

FINAL REGISTRATION LIST
March 16, 2004
Project Descriptions for Judges

BIOCHEMISTRY

- BC.01: Vanessa Simone Troiano, and Janet Olevskaia
Comparing the Effectiveness of DEET with Molecularly Similar Compounds
In this project, 11 variations of DEET, and DEET itself, are synthesized through combinatorial chemistry methods. The results are tested on fruit flies to determine how effective each is in comparison with the other compounds, thus pinpointing the superior form.
- BC.03: Denise Ichinco
Rheumatoid Arthritis
Investigation of the specificity of rheumatoid factors binding to the Fc portion of the Ig.
- BC.04: Veena Venkatachalam
The Purification and Characterization of Basic Fibroblast Growth Factor-like Antibody
The primary objective of this research was to purify a bFGF-like antibody from human serum.
- BC.05: Mary Germino
Screening for Binding Mutants of Protein A and IgG1 Fc
Mutations of protein A (EZZ) and IgG1 Fc were generated and screened to find mutant EZZ/mutant IgG1 Fc pairs that bind to each other but not to wt EZZ or wt IgG. These mutant pairs could be used for improved protein purification protocols.
- BC.06: Jillian Chase, Lauren Natoli, and Jillian Wilson Merrel
Sequencing and Analyzing the Unknown Genome of Caenorhabditis remanei
This project involves the isolating and sequencing of *C. remanei* DNA and comparing it to other species of worms and higher eukaryotes.
- BC.07: Vanessa Simone Troiano, and Janet Olevskaia
Comparing the effectiveness of DEET with molecularly similar compounds
In this project, eleven variations of DEET, and DEET itself, are synthesized through combinatorial chemistry methods. The results are tested on fruit flies to determine how effective each is in comparison with the other compounds, thus pinpointing the superior form.
- BC.08: Natalia Hlushko
Dimethyl Sulfoxide (DMSO) as an Antibody Solubilizing Agent.
My project consists of testing the ability of DMSO to solubilize and deliver antibodies through skin.
- BC.09: Hua Chai
Isolation of Mouse and Characterization of Mouse and Human PDE4D9 isoform
The human and isolated mouse PDE4D9 isoforms enzymatic activities on the hydrolysis of cAMP and their response to a repression drug, Rolipram, were analyzed.

BC.10: Simon Mathew Stilwell

Analyzing Genes Involved in the Dauer Pathway of C.elegans

In Dr Patterson's lab of Rutgers University, microarray analysis of gene expression was used to identify genes that are directly and indirectly regulated as a consequence of TGF beta signaling during dauer formation process in C.elegans. The dauer formation pathway in C.elegans involves an important group of chemosensory neurons that measure food and competition for resources. Scarce food, high temperature and high pheromone levels promote dauer formation. This is important because while in the Dauer state the worms are considered nonaging. Insulin is an important trigger in these chemosensory neurons. We are using RNAi feeding method to investigate genes TO5A.4, ZK355.6, F14DZ.6, T11F1.6, and ZK335.5 to analyze if they are involved in dauer formation, and are similar to known pathway regulation genes. If similar they theoretically may play an important role in the insulin pathway.

BC.11: Fred Lee

Antimicrobial Activities of Three Spices: Garlic, Rosemary, and Fennel

Antimicrobial activities of rosemary and fennel on common fungus and common gram positive and gram negative bacteria.

BC.12: William Pugh

The Effect of Bt Genes on Solanum Melogena (Eggplant) Growth and Yields

The effect of the addition of Bt genes to eggplants was examined for growth and yield

