

## *Category Prize Winners - VSSEF 2009*

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### *Best of Fair Award*

Electrochemical Analysis of Electrocatalytic Performance of Non-Precious Metal Electrodes and Catalysts on the Direct Ethanol Fuel Cell

**Abhinav Mohan**

Chantilly High School

The Significant Role of p70 Ribosomal S6 Kinase in Regulating Mouse Embryonic Stem Cell Cardiomyogenesis

**LeeAnn Li**

Thomas Jefferson High School for Science and Technology

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### *First Place in Animal Sciences*

The Effect of Bisphenol A on the Development of Artemia

**Sarah Zillioux**

Roanoke Valley Governor's School

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### *Second Place in Animal Sciences*

Are Thoroughbred Racehorses Getting Weaker?

**Audrey Boslego**

Bruton High School

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### *Third Place in Animal Sciences*

The Effects of Energy Drinks on the Growth and Behavior of Lumbriculus variegatus

**Davis Moore**

Ec Glass High School

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### *Honorable Mention in Animal Sciences*

The Correlation Between Number of First Egg Dates and Temperature and Rainfall

**Conor Mettenburg**

Clarke Co High School

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### *Honorable Mention in Animal Sciences*

The Effect of Horse Age on the Ability to Learn and Remember a Task

**Jessica Benson**

Yorktown

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### *Honorable Mention in Animal Sciences*

The effects of different types of light on tadpole development

**Emilia Sens**

Washington-Lee

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***Honorable Mention in Animal Sciences***

Evaluating KLF2 and KLF4 Interaction Based on KLF2 and KLF4 Crossings

**Andrew Shore**

Math and Science High School at Clover Hill

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***First Place in Behavioral and Social Sciences***

Investigating Spatial Memory after Genetic-Based Hippocampal Lesion

**Victoria Saadat**

Thomas Jefferson High School for Science and Technology

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***Second Place in Behavioral and Social Sciences***

Cognitive Performance Enhancement: Misuse or Self-Treatment?

**Alexander Peterkin**

Oakton High School

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***Third Place in Behavioral and Social Sciences***

Understanding the Trends, Seizing the Opportunities; A Statistical Analysis of Grocery Store Rewards Programs in Arlington Public Schools

**Haley Sanner**

H-B Woodlawn

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***Honorable Mention in Behavioral and Social Sciences***

The Effect of Sound on Short-Term Visual Memory

**Sonia Phene**

Washington-Lee

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***First Place in Biochemistry***

Discovery of Synergy Effect between Growth Factor and Shear Flow on Nitric Oxide Production by Endothelial Cells

**Alison Yu**

Albemarle High School

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***Second Place in Biochemistry***

The Effect of Ultraviolet Radiation on Scytonemin in Cyanobacteria Part II

**Zachary Truman**

Roanoke Valley Governor's School

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***Third Place in Biochemistry***

pVISIA: Vector for Surface Display of Immunogens

**Vishwajith Sridharan**

Thomas Jefferson High School for Science and Technology

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***Honorable Mention in Biochemistry***

Do Different Storage Methods Affect the Level of Vitamin C?

**Kelly Luciani**

Bishop O'Connell

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***First Place in Cellular and Molecular Biology***

The Significant Role of p70 Ribosomal S6 Kinase in Regulating Mouse Embryonic Stem Cell Cardiomyogenesis

**LeeAnn Li**

Thomas Jefferson High School for Science and Technology

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***Second Place in Cellular and Molecular Biology***

Acetyl Transferase Inhibitors: A New Treatment for Colon and Cervical Cancer?

**Arun Dutta**

Western Albemarle High School

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***Third Place in Cellular and Molecular Biology***

Investigating the French Paradox: Resveratrol as a Potential Antioxidant in Mesenchymal Stem Cell Differentiation and Genomic Stability

**Suraj Mishra**

Mills E. Godwin High School

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***Honorable Mention in Cellular and Molecular Biology***

Investigating the Role of T-bet on the Proliferation of Parasite Specific CD8+ T cells

**Margaret Chi**

The Mathematics and Science High School at Clover Hill

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***First Place in Chemistry***

Nutty Science

**Kelly Martins**

Langley High School

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***Second Place in Chemistry***

A Nanoparticle-Based Solution to Mitigate Corrosion of an Alkaline Fuel Cell Bipolar Plate

**Vijay Govindarajan**

Mills. E Godwin High School

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***Third Place in Chemistry***

The Effect of Surfactants and Temperature on Surface Tension

**Angela Jividen**

Osborn High School

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***Honorable Mention in Chemistry***

Microwave Assisted Synthesis of Biodiesel

**Rebekah Webster**

Pulaski County High School

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***Honorable Mention in Chemistry***

Crown Ether Based Hydrogen Storage Materials

**Manchali Madduri**

Thomas Jefferson High School for Science and  
Technology

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***First Place in Computer Science***

