling disturbance that transfers energy and momentum.	
	6.B	A periodic wave is one that repeats as a function of both time and position and can be described by its amplitude, frequency, wavelength, speed, and energy.	
	6.D	Interference and superposition lead to standing waves and beats.	

Unit 9			
Electricity			
Duration	2 weeks		**Assessed**
Priority Standard(s)	Big Idea 1	Objects and systems have properties such as mass and charge. Systems may have internal structure.	
	Big Idea 3	The interactions of an object with other objects can be described by forces.	
	Big Idea 5	Changes that occur as a result of interactions are constrained by conservation laws.	
Supporting Standard(s)	1.B	1.B: Electric charge is a property of an object or system that affects its interactions with other objects or systems containing charge.	
	1.E	1.E: Materials have many macroscopic properties that result from the arrangement and interactions of the atoms and molecules that make up the material.	
	3.C	3.C: At the macroscopic level, forces can be categorized as either long-range (action-at-adistance) forces or contact forces.	
	5.A	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	5.B: The energy of a system is conserved.	
	5.C	5.C: The electric charge of a system is conserved.	