



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Austin J. Hiatt	Project Number J0214
Project Title Determining the Fastest Gear Set-Up on a Single Speed BMX Bike through a Designated Course	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of my project is to determine the best gear combinations and crank arm lengths for a single speed BMX race bike on a designated course.</p> <p>Methods/Materials A 2006 Redman Expert XL BMX Racing Frame with 20" wheels was used with 6 different gear set-ups with 160mm and 165mm crank arms. A testing course was selected on an American Bicycle Association Sanctioned Track and measured with a measuring wheel. Using a hydraulic strating gate and a line and cones marking the finishing point, I tested the different gear set-ups using a stop-watch to track the results. I rested during each gear change as to be sure that fatigue would not effect the results.</p> <p>Results After running several tests on the designated course, I recorded my results on a chart. The smaller front chain ring and rear cogs with the 165mm crank arms proved to be the fastest combinations.</p> <p>Conclusions/Discussion After testing the gear combinations, I realized that the 37 front chain ring gear with a 13 rear gear using the 165mm crank arms produces the fastest average time on the first straight of Tulare BMX track. This set-up had the perfect resistance against my feet at top end speed and surprisingly did not take that much effort to get moving. The slowest set-up was the 43 front chain ring gear with a 16 rear gear using the 165mm crank arms. This set-up was the easiest to get going because of the torque it produces during the start. However, the gear had lost all resistance against my feet at top speed.</p>	
Summary Statement My project is about finding the fastest gear set-up for me that has the fastest time on the first straight of a BMX course which is a crucial part of the track in a BMX race.	
Help Received My dad helped with the timing and changing gears during the testing as well as helping to put the board together.	