


Prince William-Manassas  
Regional

# Science and Engineering Fair

The logo for the Science and Engineering Fair features the words "Science and Engineering Fair" in a large, bold, black font. The word "Science" is on the top line, "and" is in the middle, "Engineering" is on the bottom line, and "Fair" is to the right of "Engineering". Various scientific and engineering icons are integrated into the text: a test tube in the 'S', a red horseshoe magnet in the 'e', a wrench in the 'E', a flask with blue liquid in the 'n', a microscope in the 'g', and a molecular model in the 'r'.

**MIDDLE DIVISION PROJECTS  
PROMOTED TO PHASE II:  
IN-PERSON JUDGING ON  
MARCH 16, 2024**

# Middle Division Participants

## Animal Sciences

School	Students	Project Title
Parkside Middle School	JR-AN-18	Which Food Makes Hornworms Grow the Fastest?
Porter Traditional School	JR-AN-20	Cat Food Experiment
Benton Middle School	JR-AN-21	Tracing the Trail of Toxins Through our Ecosystems: The Effect of Microplastics on the Lifecycle of the Butterfly
All Saints Catholic School	JR-AN-26	The Effect of Repetition on a Cat's Time in a Maze
Graham Park Middle School	JR-AN-23	The Effect of Visual Cues on Canine Reaction Times
Gainesville Middle School	JR-AN-27	What is the Effect of <i>Daphnia magna</i> Heart Rate Under Different Amounts of Sugar?

## Behavioral and Social Sciences

School	Students	Project Title
Bull Run Middle School	JR-BE-17	Can You Spot the Artificial Intelligence?
Lake Ridge Middle School	JR-BE-19	Music Matters
Graham Park Middle School	JR-BE-24	The Effect of Different Types of Mint Gum on People During Times of Mental Fatigue
Gainesville Middle School	JR-BE-23	Rubik's Race
All Saints Catholic School	JR-BE-27	The Effect of Age on Memory
Bull Run Middle School	JR-BE-28	What is the Effect of Knowledge of Microplastics on Plastic Waste Habits?

# Biochemistry

School	Students	Project Title
Porter Traditional School	JR-BI-17	How Much Starch?
Parkside Middle School	JR-BI-19	Does the Amount of Active Ingredient in Alcohol-Based Hand Sanitizers Really Eliminate Bacteria?
Parkside Middle School	JR-BI-20	Bacterial Growth vs. Essential Oils
Gainesville Middle School	JR-BI-22	What is the Effect of Several Variations of Potatoes on Enzyme Catalase?

# Chemistry

School	Students	Project Title
Lake Ridge Middle School	JR-CH-13	What Makes Ice Melt the Fastest?
Graham Park Middle School	JR-CH-14	The Effect of Nut Type on Oil Extraction
All Saints Catholic School	JR-CH-17	How Does the Price of Laundry Detergent Affect How Well It Removes Stains?
Rippon Middle School	JR-CH-20	The Effect of Different Types of Light on Yeast Activation Time
Rippon Middle School	JR-CH-22	The Effect of pH on Enzyme Reaction
Woodbridge Middle School	JR-CH-24	How Electricity Changes pH in Salt Solutions

# Computer Science

School	Students	Project Title
Rippon Middle School	JR-CS-06	The Effect of Reinforcement Learning and the Rewards System on the Speed of an Artificial Intelligence Completing a Maze
Rippon Middle School	JR-CS-07	Battle of the Artificial Intelligence: Testing the Accuracy of Different Styles of Language Models
Graham Park Middle School	JR-CS-09	The Effect of Using Different Memory Slot on a Random-Access Module's Performance
Woodbridge Middle School	JR-CS-14	The Effect of Battery Discharge on Response Time on a Wii Remote
St. Francis of Assisi School	JR-CS-15	The Keeper of Passwords: The Effect of Time on Passwords
All Saints Catholic School	JR-CS-16	How Does Manipulating a Game Affect Computer Learning?

# Earth and Planetary Science

School	Students	Project Title
Gainesville Middle School	JR-EP-04	What is the Effect of El-Nino and La-Nina on the Amount of Winter Weather We See?
Graham Park Middle School	JR-EP-05	The Effect of Earthquakes on Different Materials of Model Houses
Rippon Middle School	JR-EP-06	The Effect of Different Types of Water on Crystal Growth

# Engineering

School	Students	Project Title
Rippon Middle School	JR-ENG-23	The Effect of Barrier Designs on Waves
Porter Traditional School	JR-ENG-25	Earthquake-Prone Buildings
Gainesville Middle School	JR-ENG-26	Reducing Carbon Emissions in Space Exploration: The Effectiveness of Green Propulsion Systems
Gainesville Middle School	JR-ENG-29	Rocket Science: How Hard Could It Be? The Sequel.
Benton Middle School	JR-ENG-37	Effect of Solar Panel Angles on Solar Energy Efficiency
Marsteller Middle School	JR-ENG-39	Suture Self! Untying the Knot in Surgical Sutures



