CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY

Name(s)
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Project Number
J0909

Project Title
It's My Fault, I Couldn't Handle the Pressure: Compression Obsession

Abstract

Objectives/Goals
The purpose of this experiment was to understand geological folding patterns of different earth materials while under the stress of lateral compression. I focused on continent-to-continent convergent plate collisions that create fold mountains. I tested the height of anticline folds, distance of first overturned folds and total number of folds? My hypothesis was that diatomaceous earth would result in the highest anticline fold and create the quickest overturned fold. I believed that sand would produce the most folds.

Methods/Materials
I built a "compression box" that pushed a wood plate forward. As this lateral compression moved forward I recorded data at 10, 20 and 30 centimeters. I used diatomaceous earth, sand and pea gravel (independent variables). Data was recorded for the height of anticline folds, distances of overturned folds and for how many folds were created at 30 centimeters (dependent variables). The rate of compression, distance of compression and volume of material used were my controlled variables.

Results
My experiment revealed that diatomaceous earth made the highest anticline folds at 10, 20 and 30 centimeters with average heights of 9.28, 10.25 and 11.11 centimeters respectively. The further the compression plate moved forward the closer in height all three materials became. Diatomaceous earth's anticline height at 10 centimeters was 2.72 centimeters higher than sand and 2.53 centimeters higher than pea gravel. However, at 30 centimeters the height of diatomaceous earth's anticline fold was only 0.36 centimeters higher than sand and 0.65 centimeters higher than pea gravel. Diatomaceous earth's variability was greater at 10 centimeters of lateral compression and less at 30 centimeters while pea gravel's variability was the opposite - smaller at 10 centimeters and larger at 30 centimeters of lateral compression. Diatomaceous earth resulted in the first overturned fold at an average distance of 16.79 centimeters. Diatomaceous earth was the only material to create multiple folds at 30 centimeters of lateral compression.

Conclusions/Discussion
Understanding geological folding patterns of our earth's crust is important. We can improve our understanding of concepts such as climate change and responsible harvesting of natural resources. I believe geoscientists would benefit mostly from my experiment's data. My experiment also clearly shows what is happening beneath the surface of our crust.

Summary Statement
Using lateral compression, my project tests different earth materials to determine the height of anticline folds, the distance of the first overturned fold and the total number of folds created.

Help Received
I designed and carried out this project by myself. My neighbor provided assistance and supervision with the construction of the compression box.