

**27th Annual Blue Ridge Highlands Regional Science Fair
March 2 - 3, 2018 – Radford University**

AWARDS BY PROJECT NUMBER

SENIOR DIVISION

ANIMAL SCIENCES

- 101 Tyler Kwak
Analyzing the Effects of Lead and Maltol on the Visual Behaviors of the Brain in Xenopus laevis Tadpoles
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips
Animal Sciences – Second Place, Senior Division
Radford University Sigma Xi Chapter Distinguished Award in Science
- 102 Jeanette Reed
Paw-ness in Pure and Mixed Breed Canines
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips
Animal Sciences – First Place, Senior Division
Virginia State and Science and Engineering Fair Delegate
American Society of Mammalogists Awar
Virginia Dental Award
- 103 Ryan Vandyke and Jessie Lester
Do Worms Prefer Light or Dark?
Richlands High School
Sponsor: Tiffany Stillwell
Animal Sciences – Third Place, Senior Division

BEHAVIORAL AND SOCIAL SCIENCES

- 202 Ben June
Soliciting Requirements for a Music Search-Engine for Band Directors
Blacksburg High School
Sponsor: Katharine Davis
Behavioral and Social Sciences – Honorable Mention, Senior Division

- 203 Zoe Mathis
Openness to Experience Among Age Groups and Gender Relations
Southwest Virginia Governor's School
Sponsor: Sherry Pugh
Behavioral and Social Sciences – Second Place, Senior Division
- 204 Sydney Stephens
The Effectiveness of Clickbait on Students
Southwest Virginia Governor's School
Sponsor: Greg Riffe
Behavioral and Social Sciences – Third Place, Senior Division
Emory and Henry Scholarship
- 205 Audra White
The Effect of an OXTR Gene Variant on Empathy In Female Adolescents
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips
Behavioral and Social Sciences – First Place, Senior Division
Virginia State and Science and Engineering Fair Delegate
American Psychological Association Award
American Red Cross Award
Virginia Dental Award

BIOMEDICAL AND HEALTH SCIENCES

- 302 Laura Gautier
The Effects of Sound Frequencies on a Tinnitus Model
Southwest Virginia Governor's School
Sponsor: Matthew Frazier
Biomedical Engineering Award – Virginia Tech
Regeneron Science Talent Search
- 303 Shay Ladd
Astrocyte Response to Traumatic Brain Injury
Blacksburg High School
Sponsor: Katharine Davis
Biomedical and Health Sciences – First Place, Senior Division
Virginia State and Science and Engineering Fair Delegate
U. S. Air Force Distinguished Achievement Award
Virginia Dental Award

- 304 Victoria Pratt-Myers
Variation in the COMP Gene and its Association With Ligament Sprains and Tendon Sprains
 Southwest Virginia Governor's School
 Sponsor: Rebecca Phillips
Biomedical and Health Sciences – Third Place, Senior Division
- 306 Senah Stephens
The Effect of Palm Kernel Oil On Streptococcus mutans in In Vitro Oil-Pulling Techniques
 Southwest Virginia Governor's School
 Sponsor: Catherine Spachmann
Biomedical and Health Sciences – Second Place, Senior Division

CELLULAR AND MOLECULAR BIOLOGY

- 401 Xavia Arnold
Association of the CHRNA4 Gene Variants and Smoking Habits
 Southwest Virginia Governor's School
 Sponsor: Rebecca Phillips
Cellular and Molecular Biology – Second Place, Senior Division
- 404 Rosa Maria Lovo
Monitoring the Growth of Kombucha SCOBY's in Various Types of Tea
 Southwest Virginia Governor's School
 Sponsor: Catherine Spachmann
Cellular and Molecular Biology – Third Place, Senior Division
Manufacturing Technology Center Award
- 405 Raaga Unmesha Vullikanti
Peptide Nucleic Acids as Potential Designer Antimicrobials
 Blacksburg High School
 Sponsor: Katharine Davis
Grand Award Winner
Cellular and Molecular Biology – First Place, Senior Division
Virginia State and Science and Engineering Fair Delegate
Arizona State University Sustainability Solutions Initiatives Awards
Beta Beta Beta Biological Honor Society Excellence in Biological Sciences
Award- Radford University
U. S. Metric Association Award
Virginia Dental Award

