



Colorado Science and Engineering Fair

2024 Individual Project Abstract Form

Please print 2 copies of the completed form. Sign both copies, keep 1 for your notebook and submit 1 copy to your Regional Fair Director with your other paperwork.

Title of Project: The effects of stimulants and depressants on the heart rate of Daphnia

Finalist's Name: Zaira McGee

School and City: Summit Charter Middle

Sponsor's Name: Valerie Keeney

Category: Behavioral & Social Sciences (BEHA)

Division: Junior (6th - 8th grades)

Abstract (250 words or less):

The purpose of this project was to visually express the effects of stimulants and depressants on the heart. The hypothesis is Daphnia's heart rate increases with the stimulant solution and decreases with the depressant solution at a linear rate. Remove one Daphnia via pipet from its beaker of cultured water and place it on one cavity slide under the microscope. Use the stopwatch to track the untested average of the Daphnia's heart rate (bpm) in a minute. Do five trials of the untested Daphnia. This will be used to compare to the tested data sets. Then repeat for all levels caffeine and alcohol. My two main graphs are scatter plots one showing the linear increase in heart rate with the caffeine with an R2 value of 0.78 and the other showing the linear decrease in heart rate with the alcohol solution with an R2 value of 0.992. The R2 value means how much it increases and decreases per change. The other four graphs are comparing the control group to each level of caffeine solution and alcohol solution. The findings of the project were that the higher increase in caffeine concentration increases the daphnia's heart rate at a linear rate as well as the higher the depressant concentration decreases the daphnia's heart at a linear rate. The graph shows a linear increase in Daphnia's heart rate with higher caffeine concentrations as well as a linear decrease in Daphnia's heart rate with higher depressant concentrations.

I hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I also attest that the above properly reflects my own work.

Finalist's Signature:

Date:

2/28/24

In addition, all students must complete the ISEF Student Checklist (1A), Research Plan, Approval Form (1B), and Checklist for Adult Sponsor (1), and any other ISEF forms required for this type of project. See the International Rules and Guidelines for form requirements. Return COPIES of all of these forms to your Regional Fair Director with your Finalist Verification/Permission Form. A signed copy of this form must be included in your notebook.