HS Introductory Physics 2006 Science and Technology/Engineering Framework

Grade	Chapt / Sec	Pages / Other	Month	ID	Code	Domain/Topic	Cluster
	2	10 - 24	Sept	STE.IP.MF1.2	1.2	Motion and Forces	Distinguish between displacement, distance, velocity, speed, and acceleration. Solve problems involving displacement, distance, velocity, speed, and constant acceleration.
11 - 12	2.7	21 - 24	Sept	STE.IP.MF1.3	1.3	Motion and Forces	Create and interpret graphs of 1-dimensional motion, such as position vs. time, distance vs. time, speed vs. time, velocity vs. time, and acceleration vs. time where acceleration is constant.
11 - 12	3	28 - 39	Sept / Oct	STE.IP.MF1.1	1.1	Motion and Forces	Compare and contrast vector quantities (e.g., displacement, velocity, acceleration, force, and linear momentum) and scalar quantities (e.g., distance, speed, energy, mass, and work).
11 - 12	4.3	44 - 45	Oct / Nov	STE.IP.MF1.6	1.6	Motion and Forces	Distinguish qualitatively between static and kinetic friction, and describe their effects on the motion of objects.
11 - 12	5	64 - 65	Nov	STE.IP.MF1.5	1.5	Motion and Forces	Use a free-body force diagram to show forces acting on a system consisting of a pair of interacting objects. For a diagram with only co-linear forces, determine the net force acting on a system and between the objects.
11 - 12	4, 5, & 6	43 - 82	Nov - Jan	STE.IP.MF1.4	1.4	Motion and Forces	Interpret and apply Newton's three laws of motion.
11 - 12	7	86 - 99	Jan - Feb	STE.IP.CEM2.5	2.5	Conservation of Energy and Momentum	Provide and interpret examples that linear momentum is the product of mass and velocity, and is always conserved (law of conservation of momentum). Calculate the momentum of an object.
11 - 12	8	103 - 118	Feb - Mar	STE.IP.CEM2.2	2.2	Conservation of Energy and Momentum	Interpret and provide examples of how energy can be converted from gravitational potential energy to kinetic energy and vice versa.
11 - 12	8	110 - 111	Feb - Mar	STE.IP.CEM2.1	2.1	Conservation of Energy and Momentum	Interpret and provide examples that illustrate the law of conservation of energy.

11 - 12	8	105 - 106	Feb - Mar	STE.IP.CEM2.3	2.3	Conservation of Energy and Momentum	Describe both qualitatively and quantitatively how work can be expressed as a change in mechanical energy.
11 - 12	8	103 - 106	Feb - Mar	STE.IP.CEM2.4	2.4	Conservation of Energy and Momentum	Describe both qualitatively and quantitatively the concept of power as work done per unit time
11 - 12	9	122 - 132	April	STE.IP.MF1.8	1.8	Motion and Forces	Describe conceptually the forces involved in circular motion.
11 - 12	12	172 - 173	Feb Vaca	STE.IP.MF1.7	1.7	Motion and Forces	Describe Newton's law of universal gravitation in terms of the attraction between two objects, their masses, and the distance between them.
11 - 12	21	307 - 321	Apr - May	STE.IP.HHT3.4	3.4	Heat and Heat Transfer	Explain the relationship among temperature change in a substance for a given amount of heat transferred, the amount (mass) of the substance, and the specific heat of the substance.
11 - 12	22	325 - 336	May	STE.IP.HHT3.2	3.2	Heat and Heat Transfer	Explain how heat energy will move from a higher temperature to a lower temperature until equilibrium is reached.
11 - 12	22	325 - 336	May	STE.IP.HHT3.1	3.1	Heat and Heat Transfer	Explain how heat energy is transferred by convection, conduction, and radiation.
11 - 12	23	339 - 350	May	STE.IP.HHT3.3	3.3	Heat and Heat Transfer	Describe the relationship between average molecular kinetic energy and temperature. Recognize that energy is absorbed when a substance changes from a solid to a liquid to a gas, and that energy is released when a substance changes from a gas to a liquid to a solid. Explain the relationships between evaporation, condensation, cooling, and warming.
11 - 12	25	372 - 386	*	STE.IP.Wave4.2	4.2	Waves	Distinguish between mechanical and electromagnetic waves.
11 - 12	25	372 - 386	*	STE.IP.Wave4.3	4.3	Waves	Distinguish between the two types of mechanical waves, transverse and longitudinal.
11 - 12	25	372 - 386	*	STE.IP.Wave4.1	4.1	Waves	Describe the measurable properties of waves (velocity, frequency, wavelength, amplitude, and period) and
11 - 12	25	376 - 377	*	STE.IP.Wave4.5	4.5	Waves	Recognize that mechanical waves generally move faster through a solid than through a liquid and faster through
11 - 12	25	382 - 384	*	STE.IP.Wave4.6	4.6	Waves	Describe the apparent change in frequency of waves due to the motion of a source or a receiver (the Doppler

