



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> <b>Kia R.R. Hayes</b>	<b>Project Number</b> <b>J0715</b>
<b>Project Title</b> <b>What Barrier Materials Reduce Wireless Computer Signal Range? Why Does WiFi Not Fly Further?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> My objective was to learn how the range of a WiFi wireless computer signal is reduced by passing through different barrier materials. My research led me to believe that metal materials would completely block the signal while other materials would reduce its range.</p> <p><b>Methods/Materials</b> A WiFi wireless computer base station was surrounded by different materials including redwood blocks, aluminum foil, a metal pan, two types of wire mesh, two types of #Faraday# cages, cinder blocks, and bricks. A laptop computer was moved away from the base station until the computer lost the wireless signal. The distance from the base station that the signal reached was measured for each of the materials.</p> <p><b>Results</b> Redwood blocks greatly reduced the range of the wireless signal. The metal and other materials did not have as much influence on the signal range as I expected.</p> <p><b>Conclusions/Discussion</b> My conclusion is that redwood blocks significantly reduce the range of a WiFi wireless signal. My other conclusion is that there is some unexplained reason why the metal pan, aluminum foil, wire mesh, and Faraday cages did not greatly reduce the range of the wireless signal. I want to find out why. Understanding how different materials block wireless signals will help people set up their wireless computer networks more effectively.</p>	
<b>Summary Statement</b> My experiment tested how the range of a WiFi wireless computer signal was reduced by passing through different materials.	
<b>Help Received</b> My Dad helped me wire the grounding circuit for the Faraday cages. I borrowed a laptop computer from my school.	