CHEMISTRY

- 501 Drew Ayers
A Study on the Physical and Functional Properties of Surfactants and Their Incorporation into Biscuit Making
Southwest Virginia Governor's School
Sponsor: Jared Brown
Chemistry – Second Place, Senior Division
Virginia State and Science and Engineering Fair Delegate
American Chemical Society, Northeastern Tennessee Section Award – Third Place
- 503 Christopher Todd Cochran
The Effects of Alcohol Oxygenates on the Energy Density of Gasoline
Southwest Virginia Governor's School
Sponsor: Jared Brown
Chemistry – Honorable Mention, Senior Division
U. S. Air Force Distinguished Achievement Award
- 504 James Crewey
Effects of Chemical Sorbents on Varied Concentrations of Water-Ethanol Solutions
Southwest Virginia Governor's School
Sponsor: Jared Brown
Chemistry – Third Place, Senior Division
- 507 Dawson Little
Comparing the Effect of Types of Catalyst on Biodiesel Quality
Southwest Virginia Governor's School
Sponsor: Jared Brown
Chemistry – Honorable, Senior Division
- 508 Kathleen Reuwer
Potential Hazardous Hexavalent Chromium Exposure From the Sharpening of Ice Skate Blades
Southwest Virginia Governor's School
Sponsor: Jared Brown
Chemistry – First Place, Senior Division
Virginia State and Science and Engineering Fair Delegate
American Chemical Society, Northeastern Tennessee Section Award – Second Place
Virginia Dental Award
Radford University Scholarship

- 509 Jadan Robertson
Can the Chicken Egg Cuticle Filter Contaminated Water
Southwest Virginia Governor's School
Sponsor: Jared Brown

EARTH AND ENVIRONMENTAL SCIENCES

- 601 Nicholas Harvey
Self-Assembled TiO₂/Polyelectrolyte Composite Films for Catalytic Photodegradation of Pollutants
Southwest Virginia Governor's School
Sponsor: Jared Brown
Earth and Environmental Sciences – Third Place, Senior Division
American Chemical Society, Northeastern Tennessee Section Award – First Place
American Chemical Society, Virginia Blue Ridge Section Award
U. S. Air Force Distinguished Achievement Award
- 602 Ainsley LaPlante
Effects of Gasoline on Pavona frondifera and Montipora capricornis Corals
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips
Earth and Environmental Sciences – First Place, Senior Division
Virginia State and Science and Engineering Fair Delegate
American Meteorological Society Award
Association for Women Geoscientists Award
Genius Olympiad
National Oceanic and Atmospheric Association Award
Office of Naval Research Award – Distinguished Achievement
Regeneron Science Talent Search
Society for In Vitro Biology Award
Stockholm Junior Water Prize
Virginia Dental Award
Virginia Dental Grand Award
- 603 Andrew Rhys Lewis
Using Algae to Modify the Atmosphere of Mars
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips
Earth and Environmental Sciences – Honorable Mention, Senior Division

- 604 Olivia Smoot
Water Toxicity Test of a Rural Area Using Daphnia Magna
Southwest Virginia Governor's School
Sponsor: Catherine Spachmann
*Earth and Environmental Sciences – Second Place, Senior Division
Genius Olympiad*

EMBEDDED SYSTEMS

- 701 Ethan Dehoff
MatLab Simulation of FMCW Radar: Noise and Signal Processing
Blacksburg High School
Sponsor: Katharine Davis
Embedded Systems – Third Place, Senior Division
- 702 Collin Gray
The Effects of Different Computer Components on Computer Efficiency
Southwest Virginia Governor's School
Sponsor: Matthew Frazier
*Embedded Systems – Second Place, Senior Division
Mount Tabor Ruritan Award*
- 703 Elijah Hodges, Liam Lawrence, and Siddharth Nathella
Genesis of an Isolated High Dynamic Range Video System
Blacksburg High School
Sponsor: Katharine Davis
*Grand Award Winner Alternate
Embedded Systems – First Place, Senior Division
Virginia State and Science and Engineering Fair Delegate*

