About Broadcom MASTERS

Broadcom MASTERS® (Math, Applied Science, Technology and Engineering for Rising Stars), a program of Society for Science & the Public, is the premier middle school science and engineering fair competition, inspiring the next generation of scientists, engineers and innovators who will solve the grand challenges of the 21st century and beyond. We believe middle school is a critical time when young people identify their personal passion, and if they find STEM elements, they can be inspired to follow their passion by taking STEM courses in high school.

As the only middle school STEM competition that leverages Society-affiliated science fairs as a critical component of the STEM talent pipeline, the Broadcom MASTERS consists of the top 10 percent of 6th, 7th and 8th grade projects entered in Society-affiliated fairs around the country. After submitting the online application, the Top 300 MASTERS are selected by a nationally ranked panel of scientists, engineers and educators.

The Top 300 MASTERS are honored for their work with a prize package that includes an award ribbon, semifinalist certificate of accomplishment, Broadcom MASTERS backpack, a Broadcom MASTERS decal, a one-year family digital subscription to Science News magazine, an Inventor’s Notebook, courtesy of The Lemelson Foundation, a one-year subscription to Wolfram Mathematica software, courtesy of Wolfram Research and a special prize from Jeff Glassman, CEO of Covington Capital Management. In recognition of the role that teachers play in the success of their students, each Top 300 MASTERS’ designated teacher also will receive a Broadcom MASTERS tote bag, a one-year digital subscription to Science News magazine, and a special edition booklet of Invention and Innovation articles, courtesy of The Lemelson Foundation.

From the Top 300 MASTERS group, 30 finalists are selected on September 18. They will present their research projects and compete in hands-on team STEM challenges to demonstrate their 21st Century skills in critical thinking, collaboration, communication and creativity at the Broadcom MASTERS finals. Top awards include a grand prize of $25,000, trips to STEM summer camps and more.

Broadcom Foundation and Society for Science & the Public thank the following for their support of 2018 Broadcom MASTERS:

• Samueli Foundation
• Robert Wood Johnson Foundation
• The Lemelson Foundation
• Jeff Glassman, CEO
  Covington Capital Management
• Wolfram Research
• Computer History Museum
• Science News for Students
• Smithsonian Environmental Research Center
• Society for Science & the Public’s Affiliated
  Regional and State Science and Engineering Fairs
• Parents, teachers and mentors of the 2,537
  Broadcom MASTERS entrants
2018 Top 300 MASTERS

Students are listed in order by home state, fair code, and name of school based on information provided by each student in their entry. Students listed under the state fair may also have qualified through their regional fair. Students conducting team projects were eligible, but each student entered individually and was judged based on the submitted written entry. The grade listed for each student is from Spring 2018. Visit https://findafair.societyforscience.org to look up Broadcom MASTERS affiliated fairs by state. *Top 300 MASTERS nominated by regional and state fair.

ALABAMA

USAL03

Discovery Middle School
Ashwin Prabhakar (7th Grade)
Madison, Alabama
Synthetic Enhancement of Photosynthesis

USAL05

Holy Spirit Catholic High School
Hayden Pilkinton (8th Grade)
Boligee, Alabama
Glaze Color Change

ARIZONA

USAZ03

Arizona College Prep–Oakland
Vinay Raman (8th Grade)
Chandler, Arizona
Effect of Chemical Dispersant Amount on the Difference of Interfacial Tension of Oil

Gowan Science Academy
Matthew Boelts (6th Grade)
Yuma, Arizona
Fatal Attraction

Ironwood Elementary
Adam Velazco (6th Grade)
Marana, Arizona
Wildlife Construction Malfunction

USAZ50

BASIS Scottsdale
Maya Schwickert (7th Grade)
Scottsdale, Arizona
Dissolving Gelatin after High-Performance Synchro

BASIS Scottsdale
Akshaya Venkatesh (8th Grade)
Scottsdale, Arizona
A Novel Mobile App to Minimize Food Waste and Maximize Harvest
<table>
<thead>
<tr>
<th>State</th>
<th>School</th>
<th>Grade</th>
<th>Project Title</th>
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<tbody>
<tr>
<td>ARKANSAS</td>
<td>USAR04 Rural Special School</td>
<td>7th</td>
<td><strong>Echo Mitchell (7th Grade)</strong>&lt;br&gt;The Arachnoid Fog Trap: Solving the Global Water Crisis</td>
</tr>
<tr>
<td>CALIFORNIA</td>
<td>USCA01 Arroyo Vista Middle School</td>
<td>8th</td>
<td><strong>Shaivi Shah (8th Grade)</strong>&lt;br&gt;iRelief: Smartphone-Based Eye Exercising Tool to Reduce Computer Vision Syndrome through Visual Movement Patterns</td>
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<tr>
<td></td>
<td>Fairmont Private School</td>
<td>6th</td>
<td><strong>Kamran Ansari (6th Grade)</strong>&lt;br&gt;Mathematical Modeling of Intracranial Pressure Response to Inversion Therapy for Dural Leak Headaches</td>
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<td></td>
<td>Fairmont Private School</td>
<td>8th</td>
<td><strong>Nadia Ansari (8th Grade)</strong>&lt;br&gt;Removal of Dye Nanoparticles Using a Natural Coagulant with Electrocoagulation in Series to RemEDIATE Wastewater</td>
</tr>
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<td>Fairmont Private School–Anaheim Hills Campus</td>
<td>8th</td>
<td><strong>Firas Qureshi (8th Grade)</strong>&lt;br&gt;A Geotechnical Investigation on Infused Soil Characteristics</td>
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<td>Our Lady Queen of Angels School</td>
<td>8th</td>
<td><strong>Emma Zebrowski (8th Grade)</strong>&lt;br&gt;How do the Angle and Direction of a Solar Cell Affect the Amount of Energy Generated?</td>
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<td>Rancho San Joaquin Middle School</td>
<td>8th</td>
<td><strong>Emily Hsi (8th Grade)</strong>&lt;br&gt;A Scientific Method of Choosing Sweet Grapes—An Evaluation of 12 Characteristics</td>
</tr>
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<td>Saint Margaret’s Episcopal School</td>
<td>8th</td>
<td><strong>Parisa Khashayar (8th Grade)</strong>&lt;br&gt;Micro-Processor Based Fire Fighter Assist Unit Using IOT</td>
</tr>
<tr>
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<td>USCA02 American Martyrs School</td>
<td>8th</td>
<td><strong>Clara Mangali (8th Grade)</strong>&lt;br&gt;Ionic Liquids versus Enzymes: Cellulose Saccharification for the Production of Ethanol</td>
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</tbody>
</table>
American Martyrs School

**Emily Champion (7th Grade)**
Redondo Beach, California

*Solutions for Canine Otitis*

Vahan and Anoush Chamlian Armenian School

**Jake Grigorian (7th Grade)**
Glendale, California

*Which Robotic Apparatus Picks up a Cone the Fastest?*

Mountain Avenue Elementary School

**Mahesh Arunachalam (6th Grade)**
Montrose, California

*Seal that Mask!*

Mountain Avenue Elementary School

**Mihir Manchikatla (6th Grade)**
La Crescenta, California

*Seal that Mask!*

Saint Gregory A & M Hovsepian School

**Daron Yacoubian (7th Grade)**
Glendale, California

*PorSHA H₂O (Portable Solar Heating Apparatus)*

Saint Timothy School

**Lola Castorina (7th Grade)**
Marina Del Rey, California

*Can Road Salt be Used to Control the Mosquito Population?*

Granite Ridge Intermediate School

**John Benedict Estrada (7th Grade)**
Fresno, California

*Comparison of Plant Chlorophyll Content Measurement Utilizing a Ground SPAD Meter Versus a Low Altitude Multispectral Camera*

