



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Carolyn P. Coyle	Project Number J0205
Project Title Some Variables Affecting the Torque Required to Turn a Screw	
Abstract Objectives/Goals The objective of my project was to measure how much torque in newton-centimeters was required to turn a lag screw in a block of wood as the diameter of the screw, the depth of the screw, or the size of a pilot hole was changed. Methods/Materials Torque was measured by pulling perpendicularly on the handle of a socket wrench with a spring scale and measuring the force required to begin turning the screw in a large block of wood. Each trial was performed three times. The first experiment measured the differences in torque needed to turn screws with different diameters at a fixed depth in the wood. The second experiment measured the differences in torque needed to turn the same screw at different depths. The third experiment measured the differences in torque needed to turn identical screws at a fixed depth in the wood as the sizes of pilot holes were varied. Results Progressively more torque was needed to turn the screws as the diameter of the screw increased, as the depth in the wood increased, and as the size of the pilot hole decreased. Conclusions/Discussion My experiment showed that there was a significant difference in the amount of torque required to turn a screw as each of the three variables was changed. These findings have a practical use in the design of tools and the use of building materials.	
Summary Statement My project quantifies the amount of torque required to turn a screw under different conditions.	
Help Received Father helped design project and gather materials; Father drilled holes in wood.	