BEHAVIORAL SCIENCE

- BS.01: Monica Bauer
Is Inappropriate Backpack Use Causing Back Pain?
Middle school students were weighed and compared to the weights of their backpacks.
- BS.02: Nicole Lee Caruso
Effect of 1,3,7-trimethylxanthine on Speed of Neurological Interval Timer
Caffeinated beverages were administered to experimental group participants to determine whether mild stimulant intake accelerates the human neurological interval timer and distorts time perception of sound durations (due to increased dopamine levels which facilitate cortical firing processes).
- BS.03: Michael Jonathan Rosenman
Effects of Playing Video Games on Hand-Eye Coordination
The purpose of this experiment is to test the effects of action video game playing on hand-eye coordination, among both males and females. The experiment would be performed on students aged 13-18, of both genders. Both habitual players and students who play few, if any, games would be tested.
- BS.04: Sarah Elmedani
Investigating the Repellent Properties of Nigella sativa to Different Planaria
Many countries around the world contain a great percentage of people with intestinal worm diseases. My project is to find whether or not *Nigella sativa*, an herb that is cheap and obtainable, can act like an effective worm repellent.
- BS.05: Margaret Demkow
Comparison of the learning ability of migratory and non-migratory fish.
The learning ability of a migratory and a non-migratory fish will be tested using classical conditioning and response.
- BS.06: Chris Schmidt
Whats a Good Password?
Choosing patterns for computer users selecting passwords was analyzed.
- BS.07: Christine Vitiello
Cucumber Peels and Bay Leaves as Natural Ant Deterrents
Fresh, dried and juice from cucumber peels and juice and bay leaves were tested to determine the possibility of use as an ant deterrent.
- BS.08: Sara Michelle Stenchever
How to Calm an Aggressive Horse: A Further Study of On Target Training
On Target Training was used to train an aggressive Shetland pony.
- BS.09: Huai-Ming Xu
The Effects of Reaction Time on Humans
I will attempt to find the factors that affect reaction time in humans. In addition I want to see how reaction time differs between parents and their children.
- BS.10: Eric Callocchia
The Effects of the First Overall Draft Pick on NFL Team Performances
Does selection of the top player in the draft picks have a strong effect on the performance of a low ranked team?

BS.11: James Darwin OBrien

Improved Toy Safety

This project uses new materials to prevent choking hazards and considers industry methods.

BS.12: Alex Bick

Examining effects of personal digital assistant usage on academic achievement

This study uses GPA to compare the achievement of personal digital assistant users with nonusers

BS.13: David Yuwoon Choi

Practicing Teachers Use of Online Subscription Databases

A survey of practicing teachers use of online subscription databases to access information in peer-reviewed journals and the factors influencing this.

BOTANY and ZOOLOGY

- BZ.01: Daniel Bobev
A Botanical and Taxonomic Study of Trees
The trees that have been planted on our large school property over a period of 45 years were identified and labelled.
- BZ.02: Fayza Aly
Investigating the effects of Boswellia extract on bacterial plant pathogens
The project will test the ability of the Boswellia extract to prevent plant infection.
- BZ.03: Katherine Anne Myers
The Correlation Between Stomata Density and Leaf Position
Three species of plants from different climate zones were found to regulate stomata density on a leaf by leaf basis, with a higher stomata density in leaves receiving direct sunlight.
- BZ.04: Shilpa Dass
Acquired growth in gibberellin-deficient plants is not inheritable.
Plants are simple models for researching important problems in biology. This project uses plant strains to investigate if acquired traits are inheritable.
- BZ.05: Deen Gu
Effect pH has for Nutrient Mineral Availability in Hydroponic Plants
Calcium and magnesium are critical nutrients for hydroponic systems. This project aims to find whether an increase in pH level, which increases calcium and magnesium levels, will be enough to offset an originally low level of the mentioned nutrients.
- BZ.06: Nicole Hansen
The Effects of Temperature and Concentration of Wastewater on the Growth of Bean Plants
The purpose of this research was to determine if the temperature and/or concentration of wastewater affects the growth of common bean plants
- BZ.07: Leandra Sedlacek
Effectiveness of Blood Chemistry Panels in Diagnosing Veterinary Patients
Analysis of blood chemistry panels was used to determine whether such tests could be used to accurately diagnose veterinary patients.
- BZ.08: Christopher Granger
The Attraction of Fireflies to Specific Plants and Shrubs
A study of several areas was done to determine which area and which plants in the area were most attractive to fireflies
- BZ.09: Preyanka Makadia
The Induction of Heat Shock Protein in Rotifers
By introducing rotifers to sub-lethal and then lethal temperatures, the organisms will be able to synthesize heat shock protein for their survival.
- BZ.11: Sarah Arshad, and Divya Gupta
The Effects of Different Composts on Cherry Bell Radish Plants
Composting is one of the oldest and simplest methods of organic waste stability. Home production of compost is considered to have more nutrient values. This experiment involves the comparison between home-based composts with chemical fertilizer to observe productivity levels in plants.

