



CALIFORNIA STATE SCIENCE FAIR 2014 PROJECT SUMMARY

Name(s) Timothy A. Valadez	Project Number 34804
Project Title Virtual Images: The Science behind Pepper's Ghost	
Abstract Objectives/Goals The principal goal of this project was to create virtual images on a model scale using Peppers ghost technology. Several parameters within this broader goal were examined with distance, backgrounds, lighting, and materials to achieve a viable image. This idea has application in several industries using illusions such as the Haunted Mansion at the Disney parks. Methods/Materials I used a small box to create a room. A dark surface of flat black was prepared inside the box. I initially tried using a CD case for a transparent panel or wall. The CD case was placed open on its side at a 90 degree angle with a dark surface of black construction paper attached to one side, and the opposite side remaining transparent. An LED light source was affixed to the back of the transparent side. A model figure of a ghost made of white material was place in the forward portion of the box in front of the light source. A background scene for contrast was placed the rear area of the box with another small light source to illuminate the background. Cut a small square shaped opening (about 6 centimeters) on the end of the box closest to your forward light source. A light switch was then installed. With a lid installed, I then turned the forward light source on and off and rated the quality of the illusion with the ghost appearing and disappearing. Variables with light intensity, background and subject color contrasts were made. Results My observations indicated that the darkest backgrounds within the model and the brighter the lights I used in the forward portion of the box yielded the better images. Conclusions/Discussion My goals were initially met of being able to create the ghost image. I found that darker backgrounds and a brighter light illuminating the ghost image produced the best contrasts with the materials available to me. I am continuing experimentation with transparent and reflective materials to improve both the transparent and reflective qualities of the images.	
Summary Statement This project examines virtual images created with several parameters of reflected and transparent surfaces on a small scale model using Pepper's Ghost illusion technology.	
Help Received My father helped me assembled some key areas of the project. All other work was mine.	