



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Madison R. Utrecht	Project Number J2428
Project Title Geckos, the Amazing Wall Climbers: How Do They Do It?	
Abstract Objectives/Goals My objective was to find out how geckos are able to walk on walls and ceilings, and if there are any materials that they can't stick to. Methods/Materials Several different materials were prepared by securing them to rigid pieces of cardboard. A material sample was selected and placed on the bottom of a clear box. A juvenile gecko was placed on the material. The gecko was observed on the material as the box was rotated about one edge, creating a steep incline. If there was any sliding of the gecko's feet, then the height of the lifted edge of the box was recorded. The angle and the coefficient of friction were then calculated. Two geckos were observed for each material sample. Results Four out of nine of the materials tested made the geckos slip. These materials were vinyl, wax, soap, and Teflon. Sliding was observed on the wax and Teflon at the shallowest angles. The geckos did not slip on aluminum foil, Teflon tape, acetate, Mylar, or glass. Conclusions/Discussion My conclusion is that there are materials that geckos have trouble sticking to. Gecko adhesion is made possible by a molecular force called the Van der Waals force. I think that the geckos slid on the Teflon because the molecules in Teflon are firmly bonded and therefore resistant to the Van der Waals force. The geckos may have slid on the wax because the wax that the geckos attached themselves to rubbed off of the main wax block.	
Summary Statement I tested geckos' ability to walk on different materials to find out whether there were any materials that they were unable to stick to.	
Help Received My mother helped with typing, preparing materials, and handling the geckos.	