- BZ.12: Mohammed Vayani, and Tariq Suleman
The Effects of A Carotenoid-Based Sunscreen on the absorption of UV radiation by plants.
find a sunscreen for plants.
- BZ.13: Matthew Gomez
The Effect of Different Sources of Light on Plants
I used different types of light such as Incandescent and Fluorescent on the same types of plants and recorded the results to see how they differ in growth.
- BZ.14: Evan Gabriel Schlecker, and Elizabeth Anne Volkert
Increasing the Chlorophyll Content of Plants
Chlorophyll is a complex organic molecule based around magnesium. We are growing plants in soil enriched with magnesium in attempt to increase the chlorophyll content in the test plants.
- BZ.15: Kerry Ryan
Differences in Populations of Tegula fasciata
Two populations of Tegula fasciata were examined, measured and compared to a standard and to each other to determine the presence of variations in the populations.
- BZ.16: Patrick Lombardi
Tracking snakes using fluorescent powder
The feasibility of tracking snakes using fluorescent powder was tested.
- BZ.17: Jason Anthony Corbiere
Recessive and Dominant Genetic Traits of Different Tomato Varieties
To develop a strain of tomato plant that has a good flavor, but increase the tolerance to blights and diseases as well.
- BZ.18: Kristen Michelle Wachocki
OTC substances and fly development with application to forensic entomology.
The development of maggots will be tested using different kinds of over the counter substances.
- BZ.19: Ankit Mathur
Health and Quality of Rice Seeds
The project conducted was done using rice seeds samples sent from third-world countries by farmers who were not able to yield enough rice seeds for the human consumption. Once the seeds were attained they were tested for diseases and fungus using different tests.

CHEMISTRY

CH.01: Yvonne Ovoke Obukowho

Protection of Hair Surface With a Quaternized UV Filter

This experiment investigated the importance of substantivity (adhering) of a UV product when delivered from a shampoo base and how this helped to improve that damage surface of the hair.

CH.02: Kristine Sedillo

The Effects of Hydrangea macrophylla Petal Juice on Diluted Acids and Bases

Serial dilutions of blue and red hydrangea petal juice were used on serial dilutions of vinegar and detergent to see if the hydrangea juice could be used as an indicator.

CH.03: Samantha Dolph, Rebecca Rothkopf, and Golnar Gnodes

Kinetic Study of the Chromium EDTA Reaction

Mix various amounts of chromium, EDTA and acid. Then measure the rate of the reaction by Spectroscopic analysis.

CH.04: Jacob Nathan Sanders

Combinatorial Synthesis of Anti-bacterial Hydrazone Compounds

This project uses the methods of combinatorial chemistry to synthesize a series of hydrazone compounds from aldehydes and hydrazines. The hydrazone compounds are then tested on E. coli cultures to determine the presence of anti-bacterial activity.

ENVIRONMENTAL and EARTH SCIENCE

- EE.01: Fariha Hanif Ramay
The Effect of Arsenic Trioxide on the Mitotic Rate in Cancerous Rat Leukemia cells in Vitro.
The effect of various concentrations of arsenic trioxide on the mitotic rate of cancerous rat leukemia cells were evaluated.
- EE.02: Elyce Cole
The Effectiveness of Common Filter Mediums for the Removal of Aspirin from Drinking Water
Five common filter mediums were tested to see which most effectively removes aspirin from a water supply
- EE.03: Vishal Kachhadia
Water Analysis
An investigation of water sampling techniques and water analysis.
- EE.04: Jon Chizacky
Natural Prevention of Soil Erosion in Undeveloped Sites
Methods for natural prevention of soil erosion in undeveloped construction sites were tested and analyzed
- EE.05: Kevin Bruce Paszinski
Thermal Buffering and Enzymatic Activity in Sarracenia purpurea.
I utilized field and laboratory measurements of the thermal properties of the leaves of purple pitcher plant (*Sarracenia purpurea*) and how it relates to the activity of digestive enzymes within the leaf.
- EE.06: Aakash Kaushik Shah
The Role of Hormesis in the Toxicology of Copper in Rotifers
This project investigates the toxicology of copper on the effects of hormesis in rotifers.
- EE.07: Lauren Harte
Accuracy of the Ten-day Weather Forecast for Flemington, NJ
A eight month study was done to determine the accuracy of the ten-day weather forecast for a specific area.
- EE.08: Thomas Charles Cannone
The Effect of Bovine Growth Releasing Factor on Poecillia reticulata
The growth of and the number of offspring produced by *Poecillia reticulata*, that are placed in a dilute aqueous solution of bGRF, will be compared with control groups.
- EE.09: Madhavi Jayesh Patel
The cytotoxic effect of the herbicide, 2,4-D on cancer and normal cells in vitro.
The purpose of this project is to investigate the mitotic rate and viability of rat cancer cells in the herbicide, 2,4-D.
- EE.10: Brundha Kranthi
Bioremediation of Oil Spills
This project looks at the aspect of depth related to the ability of nutrients to reach bacteria, and how different substrates react to nutrients.

