CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
Sean T. Carroll

Project Number
J0801

Project Title
Toil with Soil: Is There a Relationship between Soil Color and Its Iron Content?

Abstract

Objectives/Goals
My objective was to determine if the color of soil can predict the presence of iron.

Methods/Materials
Materials: 1 each of ACE Hardware paint color cards of all brown tones;3 samples of ¼ cup each of red (clay),yellow (sandy),and brown(loam)soil purchased from Science Kit and Boreal Laboratories; Nine Bowls,473.1 mL; 1 set KitchenAid measuring cups; Nine Kirkland Brand Paper towels; One 2#Almico Horseshoe Magnet style #07225 from The Magnet Source; Nine pieces of 12 inch string-Ace Multi-purpose Twine #24 twisted cotton,Light load 3lb. limit;4.262 Liters Water;One triple beam balance scale
Procedure: A.Match each soil sample to its corresponding shade on paint cards
B. Weigh one clean paper towel and record C. Measure ¼ cup soil from the soil sample D. Fill up a bowl with 1 cup of water and ¼ cup of soil and mix for 30 sec. E. Put a strong magnet on a string and dip it in the water, move it slowly around the bowl F. After a minute, pull up the magnet and wipe it on a paper towel. G. Weigh the paper towel and its contents in grams and record weight on paper H. Subtract the weight of the clean paper towel from the paper towel used to wipe off the magnet to get the iron weight and record I. Repeat steps C through H three times for each of the three soil samples:
Brown loam(Wild Wild West);Red clay(Outpost);Yellow sandy(Wagon Wheel)

Results
Surprisingly,the brown loam soil(Wild Wild West)had the lead in the highest iron content by a significant amount of iron. The second highest amount of iron was the red clay soil(Outpost)and the least amount of iron was the yellow sandy soil(Wagon Wheel).

Conclusions/Discussion
Conclusion: My conclusion is that my hypothesis was not proved and brown soil had the highest amount of iron.
Discussion: Two soil layers called horizons are named topsoil and subsoil. Top soil is mostly decomposed and organic materials and subsoil consists of mineral deposits, clay and bedrock. These soils are a variety of colors and the color can tell us about its chemical composition. A soil red in color usually indicates a high amount of iron in the form of iron oxide. The data in my experiment shows that it would be smart to test soil before making an assumption that only red soil is high in iron. There may be other factors affecting the soil color. Farmers and geologists could save time and money by testing their assumptions before planting or mining.

Summary Statement
This experiments tests whether you can predict a high iron content based on the color of soil.

Help Received
Mother helped type report, helped design board and purchased materials. Teacher helped with editing.

CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
Michael A. Castillo

Project Number
J0802

Project Title
Which Organic Mixing Has the Least Soil Compaction Rate?

Abstract

Objectives/Goals
The purpose of my science fair project is to determine which organic mixings have the least compaction rate when mixed with water and soil. The reason I am investigating this is to determine the best way to prepare the soil to promote maximum growth to plants once they are transplanted into the ground.

Methods/Materials
For testing I will use a 5 gallon bucket with a hole drilled into the side 5in. from the bottom, in the hole will be a wooden dowel with a compaction tool attached to it. For my control I will fill the bucket 3/4 full with soil, then I will add 2 cups of water, then I will place 2 4lb. garden bricks on top of the test soil after 2 minutes I will pull on the compaction tool attached to the dowel to measure the compaction rate (measured in newtons). For my test groups I will repeat these steps but I will also mix in 2 cups of my test substance to the soil before adding the water. My test substances are: grass clippings, leaves, small rocks, wood chips, and potato peelings. I will repeat the test 10 times with each test substance for a total of 60 tests and log results in my data book.

Results
My results showed that all test substances lowered the soils compaction rate when compared to my control test. The leaves and small rock compaction test averaged 9 newtons of compaction, potato peels averaged 8 newtons of compaction, grass clippings were 7 newtons of compaction, while wood chips only had 6 newtons of compaction. Clearly all test substances had an affect on the compaction rate, but soil with the wood chip mixture had the greatest change in compaction by having the least compaction rate.

