

March 1 9, 202 2
Senior Division
Project Listing

Project Categories

- Animal Sciences (AS)
- Behavioral and Social Sciences (BE)
- Biochemistry (BI)
- Biomedical and Health Sciences (BM)
- Chemistry (CH)
- Computer Sciences (CS)
- Earth and Environmental Science (EA)
- Engineering (EN)
- Mathematics (MA)
- Microbiology (MI)
- Physics and Astronomy (PH)
- Plant Sciences (PS)
- Robotics and Embedded Systems (RO)

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Animal Sciences (AS)

GRADE 0

Alberto-Lopez Elizabeth (103-07, AS)

Project Submission

Which type of paper makes the most aerodynamic airplane?

" In my experiment, I made 3 airplanes that are made of different materials. I threw them all in the same direction as the meter stick to find which airplane traveled the farthest. As hypothesized, I found the notebook paper traveled the farthest by 209.7 cm averaged."

Behavioral and Social Sciences (BE)

GRADE 1

Vashistha Sneha (11-04-14, BE)

Project Submission

Biochemistry (BI)

GRADE 2

Javeri Sanika (2-02-17, B)

Project Submission

Investigation on Mutations in Genes Leading to Heart Diseases Bioinformatics Approach

"Heart Disease, which can refer to several distinctive forms of heart conditions, is strikingly more dangerous than many presume. Inducing several deaths worldwide and being the number one killer in the U.S., heart disease is also a major cause of disability. In most scenarios, the root cause of the diseases is still unknown, but dietary habits, sedentary lifestyles, and other environmental factors can play key roles in the etiology of the heart diseases. Additionally, hereditary gene inheritance can also be classified as a prominent reason for some of the severe heart diseases. In this project, I did research on genetic etiology of the two predominant heart conditions that many suffer from. Using the NCBI database and search engine, I was able to determine what genes are involved and to determine if expression is taking place. I accomplish this project in three steps. 1. preliminary research on heart diseases. 2. developing methodology to investigate genes using the NCBI search engine and 3., Research on impact and relation the diseased genes have on heart diseases.

Biomedical and Health Sciences (BM)

GRADE 9

Borneman, Sean (0

and has the lowest transmission at 0.0. My results show that the KN95 mask and surgical masks were the most effective since they both had the lowest repeatability and lowest transmission rate of 0.0 in."

Huang, Bolong (Alan) (10-06*-10, BM)

Yang, James (11-06*-10, BM)

Project Submission 2

Identification of X-linked Candidate Disease Genes through Trio Analysis of Family Pedigree

"With thousands of Mendelian inherited diseases, new bioinformatics technology such as WES has been implemented to identify causal genes and variants within patients. Even with modern technology, analysis of WES sequencing remains difficult for researchers as an individual's exome spans over 30,000 variants with many complex variants. Many variants in X-linked diseases lead to developmental disorders (DD) associated with the brain. In support of using WES to analyze X-associated Mendelian diseases, a software called Exomiser can be implemented. Exomiser contains multiple filtering, prioritization, and ranking algorithms, making it the ideal software for my partner and me to identify disease-causing variants within patient(s). We applied Exomiser to a DNA trio (two parents and their child) extracted from CEPH family 1463. The CEPH reference panel serves as the CEU (Central Europe) population of the HapMap project for the generation of a haplotype map of the human genome, making it the ideal basis of research f

therefore early limb development in an organism as Shh has been shown to control the width of the limb bud by stimulating mesenchyme cell proliferation due to its abil

**Earth and
Environmental Science
(EA)**

GRADE

was selected because of a drive to know how fruits could contribute to electricity generation. The experiments were conducted in a science classroom and outside the school (IMSA North) building. The experiment took a week to complete.

Mathematics (MA)

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Microbiology (MI)

–

Physics AND Astronomy (PH)

GRADE 11

Mo, Lucca (11-05-15, PH)

Project Submission

Utilizing the Swift UVOT Data to Improve the Classification of GammaRay Bursts through ColorColor and ColorMagnitude Diagrams with Color Indices Based on Temperature

“GammaRay Bursts (GRBs) have been classified into two recognizable categories designated as short (TypeI) and longshort (TypeII). However, the possibility of newer classes of GRBs have been debated and speculated due to the current

GRADE 1

Akin-Olukunle Felicia (11-01-11, PŞ)

Project Submission

Energy Conversion with Berries

"The experiment was conducted to deduce if berries

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