- EE.11: Casey O'Brien
Earthquakes and Building Structures
Building an earthquake proof house.
- EE.12: Christina Michele Arocha, and Valerie Tice
"Affects of Hairdye on Daphnia"
We are studying the affects of different colored hairdyes on Daphnia and testing the toxicity of them.
- EE.13: Kristin Couch
Comparison of Water Quality from Two Local Purification Plants
Samples of water processed at two local purification plants were tested for iron, pH, hardness and sulfites levels.
- EE.14: Jessica Jeeyoun Lim
Does the Southern Mustard Plant have an Invasive Nature?
We are seeing if the Southern Mustard Plant has a chemical in it that prevents other plants from growing around it and thus hindering its growth.
- EE.15: Mary Kathryn Kelly
Wind Power as a Supplemental Energy Source
The purpose of my research into wind power is to investigate the expense, effectiveness, and practicality of wind energy systems, in an attempt to rid our world of a reliance on fossil fuels.
- EE.16: Tripali Kundu
Rates of Groundwater Remediation using Metals in First Order Reactions
Different metals were used as reducing agents to break down organic material in dye-contaminated water. The rate of the reaction was determined in each variance.
- EE.17: Kimberly Ann Boyko
3-D Area in Applying the Theory of Island Biogeography to Microhabitats
A sonic range finder was used to collect height data for sphagnacious hummocks to be integrated into three-dimensional surface area maps of the hummocks. These maps will be used to test the theory of island biogeography.
- EE.18: Matthew Lev
Crystallization
An investigation of geologic crystallization.
- EE.19: Rosalind Pan
The Effect of Herbicide 2,4-D on Fathead Minnow Epithelial Cells
Herbicide 2,4-D is diluted in various concentrations and put into a culture of fathead minnow cells to observe mitotic rate.
- EE.20: Amita Dilip Patel
Phytoaccumulation of Selenium-Laden Soils Using Mustard Plants
The crop rotations of mustard plants were varied to determine the effect on the amount of selenium removed from the soil. The mustard plants that were grown for the shortest period, and then replaced removed the most selenium from the soil.

EE.21: Daniel Eric Miller, and Amanda Lauren Miceli

A study of the effects of insecticides on aquatic ecosystems

We set up four identical aquariums which contained aquatic fish, ghost shrimp, snails and plants. We added different chemicals to the aquariums being sure to keep a control in order to test the effects of these herbicides, insecticides, and fertilizers. *no living creatures were harmed in the conducting of this experiment

EE.22: Sarah Garon

The Effect of Rhizobium Leguminosarum on the Growth of Pea Plants

This experiment studied the effect of the nitrifying bacteria, Rhizobium Leguminosarum on the growth of pea plants.

ENGINEERING

- EN.01: Sam Yang
The Most Effective Speaker Design
Speaker designs were tested and evaluated.
- EN.02: Brett Michael Fowler
The Applications of Nitinol Memory Wire on Human Hand Prosthetics
My projects goal is to utilize the properties of Nitinol Memory Wire and apply them to the opening and closing of a prosthetic hand.
- EN.03: Gizem Askin
Voice Activated Life (VAL)
Voice Activated Life (VAL) Household appliances are hooked up to X10 devices. With a simple Visual Basic program and using XML, the computer communicates with the X10 Modules using an interface card. Then the X10 modules communicate with the X10 devices, enabling the household appliances to be controlled with voice activation.
- EN.04: Ben Kanigel, and Danny Chen
Optimizing Utilities in an Industrial Building: An Engineering Analysis
The most efficient methods for building construction and implementation of utilities were analyzed and identified.
- EN.05: George Francis Hotz
Mapping Robot
The project is a robot that will drive around relaying coordinates a computer. From this data the computer will assemble a map of the robots environment
- EN.06: Stephanie Iris Mok
Computer Modeling and Simulation of Epidemic Outbreaks and Assessment of Control and Intervention Measures
This project applied population mobility/spatial characteristics in predicting virus spread. The developed computer epidemic model can assess the effectiveness of vaccination and other outbreak intervention and control measures. The outcome of this project is an epidemic intensity model that can evaluate risk for metropolitan cities.
- EN.07: Tim Swain
Pressurized Air Engine
A pressurized air engine was designed, built and tested for efficiency.
- EN.08: Katelynn Gabrielle Coleman
Testing of LISST-100 for Accurate Sediment Size and Concentration Measurements
With this experiment the LISST-100 was tested for accuracy in measuring, through the use of several tests, each with varying sediment amounts and sizes. The accuracy was determined by comparing how close the collected measurements were to the known measurements.
- EN.10: Evan Colquhoun
The Effect of Wing Style on Lift and Drag
Wing styles were analyzed to determine their effects on lift and drag.

