



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Matthew G. Arnall	Project Number J1801
Project Title Stealth: Applying Wave Theory to Affect Visibility	
Abstract Objectives/Goals My objective was to show how to make an object invisible or less visible. I believed that an object should become less visible by changing its angle of incidence to a light source, which by applying the Law of Reflection, should change the amount of light reflected back to the eye or any other sensor. Methods/Materials I fashioned objects from identical size pieces of white foam board: one being a single plane object, and the others being two-plane objects with different interior angles. I set each object on a stand at a fixed distance from my light source. At night in the dark, I shined the light on each object. I varied the angle of incidence of the single plane object and measured the reflected light at each of those angles using a lux meter. For each of the two-plane objects, I recorded lux meter readings for light reflected from both the interior as well as the exterior angles. Results The angle of incidence of the object to the light correlated directly to the measured amount of light reflected back from the object. For the single plane object, it was a linear correlation. For the two-plane objects, it appeared to be a parabolic correlation. Conclusions/Discussion Light behaves like a wave, and an object can become less visible, or invisible, by changing its angle of incidence to a light source.	
Summary Statement My project applies wave principles to reduce the visibility of an object.	
Help Received Father helped construct test objects and helped locate research materials on the internet, bought a lux meter and photographed me doing testing. Mother helped glue display items on board, and helped type my report and type this form.	