CURRICULUM MAP SUBJECT:__Physics_____GRADE:___11/12_____

MONTH	ESSENTIAL QUESTION	CONTENT (CHAPTER/UNIT DESCRIPTION/ACTIVITIES	SKILLS (STANDARDS/LEARNING OUTCOMES)	MATERIALS/ RESOURCES	ASSESSMENT (Objective/Subjective)
1 day	What is the language of Physics?	Introduction to Physics/overview of topics	Convert units using dimensional analysis	Units and dimensional analysis worksheets in "supplement"	Part of written quiz
15 days	How do we describe and/or measure motion in one dimension?	Motion in one dimension: distinguish and compare velocity, speed and acceleration , distance and displacement, vector and scalar quantities.	Describe the difference between scalar and vector quantities including distance, displacement, speed, velocity and acceleration. Determine whether an object is accelerating when given a description of the motion. Solve problems involving one-dimensional motion (Frameworks 1.1, 1.2, 1.3)	• Tufts Motion Detector Lab • Falling weight with ticker timer then graph • Drop one penny vs pack of pennies • Carts on a ramp with CBL • Homework page from Motion Detector Lab	2 Written concept quizzes for topics listed, including unit conversion. Motion Lab Homework packet, Problem solving test

				• Other worksheets in Conceptual Physics	
13 days	How do we describe and/or measure motion in a plane? (motion in 2 dimensions)	Represent relative motion, motion in two dimensions and projectile motion as vector quantities. Investigate how the quantities of velocity, time, distance and acceleration are related in motion in a plane	• Add and subtract vectors graphically and numerically. • Multiply and divide vectors by scalars. • Resolve vectors into components. • Analyze projectiles launched horizontally and at an angle • Solve problems in two-dimensional motion including relative motion and projectile motion.	• Pacing off triangles with orienteering compass • Three scales pulling on knot in center • Converting between rectangular and polar worksheet • Adding Vectors worksheet • Rolling Marble off table into cup lab • Shooting marble into barrel from random distance lab • Demo pennies shot from edge of table with	2 quizzes covering vector arithmetic and projectile motion. Test covering problem solving in two dimensional motion problems.

				ruler • Demo with fan carts	
11-12 days plus 2 days for Mid-Term Exam and review	What is the role of force in the world around us?	Newton's Laws	• Draw a free-body diagram • Relate mass and inertia to Newton's First Law • Distinguish between mass and weight • Explain in practical terms with examples the meaning of Newton's Laws. • Determine the direction in which friction acts • Calculate frictional force • Solve problems involving Newton's Laws including Equilibrium, horizontal forces, unbalanced pulleys, elevators, inclined planes and friction.	• Pull wagons or barrels with spring scale • What Affects Friction? Lab • Pasco carts on track with pulley and weights. • Students pull each other on skateboards (or barrel wheels) trying not to move themselves • Spring scale demos with weights, fixed attachment and pulleys • Try to hold weighted chain or rope completely horizontal.	2 concept quizzes Friction Lab experiment design write-up Problem solving test

				• Hewitt video(s) • Bed of Nails demo on Kinetic Karnival video	
9-10 days	What is the **law of conservation of energy**, and how does it enable the prediction of motion?	Understand the fundamental relationship between Work and various forms of mechanical Energy. Solve problems using the law of conservation of energy	Define work and calculate work done in a variety of situations Identify kinetic, gravitational potential energy, elastic potential energy Calculate mechanical energy Relate work- energy theorem to work, time, power, force and speed Solve problems related to conservation of mechanical energy	• Hooke's Law lab • Roll marble down hot wheel track measuring height of drop and velocity at bottom • Mechanical Universe video • Superball challenge (find one that bounces higher than you drop it from-warn adjoining classes)	Hooke's Law lab analysis Concept quiz Problem solving test
9-10 days	What is momentum and how does it differ from inertia?	Momentum and Collisions	Define momentum in terms of velocity. Relate impulse and momentum Use conservation of momentum to solve	Momentum lab with Pasco bumper carts on Physics lab tables or track • Bouncing darts • Mechanical	Concept Quiz Problem solving test

			problems Distinguish between elastic and inelastic collisions Solve problems involving perfectly inelastic and elastic collisions	Universe Video with pool table	
9 –10 days (may be done before Work/ Energy unit)	How can an understanding of circular motion and gravitational forces lead to a clearer understanding of our universe?	Understand what forces cause circular motion and how they affect velocity and path radius. Understand the Universal Law of Gravitation and its role as a centripetal force	Describe the direction of centripetal force Apply the mathematics of circles to calculate tangential velocity and acceleration Calculate centripetal acceleration Calculate gravitational force Calculate velocity and radius of satellite orbits	• Rubber stopper Centripetal force lab • Hewitt CD worksheets • Pennies on a turntable demo • Hewitt video • Newton and the Apple video • Mechanical Universe Kepler's Laws Video	Centripetal Force lab calculations and analysis Concept quiz Problems solving test
14-15 days	Why is it easier to hold a long object at the point of most concentrated mass?	Rotational Dynamics	Determine whether an object will topple when given the center of gravity Find the CG of two-dimensional shapes. Calculate torque Solve problems involving extended bodies and lever arms	• Meter stick torque lab • Hanging Mobiles • Canned Good races • Pass around meter stick with weight near one end	Concept quiz Problem solving test

				• Spinning on stool with weights or with bicycle wheel demos • Kinetic carnival video	