- EN.11: Thomas Andreovich
The Effects of Slope and Frontal Height on a Pinewood Derby Racing Car
A pinewood derby racing car was tested for changes in the slope and height of the frontal piece.
- EN.12: Young-Bin Won
Experiments on Radio
The controversial beginnings of the original radio and basic radio circuits are studied under new technology.
- EN.13: Michele Reilly
The Structural Strength of Atlantic Surf Clam Shells
Height and base of shells were measured and the relationship between these factors was compared to the amount of weight needed to break the shells
- EN.14: Justine Soo Yun Yoon
Biometric Environment Control
A device will be built that will measure the temperature of the sleeping body without any contact. Then according to the temperature, an air conditioner will be turned either on or off. However, at the science fair, instead of an air conditioning unit, an LCD will be connected that will display either "Air Conditioner On" or "Air Conditioner Off".
- EN.15: Chris Jackson
Aerodynamic Model
A model airplane was designed, fabricated, and tested.
- EN.16: Chaitanya Rastogi
Adaptive Switches
Various switches are designed for people with disabilities.
- EN.17: Hyun-Soo Kim
Robot Control via a Serial Interface
A visual programming environment is designed for a robot that has multiple degrees of freedom.

MICROBIOLOGY

MB.01: Caitlin Ensor

Protozoa and Bacteria Interaction

A study of the interaction of protozoa and bacteria in the Hackensack River. Feeding preferences of protozoa were studied.

MB.02: Ekaterina Pak

Population Growth of Bacillus subtilis Subjected to Varying Organic Natural Fertilizer Concentrations

When goose feces are deposited into the soil, microorganisms break them down. The purpose of the experiment was to determine if *Bacillus subtilis*, a bacteria found in soil, would show a greater growth rate in broth solutions containing different concentrations of goose feces. Fecal deposits from Canada geese were collected. Three separate solutions of nutrient broth, control, 5%, and 10% goose feces, were made and autoclaved. The solutions were inoculated with laboratory culture *B. subtilis* using aseptic techniques and placed into the incubator. The preparations were analyzed for percent transmittance at 72 hours. Anova statistical analysis of transmittance data from three replications showed significant differences ($p < 0.05$) between the broths. No linear trend was present, but fecal broth solutions, high nitrogen content, showed significantly less transmittance than controls. Hence, greater bacterial growth occurred with the fecal broths.

MB.03: Michael Jon Spoganetz

The Effect of Human and Canine Saliva on Various Cultures

Human saliva is introduced to seven various cultures. Canine saliva is then added to different samples of the same seven cultures. The effects are compared.

MB.04: Lynna Bermudez

Battle of the Flavonoid: who Will Win in the Battle Against Cancer

The project is extracting flavonoid from grape and use it in experimentation in mutated and normal yeast to see a difference in repairing its cell cycle.

MB.05: Jigna A. Patel

The Susceptibility of Escherichia coli at Various Temperatures

The project involves exposing *E. coli* bacteria to various temperatures and observing the effects on its growth and behavior.

MB.06: David Wu

Does goose fecal concentration affect E.coli growth?

Canadian goose (*Canadensis brasiliensis*) feces were collected, mixed with nutrient broth, dispensed into test tubes of 0%, 5%, and 10% fecal concentrations and sterilized. The tubes were inoculated with laboratory stock *E. coli*. Spectrophotometer transmission readings at 686nm were read at 48, 52, 67, 72 hours incubation. Preliminary ANOVA analysis determined that lab *E. coli* growth is enhanced by 5% goose feces concentration up to 72 hours. Results are pending replication. Wild isolate *E. coli* testing is pending culture isolation.

MB.07: Rafay Abbasi, Sarath Chandra Velagaleti, and Irena Spassora

Ultra Violet Light and Its effect on the DNA

We will study the effects of ultraviolet light on yeast cells and compare them to cells that have not been treated with UV Light.

