



**CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY**

Name(s) Wesley N. Weisenberger	Project Number J1315				
Project Title I Need to See through Walls					
<table border="1"><thead><tr><th>Objectives/Goals</th><th>Abstract</th></tr></thead><tbody><tr><td><p>My Project was to determine how electromagnetic waves were attenuated through various materials and figure out how to make the WiFi in our house faster.</p><p>Methods/Materials</p><p>A wireless router was placed in the bottom of an open top wooden box with material coating the sides to absorb reflected waves. Samples with different thicknesses of materials were placed on top of the box. A WiFi receiver was placed on a frame at a constant distance from the source and the signal was read from a computer in dBm and compared on a chart.</p><p>Results</p><p>My actual results are plotted in my science fair display.</p><p>Metal attenuated the signal.</p><p>Paper, wood and glass had significant attenuation in the range of 35%.</p><p>Water had high attenuation that amounted to about 80% as did the human body.</p><p>Conclusions/Discussion</p><p>The attenuation of the human body is probably due to the high water content. I was surprised at the amount of attenuation of wood and paper. Library shelves and walls could give unexpected attenuation. I expected water to have significant attenuation, but it was far higher. It almost blocks WiFi. Water attenuates visible light, but you can still see 20 feet into the water. Water goes through our walls for radiant heat and should be avoided.</p></td><td></td></tr></tbody></table>		Objectives/Goals	Abstract	<p>My Project was to determine how electromagnetic waves were attenuated through various materials and figure out how to make the WiFi in our house faster.</p> <p>Methods/Materials</p> <p>A wireless router was placed in the bottom of an open top wooden box with material coating the sides to absorb reflected waves. Samples with different thicknesses of materials were placed on top of the box. A WiFi receiver was placed on a frame at a constant distance from the source and the signal was read from a computer in dBm and compared on a chart.</p> <p>Results</p> <p>My actual results are plotted in my science fair display.</p> <p>Metal attenuated the signal.</p> <p>Paper, wood and glass had significant attenuation in the range of 35%.</p> <p>Water had high attenuation that amounted to about 80% as did the human body.</p> <p>Conclusions/Discussion</p> <p>The attenuation of the human body is probably due to the high water content. I was surprised at the amount of attenuation of wood and paper. Library shelves and walls could give unexpected attenuation. I expected water to have significant attenuation, but it was far higher. It almost blocks WiFi. Water attenuates visible light, but you can still see 20 feet into the water. Water goes through our walls for radiant heat and should be avoided.</p>	
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Summary Statement It is about the variable nature of Electromagnetic absorption with different materials.					
Help Received Dad bought materials and also was my assistant for measurements. We also discussed the nature of light. Dad read over project and made comments.					