11 - 12	27	408	*	STE.IP.EM6.2	6.2	Electromagnetic Radiation	Describe the electromagnetic spectrum in terms of frequency and wavelength and identify the locations of radio waves, microwaves, infrared radiation, visible light (red, orange, yellow, green, blue, indigo, and violet), ultraviolet rays, x-rays, and gamma rays on the spectrum.
11 - 12	29	442 - 459	*	STE.IP.Wave4.4	4.4	Waves	Describe qualitatively the basic principles of reflection and refraction of waves.
11 - 12	32	500 - 514	*	STE.IP.EM5.1	5.1	Electromagnetism	Recognize that an electric charge tends to be static on insulators and can move on and in conductors. Explain that energy can produce a separation of charges.
11 - 12	32	500 - 514	*	STE.IP.EM5.4	5.4	Electromagnetism	Describe conceptually the attractive or repulsive forces between objects relative to their charges and the distance between them (Coulomb's law).
11 - 12	33	517 - 528	*	STE.IP.EM5.5	5.5	Electromagnetism	Explain how electric current is a flow of charge caused by a potential difference (voltage) and how power is equal to current multiplied by voltage.
11 - 12	34	535 - 538	*	STE.IP.EM5.2	5.2	Electromagnetism	Develop a qualitative and quantitative understanding of current, voltage, resistance, and the connections among them (Ohm's law).
11 - 12	35	548 - 558	*	STE.IP.EM5.3	5.3	Electromagnetism	Analyze simple arrangements of electrical components in both series and parallel circuits. Recognize symbols and understand the functions of common circuit elements (battery, connecting wire, switch, fuse, resistance) in a schematic diagram.
11 - 12	36	563 - 574	*	STE.IP.EM5.6	5.6	Electromagnetism	Recognize that moving electric charges produce magnetic forces and moving magnets produce electric forces. Recognize that the interplay of electric and magnetic forces is the basis for electric motors, generators, and other technologies.
11 - 12	27 - 28	404 - 438	*	STE.IP.EM6.1	6.1	Electromagnetic Radiation	Recognize that electromagnetic waves are transverse waves and travel at the speed of light through a vacuum.

Grade	When / How Often	Where / How	ID	Code	Grade/Strand	Domain/Topic	Cluster
11 - 12	Daily	Book Questions / Sheets / Homework / Work Sheets	STE.IP.SIS.1	SIS1	Introductory Physics High School Course	Science Inquiry Skills	Make observations, raise questions, and formulate hypotheses.
11 - 12	Daily	Labs / Classroom					Observe the world around them from a scientific perspective.
11 - 12	Monthly	Science Articles, Science Magazines (Science World, Popular Science), Labs					Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.
11 - 12	Monthly	Science Articles, Science Magazines (Science World, Popular Science)					Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories.
11 - 12	Bi-Weekly	Science Labs	STE.IP.SIS.2	SIS2	Introductory Physics High School Course	Science Inquiry Skills	Design and conduct scientific investigations.
11 - 12	Bi-Weekly	Science Lab Reports / Lab Sheets					Articulate and explain the major concepts being investigated and the purpose of an investigation.
11 - 12	Bi-Weekly	Science Labs					Select required materials, equipment, and conditions for conducting an experiment.
11 - 12	Daily / Bi-Weekly	Chapter Work / Science Labs / Lab Reports / Lab Sheets / Work Sheets					Identify independent and dependent variables.
11 - 12	Bi-Weekly	Science Labs / CMS Presentations / Projects					Write procedures that are clear and replicable.
11 - 12	Daily	Classwork / Science Labs					Employ appropriate methods for accurately and consistently making observations
11 - 12	Daily / Bi-Weekly	Chapter Work / Science Labs / Lab Reports / Lab Sheets / Work Sheets					making and recording measurements at an appropriate level of precision
11 - 12	Daily / Bi-Weekly	Chapter Work / Science Labs / Lab Reports / Lab Sheets / Work Sheets / Presentations					collecting data or evidence in an organized way.
11 - 12	Bi-Weekly	Science Labs / CMS Presentations / Projects					Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including: set-up, calibration (if required), technique, maintenance, and storage.