Granite Ridge Intermediate School

**Ananya Vinay (7th Grade)**
Fresno, California

*Testing Effectiveness of Computer-Based Study versus Traditional Methods: Are You Being a Neo-Luddite?*

Quail Lake Charter School

**Ashley Schletewitz (8th Grade)**
Sanger, California

*Determining the Effects of Equisetum hyemale on the Growth Rate of Penicillium italicum*

Altamont Elementary School

**Alicia Roice (8th Grade)**
Mountain House, California

*Radical Terminators!: Comparing Antioxidant Activity of Different Polyphenol Rich Food Using the Briggs-Rauscher Reaction and a Raspberry Pi*
USCA04  
Altamont Elementary School  
**Ashlyn Roice (8th Grade)**  
Mountain House, California  
*Radical Terminators!: Comparing the Antioxidant Activity of Different Food Samples Using the Briggs-Rauscher Reaction and Raspberry Pi*  

California Connections Academy at Ripon  
**Yahvin Gali (8th Grade)**  
Tracy, California  
*eSphere — Buoy-Less, Biomimetic, Versatile, Low-Impact, Zero-Carbon Hydrokinetic Device that Harvests Energy from the Movement of Water Using Electromagnetic Induction, Without Harming the Environment and the Wildlife in It*  

USCA05  
Bernardo Heights Middle School  
**Anusha Kadiyala (8th Grade)**  
San Diego, California  
*Determining Gene Dominance in Polygenic Traits*  

Escondido Christian School  
**Adrian Derderian (8th Grade)**  
San Diego, California  
*Probing Photons with Polarizers, Counting them with Cosines*  

Islamic School of San Diego  
**Ziyad Soliman (8th Grade)**  
Del Mar, California  
*Map It Right!*  

Mesa Verde Middle School  
**Atulya Mandyam (8th Grade)**  
San Diego, California  
*Relating Voluntary Wheel Running to Changes in Levels of Dopamine*  

Nazareth Catholic School  
**Rohan Murali (7th Grade)**  
San Diego, California  
*Functional Orthotic Materials: Force Reduction during Impacts*  

The Rhoades School  
**Jasmine Elasaad (8th Grade)**  
Encinitas, California  
*Effectiveness of Method of Loci on Short-Term and Long-Term Memory*  

The Rhoades School  
**Kian Chakamian (7th Grade)**  
Rancho Santa Fe, California  
*Correlating Olive Quick Decline Syndrome Infections to Presence of Sharpshooters*
USCA05  
Thurgood Marshall Middle School  
**Blake Scurry (8th Grade)**  
San Diego, California  
*A Unique Spin on Aerodynamics; Airfoil Augmented with Semi-Auto Rotating Leading Edge Cylinder*

USCA06  
The Nueva School  
**Jack Albright (8th Grade)**  
Los Altos, California  
*Predicting the Future: Using Machine Learning to Forecast the Progression of Alzheimer’s Disease*

USCA07  
Challenger School – Strawberry Park  
**Arhana Aatresh (7th Grade)**  
Saratoga, California  
*Up, Up, and Away: The Effect of Substrate Type, Substrate Temperature, and Load on Hover Engines and Hovering Efficiency*

Challenger School – Sunnyvale  
**Diptanshu Sikdar (8th Grade)**  
Milpitas, California  
*Energy Harvesting Utilizing a Wind-Driven Triboelectric Generator*

Challenger School – Sunnyvale  
**Sonia Swamy (6th Grade)**  
Cupertino, California  
*AlgalPlast — Sustainable Bioplastic from Algae and its Effect on Tensile Strength, Water Resistance, and Compostability*

Challenger School – Sunnyvale  
**Henry Yao (6th Grade)**  
Sunnyvale, California  
*What’s in Your Lunch Box? Exploring the Effect of Time and Temperature on Nitrite Level in Cooked Foods*

Granada Islamic School  
**Ahmad Ismail (8th Grade)**  
Santa Clara, California  
*Effect of Combination Antifungal Therapy on the Treatment of Candidiasis*

Granada Islamic School  
**Fatimah Ismail (6th Grade)**  
Santa Clara, California  
*Developing an Artificial Pancreas: Dealing with Diabetes*

The Harker School  
**Sriram Bhimaraju (6th Grade)**  
Cupertino, California  
*Low-Cost Archery Assistant with an Interface for the Visually Impaired*
USCA07

The Harker School
**Alice Feng (8th Grade)**
San Jose, California
*The Effect of Mushroom Species and Substrates on the Properties of a Novel Biodegradable Material: Mycelium*

The Harker School
**Arely Sun (8th Grade)**
Saratoga, California
*The Effect of Mushroom Species and Substrates on the Properties of a Novel Biodegradable Material: Mycelium*

Joaquin Miller Middle School
**Krithi Koodli (8th Grade)**
Saratoga, California
*Distinguishing between Binary and Singular Stars Using Machine Learning*

Oakwood Country School
**Ayana Wilmot (7th Grade)**
San Martin, California
*Factors Affecting the Rate of Photosynthesis of California Lichens: A Suitability Study into Oxygen Production on Mars*

Quimby Oak Middle School
**Sneha Revanur (8th Grade)**
San Jose, California
*Analyzing Gender-Based Violence and Aggressive Behavior Through Social Media Data*

Saint Christopher School
**Joseph Thomas (7th Grade)**
San Jose, California
*A Machine Learning Approach to Predicting NBA Rookie Potential*

Stratford School–San Jose Middle School
**Vedant Janapaty (6th Grade)**
San Jose, California
*Redirecting Water to the Roots: An Effective Way to Increase Water Absorbency*

Stratford School–Sunnyvale Raynor Middle School
**Arhan Rout (8th Grade)**
Cupertino, California
*Using Adjuvant to Amplify the Effect of Organic Herbicides to Kill Undesired Plants*

Stratford School–Sunnyvale Raynor Middle School
**Aylin Salahifar (8th Grade)**
Redwood City, California
*Using Adjuvants to Amplify the Effect of Organic Herbicides to Kill Undesired Plants*
USCA07 Terman Middle School

**Roy Gross (7th Grade)**
Palo Alto, California

*An Emergency Communication Mesh Network for Civilians: Lessons from Puerto Rico*

USCA08 Iron Horse Middle School

**Jaanavi Thanamala (8th Grade)**
San Ramon, California

*How Audience Size Affects an Adolescent Speaker’s Heart Rate*

Joaquin Moraga Intermediate School

**Isabelle Katz (7th Grade)**
Moraga, California

*A Bubble Activated Human Powered Carbon Capture Device*

USCA09 Corpus Christi School

**Julia Mastracci (8th Grade)**
Oakland, California

*Can People Cure Their Own Phone Addiction?*

Harvest Park Middle School

**Lakshmi Sajith (8th Grade)**
Pleasanton, California

*Save Aquatic Life — An Alternative to Toxic Chemicals in Sunscreen*

Homeschool

**Espen Slettnes (7th Grade)***
Castro Valley, California

*Minimal Embedding Dimensions of Rectangle k-Visibility Graphs*

Homeschool

**Maya Basu (8th Grade)**
Fremont, California

*Can I Predict Double and Triple Slit Interference with Geometry?*

Stratford Middle School Fremont Curtis

**Sahan Karunaratne (6th Grade)**
Fremont, California

*Pill Minder: The Medication Reminder*

USCA11 Gateway Middle School

**Abigail Goodman (6th Grade)**
Santa Cruz, California

*B Flat Bee: Does Wingbeat Frequency Predict Honeybee Flower Selection?*

USCA12 International School of Monterey

**Ciann Amalan (7th Grade)**
East Garrison, California

*Are Handheld Devices Really Affecting Your Body?*
International School of Monterey
Abby Yamashita (7th Grade)
Monterey, California
Are Handheld Devices Really Affecting Your Body?