ENGINEERING MECHANICS ENVIRONMENTAL ENGINEERING

- 801 Alexandra Barrett
Biomechanic Simulations to Understand the Behavior of Lift-Assist Exoskeletons
Southwest Virginia Governor's School
Sponsor: Matthew Frazier
*Engineering Mechanics, Environmental Engineering – Third Place, Senior Division
Regeneron Science Talent Search*

- 802 Camden Brewer
Hydrophobic Alto Saxophone Pads
Southwest Virginia Governor's School
Sponsor: Matthew Frazier
Engineering Mechanics, Environmental Engineering – Honorable Mention, Senior Division
Regeneron Science Talent Search
- 803 Ross Brown
Engineering a Supercapacitor Derived from Agricultural Waste
Southwest Virginia Governor's School
Sponsor: Matthew Frazier
Ricoh Corporation Sustainable Development Award
- 804 Isabelle Hollars
Designing Cost Effective, Spill-Proof, and Shatter-Proof, Drinking Vessels for People Diagnosed with Parkinson's Disease
Southwest Virginia Governor's School
Sponsor: Matthew Frazier
Engineering Mechanics, Environmental Engineering – Second Place, Senior Division
Regeneron Science Talent Search
Yale Science and Engineering Association Award
- 805 Alexander Tomiak
Comparing Methods of Glare Reduction from HID Headlights in External Rearview Mirrors
Southwest Virginia Governor's School
Sponsor: Matthew Frazier
Engineering Mechanics, Environmental Engineering – First Place, Senior Division
Virginia State and Science and Engineering Fair Delegate
Virginia Dental Award

MATHEMATICS

- 901 Nicholas Agud
A Three-Dimensional Model of the Moving Sofa Problem
Southwest Virginia Governor's School
Sponsor: John Jaroma
Mathematics – Second Place, Senior Division

902 Sam Coulson
The Influence of Budgeting on Financial Aid in Higher Institutions
Southwest Virginia Governor's School
Sponsor: Greg Riffe
Mathematics – First Place, Senior Division
Virginia State and Science and Engineering Fair Delegate

MICROBIOLOGY

1001 Simonne Guenette
The role of trehalose in heat-resistant Mycobacterium avium
Blacksburg High School
Sponsor: Katharine Davis
Microbiology – Third Place, Senior Division

1003 Stevie Lowe
Comparisons of Antibacterial Activity of Amphibian Epidermal Secretions Against E. coli
Southwest Virginia Governor's School
Sponsor: Catherine Spachmann
Microbiology – Second Place, Senior Division
American Association for University Women Award

1004 Aarati Pokharel and Lily Zhu
Isolation of a Phosphate Accumulating Organism from a Local Freshwater Source
Blacksburg High School
Sponsor: Katharine Davis
Stockholm Junior Water Prize
Virginia Lakes and Watersheds Award

1005 Brittany Stiefel
Prevalence of Antibiotic Resistance in the Gut Flora (Enterobacteriaceae) of Wild and Domesticated Horses
Southwest Governor's School
Sponsor: Catherine Spachmann
Microbiology – First Place, Senior Division
Virginia State and Science and Engineering Fair Delegate
American Association for University Women Award
American Society of Mammalogists Award
Arizona State University Sustainability Solutions Initiatives Awards
Virginia Dental Award

- 1006 Tristan Conner Williams
An Analysis of the Effectiveness of Small Scale Egg Washing Methods
Southwest Virginia Governor's School
Sponsor: Catherine Spachmann
Microbiology – Honorable Mention, Senior Division

