Course: Physics			Designated Six Weeks: Sixth Six Weeks		
Unit: Optics and Modern Physics			Days to teach: 25 Days		
TEKS	**Guiding Questions/ Specificity**	**Assessment**	**Vocabulary**	**Instructional Strategies**	**Resources/ Weblinks**
Optics (7) Science concepts. The student knows the characteristics and behavior of waves. The student is expected to:(D) investigate behaviors of waves, including reflection, refraction, diffraction, interference, resonance, and the Doppler effect; (***EOC Readiness)*** (E) describe and predict image formation as a consequence of reflection from a plane mirror and refraction through a thin convex lens; ***(EOC Supporting Standard)*** (F) describe the role of wave characteristics and behaviors in medical and industrial applications. ***(EOC Supporting Standard)***	**Guiding Questions** How do corrective lenses work? **Specificity** Use ray diagrams to predict image type and location.	Chromatic aberration is avoided in (a) converging lenses. (b) diverging lenses. (c) mirrors. When white light goes from air into water, the color that refracts the most is (a) red (b) orange (c) green (d) violet (e) all refract the same amount	Reflection Refraction Concave mirror Convex mirror Concave lens Convex lens Magnification Virtual image Real image	Inquiry labs Refraction Inquiry Lab: Convex Lens and Concave Mirror (Laying the Foundation) Camera Obscura (lab 79) **ELPS:** http://ritter.tea.state.tx.us/rules/tac/chapter074/ch074a.html 1C: List/Sort/Label 1A: Think Aloud 2G: Book Reviews	Text: "Conceptual Physics" Paul Hewitt 2002 Note packets, Laying the Foundations, Graph matching software Reflection, Refraction, and Mirrors http://physics.bu.edu/~duffy/py106/Reflection.html How Cameras Work http://www.islandnet.com/~yesmag/how_work/camera.html Doppler Effect http://galileoandeinstein.physics.virginia.edu/more_stuff/flashlets/doppler.htm

Course: Physics			Designated Six Weeks: Sixth Six Weeks		
Unit: Optics and Modern Physics			Days to teach: 25 Days		
TEKS	**Guiding Questions/ Specificity**	**Assessment**	**Vocabulary**	**Instructional Strategies**	**Resources/ Weblinks**
College and Career Readiness Standards J. Optics 3. Understand concepts of geometric optics.					
Magnetism (5) Science concepts. The student knows the nature of forces in the physical world. The student is expected to: (D) identify examples of electric and magnetic forces in everyday life; ***(EOC Supporting Standard)*** ***College and Career Readiness Standards*** I.Electromagnetism 7. Understand magnetic fields and their relationship to electricity. 8. Relate electricity and magnetism to everyday life.	**Guiding Questions** How do domains form magnets? **Specificity** Field lines are strongest and closest together at the magnetic poles.	Outside a magnet, magnetic field lines are conventionally drawn from (a) north to south (b) south to north (c) either way Thrust a magnet into a coil of wire and the coil (a) becomes an electromagnet (b) has a current in it (c) both of these (d) neither of these	Domains Field lines	Project: Electromagnet Challenge **ELPS:** http://ritter.tea.state.tx.us/rules/tac/chapter074/ch074a.html 1A: Think Alouds 3G: QAR 2G: Comprehension	Text: "Conceptual Physics" Paul Hewitt 2002 Safari Montage: http://www.safarimontage.com/?gclid=CKq4k-nniqcCFZND7AodASpyeA PhET: http://phet.colorado.edu/en/simulation/gravity-force-lab

Course: Physics			Designated Six Weeks: Sixth Six Weeks		
Unit: Optics and Modern Physics			Days to teach: 25 Days		
TEKS	**Guiding Questions/ Specificity**	**Assessment**	**Vocabulary**	**Instructional Strategies**	**Resources/ Weblinks**
Quantum Mechanics (8) Science concepts. The student knows simple examples of atomic, nuclear, and quantum phenomena. The student is expected to: (A) describe the photoelectric effect and the dual nature of light; ***(EOC Readiness Standard)*** (B) compare and explain the emission spectra produced by various atoms; ***(EOC Supporting Standard)*** ***College and Career Readiness Standards*** J. Optics 1. Know the electromagnetic spectrum. 2. Understand the wave/particle duality of light	**Guiding Questions** How do automatic doors in supermarket work? How does the remote control of your TV work? Is light a particle or a wave? Why do different elements have different spectra? **Specificity** Photons are packets or bundles of light and energy.	According to quantum physics, looking at a star through a telescope (a) affects the processes occurring in the star. (b) has no effect on the processes occurring in the star. Which has less energy per photon? (a) red light (b) blue light (c) both have the same energy	Black Body Radiation Absorption Emission Spectra Compton's shift Photon Photoelectric Effect Uncertainty Principle	Lab: Flaming Out **ELPS:** http://ritter.tea.state.tx.us/rules/tac/chapter074/ch074a.html 3G: Perspective Based Activity 3H: Question Answer	Text: "Conceptual Physics" Paul Hewitt 2002 Black Body Radiation http://webphysics.davidson.edu/alumni/milee/java/bb_mjl.htm http://phet.colorado.edu/en/simulation/blackbody-spectrum Emission Spectra http://csep10.phys.utk.edu/astr162/lect/light/absorption.html Wave-Particle Duality http://hyperphysics.phy-astr.gsu.edu/hbase/mod1.html

Course: Physics			Designated Six Weeks: Sixth Six Weeks		
Unit: Optics and Modern Physics			Days to teach: 25 Days		
TEKS	**Guiding Questions/ Specificity**	**Assessment**	**Vocabulary**	**Instructional Strategies**	**Resources/ Weblinks**
Radioactivity and Nuclear Reactions (8) Science concepts. The student knows simple examples of atomic, nuclear, and quantum phenomena. (C) describe the significance of mass-energy equivalence and apply it in explanations of phenomena such as nuclear stability, fission, and fusion. ***(EOC Supporting Standard)*** (D) give examples of applications of atomic and nuclear phenomena such as radiation therapy, diagnostic imaging, and nuclear power and examples of applications of quantum phenomena such as digital cameras. ***(EOC Supporting Standard)***	**Guiding Questions** How is a half-life calculated? What are some examples of atomic, nuclear, and quantum phenomena? How do astronomers know the composition of stars? **Specificity** Helium is produced in stars from the fusion of Hydrogen particles.	When Rutherford had a stream of alpha particles hit a gold foil, most of the particles (a) bounced back (b) went almost straight through (c) stopped (d) spiraled A radiation detector measures the radioactivity of a piece of radium by catching and counting alpha particles it emits. According to quantum physics, making this measurement affects the (a) radiation rate of the piece of radium (b) alpha particles that are caught (c) both of these (d) neither of these	Half-life Isotope Fission Fusion	Lab: Half-Life **Project:** Physics Exploration **ELPS:** http://ritter.tea.state.tx.us/rules/tac/chapter074/ch074a.html 1E: Affixes, Roots and Cognates 3B: Word Knowledge	Text: "Conceptual Physics" Paul Hewitt 2002 Nuclear Science http://vod.esc11.net/videos/11303/pgr11303_256k.asf http://vod.esc11.net/videos/39383/chp949400_256k.asf