



**CALIFORNIA SCIENCE & ENGINEERING FAIR  
2018 PROJECT SUMMARY**

<b>Name(s)</b> <b>Ishika Masson; Shania Relucio</b>	<b>Project Number</b> <b>S2209</b>
<b>Project Title</b> <b>Effects of Caffeinated and Non-Caffeinated Beverages on the Physical Mechanisms in Animal Movement Processes: Lumbricus</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> As Hunger remains the leading source of death in today's world, it is important for all of us to do something for our brothers and sisters. While doing our weekly AP World History homework, in the textbook we stumbled upon a picture of some malnourished children. From this we were inspired to help our peers out by creating a project that moves towards hunger being diminished. Thus quantifying the effects of energy drinks on the movement activity of Lumbricus Terrestris and How will giving Red Bull, Sugar-Free Redbull, Gatorade, Sucrose Solution, Soda, 5-hour energy drink, and caffeine affect the distance moved on a grid by the clitellum and frequency of clitellum contractions for 2 minutes after exposure to various fluids?</p> <p><b>Methods/Materials</b> We used 84 worms purchased from a local department store and tested them over the course of two trails. We tested eight different beverages including Red Bull, Red Bull Sugar-Free, Gatorade, Sucrose Solution, Soda, 5 hour Energy, Coffee, and Water. We first placed the lumbricus Terrestris on a grid and measured its distance by looking at how many boxes the clitellum covers without any exposure to fluids. Then, we gave them various fluids a week before we started measuring them. Then after a week of them consuming different fluids, we measured out how far the lumbricus Terrestris traveled by looking at how far the clitellum moved for 2 minutes on a grid.</p> <p><b>Results</b> In our first trial, there was no possible data because all our Lumbricus Terrestris had passed away. However in our second trial the Lumbricus Terrestris seemed to move slower when given caffeine and they increased in size. The average movement of the Lumbricus Terrestris for caffeinated drinks over the course of one minute was 6 boxes covered and the average for non-caffeinated drinks was 8 boxes moved over the period of one minute.</p> <p><b>Conclusions/Discussion</b> Our hypothesis did not match up to the results we got because we predicted that the worms would move faster when given caffeine, while in reality their speed slowed down. While we did not see an increase in their movement, we did notice that the worms seemed to be bigger than when we first got them. The next steps could include using different organisms such as those with vertebrates and testing more beverages with different concentrations to see how it affects the movements.</p>	
<b>Summary Statement</b> We measured the distance moved on a grid by the clitellum and frequency of clitellum contractions for 2 minutes after exposure to eight different beverages.	
<b>Help Received</b> Our Science Fair advisor helped us with creating a plan on how to test the Lumbricus Terrestris.	