

**29th Annual Blue Ridge Highlands Regional Science Fair
March 6 - 7, 2020 – Radford University**

AWARDS BY CATEGORY

Grand Award Winners

- 403 Claire Morton
The Division Decision: The Cdc13 Protein and Cell Size Control
Blacksburg High School
Sponsor: Katharine Davis
- 704 Virginia Worrell
Determining the Toxicological Effects of Polyurethane Foam and Complex Leachate on Artemia Nauplii
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

Grand Award Alternate

- 1202 Cassady Marion
The Impact of Arbuscular Mycorrhizal Fungi on Marigold Development in Microplastic-Contaminated Soil
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

SENIOR DIVISION

ANIMAL SCIENCES

First Place

- 103 Christian Shushok
Openness Factor and Large Mammal Use of Highway Underpasses: An Observational Study of State Mitigation Techniques
Blacksburg High School
Sponsor: Katharine Davis

Second Place

- 101 Katie Highfield
Quantifying Pre- to Post-Data Involving a Blast Induced Neurotrauma
Blacksburg High School
Sponsor: Katharine Davis

Third Place

- 102 Morgan Ralph
The Facility of Gromphadorhina portentosa to Grind Microplastics
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

Honorable Mention

- 104 Bradley Turner
Can Implementing Additives to Polyethylene/Honeycomb Increase Galleria mellonella's Appetite for the Material?
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

BEHAVIORAL AND SOCIAL SCIENCES

First Place

- 215 Nadine Shannon
Is There an Association Between People with a Morning Versus Evening Chronotype and Variants of the HCRTR2 Gene?
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

Second Place

- 218 Rosemary Wnorowski
Determining the Efficiency of the Container Deposit Laws
Southwest Virginia Governor's School
Sponsor: Greg Riffe

Third Place

- 208 Samuel Grove
Nicotine Usage Rates Amongst U.S. Sexual Minority Students
Blacksburg High School
Sponsor: Katharine Davis

Honorable Mention

- 202 Anna Addison
Parental Perceptions of the Benefit of Technology in Young Children, Focused in Southwest Virginia
Southwest Virginia Governor's School
Sponsor: Greg Riffe
- 207 Diego Elias
Analysis of Public Perception of Climate Change in the New River Valley Using Contingent Valuation
Blacksburg High School
Sponsor: Katharine Davis
- 210 Sasha Ronen Halfon-DeLay
Islamophobia in Political Discourse: A Comparison Between the United States, France, Greece, and Sweden
Blacksburg High School
Sponsor: Katharine Davis
- 214 Taylor Rudisill
The Effect of the Generally Accepted Quality for Classical Literature on the Self Esteem of Student Writings in Regards to Their Own Work
Southwest Virginia Governor's School
Sponsor: Sherry Pugh

**BIOMEDICAL AND HEALTH SCIENCES
BIOMEDICAL ENGINEERING**

First Place

- 303 Haley Hansen
Assessing Compliance of Fourth and Fifth Grade Students with a National Backpack Weight Guideline
Southwest Virginia Governor's School
Sponsor: Heather Lowe

Second Place

- 304 Kayla Horne
Commonalities in Craniosynostosis Patients
Southwest Virginia Governor's School
Sponsor: Sherry Pugh

Third Place

- 305 Emi Miyazaki and Lexi Nussbaum
Epigallocatechin Gallate Blunts Inflammation Stimulated by Tumor Necrosis Factor- α in Liver Endothelial Cells Under Varying Oxygen States
Blacksburg High School
Sponsor: Katharine Davis

Honorable Mention

- 306 Lauren Perkins
Efficacy of Charcoal as a Bleaching Agent on Teeth
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

CELLULAR AND MOLECULAR BIOLOGY

First Place

- 403 Claire Morton
The Division Decision: The Cdc13 Protein and Cell Size Control
Blacksburg High School
Sponsor: Katharine Davis

Second Place

- 401 Cameron Gilmore
Isolating the Periplasmic Region of GacS(39-164) from P. aeruginosa
Blacksburg High School
Sponsor: Katharine Davis

Third Place

- 402 Dasol Lee
Stability of the Serine Hydrolase Inhibitor AA74-1
Blacksburg High School
Sponsor: Katharine Davis

CHEMISTRY MATERIALS SCIENCE

First Place

- 502 Isabella Burgoyne
Using Cellulose Nanocrystals as a Filter for Methane and Nitrogen Dioxide
Southwest Virginia Governor's School
Sponsor: Jared Brown