PHYSICS AND ASTRONOMY

- 1101 Jake Mitchell
Bent Versus Bermuda Grass on Golf Greens and How They Affect the Friction Created by the Golf Ball
Southwest Virginia Governor's School
Sponsor: Matthew Frazier
Physics and Astronomy – Second Place, Senior Division
- 1102 Reegal Shailesh Patel
The Effects of Introducing Non-Newtonian Fluids Into Football Helmet Padding On Impact Forces
Southwest Virginia Governor's School
Sponsor: Matthew Frazier
Physics and Astronomy – First Place, Senior Division
Virginia State and Science and Engineering Fair Delegate
New River Community College Scholarship
- 1103 Noah Whitlow
Shock Distribution of Common Substances
Southwest Virginia Governor's School
Sponsor: Matthew Frazier
Physics and Astronomy – Third Place, Senior Division
Mount Tabor Ruritan Award

PLANT SCIENCES

- 1201 Makayla Goines
Phytoremediation of Iron from Water by Hydroponically Grown Brassica Juncea
Southwest Virginia Governor's School
Sponsor: Jared Brown
Plant Sciences – Honorable Mention, Senior Division
- 1202 Aleah Goodson
The Effects of Water from Various Sources on Plant Growth
Southwest Virginia Governor's School
Sponsor: Catherine Spachmann
Plant Sciences – Third Place, Senior Division

1203 Sophia Link
The Role of Inositol Phosphates on Plant Development and Stress Response

Blacksburg High School

Sponsor: Katharine Davis

Plant Sciences – First Place, Senior Division

Virginia State and Science and Engineering Fair Delegate

Office of Naval Research Award – Distinguished Achievement

Virginia Dental Award

1206 Anya Robbins
The Effects of Acid Rain on Foliage and Prevention Using Calcium Carbonate

Southwest Virginia Governor's School

Sponsor: Rebecca Phillips

Plant Sciences – Second Place, Senior Division

NASA Earth System Science Award

ROBOTICS AND INTELLIGENT MACHINES SYSTEMS SOFTWARE

1301 Brandon Fan
Using Deep Learning to Return Critical Documents for Clinical Decision Support Systems

Blacksburg High School

Sponsor: Katharine Davis

Grand Award Winner

Robotics and Intelligent Machines; Systems Software – First Place, Senior Division

Virginia State and Science and Engineering Fair Delegate

Intel Excellence in Computer Science Award

1302 Aaron Vickers
Prediction of Aerodynamic Forces Using Machine Learning

Southwest Virginia Governor's School

Sponsor: Matthew Frazier

Robotics and Intelligent Machines; Systems Software – Second Place, Senior Division

Radford University Scholarship

Wytheville Community College Scholarship

JUNIOR DIVISION

ANIMAL SCIENCE & EARTH AND ENVIRONMENTAL SCIENCE

- 2001 David Altizer
The Effect of Water Runoff on Soil Types and Erosion
Classical Conversations
Sponsor: Karen Altizer
Animal Sciences; Earth and Environmental Sciences – Second Place, Junior Division
Virginia Lakes and Watersheds Award
- 2002 Bryce Havens
Tackling Toxic Taps
Graham Middle School
Sponsor: Holly Smith
Animal Sciences; Earth and Environmental Sciences – First Place, Junior Division
Broadcom Masters Award
- 2003 Tina Huang
Paper Chromatography with Creek Water
Tazewell Middle School
Sponsor: Loretta Hypes
Animal Sciences; Earth and Environmental Sciences – Third Place, Junior Division
- 2004 Jenna Ramey
How do oil spills affect marine life?
Riverview Elementary Middle School
Sponsor: Kay Ratliff
Animal Sciences; Earth and Environmental Sciences – Honorable Mention, Junior Division
- 2005 Keyonna Rhodie
Does the Ph Level Affect Mosquito Growth?
Tazewell Middle School
Sponsor: Loretta Hypes
Animal Sciences; Earth and Environmental Sciences – Honorable Mention, Junior Division