MB.08: Andrea Hodgson

The Antimicrobial Effect of Mimosa tenuiflora vs. Antimicrobial Soap.

This experiment will compare the antimicrobial effect of Mimosa tenuiflora soap, non-antimicrobial soap, and antimicrobial soap.

MB.09: Fan Zhang, and Chaitanya Rastogi

Statistical Analysis of the Adaptation of Bacteria to Anti-bacterials

The survival rate of stock bacteria exposed to anti-bacterial agents is statistically compared to the survival rate of bacteria that have been adapted to anti-bacterials through natural selection.

MB.10: Laura Toth

Differences in bacterial transfer between wooden and plastic cutting boards

Samples of wooden and plastic cutting boards will be exposed to E. coli solutions to determine which board transfers more bacteria to other solutions.

MB.11: Michael Charles Kreisel, Irena Smilenova Spassova, and Andrij Olexander Kuzyszyn

Laser and its Effect on Cancer

My group is testing the effects of a laser on mutant yeast cells. These cells cannot grow at a certain temperature and we want to see if, after laser treatment is administered, the cells will grow more rapidly and in greater numbers. These cells have a mutation in their cell cycle much like the mutation in cancer cells. It has also been proven that the cell cycle genes in both humans and yeast are exactly the same. This is how the project relates to cancer. If the laser cures the mutation in the yeast cells, it also may cure the mutation in cancer cells, providing a new treatment for cancer.

MB.12: Dina M. Alhelawe

*The Effects of Aqueous Extract *Salvadora persica* and *Azardichta indica* on *Streptococci mutans* and *Streptococcus Sanguis* in Comparison vs. Toothpaste.*

Two types of branches (chewing sticks) from India and the Middle East will be tested against *Streptococci mutans* and normal flora within the mouth.

MATHEMATICS and COMPUTERS

- MC.01: Vincent Edward Scarfo
Audio and telecommunications device combination
I will be combining a cell phone, cd player and am/fm radio into a single convenient device by combining similar components in each (this includes power sources, antennae, amplifiers, etc.).
- MC.02: Rajesh Ramakrishnan
The Ultimate Spam Killer
A new approach to electronic mail that kills spam
- MC.03: Robert Lee-Own
Dealer Rules and the Game of Blackjack
Games of Blackjack were played to determine if the dealer wins more often than the players since the rules used by the dealer differ from those used by the players.
- MC.05: Vishal Patel
Using Propositional Logic in Database Search Engines
This project created search algorithms using propositional logic.
- MC.06: Samar S Kamat
Implementation of Java to Reconstruct the Apriori Algorithm to Aid Financial Institutions
This research project tries to use the apriori algorithm in automating the handling of loan applications, in Java. This is a new application for this program, and will properly test the algorithms' true adaptiveness.
- MC.07: Kris Fernandez
Testing, Evaluating and Implementing Enterprise Active Directory Auditing Software
User access rights were audited using third party software.
- MC.08: Marc Jonathan Sweetgall
Wireless Controller for MP3 Player
A wireless radio controller that allows the user to control the music playing on a computer.
- MC.09: Jessica Smith
Predicting the Unpredictable: A Study on Forecasting the Stock Market
An analysis of market trends was conducted in order to determine if predictable patterns exist.
- MC.10: Michael F. Page
2x2 Contingency Tables: Jackknife Analysis of Asymptotic and Exact Tests
Two techniques, the jackknife (leave out one observation at a time) and the modified jackknife (leave out or add one observation at a time), are applied to two statistical tests of independence for 2x2 contingency tables with large samples. Medical examples demonstrate how such analysis can lead to a different conclusion about the significance of the test results.
- MC.11: Raymond Louis Barsa
Multi-Purpose Remote Display
An lcd screen that displays messages sent from a remote terminal utilizing telnet.