Second Place

- 501 Allison Adams
Determining Concentrations of Lead in Jewelry Using Inductively Coupled Plasma
Southwest Virginia Governor's School
Sponsor: Jared Brown

Third Place

- 503 Hannah Dishner
The Extraction of Lead from Cathode Ray Tubes Through the Use of Acidic Water Leaching
Southwest Virginia Governor's School
Sponsor: Jared Brown

Honorable Mention

- 507 Kennedy Williams
Turbidity in Water in a Local Wellness Center Pool
Southwest Virginia Governor's School
Sponsor: Jared Brown

COMPUTATIONAL BIOLOGY AND BIOINFORMATICS SYSTEMS SOFTWARE

First Place

- 601 Brandon Fan
An AI-based System for Early Detection of Natural Disaster and Incidents Using Open Data
Blacksburg High School
Sponsor: Katharine Davis

Second Place

- 602 Michael Wojdak
Modeling the Effects of Solenopsis invicta Expansion on Other Species
Southwest Virginia Governor's School
Sponsor: Greg Riffe

EARTH AND ENVIRONMENTAL SCIENCES

First Place

- 704 Virginia Worrell
Determining the Toxicological Effects of Polyurethane Foam and Complex Leachate on Artemia Nauplii
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

Second Place

- 703 Grace Shen
The Effects of Storm Intensity on the Filtration of Microplastics from Sediment
Blacksburg High School
Sponsor: Katharine Davis

Third Place

- 701 Emma Freeborn
Evaluating Forest Industry Educational Opportunities in Southwest Virginia
Southwest Virginia Governor's School
Sponsor: Heather Lowe

Honorable Mention

- 702 Jack Graves
The Difference of pH and Nitrogen Levels in Natural Ponds Compared to Man-Made Ponds
Southwest Virginia Governor's School
Sponsor: Jared Brown

ENERGY: SUSTAINABLE MATERIALS AND DESIGN ENVIRONMENTAL ENGINEERING

First Place

- 803 Adam Downs
Analyzing the Relationship Between Brine Viscosity and Anti-Icing Viability Across Multiple Snow Cycles
Southwest Virginia Governor's School
Sponsor: Jared Brown

Second Place

- 804 Shayla Meadow Utzinger
Analysis of the Pressure Distribution of Differing Widths and Tensions of Backpacking Hammock Straps
Blacksburg High School
Sponsor: Katharine Davis

Third Place

- 801 Raaj Aggarwal
How Different Levels of pH Affect the Efficiency, Productivity, and Chemical Composition of Hydrogen in Hydrolysis Converters
Southwest Virginia Governor's School
Sponsor: Jared Brown

Honorable Mention

- 802 Mason Baber
An Inquiry Into the Viability and Efficiency of Utilizing Small-Scale Gravitation Water Vortex Turbines in Supplementary Power Production
Southwest Virginia Governor's School
Sponsor: Matthew Frazier

ENGINEERING MECHANICS

First Place

- 902 Kate Childers
The Application of Fiber Optic Multi-Core Shape Sensing Fibers on Flexible Models
Southwest Virginia Governor's School
Sponsor: Matthew Frazier

Second Place

- 904 Henry Myers IV
The Structure of a Quadcopter Drone Under Crash Conditions
Blacksburg High School
Sponsor: Katharine Davis

Third Place

- 903 Keaton Hansen
Simple Stopper Device for Use and Attachment on Existing Shopping Carts
Southwest Virginia Governor's School
Sponsor: Matthew Frazier

Honorable Mention

- 901 Curtis Case
Examining Rates of Rowhammer-Type Errors Between Manufacturers of DRAM Chips
Southwest Virginia Governor's School
Sponsor: Matthew Frazier

MATHEMATICS

First Place

- 1001 Lauritz Cedric Means Christensen
The Quantification of Gerrymandering in Montgomery County: An Exploration of Cracking in Southwest Virginia
Blacksburg High School
Sponsor: Katharine Davis

Second Place

- 1006 Abigail Musser
Correlation Between Court Location, Hand Contact, and Likelihood of Scoring in Women's Division I College Volleyball
Southwest Virginia Governor's School
Sponsor: Matthew Frazier

Third Place

- 1005 Quinne Jimenez
Static and Emergent Shape Thinking in Contrast to Success in Calculus
Southwest Virginia Governor's School
Sponsor: Heather Lowe

Honorable Mention

- 1002 Elizabeth Coleman
The Effects of 3D Models on Understanding the Concept of Integration
Southwest Virginia Governor's School
Sponsor: Heather Lowe

