Name of Course: CP Physics

Course Overview:
CP Physics Covers Units, Measurement, Inertial Reference Frames, Velocity, Displacement, Acceleration, Kinematics, Newton's Laws, Projectile Motion, Conservation of Energy, Conservation of Momentum, Gravity and Rotational Motion, experiment design and laboratory techniques. Performance Indicators: HS-PS2 Motion and Stability: Forces and Interactions HS-PS3 Energy HS-ETS1 Engineering Design

Unit of Study	Essential Question(s)	Content/Skill/Concept	Instructional Strategies
Unit 1 Units and Measurement, Precision, Accuracy, 1 Dimensional Motion	How do I communicate quantitatively? What is a frame of reference? What is the difference between velocity and speed, distance and displacement?	Be able to convert units. Be able to choose a basis of measurement. Be able to calculate displacement, velocity, and acceleration	• Direct instruction, • I do it-we do it- you do it, • write pair share, • demonstration observation sheets, • in-class problem solving, • in-class problem writing, • Article reading/summary • Stop action video • In- class inquiry activities • Interpret data/discussions • Student self assessment • Peer review of student work
Unit 2 Accelerated Motion in One Dimension	How can I apply kinematics to analyze Projectile Motion?	Apply kinematic equations to 2 dimensional motion. Predict displacement, velocity, and time of a projectile flight.	• In-class inquiry activities • Online experiment simulations • Direct instruction, • I do it-we do it- you do it, • write pair share, • demonstration observation sheets,

			• in-class problem solving, • in-class problem writing, • students work in groups to develop their own unique experiment designs, test ideas by applying engineering skills to solve problems along the way • Article reading/summary • Stop action video • Interpret data/discussions • Student self assessment • Peer review of student work
Unit 3 Newton's Laws Applied, Accelerated motion in 2 Dimensions, Projectile Motion	How can I apply Newton's Laws to objects that are in constant motion, or accelerating.	Apply vector operations to displacement, velocity, and acceleration in two dimensions, apply kinematics to projectiles. Explain inertia, model and refine models of motion using Newton's Laws.	• In-class inquiry activities • Online experiment simulations • Direct instruction, • I do it-we do it- you do it, • write pair share, • demonstration observation sheets, • in-class problem solving, • in-class problem writing, • students work in groups to develop their own unique experiment designs, test ideas by applying engineering skills to solve problems along the way • Article reading/summary • Stop action video • Interpret data/discussions • Student self assessment • Peer review of student work
Unit 4 Energy and Work	What are the conditions to meet when is energy conserved?	Model and refine models of energy conservation systems. Define and model potential energy. Define and model kinetic energy. Calculate work and power. Identify and model elements of a system that are non conservative).	• In-class inquiry activities • Online experiment simulations • Direct instruction, • I do it-we do it- you do it, • write pair share, • demonstration observation sheets, • in-class problem solving, • in-class problem writing, • students work in groups to develop their

			own unique experiment designs, test ideas by applying engineering skills to solve problems along the way ● Article reading/summary ● Stop action video ● Interpret data/discussions ● Student self assessment ● Peer review of student work
Unit 5 Momentum and Impulse	What are the conditions to meet when momentum is conserved? How can impulse be used to analyze interaction of masses in motion?	Model collisions with conservation of momentum. Apply conservation of momentum in three types of collisions.	● In-class inquiry activities ● Online experiment simulations ● Direct instruction, ● I do it-we do it- you do it, ● write pair share, ● demonstration observation sheets, ● in-class problem solving, ● in-class problem writing, ● students work in groups to develop their own unique experiment designs, test ideas by applying engineering skills to solve problems along the way ● Article reading/summary ● Stop action video ● Interpret data/discussions ● Student self assessment ● Peer review of student work
Unit 6 Circular Motion	What is the cause of circular motion? How does velocity change for objects circular motion.	Apply Newton's Law of Gravity Model and refine models of circular motion, including planetary orbits. Extension: Kepler's Laws	● In-class inquiry activities ● Online experiment simulations ● Direct instruction, ● I do it-we do it- you do it, ● write pair share, ● demonstration observation sheets, ● in-class problem solving, ● in-class problem writing, ● students work in groups to develop their own unique experiment designs, test ideas by applying engineering skills to solve problems along the way

			• Article reading/summary • Stop action video • Interpret data/discussions • Student self assessment • Peer review of student work • Student self assessment • Peer review of student work