Lee Vining Elementary School
Ellery McQuilkin (8th Grade)*
Lee Vining, California
A Tale of Two Slopes: Aspect Creates Microclimates

Mt. Baldy Joint Elementary School
Harrison Cameron (7th Grade)
Upland, California
Out of Control: Blood Glucose Meter Accuracy

El Cerrito Middle School
Nathan Gomez (7th Grade)
Corona, California
Biomass to Biogas

Homeschool
Saira Gupta (8th Grade)
Riverside, California
Making Our Smartphones Lifesavers: Allergen Residue Detection

Riverside Virtual School
James Fagan (8th Grade)
Riverside, California
Design and Calibration of a Subsonic, Low Density Wind Tunnel for Martian Aerodynamic Research

Central Middle School
Sarah Hansen (7th Grade)
San Carlos, California
Eyedropper Properties that Affect Drop Size

Central Middle School
Christopher Kwok (7th Grade)
San Carlos, California
R.I.P. Double Reeds: How to Delay the Decaying Rate of a Double Reed?

Central Middle School
Nicholas Kwok (7th Grade)
San Carlos, California
R.I.P. Double Reeds: How to Delay the Decaying Rate of a Double Reed?

Crocker Middle School
Alexis MacAvoy (7th Grade)
Hillsborough, California
A Rising Power: Improving the Power Output of a Microbial Fuel Cell, the Rising Solution to Our Quest for Renewable Energy Sources
La Entrada Middle School

**Sina Kassayan (6th Grade)**
Atherton, California

*Light Bite: An Optical Measurement Method and Device to Determine the Ripeness of Fruits*

The Nueva School

**Alexandra Wingate (7th Grade)**
San Mateo, California

*Using Probabilistic Techniques to Build a Better Primality Test*

Woodside Elementary School

**Georgia Hutchinson (7th Grade)**
Woodside, California

*Designing a Data-Driven Dual Axis Solar Tracker*

Altamont Elementary School

**Jacqueline Prawira (8th Grade)**
Mountain House, California

*Bio.fiber.plastic: The Effect of Lignocellulosic Fiber in Enhancing the Formation and Tensile Strength of Rice Bioplastic*

Challenger School – Berryessa

**Nithika Karthikeyan (8th Grade)**
San Jose, California

*The Design of Algorithms to Encode English Text in Amino Acids Using Digital Data Compression*

Delphi Academy of Campbell

**Samik Pattanayak (6th Grade)**
Saratoga, California

*Does Screen Time before Bedtime Impinge the Quality of your Sleep?*

The Harker School

**Harsh Deep (8th Grade)**
Saratoga, California

*The Effect of T4 Bacteriophages on Antibiotic Resistant E. coli*

The Harker School

**Shounak Ghosh (8th Grade)**
Saratoga, California

*The Effect of T4 Bacteriophages on Antibiotic Resistant E. coli*

Los Cerritos Middle School

**Spencer King (8th Grade)**
Thousand Oaks, California

*Magnetic Levitation: Reducing Train Friction with Track*

Notre Dame Catholic School

**Emily Huitt (8th Grade)**
Chico, California

*Investigating the Effects of Endomycorrhiza Fungi versus Cow Manure on the Growth of Tomato Plants*
USCA78
Sierra Vista Middle School
Jude Alexis (7th Grade)
Irvine, California
*Melding with Machines: An AI Based Non-Invasive Artificial Pancreas System*

Sierra Vista Middle School
Braedyn Hutchison (7th Grade)
Irvine, California
*The “Sweetest” Rocket Candy: Evaluating Sucrose, Glucose, and Fructose as Fuels for Sugar-Based Solid Rocket Motors*

USCA79
Goleta Valley Junior High School
Antonio Cortijo Rodgers (8th Grade)
Goleta, California
*Branding and its Effects on Consumer Satisfaction and Preferences*

COLORADO
USCO06
Walt Clark Middle School
Kelly Clingan (8th Grade)
Loveland, Colorado
*Can We Prevent Concussions in Youth Sports and Chronic Traumatic Encephalopathy (CTE) in Later Life? An Evidence Based Analysis of Collision Impulse Reduction and Protective Headgear Effectiveness*

USCO09
Summit Middle Charter School
Haiyan Wang (8th Grade)
Boulder, Colorado
*Plant Growth in a Mars-Like Environment*

Summit Middle Charter School
Ethan Wurman (8th Grade)
Boulder, Colorado
*A Salt and Battery: The Electrolysis of Salt Water Solutions*

USCO10
Challenge Middle School
Sirinya Frankel (8th Grade)
Greenwood Village, Colorado
*The Effect of Impermeable Surfaces on Soil Biodiversity*

Challenge Middle School
Georgia Hartley (8th Grade)*
Denver, Colorado
*Mind the Gape: The Effect of Tension on the Gaping of Sutures*

Challenge Middle School
Esha Sury (8th Grade)
Greenwood Village, Colorado
*Synergizing Antibiotics with Broad-Range Bacteriophage K and Prophylactic Silver Nanoparticles: An Attempt to Tackle Specific Cases of Resistance*
USCO10 Challenge Middle School
**Neil Sury (7th Grade)**
Greenwood Village, Colorado
*Enhancing Gecko Adhesive Technology Using Micro-Fiter Nano Molding and Carbon Nanotubes*

STEM School
**Gitanjali Rao (7th Grade)***
Lone Tree, Colorado
*Detecting Lead Compounds in Water Using Carbon Nanotubes*

CONNECTICUT
USCT50 Saint Bridget School
**Kavin Kathir (8th Grade)**
Cheshire, Connecticut
*Transforming Trash into Treasure: Sustainable Approach to Oil Spill Cleanup*

Saint Gregory the Great School
**Maximilien Coisman (7th Grade)**
Danbury, Connecticut
*Testing Different Species of Algae in Building Self-Sustaining Microbial Fuel Cells*

Talcott Mountain Academy
**Julian Kage (8th Grade)**
Glastonbury, Connecticut
*Quick Lyme: The Rapid Test for Lyme Bacteria in Ticks*

Talcott Mountain Academy
**Emma Ruccio (8th Grade)**
Southington, Connecticut
*Got Your Back*

Westside Middle School Academy
**Khushi Parikh (8th Grade)**
Danbury, Connecticut
*Artificial Intelligence Based Image Recognition to Diagnose Lyme Disease*

FLORIDA
USFL05 Canterbury School
**Jason Nanda (6th Grade)**
Fort Myers, Florida
*Does Transmission Efficiency Correlate with Long-Term Durability in Worm Gear Reducers?*

USFL07 Okaloosa STEMM Academy
**Gabriel Lerner-Sperow (7th Grade)***
Niceville, Florida
*Fueling the Future: Hydrogen Production Yield and Rate Dependent upon Aluminum Surface Area*
USFL08 Abraham Lincoln Middle School
Anjana Balachandar (8th Grade)*
Gainesville, Florida
The Behavior of Bent Backbones