Conclusions/Discussion
After completing my testing I learned that my hypothesis was incorrect, I thought that by adding grass clippings to soil I would get the lowest compaction rate; when in fact, it was the addition of wood chips to soil that produced the lowest compaction rate. I feel further testing needs to be done on different types of soils to determine if we would have the same results and to find out if a lower compaction rate will allow the root system of a plant an easier time growing through the soil and if this will promote healthier plants and trees.

Summary Statement
The objective of my project was to determine if the addition of organic materials to soil will ease the force of soil compaction.

Help Received
Father took photographs of experiment; Mother helped with typing.

CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
Marissa A. DeVogelaere

Project Number
J0803

Project Title
Should You Look to the Ocean to See What Will Happen in the Sky?

Abstract

Objectives/Goals
We all know that weather is slightly different every year, if not a lot. I wanted to describe the weather patterns in Moss Landing and see if it correlated with ocean surface temperature.

Methods/Materials
By looking at the sky before going to school each morning over the last nine years, I was able to get average weather conditions and calculate how each year was different from average. I was also able to get ocean temperature information from a research buoy in the Monterey Bay that has been recording ocean temperature since 1990.

Results
In general, when the ocean temperatures were cooler than average, there was more fog and less sun compared to the average weather pattern.

Conclusions/Discussion
There were exceptions to the patterns I saw, and more frequent, detailed sampling would probably improve my understanding between the links of ocean temperature and weather.

Summary Statement
I correlated 9 years of weather patterns in Moss Landing (cloudy, sunny, fog, rain, overcast) with local ocean temperature buoy measurements.

Help Received
I was just going to do my project on the weather in Moss Landing, but I thank Mr. Kreeger for suggesting that I correlate it with something else. I thank my father for all his advice on my project, and my mom, who helped with my poster. I also thank my brother for gathering data three years before I started school.

CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
Kent R. Gleim

Project Number
J0804

Project Title
The Toxicity Rate of Pesticide Percolating into Different Soils

Abstract

Objectives/Goals
I am doing this project is because the left over used pesticide will either mix with runoff water, or percolate into soils and seep into ground water, making it undrinkable, wasting millions to filter it.

Methods/Materials
I used a ruler, measuring cup, timer, 5 14 in tubes(with 4 holes vertically on it), crickets, fine soil, coarse soil, cotton balls, (liquid) pesticide, and disposable gloves. I placed 5 tubes next to each other on a wooden base, poured soil into the base tubes, placed a cricket in each of the smaller tubes, plugged the ends with cotton balls, poured 1 oz of the pesticide in a measuring cup, poured 1 oz on each tube, checked the crickets every 15 minutes, 4 times, recorded the data, cleaned out the tubes, repeated the steps, and did repeated this for the other soil.

Results
The pesticide percolated farther down the sandy soil instead of the fine soil, possibly since it had more gaps in between the grains then the fine soil, allowing the pesticide to percolate farther. I also believe that the pesticide could have some how avoided the indicators without poisoning them. Though if neither of those were right, its was possible that the pesticide wasn#t strong enough to show signs that the crickets were effected by the pesticide within the hour.

Conclusions/Discussion
My hypothesis was incorrect. The pesticide percolated farther down in the coarse soil, then the fine soil. I also found that this was possibly due to different 4 theories. The pesticide didn't make contact with the crickets, the coarse grains allowed it to percolate farther, the pesticide was not strong enough to show any effects in the hour, or it just didn't percolate very far. I also found that though the crickets did make contact with the pesticide did, they didn't all die until about 1 hour after. And so, people who use pesticides on rich soil have more time to extract it before it mixes with ground water. Another thing is was that the pesticide seemed slow percolating due to cold temperatures, similar to how oils percolate slower in cold water. farmers, who use pesticides, at risk of tainting ground water, and those near sand based areas, are doing more damage to the environment than they think, even if it doesn't percolate directly.

Summary Statement
Investigating the toxicity rate of pesticide percolating into different soils

Help Received
My mother helped during the experimentation, my father helped shape the tubes, and Mr. Gong helped me write the graphs

CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
Shayne M. Hayes

Project Number
J0805

Project Title
Predicting When My Neighborhood Will Flood Again: A Study of the Sensitivity of the San Lorenzo River

Abstract

Objectives/Goals
The main idea of my science fair project is to come up with a basic mathematical equation that can model the height of the San Lorenzo River using years of river data and some soil saturation tests of my own.

