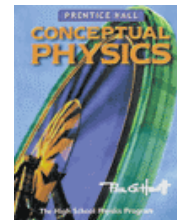


## Chapters 27–29 – *Light, Color and Reflection*

### Text Readings (Conceptual Physics – Prentice Hall ©2002)

- Chapters 27 (pages 404–420), 28 (pages 421–441) and 29 (pages 442–462)
- Your textbook web site: Chapter 27: [www.tinyurl.com/3u2n5](http://www.tinyurl.com/3u2n5)  
Chapter 28: [www.tinyurl.com/4bm4m](http://www.tinyurl.com/4bm4m) Chapter 29: [www.tinyurl.com/69gez](http://www.tinyurl.com/69gez)



### Objectives (This is exactly what will be on the test)

- ❑ Describe the necessary components for human vision including the cornea, retina, rods, cones, optic nerve and the brain. Know the difference in function for rods and cones.
- ❑ Know that our eyes actually take snapshots of our environment rather than see continuous motion. Explain how these “snapshots” allow us to see continuous motion with movies and animation.
- ❑ Know the three primary colors that our eyes see and the colors that are produced when mixed.
- ❑ Know how the primary colors can be created by mixing the primary pigments.
- ❑ Explain why light is to be considered to be both a particle and a wave.
- ❑ Describe the photoelectric effect and some of its practical applications.
- ❑ Explain why it is difficult to measure the speed of light and why the speed of light is considered to be a universal speed limit.
- ❑ Know where the visible light spectrum fits in the electromagnetic spectrum. Be familiar with other parts of the spectrum including ultraviolet (UV), infrared (IR), microwave, X-ray and radio waves.
- ❑ Explain the difference between transparent, translucent and opaque materials.
- ❑ Describe 3-D vision. Know the two ways to generate 3-D vision.
- ❑ Describe some practical applications for polarized light.
- ❑ Know how pigments absorb some colors of light and allow the transmission or reflection of other colors of light.
- ❑ Explain why the daytime sky is blue and why sunsets are red.
- ❑ Describe the law of reflection and know some practical applications of total internal reflection.

### Pennsylvania Standards addressed in this unit:

*Reading & Writing* 1.1–1.8

*Mathematics* 2.1–2.4

*Science:*

- 3.1.12.A – Apply concepts of systems, subsystems, feedback and control to solve complex technological problems.
- 3.1.12.B – Apply concepts of models as a method to predict and understand science and technology.
- 3.1.12.C – Assess and apply patterns in science and technology.
- 3.1.12.D – Analyze scale as a way of relating concepts and ideas to one another by some measure.
- 3.2.12.B – Evaluate experimental information for appropriateness and adherence to relevant science processes.
- 3.2.12.C – Apply the elements of scientific inquiry to solve multi-step problems.
- 3.2.12.D – Analyze and use the technological design process to solve problems.
- 3.4.12.A – Apply concepts about the structure and properties of matter.
- 3.4.12.C – Apply the principles of motion and force.
- 3.4.12.D – Analyze the essential ideas about the composition and structure of the universe.
- 3.7.12.B – Evaluate appropriate instruments and apparatus to accurately measure materials and processes.
- 3.8.12.A – Synthesize and evaluate the interactions and constraints of science and technology on society.
- 3.8.12.C – Evaluate the consequences and impacts of scientific and technological solutions.