USFL08 Abraham Lincoln Middle School
Janani Kumaran (8th Grade)*
Gainesville, Florida
Integrated Control of the Invasive Aquatic Plant Hydrilla Using Snails and a Plant Growth Regulator (Continuation Project: Year 2)

Abraham Lincoln Middle School
Akash Verma (7th Grade)*
Gainesville, Florida
Boosting Cognitive Skills: An EEG Study

Canterbury School
Maya Chandar (8th Grade)*
Fort Myers, Florida
The Effect of Laser Beams on the Cellular Respiration and ATP Production in Zophobas morio (A Novel 3rd Year Study)

USFL09 American Heritage School
Christian Custodio (8th Grade)
Coral Springs, Florida
Analysis of Monotherapy and Combination Therapy on Helicobacter felis

American Heritage School
Rohan Kumar (8th Grade)
Miramar, Florida
Subculturing Coccolithophores with Iron Fertilization to Sequester Carbon Dioxide as a Potential Solution to Global Warming

Crystal Lake Middle School
Khushi Desai (7th Grade)
Coral Springs, Florida
Effect of Colloidal Solution Turbidity on Optimum Consumption of Metal-Based Coagulant in Clarification of Colloidal Particles from Solution

USFL10 Julia Landon College Preparatory and Leadership Development School
Chace Caven (7th Grade)*
Jacksonville, Florida
Designing Ligands that Dock with Mutated LRRK2 Proteins as a Potential Intervention for Parkinson’s Disease

Julia Landon College Preparatory and Leadership Development School
Nicole Stover (8th Grade)*
Jacksonville, Florida
The Effect of Dissolved Oxygen Augmentation on the Kratky Non-Circulating Method of Hydroponic Tomato Cultivation
USFL14
Ronald McNair Magnet Middle School
Kai Aravena (8th Grade)
Melbourne, Florida
The Safest Catcher’s Mask

USFL15
Saint Rose of Lima Catholic School
Gabriela Muriel (8th Grade)
Aventura, Florida
Paraplegics Achieving Stability in the Vertical Wind Tunnel

John I. Smith K–8 Center
Carina Mariaca (8th Grade)
Doral, Florida
Squeeze the Green

USFL17
Lake Highland Preparatory School
Varun Madan (8th Grade)*
Orlando, Florida
Field Testing of Feeding Bacterium Bifidobacterium infantis (Found in a Human Gut Probiotic) in Order to Improve Honey Bee Health

Orange County Preparatory Academy
Mikayla Simmons (8th Grade)
Orlando, Florida
The Number 7 May Prove to be Lucky with Cancer

USFL19
Covenant Christian School
Colin Campbell (8th Grade)
Panama City, Florida
The Effect of In-Water Application of Vibration on the Posterior Regeneration of Dugesia tigrina

Surfside Middle School
Lillian Mefford (8th Grade)
Panama City Beach, Florida
Operation Turtle Grass: Exploring the Relationship Between Turbidity and Thalassia testudinum in St. Andrew Bay and Grand Lagoon

USFL21
Fruit Cove Middle School
Lourdes McKay (8th Grade)
St. Johns, Florida
Mythbusting: Does Coffee Roast Style Affect Caffeine Concentrations?

Liberty Pines Academy
Hannah Rivkin (7th Grade)
St Augustine, Florida
Which Airfoil Type Can Achieve the Greatest Angle of Attack (CL Max) Without Losing Lift?
USFL21

Sanford Middle School

Deepika Kannan (8th Grade)*
Oviedo, Florida

*Li-fi Versus Wi-fi: Factors Affecting Data Transmission Across Electromagnetic Spectra*

Sanford Middle School

Annika Vaidyanathan (8th Grade)*
Oviedo, Florida

The Sweet Sound of Silence: A New Design for Quieter Vent and Fan Grilles (Year 2 Study)

USFL23

Sanford Middle School

Kyra Henriques (7th Grade)
Sanford, Florida

Testing the Antimicrobial Properties of Herbs and Spices on Aerobic Microbes in Milk

Seminole Science Charter School

Timo Horn (6th Grade)
Winter Park, Florida

Performance Difference Between Lithium-Based Automotive Greases

USFL29

American Heritage School of Boca Delray

Ayden Lapon (8th Grade)
Delray Beach, Florida

Does Bacteria Show Aggressive and Territorial Behavior?

USFL29

The Weiss School

Benjamin Barron (8th Grade)
Palm Beach Gardens, Florida

Coronary Stent Design and Optimization

USFL30

Charles S. Rushe Middle School

Hailey Mahadeen (8th Grade)
Lutz, Florida

Cryoprotection

USFL31

Gifford Middle School

Zachary Hessler (7th Grade)*
Vero Beach, Florida

SOS 2: See Our Silence; An Optical Approach to Controlling Digital Noise Cancellation

Storm Grove Middle School

Lucero Long (8th Grade)*
Vero Beach, Florida

Do You Get My Drift? The Effect of Drift Reduction Agent on Spray Patterns
USFL50

Howard Middle School

Vivek Sandrapaty (7th Grade)*
Ocala, Florida

*Take a Dive into the Future of Water Safety: An Idea for a Small Electronic Device that May Prevent Accidental Drowning in Swimming Pools

Lawton Chiles Middle School

Varsha Naga (8th Grade)*
Oviedo, Florida

*Rush to Green Gold: Comparative Efficiency of Biofuel Processed from Green Sources versus Fossil Fuels

USFL50

Pine Ridge Middle School

Benno Hermans (7th Grade)
Naples, Florida

Bioplastics

West Shore Junior/Senior High School

Kaylee Krininger (8th Grade)
Melbourne, Florida

*Determining if a Method Using Chemical and Gelid Temperature Cell Lysis can Most Effectively Decellularize Bos taurus Renal Tissue while Preserving the Extracellular Matrix Scaffolding and Other Intracellular Contents (A Second Year Study)

GEORGIA

USGA03

The Westminster Schools

William Jenkins (8th Grade)*
Atlanta, Georgia

Robotic Tennis Ball Sorter

USGA09

J.C. Booth Middle School

Marc van Zyl (7th Grade)
Peachtree City, Georgia

Automatic Mangivison

Whitewater Middle School

Jacob Morrison (7th Grade)
Senoia, Georgia

Collision Chaos

USGA12

General Ray Davis Middle School

Nylah Ductan (8th Grade)
Conyers, Georgia

Which Bioabsorption Technique is More Efficient?