A Heterogeneous Mixture Model for Unsupervised Pattern Classification

**Aditya Palepu**

Thomas Jefferson High School for Science and  
Technology

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***Second Place in Computer Science***

Dynamic Visual Pattern Recognition of Spoken Vowels: An Experiment in  
Automated Lip Reading

**Joseph Jachowski**

Thomas Jefferson High School for Science and  
Technology

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***Third Place in Computer Science***

Identification by Text Analysis

**Yosyp Shvab**

T. C. Williams

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***Honorable Mention in Computer Science***

Prototyping an Intuitive Alternative to the Computer Mouse in Three Dimensions

**Jeffrey Cooper**

Langley High School

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***First Place in Earth and Planetary Science***

A New Satellite Data-Based Global Drought Index

**Varun Bansal**

Thomas Jefferson High School for Science and  
Technology

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***Second Place in Earth and Planetary Science***

The Effect of the Uptake of Anthropogenic Carbon Dioxide in Oceans on the  
Growth and Calcium Production of Halimeda

**Trey Campbell**

Rustburg High School

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***Third Place in Earth and Planetary Science***

Burning Objects at Elevated Pressures : A Study of the Increasing Burn Rate as  
Atmospheric Pressure Increases.

**Holly Peterson**

Sherando High School

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***Honorable Mention in Earth and Planetary Science***

The Effect of the Entry Angle of A Projectile on the Amount of Ejecta Expelled

**Anthony Hennig**

Maggie Walker Governor's School for Government  
and International Studies

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***Honorable Mention in Earth and Planetary Science***

Determining the Statistical Relationship Between Human Population and  
Atmospheric CO<sub>2</sub> Increase and Inter-annual Variation

**Conor Dancy**

Loudoun Academy of Science

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***First Place in Energy and Transportation***

Electrochemical Analysis of Electrocatalytic Performance of Non-Precious Metal  
Electrodes and Catalysts on the Direct Ethanol Fuel Cell

**Abhinav Mohan**

Chantilly High School

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***Second Place in Energy and Transportation***

Biodiesel Production by in situ Transesterification of Spent Coffee Grounds and  
Thin-layer Chromatogram Analysis

**Dennis Li Li**

Langley High School

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***Third Place in Energy and Transportation***

Eliminating the Wall Effects of Wind Tunnel Testing Utilizing a Mobile Open-Air  
Testing Apparatus

**Jacob Harvey**

Southwest Virginia Governor's School

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***Honorable Mention in Energy and Transportation***

The Effects of Electrolysis on Internal Combustion Engine

**Daniel Aube**

Briar Woods High

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***Honorable Mention in Energy and Transportation***

The Design and Implementation of a Speed Management Device in Automobiles

**Molly Patterson**

Thomas Jefferson High School for Science and  
Technology

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***First Place in Engineering: Electrical and Mechanical***

Determining Tension and Drag and Lift Coefficients for Three Simple Paravane  
Designs

**Martin Minot**

Central Virginia Governor's School

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***Second Place in Engineering: Electrical and Mechanical***

Obtaining Optimal Efficiency From a Thompson Coil Electromagnetic Mass Accelerator

**Tim Bennett**

Bishop O'connell

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***Third Place in Engineering: Electrical and Mechanical***

Faraday Shoe that Produces a Greater Charge with a Faster Gait and Stronger Magnet

**Mackenzie Schroeder**

Loudoun County High

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***First Place in Engineering: Materials and Bioengineering***

The Degradation of the Two-way Effect in NiTi

**Scott Skirlo**

Thomas Jefferson High School for Science and Technology

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***Second Place in Engineering: Materials and Bioengineering***

A Study on the Influence of Fiber Orientation on Transverse Permeability of Fibrous Porous Media

**Mukarram Ahmad**

Mathematics and Science High School at Clover Hill

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***Third Place in Engineering: Materials and Bioengineering***

The Effect of Various De-icing Chlorides on Steel Corrosion

**Rachel Strauss**

Roanoke Valley Governor's School

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***First Place in Environmental Management***

Filtration By Mussels Of Nitrates and Phosphates

**Pasha Mostaghim**

Langley High School

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***Second Place in Environmental Management***

The Effect of A Commonly Used Pesticide on Aquatic Life

**Sarah Russo**

Yorktown

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***Third Place in Environmental Management***

The Suffocating Effect of Urban Trees on Public Health

**Edward Kim**

Mclean High School

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***Honorable Mention in Environmental Management***

The Phytoremediation of Heavy Metals by Brassica juncea

**Allison White**

Roanoke Valley Governor's School

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*First Place in Environmental Sciences*

Leaching Bifenthrin Through Various Soils

**Jordan Gulli**

Roanoke Valley Governor's School

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*Second Place in Environmental Sciences*

