Name(s)	Project Number
Elizabeth Kravtchenko	**J1416**

Project Title
How Math Helped Me Become an All-American Athlete

Abstract

Objectives/Goals
The purpose of this project was to find out if completing the most challenging triathlon races as a youth athlete would help you become an All-American triathlete (rank top 10% nationally in your gender and age group). At the beginning, my hypothesis was: If I complete the longest and the most difficult races, then I will get a very high ranking score. After my research and analysis, I revised my hypothesis to: If I complete the shorter and easier races, then I will get a very high ranking score.

Methods/Materials
In my theoretical research and analysis, I used mathematical modeling and numerical methods to derive and solve complex exponential equations. First, by hand, using paper and pencil. Then, using the Desmos graphing calculator on my phone. Finally, using the advanced Excel functionality on the computer. In my experimental method, I completed multiple long and short distance triathlon races. My dependent variable was my race score. My independent variable was the time it took me to finish the race of a certain distance. I used the basic materials and equipment needed to complete my races.

Results
In my project, I combined the knowledge from sports sciences with my analysis of the race scoring algorithm to gain valuable insights and adjust my competition strategies. My mathematical analysis showed that shorter and easier races would produce higher race scores. Indeed, in the shorter and easier races, my scores were higher.

Conclusions/Discussion
My initial hypothesis was incorrect. My revised hypothesis turned out to be correct and it was strongly supported by my experimental results. Based on my analysis and results, I formulated several recommendations for USA Triathlon: how to improve the existing scoring algorithm and how to balance out the triathlon races. Understanding the science and data behind the races allowed me to choose the right racing strategies and achieve my goal. I received a high overall ranking score, which got me an All-American Honor.

Summary Statement
My project is a story of how applying a scientific method and choosing the right racing strategies based on math and data helped me become an All-American triathlete.