Term 1			
MCF#	**DOK**	**Objective**	**Time Frame (days)**
1a*	3	Use current technologies such as CD-ROM, DVD, Internet, and on-line data search to explore current research related to a specific topic.	1-5
1b*	3	Clarify research questions and design laboratory investigations.	1-5
1c*	3	Demonstrate the use of scientific inquiry and methods to formulate, conduct, and evaluate laboratory investigations (e.g., hypotheses, experimental design, observations, data analyses, interpretations, theory development).	1-5
1d*	3	Organize data to construct graphs (e.g., plotting points, labeling x-and y-axis, creating appropriate titles and legends for circle, bar, and line graphs) draw conclusions and make inferences.	1-5
1e*	3	Evaluate procedures, data, and conclusions to critique the scientific validity of research.	1-5
1f*	3	Formulate and revise scientific explanations and models using logic and evidence (data analysis).	1-5
1g*	3	Collect, analyze, and draw conclusions from data to create a formal presentation using available technology (e.g., computers, calculators, SmartBoard, CBL's, etc.)	1-5
2a	3	Use inquiry to investigate and develop an understanding of the kinematics and dynamics of physical bodies. Vector and scalar quantities Vector problems (solved mathematically and graphically) Vector techniques and free-body diagrams to determine the net force on a body when several forces are acting on it Relations among mass, inertia, and weight	6-18, 19-21 (free-body diagrams, mass, inertia, weight)

*These objectives will be taught both 1st & 2nd Nine Weeks of each term.

Term 1			
MCF#	**DOK**	**Objective**	**Time Frame (days)**
2b	2	Analyze, describe, and solve problems by creating and utilizing graphs of one-dimensional motion (e.g., position, distance, displacement, time, speed, velocity, acceleration, the special case of freefall).	6-18
2c	2	Analyze real-world applications to draw conclusions about Newton's three laws of motion.	19-21
		End 4 1/2 weeks	
3a	2	Explain and apply the conservation of energy and momentum. Concept of work and applications Concept of kinetic energy, using the elementary work-energy theorem Concept of conservation of energy with simple examples Concepts of energy, work, and power (qualitatively and quantitatively) Principles of impulse in inelastic and elastic collisions	22-27, 28-32 (collisions)
3b	3	Analyze real-world applications to draw conclusions about mechanical potential energy (the energy of configuration).	22-27
3c	1	Apply the principles of impulse and compare conservation of momentum and conservation of kinetic energy in perfectly inelastic and elastic collisions.	28-32
2d	2	Apply the effects of the universal gravitation law to graph and interpret the force between two masses, acceleration due to gravity, and planetary motion. Situations where *g* is constant (falling bodies) Concept of centripetal acceleration undergoing uniform circular motion Kepler's third law Oscillatory motion and the mechanics of waves	33-41, 53-63 (waves)
		End 9 weeks term	

Term 2			
MCF#	**DOK**	**Objective**	**Time Frame (days)**
3d	2	Investigate and summarize the principles of thermodynamics. How heat energy is transferred from higher temperature to lower temperature until equilibrium is reached Temperature and thermal energy as related to molecular motion and states of matter Problems involving specific heat and heat capacity First and second laws of thermodynamics as related to heat engines, refrigerators, and thermal efficiency	46-54
3e	2	Develop the kinetic theory of ideal gases and explain the concept of Carnot efficiency.	46-54
2d	2	Apply the effects of the universal gravitation law to graph and interpret the force between two masses, acceleration due to gravity, and planetary motion. Situations where *g* is constant (falling bodies) Concept of centripetal acceleration undergoing uniform circular motion Kepler's third law Oscillatory motion and the mechanics of waves	33-41, 55-63 (waves)
4a	2	Describe and model the characteristics and properties of mechanical waves. Simple harmonic motion Relationships among wave characteristics such as velocity, period, frequency, amplitude, phase, and wavelength Energy of a wave in terms of amplitude and frequency. Standing waves and waves in specific media (e.g., stretched string, water surface, air, etc.)	55-63
4b	1	Differentiate and explain the Doppler effect as it relates to a moving source and to a moving observer.	55-63
4c	2	Explain the laws of reflection and refraction and apply Snell's law to describe the relationship between the angles of incidence and refraction.	55-63
		End 13 1/2 weeks	

Term 2			
MCF#	**DOK**	**Objective**	**Time Frame (days)**
5a	2	Analyze and explain the relationship between electricity and magnetism. Characteristics of static charge and how a static charge is generated Electric field, electric potential, current, voltage, and resistance as related to Ohm's Law Magnetic poles, magnetic flux and field, Ampère's law and Faraday's law Coulomb's Law	64-72
5b	2	Use schematic diagrams to analyze the current flow in series and parallel electric circuits, given the component resistances and the imposed electric potential.	64-72
5c	2	Analyze and explain the relationship between magnetic fields and electrical current by induction, generators, and electric motors.	64-72
6a	1	Analyze and explain the principles of nuclear physics. The mass number and atomic number of the nucleus of an isotope of a given chemical element The conservation of mass and the conservation of charge Nuclear decay	73-81
6b	3	Defend the wave-particle duality model of light, using observational evidence. Quantum energy and emission spectra Photoelectric and Compton effects	73-81