

**33rd BLUE RIDGE HIGHLANDS REGIONAL SCIENCE FAIR
MARCH 1 – 2, 2024
RADFORD UNIVERSITY**

WINNERS BY CATEGORY

GRAND AWARD WINNERS

- 102 Xavier Gitre
Organic Mercury and Avian Foraging: The Impact of Methylmercury Exposure on the Feeding Efficiency of Invertivorous Passerines
Blacksburg High School
Sponsor: Katharine Davis
- 306 Ethan Ririe
Investigating the Impact of Parasitic Worm Secretions on Anaphylaxis as Novel Treatment for Food Allergies
Blacksburg High School
Sponsor: Katharine Davis

GRAND AWARD ALTERNATE

- 1001 Charlotte Phillips
*Investigating Degradation of Polyhydroxyalkanoate Straws in Saltwater Environments with Varying Temperature, and in the Presence of *Turbo mamoratus* and *Lysmata wurdemanni**
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

SENIOR DIVISION

Animal Sciences

First Place

- 102 Xavier Gitre
Organic Mercury and Avian Foraging: The Impact of Methylmercury Exposure on the Feeding Efficiency of Invertivorous Passerines
Blacksburg High School
Sponsor: Katharine Davis
Grand Award Winner

Second Place

104 Alexandria Swenson
Mean Frequencies of Microplastics in Commercially Processed Equine Foods
Southwest Virginia Governor's School
Sponsor: Jared Brown

Third Place

101 Ethan Easter
Determining the Effects of Four Natural Items on Oranges to Repel Drosophila melanogaster
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

Behavioral and Social Sciences

First Place

204 Molly Morris
The Correlation Between Color Cues and Human Perception of Flavors
Southwest Virginia Governor's School
Sponsor: Greg Riffe

Second Place

205 Sophie Perdue
Comfort Level Discussing Medical Topics Based on Parental Education Level
Southwest Virginia Governor's School
Sponsor: Megan Arnold

Third Place

206 Bisan Rai
Online "Group" Effect on Addiction Recovery
Southwest Virginia Governor's School
Sponsor: Sam Muriello

Honorable Mention

201 Naomi Black
Perception of Time When Exposed to an Analog vs. Digital Clock While Completing a Task
Southwest Virginia Governor's School
Sponsor: Greg Riffe

Biomedical and Health Sciences
Biomedical Engineering
Cellular and Molecular Biology

First Place

306 Ethan Ririe
Investigating the Impact of Parasitic Worm Secretions on Anaphylaxis as Novel Treatment for Food Allergies
Blacksburg High School
Sponsor: Katharine Davis

Second Place

302 Ashley Layne
The Effects of a Specific Rest Interval on Different Levels of Physical Exertion, and How the Interval Affects Bat Speed
Southwest Virginia Governor's School
Sponsor: Matt Frazier

Third Place

307 Kyler Williams
Effects of Supportive Insoles on Foot Pressure and Performance During Soccer Movements
Blacksburg High School
Sponsor: Katharine Davis

Chemistry

First Place

401 Laken Barnette
A Nutritional Assessment of Plant-Based Milk Alternatives: Comparing Common Plant-Based Milk Alternatives to Cow's Milk Using Chemical Analyses
Southwest Virginia Governor's School
Sponsor: Jared Brown

Second Place

403 Emma Ebel
Testing Phosphoric Acid Content in Soft Drinks Using UV Visible Spectroscopy
Southwest Virginia Governor's School
Sponsor: Jared Brown

Third Place

405 Nicholas Nista
Caloric Difference of Chicken Strips from Dairy Queen: Bomb Calorimetry, Atwood Method, and Stated Content
Southwest Virginia Governor's School
Sponsor: Jared Brown

Computational Biology and Bioinformatics Earth and Environmental Sciences

First Place

502 Connor Beasley
Metagenomic Analysis of the Microbial Biodiversity in Soil of Mountain Balds in Appalachia
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

Second Place

505 James Paine
*Quantifying Microplastics in *Corbicular fluminea* from a Limnic Ecosystem*
Southwest Virginia Governor's School
Sponsor: Jared Brown

Third Place

504 Jacey Hendrix
*Testing the Effects of the Sunscreen Ultraviolet Filter Oxybenzone on the Freshwater Plant *Lilaeopsis brasiliensis**
Southwest Virginia Governor's School

Embedded Systems Systems Software

First Place

601 Alexander Li
Enhancing Driving Safety via Real-Time Suppression of Vehicle Radar Interference
Blacksburg High School
Sponsor: Katharine Davis

Second Place

602 Asher Porter
Comparing Blacksburg Transit Recorded Versus Posted Stop Times
Southwest Virginia Governor's School
Sponsor: Greg Riffe

Energy: Sustainable Materials and Design

First Place

702 Hank Schroeder
The Effects of Consumer Products with Low Refractive Indexes on the Efficiency of Solar Panels
Southwest Virginia Governor's School
Sponsor: Matt Frazier

Second Place

701 Phoebe Fant
Analysis of the Heat of Combustion Using Bomb Calorimetry of Three Different Diesel Types
Southwest Virginia Governor's School
Sponsor: Jared Brown

Engineering Technology: Statics and Dynamics

First Place

801 Jesse Dulaney
Braking Affecting Unicycling
Southwest Virginia Governor's School
Sponsor: Matt Frazier

Second Place

803 Juli Ramos
Fiberglass Insulation Alternatives
Southwest Virginia Governor's School
Sponsor: Matt Frazier

Third Place

804 Garreth Rudd
Making Flywheel Energy Storage Systems Affordable and Compact
Southwest Virginia Governor's School
Sponsor: Matt Frazier

