Wi-Fi

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Brief: Ali’s research was inspired by the third-grade science fair at his school.

Abstract
Wi-Fi is a wireless signal that can be blocked by certain materials.

Introduction
Wi-Fi is a wireless signal used to send and receive information in a radio signal, like your dad’s phone. To get a Wi-Fi signal, you first have to get a connection with a router or a little box with antennas used to send a signal to what you’re trying to get Wi-Fi on. For an example, the router is saying it’s SSID. For an example again, let’s pretend your router’s name or SSID is HOME-47C2, then your router is like, "HOME-47C2 here anyone who needs to connect to HOME-47C2?" And if your router has a password, it would be like, "Okay, sure you can connect to HOME-47C2."
Introduction continued...

but first you need to give the password. So, in a basic way that's how Wi-Fi works.

Hypothesis

If we use Aluminum foil then the net signal will be stopped.

Materials

1. App to record the strength of the Wi-Fi signal
2. A wireless router
3. Aluminum foil, Steel container, Glass container, and a plastic container
4. Lab notebook and pencil
5. Phone to take pictures
Methods

Set up a wireless router on one table, and make sure the router isn't on a crowded Wi-Fi channel. Keep the setup the same for each trial. Install a Wi-Fi signal measuring app on a wireless device and put it on the opposite table; and don't move the router or wireless device because this may affect your results. You record all trials for the control and record average and leave attenuation blank. Use a material to cover the router, and record in dB or Decibel milliwatts by looking how high or low it went on your Wi-Fi signal measuring app. Repeat the previous step for all your materials. For average you round to the nearest number that all your trials got on. Then for attenuation you put how much the material blocked the signal, and if the material didn't block the signal leave it blank.
Results
The aluminum foil blocked the Wi-Fi signal most, and the steel’s attenuation got very close to the aluminum foil’s attenuation. Glass and plastic also got very close because glass’s attenuation was one, and glass was two, and they both didn’t block the Wi-Fi signal very much. The experiment went well because we had a good Wi-Fi signal app that gave us the exact number.
I observed how the Wi-Fi signal changed so I could see which material is best to block a Wi-Fi signal. The Wi-Fi signal data I collected was three trials to determine what the average was and attenuation was to see how much the material blocked the Wi-Fi signal in dBm or Decibel Milli Watts.

Table 1.

<table>
<thead>
<tr>
<th>Materials</th>
<th>Trial 1</th>
<th>Trial 2</th>
<th>Trial 3</th>
<th>Average</th>
<th>Attenuation (dBm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>62</td>
<td>61</td>
<td>61</td>
<td>61</td>
<td>None</td>
</tr>
<tr>
<td>Glass</td>
<td>63</td>
<td>62</td>
<td>62</td>
<td>62</td>
<td>1</td>
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<tr>
<td>Plastic</td>
<td>64</td>
<td>63</td>
<td>64</td>
<td>64</td>
<td>2</td>
</tr>
<tr>
<td>Aluminum foil</td>
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<td>76</td>
<td>78</td>
<td>78</td>
<td>17</td>
</tr>
<tr>
<td>Steel</td>
<td>75</td>
<td>74</td>
<td>75</td>
<td>75</td>
<td>14</td>
</tr>
</tbody>
</table>

Conclusion

My hypothesis was right on which is the best material to block a Wi-Fi signal because the aluminum foil which was my hypothesis blocked the Wi-Fi signal most.

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About the Author: Ali is a third-grade student at Dan Mills Elementary School.