Methods/Materials
Before I create an equation that can model the height of the San Lorenzo River, there is some field data I must collect. One of the variables is the soil saturation, to see how much water will be or is running into the San Lorenzo River while it is raining outside. Because there is no data on the condition of the soil near the San Lorenzo River, I must get that data by testing how much water the soil can absorb. I will get this data by taking two soil samples (one of which is close to 100% saturated), weighing them, baking them, and then weighing them again to see how much water the soil can absorb.

Results
Based on my analysis, there is a strong correlation between the amount of rain received, the level of soil saturation and the river rise. When the soil is 100% saturated, the river goes up 6X as much as it would if the soil is not saturated. Also, when the soil is saturated, the river's peak is delayed by 2.5 hours after the peak rain. Finally, based on my soil saturation test, soil is 100% saturated when it contains 26% water by weight, which is 34.5% water by volume. This means it would take no more than 2 inches of rain to fully saturate the top 6 inches of soil.

Conclusions/Discussion
I have concluded that my hypothesis was correct; it is possible to make a simple mathematical model to predict the height of the San Lorenzo River:
deltaH=r*S
Where deltaH is the rise of the river, r is the rainfall in the last four hours and S is the soil saturation factor (which is determined by an equation based on the rain over the previous 12 hours).
This means that if the soil is 100% saturated and the river is at 10 feet, and we get another inch of rain in three hours, I can predict that the river will flood in 2.5 hours and could prepare to evacuate.
It may not be totally accurate, for storms move and come in different sizes with different rain rates, but it will at least give me an idea of whether or not the river will flood.

Summary Statement
My project was to develop a basic mathematical equation that can model the height of the San Lorenzo River using rainfall and river data and measured soil saturation.

Help Received
My dad helped me collect rainfall data and suggested some ways to analyze the data.

CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
Seth F. Kisbye

Project Number
J0806

Project Title
Determining Which Sediment Decreases Liquefaction

Abstract

Objectives/Goals
The objective of my was to figure out which sediment decreases liquefaction. I would use this information find out which sediment to build structures on. So that contractors to know which sediment to build on.

Methods/Materials
For my expirement i used one (1) ten (10) pound bag of sand, one (1) ten (10) pound bag of potting soil, one (1) ten (10) pound bag of sediment from outside, a fan, a clear bowl. I constructed my project by putting the sediment in the clear bowl putting water on the sediment and then turning on the fan.

Results
the results of my project were sediment from outside decreased liquefaction the most potting soil decreased liquefaction the second most and sand decreased liquefaction the least.

Conclusions/Discussion
Much was larned from this expirement. I learned contractors should build structure on the sediment from outside rather then sand.

Summary Statement
The purpose of my project was to determine which sediment decreases liquefaction.

Help Received
Mrs. Lopez-Lickey helped me with my graphs. My dad for helping me cut out the posterboard.

CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
Theron R. Mann

Project Number
J0807

Project Title
Erosion on Rocks

Abstract

Objectives/Goals
To test the effects that temperature changes have at contributing to the erosion of rocks.

Methods/Materials
5 pairs of rocks. One of each pair will be frozen and then boiled several times to study any changes that may occur and then compared to the rock that was not subjected to the repeated freezing and boiling.

Results
Two of the rocks showed no change at all. Two of the rocks showed small changes, such as widening holes and cracks. One rock broke into several pieces.

Conclusions/Discussion
Changes in temperature do cause some rocks to erode more quickly than others. It depends on the exact kind of rocks tested to see how the changes in temperature affect them.

Summary Statement
Testing rocks with drastic temperature changes to study how they respond.

Help Received
Mother helped type results.

CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
Joseph P. Monaghan

Project Number
J0808

Project Title
Sinkholes: Grout Method vs. Graded Filter Technique for Repairing Typical Cover Collapse Sinkholes in Karst Areas

Abstract

Objectives/Goals
This project was to determine which sinkhole repair technique would result in fewer sinkholes in neighboring areas where potential sinkholes can occur. The hypothesis was that if the graded filter technique allows more drainage of water than the grout method, then neighboring potential sinkholes would less likely form. If the grout method completely blocks out drainage, then neighboring potential sinkholes would more likely occur and at a faster rate.