11 - 12	Bi-Weekly	Science Labs					Follow safety guidelines.
11 - 12	Bi-Weekly	Science Labs / Lab Reports / Lab Sheets / Work Sheets / CMS Presentations	STE.IP.SIS.3	SIS3	Introductory Physics High School Course	Science Inquiry Skills	Analyze and interpret results of scientific investigations.
11 - 12	Bi-Weekly	Science Labs / Lab Reports / Lab Sheets / Work Sheets					Present relationships between variables in appropriate forms.
11 - 12	Bi-Weekly	Science Labs / Lab Reports / Lab Sheets / Work Sheets					Represent data and relationships between variables in charts and graphs.
11 - 12	Monthly	Microsoft Excel / Microsoft Word / Google Drive					Use appropriate technology (e.g., graphing software) and other tools.
11 - 12	Daily / Bi-Weekly	Science Labs / Lab Reports / Lab Sheets / Work Sheets					Use mathematical operations to analyze and interpret data results.
11 - 12	Bi-Weekly	Science Labs / Lab Reports / Lab Sheets / Work Sheets					Assess the reliability of data and identify reasons for inconsistent results, such as sources of error or uncontrolled conditions.
11 - 12	Bi-Weekly	Science Labs / Lab Reports / Lab Sheets / Work Sheets					Use results of an experiment to develop a conclusion to an investigation that addresses the initial questions and supports or refutes the stated hypothesis.
11 - 12	Bi-Weekly	Science Labs / Lab Reports / Lab Sheets / Work Sheets / CMS Presentations					State questions raised by an experiment that may require further investigation.
11 - 12							
11 - 12	Bi-Weekly	Science Labs / Lab Reports / Lab Sheets / Lab Groups / Work Sheets / Projects / CMS Presentations	STE.IP.SIS.4	SIS4	Introductory Physics High School Course	Science Inquiry Skills	Communicate and apply the results of scientific investigations.
11 - 12	Bi-Weekly	Science Labs / Lab Reports / Lab Sheets / Lab Groups / Work Sheets / Projects / CMS Presentations					Develop descriptions and explanations of scientific concepts that were a focus of one or more investigations.
11 - 12	Bi-Weekly	Science Labs / Lab Reports / Lab Sheets / Lab Groups / Work Sheets					Review information, explain statistical analysis, and summarize data collected and analyzed from an investigation.
11 - 12	Bi-Weekly	Science Labs / Lab Reports / Lab Sheets / Lab Groups / Work Sheets / Projects / CMS Presentations					Explain diagrams and charts that represent relationships of variables.

11 - 12	Quartly	Science Labs / Lab Reports / Lab Sheets / Lab Groups / Work Sheets & Presentations / CMS Presentations					Construct a reasoned argument and respond appropriately to critical comments and questions. Use language and vocabulary appropriately, speak clearly and logically, and use appropriate technology (e.g., presentation software) and other tools to present findings.
11 - 12	Quartly	Science Labs / Lab Reports / Lab Sheets / Lab Groups / Work Sheets & Presentations					Use and refine scientific models that simulate physical processes or phenomena.