



# CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

Name(s) <b>Christopher E. Chan</b>	Project Number <b>J1304</b>
Project Title <b>Best Shields against Electromagnetic Radiation</b>	
<b>Objectives/Goals</b> The objective of this experiment is to measure how different objects shield against electromagnetic radiation emitted by cell phone towers, high tension wires, electrical poles, and radio towers.	<b>Abstract</b> Five walls of the same size and shape were constructed from Douglas Fir wood, each insulated with different materials to comply with the Los Angeles 1-2 Family Residential Building Code and materials that could block radiation. A High Frequency Electromagnetic Field (EMF) meter was used to measure the amount of dBm's (decibels per milliwatt) one inch from the center of the walls. The measurements were repeated five times behind five walls and once without walls at ten and fifty feet from eight poles (two electrical poles, two radio towers, two high tension wires, and two cell phone towers).
<b>Results</b> The following poles are listed in order from highest to lowest average amount of electromagnetic radiation that was emitted (in dBm): cell phone towers (-27.35;-28.34), high tension wires (-41.57;-41.16), electrical poles (-49.52;-47.39), and radio towers (-46.72;-46.75).  The following walls are listed from average best to worst shield against electromagnetic radiation (in dBm): galvanized sheet metal (-43.28;-43.75), EMF shielding foil (-42.44;-43.74), grounded wire mesh (-42.04;-42.63), aluminum foil (-41.41;-42.12), and standard wall with R13 insulation (-40.68;-42.01).	
<b>Conclusions/Discussion</b> The galvanized sheet metal was the best shield against electromagnetic radiation. This proves that simple, inexpensive modifications to walls can provide protection to people who are exposed to poles that emit electromagnetic radiation.	
<b>Summary Statement</b> Lining standard walls with additional material increases the amount of protection against electromagnetic radiation emitted by eight different poles.	
<b>Help Received</b> I appreciate my father's help with safely constructing the five walls and driving me to the testing sites.	