Environmental Engineering

First Place

903 Sriya Sridhar
Enzymatic Engineering for Enhanced Plastic Degradation in a Novel Plasmid System
Blacksburg High School
Sponsor: Katharine Davis

Second Place

901 Casey Felts
Testing Accuracy of a Gravity-Powered Seed Planter
Southwest Virginia Governor's School
Sponsor: Matt Frazier

Third Place

902 Oscar Montgomery
Aerating Water by Modifying a Free Water Vortex Turbine
Southwest Virginia Governor's School
Sponsor: Matt Frazier

Materials Science

First Place

1001 Charlotte Phillips
Investigating Degradation of Polyhydroxyalkanoate Straws in Saltwater Environments with Varying Temperature, and in the Presence of Turbo mamoratus and Lysmata wurdemanni
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

Second Place

1002 Braedon Rafferty
How Shape and Material Affect Aerodynamics and Affect Turbulence in the Form of Sound
Southwest Virginia Governor's School
Sponsor: Matt Frazier

Mathematics

First Place

1102 Derek Dunford
Anticipating Bridge Refurbishment Cost Using Bridge Characteristics
Southwest Virginia Governor's School
Sponsor: Greg Riffe

Second Place

1106 Lishu Wang
The Economic Impact of California's Recent Out-Migration on its Neighboring States
Blacksburg High School
Sponsor: Katharine Davis

Third Place

1105 Austin Quesenberry
Factors That Have a Major Impact on Running Ability
Southwest Virginia Governor's School
Sponsor: Greg Riffe

Physics and Astronomy

First Place

1201 Cole Abbott
Effects of Temperature and Humidity on the Timbre of Stringed Instruments
Southwest Virginia Governor's School
Sponsor: Matt Frazier

Second Place

1202 Sid Jakoubeck
Investigating the Factors Which Allow for the Stability of Planetary Orbits in Binary Star Systems Using Numerical Simulations Based on Initial Planetary Positions
Blacksburg High School
Sponsor: Katharine Davis

Third Place

1203 Enzo Nunez
Creating a Predictive Model of Limiting Magnitude Using Environmental Factors with Respect to Economic Efficiency
Southwest Virginia Governor's School
Sponsor: Matt Frazier

Plant Sciences

First Place

1301 Sage Lahmers
Relationship between below ground biomass and soil organic matter: case study in Mt Tabor Blacksburg
Blacksburg High School
Sponsor: Katharine Davis

Second Place

1302 Katelyn Melton
Administering Helium to Dandelions, White Clover, Kentucky Bluegrass, and Broadleaf Plantains to Observe Possible Herbicidal Effects
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

Third Place

1303 Natalie Tessar

Plant Health in Hard Water Concentrations Within a Hydroponics System

Southwest Virginia Governor's School

Sponsor: Jared Brown

**Robotics and Intelligent Machines
Translational Medical Science**

First Place

1403 Radia Lu

Systematic Assessment of Large Language Model's Correctness and Biases for Minority Health

Blacksburg High School

Sponsor: Katharine Davis

Second Place

1401 Lily Anderson

Can People Accurately Identify AI Written Text?

Southwest Virginia Governor's School

Sponsor: Sherry Pugh

Third Place

1402 George Black

A Comparison of a Student Response-Based Rubric and an AI Detector on Identification of AI-Written Essays

Southwest Virginia Governor's School

Sponsor: Sam Muriello

JUNIOR DIVISION

**Animal Science
Biomedical and Health Sciences**

First Place

2103 Virginia Vandyke

Fat or Fluffy

Riverview Elementary and Middle School

Sponsor: Rita Breeding

Second Place

2101 Arabella Barton and Leah Wilson

Freezing Distraction

Council Elementary and Middle School

Sponsor: Rita Breeding

Third Place

2102 Hunter Smith and Marley Kimbrough
Move to the Beat
Twin Valley Elementary and Middle School
Sponsor: Maddie Witt

**Biochemistry
Chemistry**

First Place

2203 Jacelyn Peak
Seaweed Style? From Ocean to Outfit!
Twin Valley Elementary and Middle School
Sponsor: Nikki Peak

Second Place

2201 Kaley Barton
Different Types of Coke Versus Mentos
Council Elementary and Middle School
Sponsor: Rita Breeding

Third Place

2204 Mia Sanders
Yummy
Twin Valley Elementary and Middle School
Sponsor: Pamela Deel

**Engineering Technology: Statics and Dynamics
Physics and Astronomy**

First Place

2302 Silas Alexander Phillips
Determination of Microwave Frequency Through Antinode Analysis
Scott Memorial Middle School
Sponsor: Lucas Phillips

Second Place

2301 Jacob Ohanian
Play Harmonics Like a Rockstar
Dawning Light Homeschool
Sponsor: John Ohanian

Environmental Engineering Materials Science

First Place

2401 Kendall Brown and Knightleigh Bell
Should You Flush It?
Twin Valley Elementary and Middle School
Sponsor: Madison Witt

Second Place

2402 Jim Caleb Christian
LIGHTS OUT
Hurley Elementary and Middle School
Sponsor: Scott Embrey

Third Place

2403 Noah Hurley
Soak It Up
Hurley Elementary & Middle School
Sponsor: Scott Embrey