# Environmental Sciences

School	Students	Project Title
The Nokesville School	JR-ENV-18	When in Drought: Natural Hydrogels as an Alternative Water Resource to Aid Water Retention in Soil
Rippon Middle School	JR-ENV-19	The Effect of Cheesecloth on Water's Total Dissolved Solids
Ronald Reagan Middle School	JR-ENV-20	The Effect of Different Types of Bivalve Shell Filtration on Stream Water Quality
Ronald Reagan Middle School	JR-ENV-27	The Effect of Different Microplastic Removal Methods on Microplastics in Dasani Water
Gainesville Middle School	JR-ENV-28	The Effect of Different Ground Cover on the Erosion of Soil
Marsteller Middle School	JR-ENV-30	The Effect of Water Purity on Surface Tension

# Materials Sciences

School	Students	Project Title
The Nokesville School	JR-MS-09	Which Lube is the Winner? The Effect of Dry Lubricant Composition on Friction Reduction of Pinewood Derby Race Car Wheels
Gainesville Middle School	JR-MS-13	Sealer Madness: The Effect Wood Sealer-Finishes Have on the Water Absorption and Warp of Pine Wood
Woodbridge Middle School	JR-MS-19	Pulling Iron out of Cereals
Benton Middle School	JR-MS-23	The Effect of Insulation Materials on Temperature Change
Rippon Middle School	JR-MS-24	The Effect of Different Cup Materials on Temperature Change
St. Francis of Assisi School	JR-MS-25	Rit Dye vs. Kool-Aid

# Mathematics

School	Students	Project Title
St. Francis of Assisi School	JR-MA-01	Catching Fraud: The Effect of Predictive Modeling on Detecting Fraudulent Data Sets
Porter Traditional School	JR-MA-02	Do You Need to Spend Money to Make Money?
Parkside Middle School	JR-MA-04	The Effect of Card Shuffling on the Randomization of Cards in a Deck
Gainesville Middle School	JR-MA-03	The Impact of Sample Size on Probability Outcomes
Woodbridge Middle School	JR-MA-05	Can Technical Analysis Entirely Predict the Stock Market?

## Medicine and Health Sciences

School	Students	Project Title
Bull Run Middle School	JR-MH-17	Do Energy Drinks Affect our Physical Performance?
Gainesville Middle School	JR-MH-19	The Effect of Different Sports on Heart Rate
Marsteller Middle School	JR-MH-20	Hands Down: Exploring the Best Hand Drying Techniques
Bull Run Middle School	JR-MH-23	Hearing for Your Heart: The Effect of Occupation Background Noise on Heart Rate
Gainesville Middle School	JR-MH-25	How Strong is Your Body's Base? The Effect of Activity Level on Arch Type
All Saints Catholic School	JR-MH-26	The Effect of Different Toothpaste on Tooth Cleanliness

# Microbiology

School	Students	Project Title
All Saints Catholic School	JR-MI-10	The Effect on Organic vs. Non-Organic Strawberries and the Time It Takes for Mold to Grow
Gainesville Middle School	JR-MI-13	Dark and Light: Can the Amount of Light Have an Impact on Dinoflagellates?
Gainesville Middle School	JR-MI-14	What is the Effect of Heat Shock Temperature on the Transformation Efficiency of Genetically Modified Organism?
Woodbridge Middle School	JR-MI-15	The Effect of Food Type on Bacteria
Ronald Reagan Middle School	JR-MI-16	The Effect of Salinity of Water on How Well a Jalapeno Pepper is Preserved
Ronald Reagan Middle School	JR-MI-17	The Effectiveness of Antimicrobial Agents on Microbial Cultivation Within Petri Dishes

# Physics

School	Students	Project Title
Rippon Middle School	JR-PH-15	The Effect of Car Shape on the Distance it Travels Down a 30-Degree Ramp
Gainesville Middle School	JR-PH-16	Color Conundrum - The Effect of the Absorption of Radiant Energy by Different Colors
Graham Park Middle School	JR-PH-19	Model Rockets: Stabilization
Rippon Middle School	JR-PH-24	The Effect of Paper Airplane Design on Flight Distance
Woodbridge Middle School	JR-PH-25	The Effect of Color on Light Spread in Light Art Photography
All Saints Catholic School	JR-PH-26	The Effect on Color on Heat Absorption

# Plant Sciences

School	Students	Project Title
Gainesville Middle School	JR-PS-09	The Effect of the Amount of Water Nutrients on Plants' Growth Using Deep Water Culture Hydroponics System
Graham Park Middle School	JR-PS-10	The Effect of Hydroponic Substrates on Plant Growth
Rippon Middle School	JR-PS-11	The Effect of Pollutants on a Plant's Growth in Height
Rippon Middle School	JR-PS-13	The Effect of Lemon Juice on Plant's Growth
Woodbridge Middle School	JR-PS-18	How Plants Affect Erosion
Parkside Middle School	JR-PS-19	Acid Rain and Radish Plants

# Robotics and Intelligent Machines

School	Students	Project Title
Gainesville Middle School	JR-RI-04	The Effect of Different Sensors on the Time to Complete a Maze
Woodbridge Middle School	JR-RI-05	The Abilities of Artificial Intelligence Demonstrated Through Tic-Tac-Toe
Marsteller Middle School	JR-RI-06	How the Use of Generative Artificial Intelligence Helps Students Study Better and Improves Test Scores