Methods/Materials
A tank was built with simulated limestone karst, with five cavities in cross-section that were potential sinkholes. A tablespoon of damp salt was placed at each of the cavity openings to prevent sand from falling into the cavities. Ten trials were conducted for each situation: no repair methods (control), simulated graded filter in two out of five cavities, and simulated grout in two out of five cavities. Sand was placed on top and packed down. Water was evenly dripped on sand, creating sinkholes, voids, or no disturbances. The tank was rinsed out after each of the thirty trials. Observance of sinkholes, voids and no disturbances were recorded, as well as the time it took for the sinkholes to form.

Results
Data supported my hypothesis in that there were fewer sinkholes in neighboring areas for the trials using the graded filter technique than the grout method. Graded filter trials had a total of 17 sinkholes, 4 voids and 8 no disturbances. Grout method trials had a total of 23 sinkholes, 3 voids and 4 no disturbances. Control trials had a total of 32 sinkholes, 8 voids and 8 no disturbances. There was no significant difference in the amount of time for sinkholes to form for any of the thirty trials conducted.

Conclusions/Discussion
The graded filter technique is an important form of sinkhole repair because drainage is necessary in karst areas. Fixing a sinkhole under a house using this technique would be very difficult, if even possible. The grout method would then be used but consideration of drainage nearby is important. If preparing land for future development, excavating and using graded filter technique would be ideal. Areas overburdened by excess water drainage, will dissolve the carbonate rock and sinkholes will eventually occur. Each sinkhole is unique and must be looked at carefully before any repair technique is done.

Summary Statement
This project was to determine which sinkhole repair technique either grout method or graded filter, would result in fewer sinkholes in neighboring areas where potential sinkholes can occur.

Help Received
Mother helped rinse out tank between trials, and with layout of display board.

CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
Hannah L. Morrow

Project Number
J0809

Project Title
Determining the Percolation Rate and Particulate Count at Various Points on the Kings River

Abstract

Objectives/Goals
Determining the soils percolation rate and particulate count at varios points along the Kings River.

Methods/Materials
Six soil samples collected at two mile intervals along the Kings River were tested by adding equal amounts of each sample to a testing device, compacting then adding 1,000 ml. of water to each sample, waiting ten minutes and measuring the amount of water and particulates released.

Results
My science project determined that the farther down river I went didn't get cleaner results, but did show a pattern.

Conclusions/Discussion
After completing my experiment I found that my hypothesis was incorrect. I hypothesized that the farther down river I go the more particulates there would be. The reason my hypothesis was incorrect was that, it doesn't matter how far up or down river you go more than likely your starting point will always have the least amount of particulates and percolation rate.

Summary Statement
My project is determining the percolation rate and particulate count at various points on the Kings River.

Help Received
My dad and teacher helped in making my testing device.

CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
Kai T. Narum

Project Number
J0810

Project Title
Saturday Night Shake Down: Earthquakes and Soil Stability

Abstract

Objectives/Goals
The objective of my project was to find what soil (cat litter, dirt, sand) protected Lego towers the best against earthquakes on a shake table with varying voltage, building size and shape, and soils.

Methods/Materials
I built a shake table in which I placed three different soils (cat litter, dirt, and sand) and connected the shake table to a motor that spun a counterweight to simulate an earthquake. Cat litter was used as a substitute for unconsolidated gravel. I placed Lego towers with base to height ratios that ranged from 1.6 to 20 on the shake table, three at a time. Then I ran the shake table at 1.5 V and 3 V for 20 seconds and recorded the movement of the Lego towers and the time to fall of each tower. I repeated each experiment 4 times for a total of 120 trials.

Results
The cat litter was definitely the least stable. However dirt and sand had mixed results. The average time to fall for a 1.5 V earthquake was 19.3 seconds for cat litter, 25.5 seconds for dirt and 26.9 seconds for sand. The average time to fall for a 3 V earthquake was 9.9 seconds for cat litter, 15.1 seconds for dirt and 19.5 seconds for sand. Sand kept the Lego towers from falling the most but when the shake table shook the Lego towers would sink into the sand instead of falling over. Also the dirt was in the middle of the cat litter and sand in the protection factor. On all three soils, when the base to height ratio increased the Lego towers became more stable. Lego towers with a base to height ratio of over ten very rarely fell down. This occurred only twice over 120 trials.