The Effects of Air Pollution on Insect Pollination

**Saad Khan**

Dominion High

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*Third Place in Environmental Sciences*

The Inhibition of Convection Currents Due to Temperature and Salinity Gradients

**Edward Hackett**

Wt Woodson High School

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*Honorable Mention in Environmental Sciences*

The Production of Ethanol From Coffea arabica Fruit Waste

**Alexis Harvey**

RVGS/Patrick Henry HS

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*First Place in Mathematical Sciences*

Controlling HIV from Transformation into AIDS: Mathematical Modeling of HIV Dynamics

**Sohini Sengupta**

Ocean Lakes High

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*Second Place in Mathematical Sciences*

Circle Inversions and the Pappus Chain Theorem

**Ke Cheng**

York High School

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*Third Place in Mathematical Sciences*

A New Approach to Encryption

**Curtis Khol**

James Madison High School

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*Honorable Mention in Mathematical Sciences*

A Proof Regarding the Relation Between Isomorphisms and Automorphisms

**Andrew Bardee**

The New School of Northern Virginia

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*First Place in Medicine and Health Sciences*

Potential Cancer Cure Using Garlic and Vitamin C

**Dennis Won**

Langley High School

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*Second Place in Medicine and Health Sciences*

Decorin Reduces Fibrotic Activity In Vitro: Implications for Treatment of Fibro-proliferative Disorders

**Rishi Iyengar**

Thomas Jefferson High School for Science and Technology

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*Third Place in Medicine and Health Sciences*

The effects of aged garlic extract on the growth of canine osteosarcoma tumor cells in vitro

**Se Jeong**

Roanoke Valley Governor's School

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*Honorable Mention in Medicine and Health Sciences*

The Effect of Substituting Fruit for Sugar, on Quality of Bread

**Apoorva Venkataramani**

York High School

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*Honorable Mention in Medicine and Health Sciences*

Facilitating the Differential Diagnosis of a Tumor

**Jayson Marwaha**

Thomas Jefferson High School for Science and Technology

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*First Place in Microbiology*

The Effects of UVC Radiation on the Prevalence of Community Associated Methicillin-Resistant Staphylococcus aureus in athletic departments

**William Day**

Ocean Lakes High

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*Second Place in Microbiology*

The Effect of Different Methods of Water Purification on the Amount of Bacteria

**David Patton**

Yorktown

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*Third Place in Microbiology*

Effectiveness of Preservatives to Inhibit Botrytis cinerea Growth on Strawberries

**Jared Johnson**

Roanoke Valley Governor's School

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*First Place in Physics and Astronomy*

Determining the Dielectric Function for Ionic Crystals from the Bottom Up""

**Narendra Tallapragada**

Thomas Jefferson High School for Science and Technology

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*Second Place in Physics and Astronomy*

A Novel Approach to the Multi-Thread Theory of Solar Coronal Loops Using New Stereoscopic Imaging

**David Kim**

Thomas Jefferson High School for Science and Technology

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*Third Place in Physics and Astronomy*

The Effects of Shell Load on Shotgun Recoil

**Benjamin Graham**

Southwest Virginia Governor's School

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*Honorable Mention in Physics and Astronomy*

Asymmetric Vortex Shedding as a Cause of Rotation

**Robert Meyer**

Robinson Secondary School

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*First Place in Plant Sciences*

The Effect of Estrogen Level in Water on the Average Root Length and Average Number of Roots of the Pothos Plant

**Amanda Schanz**

Math and Science High School at Clover Hill

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*Second Place in Plant Sciences*

Using Yeast Two Hybrid System to Identify the Protein-Protein Interaction between Rxo1 and AvrRxo1

**Tian Zhou**

Blacksburg High School

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*Third Place in Plant Sciences*

Rehabilitation of Ocean Dead Zones Via Alternative Photosynthetic Pathways in Cyanobacteria

**Reid Nebergall**

Dominion High

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*Honorable Mention in Plant Sciences*

Shedding Light on Plant Growth

**Michael Rangel**

Seton Catholic School

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*First Place in the Team Category*

Microbial Cell Fueled By Organic Waste Grown Algae

**Sara Almousa**

Islamic Saudi Academy

**Noha Sherif**

Islamic Saudi Academy

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*Second Place in the Team Category*

Acidity Affects Phototaxis in *Volvox globator*

**Kathleen Atkatsch**

Thomas Jefferson High School for Science and  
Technology

**Manna Fujju**

**Sapir Nachum**

Thomas Jefferson High School for Science and  
Technology

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*Third Place in the Team Category*

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**Leigh Haley**

Roanoke Valley Governor's School

**Caroline Thomsen**

Roanoke Valley Governor's School

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*Honorable Mention in the Team Category*

Textual Summarization Using Multi-Layer Neural Networks

**Arian Khorshid**

George Marshall High School

**Syed Hassan**

**Farhang Hooshmandnia**