



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

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| Name(s) Nicholas Vanhecke | Project Number J0128 |
| Project Title Aerodynamic Efficiency | |
| Abstract Objectives/Goals The objective of my science project is to find out, with the help of my scratch built wind tunnel, if the aerodynamics of a locomotive affects its wind resistance. I am also trying to find out which locomotive is the most aerodynamic out of the four I am going to test. Methods/Materials Four locomotives will be built from different eras: A 1920's steam locomotive. A 1950's streamlined diesel-electric locomotive. A 1980's flat nosed freight locomotive and a modern bullet train. These will be placed in the wind tunnel and subjected to different wind speeds. The resistance of each locomotive will be measured in grams by a slim pen scale attached to the front of the locomotive and the stationary base. Results The locomotive with the least amount of resistance was the modern bullet styled locomotive. The second was the streamlined 1950's diesel. The 1980's freight locomotive was third and the 1920's steam locomotive was fourth. Conclusions/Discussion My conclusion is that aerodynamics plays a very important role in the locomotives efficiency. The earlier locomotives did not reach high speeds and therefore wind resistance was not taken into consideration. As locomotives became more powerful and their speed increased, aerodynamics had to be taken into consideration for efficiency, speed and safety. | |
| Summary Statement Aerodynamic efficiency of train locomotives over the past 100 years. | |
| Help Received Mrs. Lashlee (Science teacher): Project preparation. Father: Use of power tools in construction. Photographs. | |