



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) Justin K. Yeh	Project Number J0735
Project Title Cell Phone Radiation	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals On Oct 14 2004, Reuter News reported a study by Sweden Karolinska Institutet showing that ten or more years of mobile phone use increases the risk of developing acoustic neuroma. The TCO 99 standard for computer monitor limits the EMF to 2mGauss at a distance of 30 cm from the front of the monitor. If I apply the TCO 99 standard to a cell phone how far do I have to be to get an EMF exposure of 2mG? My HYPOTHESIS was that the minimum distance from a working cell phone to get an electromagnetic field exposure of 2mG was 4 cm.</p> <p>Methods/Materials Using 8 different cell phones, I measured the distance from the phone when the EMF is 2 mGauss for 5 modes: standby, connect, listen, talk and listen+talk; with MagnaScan 88 EMF detector from LeeF Technology Inc.</p> <p>Results The distance to 2mG for standby mode was 0 cm for all 8 phones. The average distance for connect mode was 12.39 cm, with the shortest being 2.12, and the longest being 33.02. The average for listen mode was 13.6 cm, with the range of 4.23 to 33.02 cm. The average for talk mode was 13.92 cm with the range of 3.39 to 33.02 cm. Finally, the average for listen + talk mode was 18.67 cm, with the range of 2.96 to 43.18 cm.</p> <p>Conclusions/Discussion My hypothesis is incorrect. In most of the modes, all but 2 cell phones emitted 2 mGauss of EMF for a distance of more than 4 cm. The average distance of listen + talk was the longest at 18.67 cm. I expected that because listen + talk mode involves two frequency bands, thus more EMF. I was surprised that connect mode generated almost as much as the listen + talk mode. That suggested that even though when there wasn't any one talking, the cell phone continues to send and receives signals. Further research is needed to see why there is such a great variation of EMF emission among the cell phones and how to lower the radiation.</p>	
Summary Statement My project was to measure the EMF from 8 cell phones using 5 different modes: standby, connect, listen, talk and listen+talk mode.	
Help Received Sister Tiffany helped me with the measurements. Mother helped decorate the poster. Relatives provided some of the cell phones. My father's friend, David Law, provided the MagnaScan 88.	