**Title: Diffraction of Light**

Revision: February 1, 2006

Authors: Gil Toombes, Andrew J. Telesca, Jr., Martin Alderman, Jim Overhiser

Appropriate Level: Physics, Grades 9-12

Abstract: The diffraction and interference of light are easily observed phenomena that give direct, tangible evidence of the wave nature of light. Diffraction is at the root of many technologies, scientific techniques, and common visual phenomena. Students explore diffraction phenomena by shining a laser at a hair, a variable single slit made from pencils, wire meshes of various size and diffraction gratings. After an introduction to single-slit and N-slit diffraction equations students are faced

with three challenges: (1) to measure the track spacing in a CD and DVD, (2) to determine the relative thickness of hairs, and (3) to estimate the diameter of a lycopodium spore. In the last two challenges, students design their own procedure.

Time Required: Two 40 minute periods

NY Standards Met: Standard 1, Math Analysis, Key Idea 3, Scientific Inquiry Key Idea 1

Standard 4, Key Idea 4, Performance Indicator 4.3, Major Understandings l, m