Conclusions/Discussion
My results did not clearly support my hypothesis, which was that dirt would protect the Lego towers the best against the 1.5 V and 3 V earthquakes. I can conclude that cat litter was the least stable. Although sand kept the Lego towers from falling better than dirt it is on such a small scale and I could not measure the damage done to the Lego towers. So I can conclude that sand kept the Lego towers the best from falling but I could not measure damage so I would further this project by making a bigger scale and use real building codes to make it more realistic. The base to height ratio played a big part in my project, and a base to height ratio of ten marked a threshold for not falling down.

Summary Statement
The purpose of my project was to investigate which soils provided the most stability for Lego towers in simulated earthquakes.

Help Received
I received help building my shake table from my dad (with power tools) and my neighbor (with a power saw). I received help from my dad also with running my shake table because it is a two person job. I received help from my mom with my backboard layout.

CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
Caitriona M. Parker

Project Number
J0811

Project Title
How Soil Type and Additives Affect Bearing Capacity

Abstract

Objectives/Goals
The objective of my project is to determine if adding different materials to various soil types will have an affect on the soils' overall bearing capacity. My hypothesis was that plain rocky soil will have the highest bearing capacity.

Methods/Materials
One 5/8" dowel, a piece of plywood, a plastic tub, a Tupperware container(holding 6.8 kg/15 lbs), a 5 gallon bucket, sandy soil, clay soil, rocky soil, leaves, bark, and packing peanuts. First, I filled the plastic tub with the soil, then I set the dowel-tray on top of the soil for 1 minute. I recorded the depth that each of the four legs had sunk.

Results
I found that rocky soil had the smallest average depth of sinkage (2.29 cm). Clay soil had the largest average depth of sinkage (7.07 cm), while sandy soil had a average depth of (6.47 cm), in the middle of the other two.

Conclusions/Discussion
My hypothesis was proven correct. Rocky soil had the highest bearing capacity as evidenced by the lowest depth of sinkage. As a result of my study, it would appear that rocky soil or soil mixed with rocks, would strengthen the load bearing capacity of the soil at a building site.

Summary Statement
My project is to determine if adding different materials to soil will have an effect on the soil bearing capacity.

Help Received
Mother helped type, Father helped collect soils.

CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
Samantha L. Stott

Project Number
J0812

Project Title
Where Does California's Rain Come From?

Abstract

Objectives/Goals
This study investigated how La Nina in the tropical Pacific influences sources of rainwater over California. The ratio of heavy to light oxygen isotopes in storm water was used to identify the sources of California's rainwater.

Methods/Materials
Rainwater was collected from individual storms in a collection container at 40 Mustang Road, RPV CA. Additional samples were collected by Dr. Nikolaus Buenning of the University of Southern California. Samples from each storm were placed in vials and labeled with time and date. The ratio of heavy to light isotopes of oxygen in the samples was measured using a Picarro Cavity Ring-Down Spectrometer at the University of Southern California. The isotope results of each sample were compiled and the average and standard deviation for samples from each storm was calculated. The results of these analyses were then compared with satellite images from NOAA to evaluate how the isotope ratio changed with northern and southern storms.

Results
In the winter of 2010/11, 6 of 11 storms had d^1^8O values higher than -5^o/oo, which is typical of moisture from the Tropics. The results indicate that the majority of storms that reached southern California contained moisture from the Tropics. Among the six Tropical storms several were called "Pineapple Express" because they brought large amounts of rain from the Tropics with high isotope values of -2 to -3^o/oo. The six Tropical storms had an average d^1^8O value of between 2 and -5^o/oo. The two lowest isotope values within the data set were from storms that tracked from the North Pacific with average d^1^8O values between -8 and -11^o/oo. Three storms had isotope values that indicate moisture from both the Tropics and the North Pacific.