USGA13

Fulton Science Middle School

Khalil Lindo (6th Grade)
Decatur, Georgia

Nature’s Water Filters
USGA50
Chapel Hill Middle School
**Kennedy Rogers (7th Grade)**
Douglasville, Georgia
*Play It Safe: Detecting Concussion Prone Impacts in Youth Sports*

Northwestern Middle School
**Asmi Kumar (8th Grade)**
Milton, Georgia
*Developing a Device to Predict Autistic Meltdowns Using Arduino & MS Azure*

USGA78
Lovinggood Middle School
**Stephen Litt (8th Grade)**
Marietta, Georgia
*Phase III: Can Epigallocatechin-3-Gallate Identify and Eliminate Cancerous Tumors in Planarians? A Novel Approach Toward a Cure for Cancer*

**HAWAII**

USHI05
Waiakea Intermediate School
**Claire Hughes (8th Grade)**
Hilo, Hawaii
*Do Different Populations of Ohia Seedlings from Around the Island Have any Resistance to ROD Lukuohia/Huliohia*

USHI06
Kailua Intermediate School
**Heather Dinman (8th Grade)**
Kailua, Hawaii
*Maximize Hydroponic Plant Growth*

USHI08
Robert Louis Stevenson Middle School
**Zoey Duan (8th Grade)***
Honolulu, Hawaii
*Munch On Plastic*

USHI50
Waiakea Intermediate School
**Matthew Okuda (8th Grade)**
Hilo, Hawaii
*Obtaining Optimum Efficiency in a Solar Autoclave: A Global Solution*

**ILLINOIS**

USIL05
Quest Academy
**Saanvi Chelickani (8th Grade)**
Palatine, Illinois
*Heavy Metals in Water: It’s Not Just a Band*

**INDIANA**

USIN24
Schmucker Middle School
**Faisal Syed (8th Grade)**
Granger, Indiana
*The Effect of Artificial Sweeteners on Drosophila melanogaster Circadian Rhythms*
West Lafayette Junior/Senior High School

**Irene Bhunia (8th Grade)**
West Lafayette, Indiana

*Renal Microbe Mishap: Microbial Imbalance’s Effect on the Formation of Kidney Stones*

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Lewis Central Middle School

**Amara Orth (8th Grade)**
Glenwood, Iowa

*Chemical Analysis of Honey Bee Propolis: Habitat Diversity Affects the Quality of Propolis, an Essential Component of Honey Bee Colonies*

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Albert W. Merrill Middle School

**Carl Tubbs (7th Grade)**
Des Moines, Iowa

*Taking the Sting from the Swing*

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Delta Woods Middle School

**Bentley Siems (6th Grade)**
Blue Springs, Missouri

*Radiation’s Effects on Bacteria Surface Area*

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South Middle School

**Thomas Lushington (7th Grade)**
Lawrence, Kansas

*TDP-43 Fibril Cappers for ALS Treatment via Molecular Simulations*

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South Middle School

**Frances Parker (7th Grade)**
Lawrence, Kansas

*Simulations and Design of Protein Helix Stabilizers for ALS Treatment*

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Saint Francis of Assisi

**Avery Ramsey (7th Grade)**
Louisville, Kentucky

*The Impact of Flame Retardants on Stem Cell Behavior*

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Meyzeek Middle School

**Shraman Kar (6th Grade)**
Louisville, Kentucky

*Garden Bot — Healthy Garden Producing Maximum Output while Conserving Precious Groundwater Using Arduino Based Controller and Sensors*

---

Meyzeek Middle School

**Shreyas Kar (8th Grade)**
Louisville, Kentucky

*Right Charity — A Software-Based Web Application to Bring Donors, Charities and Receivers on the Same Platform and Facilitate to Donate and Distribute Most Needed Items to Right People at Right Time*
USKY03
Meyzeek Middle School
Luke Mo (7th Grade)
Louisville, Kentucky
*Does Ambient Particulate Matter Cause Cytotoxicity and DNA Damage?

USKY05
Trinity Christian Academy
Alexis Hopper (7th Grade)
Georgetown, Kentucky
*Shocking Stem Cells

USKY05
Edythe J. Hayes Middle School
Kiera Fehr (7th Grade)
Lexington, Kentucky
*Saved in Space: The Mission Continues

USKY50
Saint Francis of Assisi Catholic School
John Mulvihill (6th Grade)
Louisville, Kentucky
*Creating Pawpaw Bioplastics

USKY50
Saint Francis of Assisi Catholic School
Kate Quinn (6th Grade)
Louisville, Kentucky
*Exploring Atrazine’s Neurotoxicity as a Possible Cause of Parkinson’s Disease

LOUISIANA
USLA02
Caddo Parish Middle Magnet School
Ashini Modi (8th Grade)*
Shreveport, Louisiana
*Photometric Detection of Extra Solar Planetary Transits Across Sun-Like Stars

USLA08
John Curtis Christian
Rachel Pizzolato (8th Grade)*
Metairie, Louisiana
*Improving 3D Printed Turbine Efficiency by Exploiting the “Lotus Effect” Through the Application of Silicon Nanoparticles to Turbine Blade Surfaces and Varying the Wind Diverter Angle of a Venturi

MARYLAND
USMD02
Urbana Middle School
Maansi Manoj (7th Grade)
Frederick, Maryland
*The Effect of Neem Leaf Extract as an Antibacterial and Antifungal Agent

USMD02
Urbana Middle School
Emily Wang (7th Grade)
Frederick, Maryland
*The Effect of Neem Leaf Extract as an Antifungal and Antibacterial Agent

USMD03
Roberto Clemente Middle School
Daniel Choi (8th Grade)
Germantown, Maryland
*Antioxidants on Regeneration: The More the Better?
USMD03

Roberto Clemente Middle School

Efe Eroz (8th Grade)
Rockville, Maryland
*Examining the Correlation between Water Toxicity and Lettuce Growth through a Biological Assay*

Roberto Clemente Middle School

Mihir Gupta (8th Grade)
Clarksburg, Maryland
*How Different Types of Helmets Affect How the Head Is Protected*

Roberto Clemente Middle School

Frank Horrigan (8th Grade)
Darnestown, Maryland
*The Ratio of Antioxidant to Glycemic Load in Fruit Juice*

Roberto Clemente Middle School

Jeffrey Jiang (8th Grade)
Germantown, Maryland
*What Helmet is Best for You?*

Roberto Clemente Middle School

Benjamin Nachod (8th Grade)
Clarksburg, Maryland
*Measuring the Effect of Different Seaweed Based Bio-Stimulants on the Growth of Plants*

Roberto Clemente Middle School

Sarah Thomas (8th Grade)
Clarksburg, Maryland
*The Effects of Aerobic and Anaerobic Conditions on the Metabolic Efficiency of Yeast*

MASSACHUSETTS

USMA02

Andover School of Montessori

Anna Du (6th Grade)
Andover, Massachusetts
*Developing a Smart Infrared Based ROV to Identify Microplastics in Marine Environments*

Blanchard Middle School

Diya Godavarti (8th Grade)
Westford, Massachusetts
*The Science Behind Homemade Yogurt Manufacturing*

Littleton Middle School

Vivienne Lance (8th Grade)*
Littleton, Massachusetts
*Plant-Based Phytol Makes Clean-Up of Oil Spills More Effective*
USMA02
Littleton Middle School
Michael Taylor (8th Grade)*
Littleton, Massachusetts
An Analysis of the Effects of Increased Atmospheric Carbon Dioxide on the Protein Concentration and Proteinogenic Amino Acid Concentrations of Brassica rapa Floral Pollen: A Potential Cause of Honeybee Colony Loss and Colony Collapse Disorder (CCD)

USMA05
Advanced Math and Science Academy Charter School
Sruthi Kurada (8th Grade)
Littleton, Massachusetts
Building a State-of-the-Art Audio Classifier through Machine Learning

USMA50
Homeschool
Ella Berger (6th Grade)
Marlborough, Massachusetts
Are Superluminal Speeds Really Unreachable?

