

Whitfield Career Academy

Project Overview

Project Title: *Lock Down: Laser Lab*

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Subject Areas: Science and Math

Grade Level and Location: 9th Grade, rooms 226 and 230

Duration: Approximately 1 week

Driving Question: How can you create a security system using mirrors, prisms, laser beams and the properties of polygons?

Project Summary: Using multiple mirrors, a prism, and 1 laser, students will propose a laser dependent security system in response to a variety of prompts and situations. Students will lean heavily on their newly acquired knowledge of electromagnetic waves, laws of reflection, refraction, and diffraction. Students will also identify the behavior of polygons as they occur in their laser design. This will be a competition, with the most complex laser design having the opportunity to take it to scale. Other students will attempt to breach the security system while the song "Mission Impossible" is played.

Major Student Products:

Individual – Scale drawings,

Group – Tested results of scale drawings/winner will build full scale security system

Individual – Students attempt to penetrate security system

How the Project Was Conceived and Planned: This project was designed because of students' interest in lasers. Since this is a difficult concept to teach, science and math teachers collaborated and conversation led to the possibility of the laser security system with set parameters and requirements.

Entry Activity: We began this project by showing a movie clip from "Oceans 12" with laser song. In math class, students were issued a laser challenge where they investigated angles of reflection on a scale drawing. In science class, students investigated reflection, refraction and diffusion by using a light source, mirrors and prisms to reflect and refract light beams.

