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

Abstract
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.

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.

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 starting 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.

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.

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.

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.