Conclusions/Discussion
In the winter of 2010/11 a La Nina influenced storm tracks in October and November and resulted in more rainwater from the Tropics. However, the La Nina appears to have had less influence on storms in December and January due to a shift to a negative Arctic Oscillation, which caused an increase in the number of storms from the North Pacific. Overall, southern California received most of its precipitation from the Tropics in the winter of 2010/11.

Summary Statement
Oxygen isotope ratios of rainwater can be used to trace the source of California's moisture.

Help Received
Dr. Nikolaus Buenning provided samples and taught me how to measure the oxygen isotope ratio in rain water using the Picarro instrument in the stable isotope laboratory at USC. My dad advised me how isotopes might be used to distinguish sources of moisture. My mom helped design the board layout.

CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
Sheng Yue Zhang

Project Number
J0813

Project Title
Hail to Tornadoes: The Fastest Winds on Earth

Abstract

Objectives/Goals
The objective is to determine whether or not there is a relation between hail and tornadoes using F4 and F5 tornadoes for better tornado prediction methods.

Methods/Materials
A tornado and hail database named Severe Plot 3.0 was used to obtain F4 and F5 tornado records and hail records that included the time, location, and size of tornadoes and hail occuring.Geographic locations were also recorded. Each tornado was matched up to hail records occuring around its area within an hour prior to its occurrence. These information were recorded on Microsoft excel and in data tables made in the composition book. There were two parts to this project, each consisting of four trials.

Results
F5 tornadoes (the strongest rank of tornadoes, from F0-F5) were 21.21% more likely to be preceded by hail than F4 tornadoes (the second strongest rank of tornadoes). The tornado intensity has nothing to do with the size of the hail it is associated with. Overall, 52.66% of tornadoes were preceded by hail, and the majority of the hail was severe sized. Kansas was the most popular place for tornadoes, and Texas had the largest sized hail.

Conclusions/Discussion
My results did not support my hypothesis, which was that 25% of tornadoes F4 and above would be preceded by severe hail, as opposed to 75% preceded by common sized hail (smaller than 1 in.). Overall, 87% of tornadoes F4 and above were preceded by severe hail. Some other interesting elements were discovered. Hail occurrences have almost tripled during the last 30 years, it was concluded that global warming or better tracking technology may be the cause of this. A tornado blind spot in the Appalachian Mountains was also discovered. This may be because the humid air coming from the East is being pushed up into the higher elevations then coming down in another form such as hail or rain instead of drifting onward to meet the warm and cool dry air from the West that would usually cause an unsettlement in the air, thus creating tornadoes.

Summary Statement
By analyzing previous tornado and hail data, a relation between hail and tornadoes is hoped to be discovered for better tornado prediction methods.

Help Received
My mentor, Mr.Fain, helped me answer many questions I had on tornado and hail formation.

CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)

Hannah N. Johnson; Hannah R. Larsen; Zachary J. Larsen

Project Number

J0899

Project Title

Trilobite Leftovers: Mortality or Moulting?

Abstract

Objectives/Goals

The goal of our project was to determine if the size of trilobite fossils we found related to the probability of mortality.

Methods/Materials

We went to the Marble Mountains in the Mojave Desert to collect fossil specimens for analysis. Collection involved use of a rock hammer. The fossils were examined and classified using a dissecting microscope and a college level field guide. Fossil sizes were then measured using engineering tools and the data was plotted for analysis.

Results

We found several different types of fossils at the excavation site including brachiopods, trilobites, algae, and worms. We studied two different types of fossils (trilobites and brachiopods) to see if there is a relationship between size and mortality. For the brachiopods, we saw that there was no relationship between size and mortality. In contrast for the trilobites, we found that as they got larger, there were fewer fossils. Additionally, in comparison to the smaller trilobite fossils, a far greater number of the larger trilobite fossils were incomplete, which is not consistent with moulting.

Conclusions/Discussion

In contrast to brachiopods, we conclude that the mortality rate for trilobites grew larger as their size increased, with this likely resulting from more predation of larger trilobites compared to brachiopods and smaller trilobites.

Summary Statement

The project focused on determining whether there was a relationship between trilobite fossil size and rate of mortality.

Help Received

Parents drove our team to the fossil site. Parents provided the dissecting microscope from laboratory.