



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Rebecca D.E. Wehrle	Project Number S1920
Project Title Snake Locomotion: Analysis of Forces	
Abstract Objectives/Goals The purpose of this project is to look into the pattern of force exerted during lateral undulation, the most common form of snake locomotion. Methods/Materials I analyzed the forces involved in this movement by running my snake through a trough of sand (repeated five times) and recording through photography. I hypothesized that the force exerted at each vertex of the sinusoidal curve will be the greatest exerted. I analyzed the data to find three common types of #sand mounds# created and I reproduced them by using a prosthetic snake of the same approximate density and diameter as my subject. Results I found that A (the track leading towards the outside vertex) was on average the product of 1.3 times the force needed to create B(the track leading towards the inside vertex) and that the force exerted to make C (track approximately perpendicular to the direction in which the snake was traveling) was significantly reduced compared to A and B. Conclusions/Discussion All the tracks were produced with the vertices of one side of the sinusoidal curve against the wall of the trough and so I conclude that some force was exerted on the wall, creating an uneven pattern of force in the sand.	
Summary Statement This project is about how forces are distributed within a snake track.	
Help Received Mr. Fabini lent me a spring scale and suggested that I should try to recreate the tracks as opposed to look at the properties of the sand. My father helped clean up the edges of the display. My parents put up with a sand trough on their counter for a year.	