Oak Middle School
Diya Satanur (8th Grade)
Shrewsbury, Massachusetts
Helping Hands—Aide Speech Disorder in Children

Sharon Middle School
Srivishnu Piratla (8th Grade)
Sharon, Massachusetts
R-View: An Inexpensive and Efficient System to Detect Firearms in Public Spaces

South Middle School
Kaia Rodrigues (7th Grade)
Brockton, Massachusetts
Improving the Effectiveness of Highway Noise Barriers

MICHIGAN
USMI02
Huda School and Montessori
Adnan Khan (7th Grade)
Bloomfield Hills, Michigan
Cages, Foil, and Shields — How to Keep Your Smartphone from Zapping You!

Michigan Islamic Academy
Ahmad Sukhon (6th Grade)
Ann Arbor, Michigan
Braille Translator Device and Software

Saint Matthew Lutheran School
Anthony Quittschreiber (8th Grade)
Milford, Michigan
Riddled with Potholes
USMI02
West Hills Middle School
Pooja Kannappan (8th Grade)
West Bloomfield, Michigan
Artificial Intelligence (AI) in Healthcare

USMI03
Saginaw Arts and Sciences Academy
Jett Miller (6th Grade)
Merrill, Michigan
Improving Air Bag Safety

MINNESOTA
USMN04
Math and Science Academy
Rikhil Seshadri (8th Grade)*
Woodbury, Minnesota
Low Cost, Non-Aqueous Electrolyte Based Supercapacitors for Energy Storage

Stillwater Junior High School
Margaret Banks (6th Grade)*
Woodbury, Minnesota
Fruity Power: Creating a Biodegradable Battery

USMN07
Homeschool
Supriya Roy (8th Grade)
Rochester, Minnesota
Mathematical Modeling of Virus Transmission During the 1918 Influenza Pandemic

MISSOURI
USMO02
Saint Patrick Catholic School
Andrew Woodley (8th Grade)
Rolla, Missouri
The Effect of the Angle of a Fidget Spinner on Spin Time

MONTANA
USMT50
Hamilton Middle School
Peyton Haddock (8th Grade)
Hamilton, Montana
Beetle Kill Wood: Changing Construction as We Know It

Kalispell Middle School
Alexandra Houseworth (8th Grade)
Kalispell, Montana
The Renewable Rotating Recharger

Sussex School
John Duerk (8th Grade)
Missoula, Montana
Quantum Entanglement with Polarization
USMT50  Sussex School
**Daisy Kulina (8th Grade)**
Missoula, Montana  
*Quantum Entanglement with Polarization*

**NEBRASKA**

USNE02  Millard North Middle School
**Anvitha Boosani (8th Grade)**
Omaha, Nebraska  
*Immune Engineering to Prevent Atherosclerosis and Other Immune-Related Diseases*

**NEW JERSEY**

USNJ03  Homeschool
**William Owen (7th Grade)**
Princeton, New Jersey  
*Angular Momentum Transport in a Galactic Collision*

Timberlane Middle School
**Charlotte Michaluk (6th Grade)**
Titusville, New Jersey  
*Terrific Tensile Tester: A Cost Effective Solution for Evaluating Adhesive Systems*

Toms River Intermediate North
**Julietta Onofrietti (8th Grade)**
Toms River, New Jersey  
*Can Plant Derived Oils Act as a Natural Way to Decrease Caries Causing Bacteria Streptococcus mutans in the Oral Cavity?*

**NEW MEXICO**

USNM01  Jefferson Middle School
**Olivia Cole (7th Grade)**
Albuquerque, New Mexico  
*The “Far Out” Spectrum of a Quasar*

School of Dreams Academy
**Gianna Nilvo (6th Grade)**
Los Lunas, New Mexico  
*The Digestion of Cat Food*

USNM50  Sierra Middle School
**Ksenia Sevostianov (7th Grade)**
Las Cruces, New Mexico  
*Play “Spot the Difference” to Fight Cancer*

**NEW YORK**

USNY01  Lagrange Middle School
**Aidan Yen (7th Grade)**
Poughkeepsie, New York  
*The Effects of Ultraviolet Light on Yeast Cells*
Commack Middle School
**Michael Jang (8th Grade)**
Commack, New York
*Development of Solar-Powered Toxic Metal Cleaning Station from Water Bodies*

Garden City Middle School
**Austin Crouchley (8th Grade)**
Garden City, New York
*Designing More Efficient Solar Panels: The Effect of Copper Cooling Coils on Solar Module Output and Hot Water Production*

Garden City Middle School
**Caroline Crouchley (6th Grade)**
Garden City, New York
*Comparing Structural Integrity of Traditionally Shaped Housing and Geodesic Domes*

Grand Avenue Middle School
**Tyler Bissoondial (7th Grade)**
Bellmore, New York
*MicroRNA-156 Regulates Gametophyte to Sporophyte Development and Sensitivity to Salinity in Ceratopteris richardii*

Rye Neck Middle School
**Kyle Ryan (6th Grade)**
Mamaroneck, New York
*Air Pollution: Particulate Matter in the Village of Mamaroneck*

Allendale Columbia School
**Madeleine Cotter (8th Grade)**
Rochester, New York
*Smooth Moves: A Comparison of Inverse Kinematics Algorithms for Natural Positions*

Transit Middle School
**Alexandra Nikiforov (7th Grade)**
Williamsville, New York
*EyeFitness*

Hunter College High School
**Andrei Iosifescu (8th Grade)**
Brooklyn, New York
*Tracking Geomagnetic Storms Using a WAAS-Enabled GPS Receiver*

Hunter College High School
**Aidan Lok (7th Grade)**
Howard Beach, New York
*Is the Five Second Rule True? The Effects of Food Type, Surface Type and Contact Time on Bacterial Transfer to Dropped Food*
R. Max Abbott Middle School
**Kaitlyn Zuravel (8th Grade)**
Fayetteville, North Carolina
*Glue Busters: A Quest to See which Glue Will Make a Lap Joint with the Largest Ultimate Shear Strength and Be Most Efficient Over Time Considering the Ultimate Shear Strength of the Joint as Well as the Cost and Mass of the Glue*

R. Max Abbott Middle School
**Lauren Zuravel (6th Grade)**
Fayetteville, North Carolina
*Glue Busters: A Quest to See which Glue Will Make a Lap Joint with the Largest Ultimate Shear Strength and Be Most Efficient Over Time Considering the Ultimate Shear Strength of the Joint as Well as the Cost and Mass of the Glue*

East Wilkes Middle School
**Chance Mastin (7th Grade)**
North Wilkesboro, North Carolina
*Is It Just a Simple Dimple?*

Roland-Grise Middle School
**Uma Volety (8th Grade)**
Wilmington, North Carolina
*What’s in Your Water? Lethal and Sub-Lethal Effects of the Polyfluorinated Compound, GenX, on the Eastern Oyster, Crassostrea virginica*

Roland-Grise Middle School
**Regan Williams (7th Grade)**
Wilmington, North Carolina
*One Grass, Two Grass, Old Grass, New Grass: Tropicalization and Its Effects on a Coastal Marine Ecosystem*

**OHIO**

Academy of Saint Adalbert
**Daniel Anthony (7th Grade)**
Strongsville, Ohio
*The Effect of Magnetic Field Strength on Ferrofluid and Its Weight Bearing Capacity*

Birchwood School
**John Shin (7th Grade)**
Richfield, Ohio
*Predicting Geomagnetic Storms with GPS*

Homeschool
**David Anand (7th Grade)**
Akron, Ohio
*Use of Haptic Feedback Controller to Counter the Effects of Varying Levels of Gravity on the Vestibular System for Inter-Planetary Space Travel*
USOH02  Homeschool  
**Kaz Kojima (7th Grade)**  
Medina, Ohio  
*Pupillography Image Analysis for Measuring Pupillary Light Reflex*