MEDICINE and HEALTH

- MH.01: Christie Fries
The Effects of Stretching on Shoulder Muscles
Two groups of eight people did a series of stretches over a five-week period but for different lengths of time to determine the effects of the stretches on shoulder muscle flexibility.
- MH.02: Georgia Isabela Castillo, and Michelle Ariel Chelnik
Various Measures of Pulmonary Function on Aerobic and Anaerobic Sports
Measures of the lungs of high school athletes (football and cross country teams) will be taken to distinguish which type of exercise, aerobic or anaerobic, yields better pulmonary benefits.
- MH.03: Amanda Karlsson
The Effect of Nutrition on the Human Body
Actual caloric intake was compared to ideal caloric intake.
- MH.04: Jamie Gomes
Effects of Non-diet and Diet Sodas on the Calcium Found in Eggshells
Different sodas were dripped onto eggshells to observe the effects on the texture, surface and color of the shells
- MH.05: Naimisha Karakala
Bioavailability of New Iron Compounds
This project tests the iron bioavailability of newly developed compounds in comparison with the commonly accepted food fortification compound, ferrous sulfate. If results find a more bioavailable compound, it could be very useful in fighting iron deficiency.
- MH.06: Benjamin Kemper
Do Social Relations Promote Smoking?
An extensive survey was used to determine if trends exist in social influences among smokers and non-smokers
- MH.07: Jennifer Luo
Plasma p53 Expression in French and Taiwan Vinyl Chloride Factory Workers
Vinyl chloride is a known human and animal carcinogen. Plasma mutant p53 protein has been associated with vinyl chloride monomer (VCM) exposure. The present epidemiological study utilizes the raw data from two previous studies conducted on the employees of a French and Taiwan vinyl chloride factory to further investigate the effect of VCM exposure. Factors such as exposure concentration and the effect of smoking and drinking were examined to determine their influence on mutant p53 expression. A comparison of raw data from each study was made to elucidate trends in the French and Taiwan populations. Results revealed a significantly higher exposure concentration in French workers than in Taiwan workers ($p < 0.05$). There was also a significant relationship between exposure and p53 positive rate in the French and Taiwan workers. There was a notably higher prevalence of p53 positives found in the French workers than in Taiwan workers (34.7% vs 10.3%, $p < 0.001$). In the French control group, smoking was shown to exacerbate the incidence of mutant p53 expression ($p < 0.001$). However, within the exposure group from the Taiwan and the French studies, smoking and drinking did not act synergistically with vinyl chloride to increase p53 positive expression. Within the present study, there is a possibility that statistical methodology, such as different cut off points for designating positive p53 expression, small sample size, or the effect of hormesis could have caused some of these statistically significant results. A further epidemiological investigation is warranted.

- MH.08: Michael Thomas St. Angelo
Relationship of IMRT DVH to the Acute Bladder and Rectal Effects
The purpose of this project is a comparison of the dose volume histograms and acute effects on bladder and rectum in patients undergoing intensity modulated radiotherapy for prostate cancer at three separate facilities.
- MH.09: Lindsay Dolan
Can Tomato Plants Remove Aspirin from Ground Water
Crickets were exposed to a control aspirin-water solution and one filtered through a tomato plant to determine if the crickets were affected by the aspirin and if the plant was able to filter the aspirin out of the water.
- MH.10: Melissa Chantell Growney
"The Use of auditory mechanisms to detect objects."
My project is based on the idea that visually impaired people can detect objects using auditory mechanisms and ambient sounds in a room.
- MH.11: Kara Ashley Culligan
Speaking Asthma
This project was developed to eliminate complications that may arise, such as ignorance and panicking, in administering medication to asthmatic children.
- MH.12: Wayne Allen DeVico
Effect of contact lenses on corneal dispersion of caustic chemicals
Using artificial eyes coated in an acid/base indicator, and using an electronic light sensor the protective abilities of contact lenses will be tested.
- MH.13: Natasha McGuinness
Blasting Kidney Stones
Online Case Studies
- MH.14: Stephanie Clemente
The Effect of the Lunar Cycle on Birth Rates in NJ over a Five-Year Period
The relationship between the number of births occurring during the new and full moons for five years was examined.
- MH.15: Jessica Jiyoung Moon
The Effect of Sodium Fluoride on the Mitotic Index Cancerous Rat Lymphoma Cells
Different concentrations of sodium fluoride will be added to cancerous rat lymphoma cells. The effect of the sodium fluoride on the mitotic index will be observed.
- MH.16: Andrew Howard
Students Fears
To identify childrens fears, their causes, and possible treatments.

