



**CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY**

Name(s) Sydney A. Walthall	Project Number S1720
Project Title Radiation Shielding: Testing Simple Radiation Shielding Methods in a Cloud Chamber	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of my project was to determine what types of materials are most effective in blocking alpha and beta radiation. I hypothesized that all the tested materials would be able to block radiation, but that the aluminum foil and cardboard would work better than the paper, cloth, or plastic wrap.</p> <p>Methods/Materials A cloud chamber was constructed and a lead 210 (210Pb) needle radioactive source was obtained for this experiment. The cloud chamber was used to indirectly observe the condensation trails of radioactive decay particles from the lead 210 needle. To test each material, aluminum foil, cardboard, plastic wrap, paper, and cloth, the lead 210 needle was wrapped with the material being tested. The number and type of condensation trails formed by radioactive decay particles in the cloud chamber were counted and described. Each material was tested three times.</p> <p>Results All the radiation shielding materials tested significantly reduced the number of observed radioactive particles in the cloud chamber. Paper and plastic were the most effective at blocking radiation because no condensation trails were observed in those tests. A small number of radioactive particles were observed in the cardboard and aluminum foil tests, probably due to incomplete coverage.</p> <p>Conclusions/Discussion My conclusion is that radiation found in the natural world, alpha and beta particles, can be blocked by basic everyday materials, like clothes, cardboard and plastic.</p>	
Summary Statement I conducted experiments in a cloud chamber to determine the ability of different materials to block alpha and beta radiation.	
Help Received I built the cloud chamber and conducted the experiment myself, and I used the Science Buddies website for instructions on how to build a cloud chamber.	