USOH10  Mason Middle School  
**Gayatri Rajan (8th Grade)**  
Mason, Ohio  
*Application Development for Alzheimer’s Pre-Symptomatic Testing (ADAPT)*

USOH50  Saint Columban School  
**Regan Sharp (7th Grade)**  
Loveland, Ohio  
*What Factors Impact Muscle Stretch?*

OREGON  
USOR04  Meadow Park Middle School  
**Gauri Arora (7th Grade)**  
Portland, Oregon  
*Mitosis in Onions*

Stoller Middle School  
**Pratik Vangal (8th Grade)***  
Portland, Oregon  
*Ameliorating Acute Respiratory Infections from Solid Biomass Fuel Combustion and Empowering Rural Kitchens with a Sustainable, Cost-Effective Ventilation Solution*

USOR07  Howard Street Charter School  
**Mihir Joshi (7th Grade)***  
Salem, Oregon  
*Terrella Aurora Model: A Demonstration of Charged Particle Shielding for Space Exploration*

Leslie Middle School  
**John Madland (7th Grade)***  
Salem, Oregon  
*Solar Radiation Charged Particle Deflector*

USOR50  Bend Science Station  
**Teaghan Knox (8th Grade)**  
Bend, Oregon  
*Increasing the Speed of Olivine Weathering as a Means of Sequestering Carbon Dioxide*

Bend Science Station  
**Tiadora Wisco (7th Grade)**  
Bend, Oregon  
*Exploration of BZ Magnetic Rings*  
Valley Catholic Middle School
Cedar Park Middle School
**Arunima Deval (6th Grade)**
Portland, Oregon
*Mycorrhizal Fungi: An Exploration of the Impact of Organic Fertilizers on Plant Growth*

Cedar Park Middle School
**Nikita Istratov (6th Grade)**
Portland, Oregon
*How Different Methods of Proportional Stringing Affect the Sweet Spot of a Tennis Racquet*

Stoller Middle School
**Rishab Jain (7th Grade)**
Portland, Oregon
*A Novel Deep Learning Approach Towards Semantic Segmentation of Malignant Pancreatic Adenocarcinoma Growths for Pancreatoduodenectomy and Image-Guided Radiotherapy (IGRT)*

Stoller Middle School
**Mithra Karamchedu (8th Grade)**
Portland, Oregon
*Arctic Methane Risk: Remote Sensing and Quantifying Permafrost Melt in Circumpolar Regions by Performing Fractal Analysis to Establish Temperature Correlations*

Stoller Middle School
**Darsh Mandera (7th Grade)**
Portland, Oregon
*A Novel General Purpose Machine Learning Approach for Effective Targeted Drug Prescription for Cancer Based on Genetic Mutations*

Valley Catholic Middle School
**Dev Rishi Udata (8th Grade)**
Beaverton, Oregon
*Adsorption of Lead in Contaminated Water*

**PENNSYLVANIA**

Saint Theresa School
**Danielle Uroda (7th Grade)**
Camp Hill, Pennsylvania
*Crash Barriers: Plastic or Sand?*

Centerville Middle School
**Daniel Hufnagle (7th Grade)**
East Petersburg, Pennsylvania
*Liquid Armor*

Lancaster Country Day School
**Milana Breuninger (7th Grade)**
Lancaster, Pennsylvania
*Even Small Towns Contribute to Global Warming*
USPA02  
Lancaster Country Day School  
**Gavin Wang (8th Grade)**  
Wyomissing, Pennsylvania  
*Characteristics of High-Energy Cosmic Rays*

Manheim Township Middle School  
**Krishnakumar Chinnasamy (7th Grade)**  
Lancaster, Pennsylvania  
*Functionalized Magnetic Nanoparticles Engineering for Cancer Theranostics*

USPA03  
Arcola Intermediate School  
**Parmesh Sivakumar (7th Grade)**  
Collegeville, Pennsylvania  
*Maximizing the Combustion Power of Ethanol*

C.C.A. Baldi Middle School  
**Maria Calderon (8th Grade)**  
Philadelphia, Pennsylvania  
*The Effects of Hurricanes*

Great Valley Middle School  
**Brighton Risch (6th Grade)**  
Malvern, Pennsylvania  
*Placebos and Prestige: Flavor Testing*

Springhouse Middle School  
**Victor Cai (8th Grade)**  
Orefield, Pennsylvania  
*Designing a Sun Tracking Solar Panel to Maximize and Quantify Energy Harvest Efficiency*

Springhouse Middle School  
**Dhivya Shepherd (8th Grade)**  
Allentown, Pennsylvania  
*Fermentation in Aerobic and Anaerobic Environments*

Tredyffrin-Easttown Middle School  
**Leo Wylonis (8th Grade)**  
Berwyn, Pennsylvania  
"Make Airplanes Great Again": Optimizing and Controlling Aircraft Wing Shape and Efficiency In-Flight through Novel Polymer Artificial Muscle Actuators

University Scholars  
**Eeshwar Krishnan (8th Grade)**  
Exton, Pennsylvania  
*Using a Computer Algorithm to Predict if a Patient with Diabetes Will Return within 30 days*

USPA04  
The Campus School of Carlow University  
**Eleanor Barth-Wu (8th Grade)**  
Pittsburh, Pennsylvania  
*Can Indium Be Extracted from Used Touch Screens*
USPA04
Dorseyville Middle School
**Arvind Seshan (7th Grade)**
Pittsburgh, Pennsylvania
*Leveraging Directional Antenna-Based Wireless Signal Localization to Aid Search and Rescue Efforts*

Kentucky Avenue School
**Olina Mukherjee (6th Grade)**
Pittsburgh, Pennsylvania
*Complex Social Behavior in Madagascar Hissing Cockroaches*

Saint Kilian Parish School
**Anna Spalvieri (8th Grade)**
Seven Fields, Pennsylvania
*Eye See It Differently*

Winchester Thurston School
**Jackson Zemek (8th Grade)**
Pittsburgh, Pennsylvania
*Harvester Robot*

USPA06
Saint Francis Xavier Catholic School
**Walter Kotlinski (8th Grade)**
Gettysburg, Pennsylvania
*Camber Position in Effective Airfoil Design*

SOUTH CAROLINA

USSC04
Dent Middle School
**Parth Desai (8th Grade)**
Columbia, South Carolina
*Effects of Musical Training on the Cognitive Performance of Children*

Dutch Fork Middle School
**Sullivan French (8th Grade)**
Columbia, South Carolina
*Sustainable Engineering Green Roof Design*

USSC78
Homeschool
**Danielle Brooks (8th Grade)**
Seneca, South Carolina
*Why Don’t Birds of a Feather Freeze Together? A Study of the Thermal Insulation Value of Feathers*

TENNESSEE

USTN04
Farragut Middle School
**Ridhima Singh (7th Grade)**
Knoxville, Tennessee
*Does Urbanization Impact Flooding?*

USTN05
Pleasant View School
**Yasmeen Mannan (6th Grade)**
Germantown, Tennessee
*The Effect of pH in Liquids on the Rate of Corrosion*
Pleasant View School