CHEMISTRY

- 2102 Emelyn Koene
Laundry Detergents
Dayspring Christian Academy
Sponsor: Bryan Koene
Chemistry – First Place, Junior Division
Broadcom Masters Award
- 2104 Zeke Phipps
Effects of Temperature on Luminol: Is it bright glow or slow glow?
Independence Middle School
Sponsor: Stacy Phipps
Chemistry – Third Place, Junior Division
- 2106 Jacob White
Explosion of Corrosion
Graham Middle School
Sponsor: Holly Smith
Chemistry – Second Place, Junior Division
Office of Naval Research Award – Distinguished Achievement
- 2108 Grant R. Williams
Effect of Butter Temperature on Chocolate Chip Cookies
Classical Conversations
Sponsor: Robert C. Williams
Chemistry – Honorable Mention, Junior Division

ENERGY: PHYSICAL

- 2201 Caleb Altizer
The Effectiveness of a 10v Solar Panel on a 12v Battery
Classical Conversations
Sponsor: Karen Altizer
Energy: Physical – Honorable Mention Junior Division
Mount Tabor Ruritan Award
- 2202 Jonathan Collier
Solar Power: Is It Too Hot?
Tazewell Middle School
Sponsor: Loretta Hypes
Energy: Physical – Third Place, Junior Division

- 2203 Hannah E. Cook
The Science of Popcorn: A Look at Popping Efficiency
Classical Conversations
Sponsor: Laura P. Cook
Energy: Physical – First Place, Junior Division
Broadcom Masters Award
- 2204 Ansley Ohanian
Is the Dark Side Warmer
Classical Conversations
Sponsor: John Ohanian
Energy: Physical – Honorable Mention, Junior Division
- 2206 Russell Alan Sarver
Ready Aim Fire
Classical Conversations
Sponsor: Judy Sarver
Energy: Physical – Second Place, Junior Division
Office of Naval Research Award – Distinguished Achievement

**ENGINEERING MECHANICS
ENVIRONMENTAL ENGINEERING**

- 2301 Jackson Brockman
Nailed It
Classical Conversations
Sponsor: Sarah Brockman
Engineering Mechanics; Environmental Engineering – First Place, Junior Division
Broadcom Masters Award
Mount Tabor Ruritan Award
- 2302 Nathan J. Cook
To Drink or Not to Drink: Water Quality in Montgomery County
Classical Conversations
Sponsor: Laura Cook
Engineering Mechanics; Environmental Engineering – Third Place, Junior Division
- 2303 Joseph E. Trout
Go the Distance: Comparing the Flight Distances of 3 Paper Airplane Designs
Classical Conversations
Sponsor: Jess Trout
Engineering Mechanics; Environmental Engineering – Second Place, Junior Division

MATERIALS SCIENCE

- 2401 Gracie Firgau
How Does the Amount of Activator Affect the Slime?
Galax High School
Sponsor: Kathryn Pakkidis
Materials Science – Third Place, Junior Division
- 2402 Aiden Stout
To Burn or Not to Burn: That is the Question
Graham Middle School
Sponsor: Holly Smith
Materials Science – First Place, Junior Division
Broadcom Masters Award
Radford University Sigma Xi Chapter Distinguished Award in Science
- 2403 Kayla Waters
Egg Substitutes
Classical Conversations
Sponsor: Danielle Waters
Materials Science – Second Place, Junior Division

PHYSICS AND ASTRONOMY

- 2501 Nathan Coburn
Insulated Ice
Classical Conversations
Sponsor: Peggy Coburn
Physics and Astronomy – First Place, Junior Division
- 2502 Isaac Rich
Blocked Signal
Classical Conversations
Sponsor: Lindsay Rich
Physics and Astronomy – Third Place, Junior Division
- 2503 Janalyn Vance
Radioactive Texts
Wallace Middle School
Sponsor: Shannon Mutter
Physics and Astronomy – Second Place, Junior Division

PLANT SCIENCES

- 2601 Jonathon Altizer
The Effect of Light Intensity on Plant Growth
Classical Conversations
Sponsor: Karen Altizer
Plant Sciences – First Place, Junior Division
- 2602 Boston Rosborough
The Effects of Colored Light on Plant Growth
Homeschool
Sponsor: Rani Rosborough
Plant Sciences – Third Place, Junior Division
- 2603 Jacob Slabach
Organic: Certified vs. Local
Classical Conversations
Sponsor: Audra Slabach
Plant Sciences – Second Place, Junior Division