Options EHS Physics A-OR	Scope and Sequence
Unit Lesson	**Objectives**
One-Dimensional Motion and Forces	
Speed and Velocity	
	Differentiate between speed and velocity.
	Describe the motion of an object using different reference frames.
	Use graphs and equations to solve speed and velocity problems.
	Interpret motion maps to describe linear motion.
Acceleration	
	Distinguish between constant velocity and constant acceleration.
	Use graphs to analyze motion with constant acceleration.
	Solve problems involving distance, time, velocity, and acceleration.
	Interpret motion maps to describe linear motion.
Lab: Motion with Constant Acceleration	
	Recognize the relationships between position, time, velocity, and acceleration.
	Calculate the average velocity of a moving object.
	Use graphs to determine acceleration.
Fundamental Forces	
	Examine the four fundamental forces.
	Compare the characteristics, strengths, and ranges of the fundamental forces.
Newton's First and Third Laws	
	Describe Newton’s first law of motion and how it relates to inertia.
	Explain Newton’s third law of motion and how it relates to action and reaction forces.

Options EHS Physics A-OR		Scope and Sequence
Unit	**Lesson**	**Objectives**
		Use vectors to calculate the effect of forces on objects.
	Newton's Second Law	
		Describe Newton’s second law of motion.
		Calculate force, mass, or acceleration given the other two quantities.
		Interpret free-body diagrams for accelerating objects.
	Lab: Newton's Second Law	
		Determine how force and mass affect acceleration.
		Calculate the acceleration of a moving object.
	Impulse and Momentum	
		Calculate mass, velocity, or momentum given the other two quantities.
		Describe impulse and how it relates to momentum.
		Solve problems involving impulse.
		Analyze and compare the momentum and impulse of different objects.
	Conservation of Momentum	
		Describe the law of conservation of momentum.
		Apply the law of conservation of momentum to analyze collisions between objects.
		Solve problems involving the conservation of momentum.
		Use mathematical representations to show that the total momentum of a system of objects is conserved when there is no net force on the system.
	Lab: Conservation of Linear Momentum	
		Calculate the momentum of a moving object before and after a collision.

Options EHS Physics A-OR		Scope and Sequence
Unit	**Lesson**	**Objectives**
		Demonstrate that momentum is conserved during a collision.
	Unit Test	
Two-Dimensional Motion and Gravity		
	Vectors	
		Use vector diagrams to determine the resultant vector.
		Resolve a vector into horizontal and vertical components.
	Projectile Motion	
		Recognize that the horizontal and vertical motions of a projectile are independent.
		Identify examples of projectile motion.
		Solve problems involving projectile motion.
	Universal Law of Gravitation	
		Explain the relationships among gravitational force, mass, and distance.
		Solve problems that involve the universal law of gravitation.
		Describe the effect of gravity on an object.
		Use mathematical representations to predict the gravitational and electrostatic forces between objects.
	Centripetal Acceleration	
		Describe and calculate tangential speed.
		Define and identify examples of centripetal acceleration.
		Solve problems involving centripetal acceleration.
	Circular Motion	
		Describe how circular motion is caused by centripetal force.
		Explain the relationship between centripetal force and inertia.

Options EHS Physics A-OR		Scope and Sequence
Unit	**Lesson**	**Objectives**
		Use centripetal force concepts to solve problems.
		Interpret motion maps to describe circular motion.
	Orbital Motion	
		Explain how Newton’s universal law of gravitation affects orbital motion.
		Identify the forces acting on an object in orbit.
		Solve problems involving the orbital speed and period of an object in orbit.
	Earth-Moon-Sun System	
		Describe Kepler's three laws of planetary motion.
		Solve problems using Kepler's laws.
		Explain the effects of Earth, the moon, and the Sun on each other.
	Unit Test	
Work, Power, and Energy		
	Work and Power	
		Define and describe work.
		Compare the work done in different situations.
		Explain how work and power are related.
		Calculate work and power.
	Potential Energy	
		Identify and describe different types of potential energy.
		Solve problems involving the potential energy of an object.
	Kinetic Energy	
		Define kinetic energy and identify situations in which it’s present.

Unit	Lesson	Objectives
		Calculate kinetic energy, mass, or velocity given the other two quantities.
		Describe the work-energy theorem and use it to solve problems.
	Energy Transformations	
		Explain how energy changes form.
		Identify and describe examples of energy transformations.
		Solve problems involving energy transformations.
		Analyze and interpret energy transfer diagrams.
	Conservation of Energy	
		Explain the law of conservation of energy.
		Apply the law of conservation of energy to solve problems.
		Use energy transfer diagrams to illustrate that energy is conserved.
	Unit Test	
Thermodynamics and States of Matter		
	Temperature and Heat	
		Distinguish between temperature, thermal energy, and heat.
		Explain how temperature relates to kinetic energy.
		Describe specific heat and explain why it differs from one substance to another.
		Solve problems involving specific heat.
	Heat Transfer	
		Explain how molecular movement transfers thermal energy by conduction.
		Describe how fluid movement transfers thermal energy by convection.
		Explain how electromagnetic waves transfer energy by radiation.

Options EHS Physics A-OR		Scope and Sequence
Unit	**Lesson**	**Objectives**
	Lab: Mechanical Equivalent of Heat	
		Describe the conversion of gravitational potential energy to thermal energy in a system.
		Calculate gravitational potential energy and heat.
		Relate the potential energy of an object to the temperature change of water.
	States of Matter	
		Differentiate among the four states of matter.
		Identify the properties of the fourth state of matter: plasma.
	Changes of State	
		Identify and describe the six changes of state.
		Explain and interpret heating curves.
		Solve problems involving latent heat of fusion and latent heat of vaporization.
	First Law of Thermodynamics	
		Explain the first law of thermodynamics.
		Solve problems using the first law of thermodynamics.
		Apply the first law of thermodynamics to describe how heat engines work.
	Second Law of Thermodynamics	
		Describe how the first and second laws of thermodynamics are related.
		Explain why entropy increases over time.
		Apply the second law of thermodynamics to describe how heat engines work.
	Unit Test	
Cumulative Exam		

Options EHS Physics A-OR		Scope and Sequence
Unit	**Lesson**	**Objectives**
	Cumulative Exam Review	
	Cumulative Exam	