



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

<b>Name(s)</b> Matthew G. Arnall	<b>Project Number</b>  31893
<b>Project Title</b> Stealth: Applying Wave Theory to Affect Visibility	
<b>Objectives/Goals</b> 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. <b>Abstract</b> <b>Methods/Materials</b> 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. <b>Results</b> 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. <b>Conclusions/Discussion</b> Light behaves like a wave, and an object can become less visible, or invisible, by changing its angle of incidence to a light source.	
<b>Summary Statement</b> My project applies wave principles to reduce the visibility of an object.	
<b>Help Received</b> 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.	