



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Charlotte B. Monke	Project Number J1721
Project Title Energy Drinks and Their Effect on Reaction Time in Youth	
Abstract Objectives/Goals The objective is to determine if young people react to a light signal faster after drinking an energy drink. Methods/Materials Twenty-three students, aged 12-14, are placed into either an experimental group or a control group. The experimental group is given 8.6 oz. of Red Bull Energy Drink mixed with red food coloring to avoid subjects from recognizing the normal Red Bull color (which is yellow). The control group is given 8.6 oz. of a placebo mixture of Sprite Zero (sugar-free) soda and concentrated Sugar-Free Raspberry Syrup. The two drink solutions look similar. An application called #Reaction Time# is used to measure reaction time. The application shows a green stop light that turns yellow then red. The person being tested must push a button on the screen with their index finger as soon as the light turns red. The reaction time, in milliseconds, appears. The students take the test three times for average, both before and 45 minutes after ingesting one of the two drink solutions. Results Students had no change in average reaction time (<0.5%) after drinking the control drink, which contained no sugar and no caffeine. Students had a 19% reduction in reaction time after drinking Red Bull Energy Drink. Average Pre-Drink time was 444 ms and average Post-Energy Drink time was 361 ms. Reaction times of males and females were also analyzed. Males were 16% faster than females before ingestion of any drink. Males and females had a decrease in reaction time by a similar percentage after drinking the energy drink. Conclusions/Discussion Recent research has warned of some dangers of energy drinks for youth. Some reports say they can cause heart problems or anxiety. In my experiment I found that there can be benefits to having energy drinks. Drinking energy drinks decreased reaction time to a visual signal, probably because of the high amounts of caffeine or some other ingredients found in the energy drink. If a faster reaction time means a faster #eye to muscle connection,# energy drinks could be used to swing at a baseball earlier if a pitch is a strike or determine which way to move earlier for blocking a soccer penalty kick. More tests need to be done to find out what specific ingredient makes kids faster after drinking energy drinks. Although energy drinks get bad publicity, they could have some benefits.	
Summary Statement This experiment shows that drinking an energy drink can make young people have a faster reaction time to a visual signal.	
Help Received Dr. Brian Tsukimura, Fresno State University Department of Biology, gave me advice about the experiment design. My father helped with making the drink solutions, teaching me to use the board layout software, getting the supplies, and typing. My science teacher, Mrs. Salazar, helped find students	