



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Shannon N. McClintock	Project Number J0219
Project Title The Little Engine That Could: Enhancing Traction through Friction	
Abstract Objectives/Goals The objective is to find a material which could enhance the traction for a train. Though fine silica (sand) is already employed in certain situations, a different substance might provide greater value. Methods/Materials An experimental device was constructed using two abutting fly-wheels to simulate a train and its track. A cycle computer with cable and sensor was used to measure how the application of different materials improved the ability of the wheels to reach a maximum acceleration. Results Garnet 100 grit performed most desirably with an average increase in acceleration of 44.87%. Garnet 36 grit also achieved a higher percent than sand (37.93%) with a 39.85% increase. Garnet 80 grit, Garnet 60 grit, Vitreous Smelter Slag 30-60 grit and Vitreous Smelter Slag 35 grit improved acceleration 33.74%, 37.64%, 31.81%, and 29.35% respectively. Vitreous Smelter Slag 16-30 grit and beeswax rendered no successful reads. Conclusions/Discussion Garnet 100 grit performed an average 6.94% better than silica due to its high density and fine consistency. It is able to penetrate and fill small crevices in a train's wheels while withstanding the weight of a locomotive.	
Summary Statement The Little Engine That Could (Enhancing Traction Through Friction) addresses the performance of different substances when employed in increasing a train's traction.	
Help Received Father assisted in obtaining materials and assemblance of mechanical device.	