MH.17: Nicholas L. Ng

The Growth and Response of Bakers Yeast (Saccharomyces cerevisiae) to Water Containing Resins Obtained from Polyethylene terephthalate (PET) Water Bottles

ABSTRACT Yeast are used as a model for human cells in order to ascertain whether drinking water from PET bottles could be considered a health threat. If yeast samples are grown in broth made from broth treated with plastic resin, they will grow less abundantly than samples grown in control broth. Yeast are grown in sterilized nutrient broths and broths treated with PET resin. Each experimental replication consists of an inoculation of 12 test tubes simultaneously: 6 of Resin Broth and 6 of Control Broth. Using aseptic techniques, yeast are transferred to control and experimental test tubes. Incubation periods last 120 hours at 32 degrees C. A spectrophotometer was used to measure % transmittance, which were recorded. ANOVA statistical analyses, for 3 experimental replications, showed significant differences in % transmittance between control and resin-broth grown yeast ($p < 0.05$), with resin groups showing greater transmittance.

MH.18: Matthew Joseph Barringer

Quantitative Difference of the Amount of Carbon Monoxide in Various Cigarettes

I measured the ppms of carbon monoxide in various cigarettes to determine a significant difference.

MH.19: Anna Tammy Lee

Synergistic effect of sound and Ibuprofen on rotifer cilia

Rotifers were exposed to a sub-lethal dose of Ibuprofen and sound to test their synergistic effect on rotifer cilia as a model for cochlear hair cells.

MH.20: Sonia Sharma

Water Absorbing Capability of Superabsorbent Polymers Under Artificial Stomach Conditions.

The purpose of this study was to determine whether the properties of superabsorbent polymers may provide a safer alternative to Gastric Bypass Surgery. A polyacrylamide-polyvinylacetate polymer was subject to conditions similar to those within the human body to test their integrity as an indigestible mass.

MH.21: Lindsay Mignone

The Effect of Cancer Treatments on MMPs in Cancer Cells

This experiment analyzed the effect of various cancer treatments on the level of MMP-2 and MMP-9 in colon cancer cells through gelatin zymography.

PHYSICS

PH.01: John DeNizio

The Effects of Temperature and Humidity on the Playability of a Tennis Ball

This research tests the effects of a number of temperatures and humidity levels and combinations and their effects on how long a tennis ball remains playable.

PH.02: Christopher Paul Pajonk

The Inhibition of Anti-bubble Formation

Using a medium of water and soap, the procedure will use a series of 1:00 minute double blind trials to test the ability of anti-bubbles to form when the potential difference is leveled, increased, or untouched.

PH.03: Alexander Paton

Left-handed materials

To investigate the properties of left-handed materials.

PH.04: Richard Brian Lopez

The Chaos Theory And Weather Prediction

In this project, current weather models used for forecasting are examined and analyzed for any holes or missing variables that would severely decrease accuracy. One of the most important factors are initial conditions.

The Chaos Theory states that in any chaotic system, small disparities that are present initially could ultimately lead to greater deviations over time. This is known as the Butterfly Effect. However, in these deviations there is a greater order overall, so in turn there is an order to the disorder.

Applying this to the weather, a meteorologist must look at the initial conditions in a given area -- it would best to look at a specific regional area, because initial conditions vary according to geographical area. By taking into account initial conditions and more variables related to geographical location, a weather forecast might become more accurate. Although in the near future weather accuracy might not reach 100%, it would be best to increase the present accuracy to a reasonable number (i.e. 70% or higher).

PH.05: Matthew Ludwig

The Effects of Temperature and Humidity on the Rebound Rate of a Baseball

This research attempted to examine the effects of temperature and humidity extremes on the rebound rate of a baseball

PH.06: Maxx Hyeok Joon Cho, and Michael Roger Baumstein

Study on Nonlinear Perception of Ultrasonic Waves

Two separate sound waves with unique ultrasonic frequencies generated an audible sound when mixed. The study investigates the source and nature of this nonlinear phenomenon.

PH.07: Kevin Foley

Does the Size of A Driver Clubhead Affect the Travelling Distance of a Golf Ball

Six drivers of different sizes were tested to determine if a larger clubhead has an effect on the distance the golf ball travels

PH.08: Jason Donal Pearson

Robotics in Motion

Im trying to determine the optimum ratio for tire size to car size. By using differentiating sets of wheels, I can assess this optimum value. Lacking a gas powered vehicle (and the funds to support one), I took a small electrical radio controlled car. Being a electrical radio controlled car makes the power source constant.

PH.09: Palak Kundu, and Hyunsoo Cho

Remote Temperature Sensing

Remotely detect if the stove is on using infrared sensing technology and alert the person when they leave.

PH.10: Maria Sullivan

Rebound Velocity of a Softball Based on Surface Resistance

Using a standard softball pitching machine, rebound velocity of a softball was tested on dry and damp soils, grass, asphalt and rubber.