



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Tanishq Bhatnagar	Project Number J2099
Project Title Caffeine Overdose in Energy Drinks	
Abstract Objectives/Goals This project is a result of the alarming number of emergency room visits by young adults consuming energy drinks. Most energy drink manufacturers claim that these drinks are as #safe# as coffee. The purpose of this project was to find out if energy drinks increase heart rate of people more than coffee does, and also determine which energy drink among the three popular ones, Red Bull, Monster Energy, and 5-hour Energy increases heart rate the most. Methods/Materials Materials: Red Bull, Monster Energy, 5-hour Energy, Daphnia magna, Starbucks pike place coffee, Petri dishes, eyedroppers, beakers, slides, microscope. Method: I decided to use Daphnia magna as my test subject. I first recorded the heart rate of Daphnia in distilled water (1st control group) and then in different concentrations of Pike Place Starbucks coffee (2nd control group). I then exposed Daphnia to different concentrations of the three energy drinks and recorded their heart rate and compared it to the two control groups. Results The heart rate of Daphnia exposed to Red Bull increased by 0%-14%. Daphnia exposed to Monster energy drink showed an increased heart rate of 3% - 15%, and Daphnia exposed to 5-Hour Energy showed an increased heart rate of 6% - 25%. All energy drinks did increase heart rate of Daphnia. Conclusions/Discussion All the energy drinks chosen for the experiment did increase the heart rate of Daphnia magna. The rate of increase however, was not the same for similar concentration of the different energy drinks chosen for the experiment. Analyzing my results I concluded that Red Bull had no significant effect on the heart rate of Daphnia and could be the safest energy drink of the three energy drinks tested, Monster energy drink may increase heart rate to some extent and may be harmful, and 5-hour Energy will significantly increase heart rate and may be quite detrimental as research shows that 10 to 22 additional beats per minute, i.e a 14% - 25% increase in human resting heart rate, raises the likelihood of death by 16%.	
Summary Statement The purpose of the project is to highlight the harmful effects of energy drinks especially on teens and young adults who are using these drinks to cope with mental and physical stress.	
Help Received My teacher, Ms. Anu Toutem helped me order the Daphnia and my sister helped me with the project.	