**Naisha Chowdhury (8th Grade)**
Memphis, Tennessee
*Effect of Linoleic Acid on Wood Sealing Abilities*

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Texas

**USTX01**

Pat and Catherine Fowler Middle School

**Vinay Ravi (8th Grade)**
Plano, Texas
*The Application of Au Nanoparticles in Dye-Sensitized Solar Cells*

Frankford Middle School

**Sophie Krajmalnik (8th Grade)***
Dallas, Texas
*SANDRA (Serve and Data Results Analysis) Athletic Tech Glove*

Otto Middle School

**Sidhya Peddinti (8th Grade)***
Richardson, Texas
*AlzAlertPi: Facial Recognition Alert System for Alzheimer’s Patients*

Otto Middle School

**Neel Shanmugam (8th Grade)**
Richardson, Texas
*Feeling Feelings — Using Wearable Technology to Teach Autistic Children Emotion Recognition*

Rice Middle School

**Rithvik Ganesh (8th Grade)***
Plano, Texas
*Diminishing Dementia: Piperine Derivatives as Inhibitors of the Angiotensin II Receptor, a Promising Drug Target Linked to Dementia Treatment*

Schimelpfenig Middle School

**Charles Hou (8th Grade)**
Plano, Texas
*A Novel Approach to Increase the Efficiency of a Galvanic Cell Battery Using Graphene Nanoplatelets*

Wilson Middle School

**Harshal Bharatia (8th Grade)**
Plano, Texas
*Intellitherm: So Cool, It’s Hot*

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**USTX02**

Radford School

**Vincent Yang (8th Grade)***
El Paso, Texas
*An Unprecedented Approach to Perceive Surrounding Environment: Helping the Visually Impaired and Blind with a New Invention*
USTX05  The Emery/Weiner School
**Victor Markhasin (8th Grade)**
Houston, Texas
*Identifying Urban Micrometeorites*

Seabrook Intermediate School
**Austin Nelson (7th Grade)**
League City, Texas
*Preserving Peanut Butter Puppies*

Seabrook Intermediate School
**Pratishtha Sharma (8th Grade)**
League City, Texas
*It’s Lit!*

USTX06  Gilmer Intermediate School
**Madison Perkins (7th Grade)**
Gilmer, Texas
*I’ve Got the Power: Creating Sustainable Energy Using Bacterial and Algae Fuel Cells*

USTX11  BASIS San Antonio Shavano Campus
**Arhan Rao (7th Grade)**
San Antonio, Texas
*Effect of Sleep Hormone “Melatonin” on Breast Cancer Growth*

Navarro Junior High School
**Megan Clark (8th Grade)**
Seguin, Texas
*Water Powered Cars — Pollution Free Renewable Energy*

Saint Matthew Catholic School
**Laura Reilly (8th Grade)***
San Antonio, Texas
*The Role of Tilapia Skin and UV Light on Tissue Regeneration and Wound Healing*

USTX13  Canyon Vista Middle School
**Prayag Sreenivasan (7th Grade)**
Austin, Texas
*Analyzing Asymmetry in Human Locomotion to Improve Body Posture*

Deerpark Middle School
**Faith Larimore (8th Grade)**
Austin, Texas
*Plasma and Magnetic Confinement*

Harmony School of Political Science and Communication
**Abrar Rahman (6th Grade)**
Austin, Texas
*Smart Personnel Assistant*
USTX13
Pflugerville Middle School
**Lamisa Mahmud (8th Grade)**
Austin, Texas
*The Effect of Milli-Quantities of Essential Oils on Drug-Resistant E. coli (Year 2)*

USTX50
Fort Settlement Middle School
**Anisha Parsan (7th Grade)**
Sugarland, Texas
*Go with the Flow (GFLOW) — Real-Time Street Flood Prediction and Warning System*

USTX50
Saint Matthew Catholic School
**Paula Reilly (7th Grade)***
San Antonio, Texas
*Biochemical and Physiologic Effects of Slime-Derived Gas Products*

UTAH
USUT04
American Heritage School
**Olivia Washburn (8th Grade)**
Orem, Utah
*THE NOISY NICU — There’s a Cap for That*

USUT04
Summit Academy Jr. High—Bluffdale Independence
**Aspen Delis (7th Grade)**
Sandy, Utah
*Does SPF Matter? An Analysis of SPF Effectiveness in Sunscreen Lotions*

USUT04
West Jordan Middle School
**Jonathan LeBaron (7th Grade)**
West Jordan, Utah
*Mind over Math*

USUT05
American Preparatory Academy Draper 2
**Huck Jones (8th Grade)**
Salt Lake City, Utah
*A Measurement of the Onset Time of the Occipital Alpha Rhythm Using a Brain Computer Interface*

USUT05
Ensign Elementary School
**Elizabeth Bennion (6th Grade)**
Salt Lake City, Utah
*Do Rich Cities Have Better Water?*

USUT07
Bear River Charter School
**Gary Zhan (8th Grade)**
North Logan, Utah
*The Colder, the Bluer — Significant Enhancement of Indigoidine Production Using a Cold-Shock Inducible Promoter*
USUT07  Mountain Logan Middle School
Camellia Yuan (8th Grade)
Providence, Utah
*The Application of Sound Detection in Antiterrorism*

Vernal Middle School
Kaylee Huber (7th Grade)
Vernal, Utah
*Playing with Fire*

VIRGINIA

USVA02  Ni River Middle School
Ryan Catullo (8th Grade)
Fredericksburg, Virginia
*How the Collective Variation in Airfoil Height and Wing Weight Affect the Amount of Lift Force Generated by Airplane Wings*

Stafford Middle School
Michael Foley (8th Grade)
Stafford, Virginia
*Utilizing Psychological Priming for the Purpose of Improving Test Scores*

USVA11  George H. Moody Middle School
Cameron Sharma (8th Grade)
Glen Allen, Virginia
*Was This Year’s Flu Epidemic Preventable: Designing the Type A Flu Vaccine, A Novel Computational Biology Approach*

George H. Moody Middle School
Tatiana Vaniakin (8th Grade)
Richmond, Virginia
*The Effect of Dominant and Non-Dominant Brain Stimulation on Cognitive Skills*

Short Pump Middle School
Alexander Coffman (8th Grade)
Glen Allen, Virginia
*The Effect of Winglet Design on Weight of Aircraft Due to Lift and Drag*

USVA12  Warrenton Middle School
Nathaniel Ribeiro (8th Grade)
Warrenton, Virginia
*The Iron Chef System: The Essential Safety Cooking Accessories for Every Home and Kitchen*

USVA78  Edlin School
Ananya Yarlagadda (7th Grade)
Ashburn, Virginia
*Predicting Gene Mutations that Could Cause Cystic Fibrosis*
WASHINGTON

USIL05
Quest Academy
Gabriella Lui (8th Grade)
Bellevue, Washington

USWA01
Enterprise Middle School
Nikhita Bontha (8th Grade)*
Richland, Washington
Understanding the Efficacy of Off-the-Shelf Probiotics and Prebiotics on the Gut Microbiome

USWA50
Homeschool
Cleah Winston (6th Grade)
Seattle, Washington
Investigating Cyber-Security in Autonomous Cars

International Community School
Audrey Gruian (8th Grade)
Sammamish, Washington
UVPDetect: Black Light and Computer Vision in a Novel Approach to the Detection of Microplastics in Water

Jason Lee Middle School
Simmi Sen (6th Grade)
Vancouver, Washington
ColiClean — E. coli Water Filter

McMurray Middle School
Iris Bordman (8th Grade)
Vashon, Washington
WaTeaUV — Saving Trees and Lives

McMurray Middle School
Alyssa Hawkins (8th Grade)
Port Orchard, Washington
WaTeaUV — Saving Trees and Lives
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