PHYSICS AND ASTRONOMY

First Place

- 1105 Vishvesha Sridhar
Identification of the Gradient Drift Instability in the Sub-auroral Polarization Stream
Blacksburg High School
Sponsor: Katharine Davis

Second Place

- 1103 Grace Mecimore
How Lubricants Affect Nail Penetration in Wood
Southwest Virginia Governor's School
Sponsor: Matthew Frazier

Third Place

- 1101 Gage Amesquita
Determining the Effectiveness of Lock Washers in High Vibration Environments
Southwest Virginia Governor's School
Sponsor: Matthew Frazier

Honorable Mention

- 1102 Bryan Beckner
Can Gloves Be Introduced to Traditional-Style Drumming Without the Loss of Grip?
Southwest Virginia Governor's School
Sponsor: Matthew Frazier

PLANT SCIENCES

First Place

- 1202 Cassady Marion
The Impact of Arbuscular Mycorrhizal Fungi on Marigold Development in Microplastic-Contaminated Soil
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

Second Place

- 1205 Jacqueline Wang
Effects of Inositol Pyrophosphates on the Growth and Physical Characteristics of Arabidopsis
Blacksburg High School
Sponsor: Katharine Davis

Third Place

- 1204 Mason Sproule
Effects of Naphthalene Acetic Acid on Prevention of Holly Berry-Drop
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

Honorable Mention

- 1203 Kaleeia Parks
The Effect of Iron Water on Hydroponic Chia Plants
Southwest Virginia Governor's School
Sponsor: Jared Brown

JUNIOR DIVISION

ANIMAL SCIENCE BIOCHEMISTRY BIOMEDICAL AND HEALTH SCIENCE

First Place

2102 Charlotte Phillips
Measuring Effects of Nicotine on Neuron Activity in Acheta domesticus
Scott Memorial Middle School
Sponsor: Lucas Phillips

Second Place

2103 Hailey Sheppard
Pheel the Burn
Graham Middle School
Sponsor: Holly Smith

CHEMISTRY

First Place

2203 Lydia Kipp
Time for Tea
Classical Conversations
Sponsor: Beth B. Kipp

Second Place

2201 Austin Barthis & Graham Pittman
Copper Plating (Electroplating)
Wallace Middle School
Sponsor: Becky Pittman

Third Place

2202 Sydney Deel & Riley Lowe
Elephant Toothpaste
Tazewell Middle School
Sponsor: Jennifer Lowe

EARTH AND ENVIRONMENTAL SCIENCES

**ENERGY: SUSTAINABLE MATERIALS & DESIGN
ENVIRONMENTAL ENGINEERING
PLANT SCIENCES**

First Place

2304 Charlotte Stevens
From Contaminated to Clean: How Filtering Can Clean Water
Classical Conversations
Sponsor: Cynthia Stevens

Second Place

2301 Molly Jones
What Wood You Use?
Graham Middle School
Sponsor: Holly Smith

Third Place

2303 Isaac Meade
How Does Your Garden Grow?
Tazewell Middle School
Sponsor: Deborah Mason

ENGINEERING MECHANICS

First Place

2402 Gregory Ghoorahoo
Batter Up! The Difference in Hitting Power
Classical Conversations
Sponsor: Leslie Ghoorahoo

MATERIALS SCIENCE

First Place

2503 Elias Stout
Did You Hear That? What Materials Work Best for Soundproofing
Graham Middle School
Sponsor: Holly Smith

Second Place

2505 Elijah Tomiak

Electromagnets: How Many Coils Are More Powerful
Scott Memorial Middle School
Sponsor: April Schmidt

Third Place

2502 Kripa Patel
Is Black Ink Really Black?
Graham Middle School
Sponsor: Ashley Rebuck

MICROBIOLOGY

First Place

2601 Aynsley Krum
Through Thick and Thin
Classical Conversations
Sponsor: Marisa Krum

PHYSICS AND ASTRONOMY

First Place

2701 Bethany Abbott
How Does the Shape of a Light Bulb Affect the Luminosity of Light?
Shawsville Middle School
Sponsor: Amy Guerin

Second Place

2703 Jaiden Borich & Alexander Fanning
Piercing Radio Waves
Graham Middle School
Sponsor: Catherine Evans

Third Place

2704 Tiffany Jackson
Voltage Levels in Homemade Batteries
Shawsville Middle School
Sponsor: Amy Guerin

Honorable Mention

2705 Carson Roten

How Does Spring Affect the Trajectory of a Soccer Ball?

Graham Middle School

Sponsor: Ashley Rebuck

2706 Amelia Wolfe

Control Your Light!

Graham Middle School

Sponsor: Catherine Evans