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#### 2021 SPONSORS

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2021 VIRTUAL FAIR





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2021 VIRTUAL FAIR





## 2021 CATEGORY AWARD SPONSORS JUNIOR

Behavioral and Social Sciences (BEHA) — Kiwanis Club of Louisville

Biochemistry (BCHM) — In Memory of Dr. Nancy Keck Biomedical and Health Sciences (BMED) — In Honor of Dr. Robert Ackland & John Kurt Brueckner

Biomedical Engineering (ENBM) — Terracon Consultants, Inc.

Cellular and Molecular Biology (CELL) — The SESCO Group Chemistry (CHEM) — In Memory of Dr. Thomas H. Crawford Computational Biology and Bioinformatics (CBIO) — Shield Environmental Associates

Earth Environmental Sciences (EAEV) — The Kentuckiana Chapter of Hazardous Materials Managers Embedded Systems (EBED) — Air Quality Services, LLC Engineering Mechanics (ENMC) — Specialty Earth Sciences Environmental Engineering (ENEV) — AECOM Materials Science (MATS) — Lubrizol Advanced Materials

Mathematics (MATH) — The Kentuckiana Chapter of Hazardous Materials Managers
Physics and Astronomy (PHYS) — Valicor Environmental Services
Plant Sciences (PLNT) — The Kentucky Chapter of the Air & Waste Management Association
Robotics and Intelligent Machines (ROBO) — American Synthetic Rubber Co. (a Michelin company)
Systems Software (SOFT) — In Memory of Dr. Nancy Keck





## 2021 CATEGORY AWARD SPONSORS SENIOR

Animal Sciences (ANIM) — Highlands Environmental, LLC Behavioral and Social Sciences (BEHA) — Kiwanis Club of Louisville

Biochemistry (BCHM) — In Memory of Dr. Nancy Keck Biomedical and Health Sciences (BMED) — University of Michigan Alumni Club of Louisville, KY Biomedical Engineering (ENBM) — Dinsmore & Shohl LLP Cellular and Molecular Biology (CELL) — Stites & Harbison, PLLC

Chemistry (CHEM) — In Memory of Dr. Thomas H. Crawford Computational Biology and Bioinformatics (CBIO) — The Kentucky Chapter of the Air & Waste Management Association

Earth and Environmental Sciences (EAEV) — Linebach Funkhouser, Inc.

Engineering Mechanics (ENMC) — Republic Services Environmental Engineering (ENEV) — Dow Chemical

Materials Science (MATS) — The ATC Group
Microbiology (MCRO) — Anytime Waste Systems
Physics and Astronomy (PHYS) — University of Louisville
Physics Department
Plant Sciences (PLNT) — Terra Systems, Inc.
Robotics and Intelligent Machines (ROBO) — American
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Systems Software (SOFT) — American Synthetic Rubber
Co. (a Michelin company)
Translational Medical Science (TMED) — Carbide Industries
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School Awards for top three Junior & Senior Schools Sponsored by LRSEF – Trophies made by APAF Amazon Innovation Projects – KY Science & Engineering Fair American Chemical Society

American Society of Civil Engineers/Kentucky Section

APAF- Asia Pacific

American Forum of GE Appliances, a Haier Company

Best of Fair Awards -Junior & Senior, GE

Appliances, a Haier Company

**BC Plumbing Company** 

Churchill Downs, Inc.

FirstBuild Innovation Award

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Materials Managers

Kentucky Gas Association

Kentucky Science Center

Kentucky Society of Professional Engineers

Kentucky State Science & Engineering Fair

Louisville Chapter of the Society for Neuroscience

Louisville Water Company

Maryam's Charity







#### "DO SCIENCE" **AWARD**

## Danya Aljabbari "Exploring Fruit & Vegetable Batteries"





#### AMAZON INNOVATION AWARD

## Ellery Reynolds

"Exploring & Remediating Vinyl Flooring Genotoxicity with Kentucky Plant Extracts"





#### AMAZON INNOVATION AWARD

#### Ifrah Shaik

"Microbial Fuel Cell"





#### Liam Amick

"Exploring the Creation of Sodium Lauryl Sulfate Remediation Products"





#### Aicha Faiz

"Adsorption: Dyeing Fabrics with Kool-Aid"





### Agnes Loeser

"Discovering the Effects of Ragweed on Amylase"





## Ellery Reynolds

"Exploring & Remediating Vinyl Flooring Genotoxicity with Kentucky Plant Extracts"





## AMERICAN SOCIETY OF CIVIL ENGINEERS AWARD

#### **Nate Shields**

"Exploring Seawall Designs & Wave Reflections"





## AMERICAN SOCIETY OF CIVIL ENGINEERS AWARD

#### Mason Nunn

"Earthquakes: Exploring the Effects of Liquid Density on Liquefaction"





# ASSOCIATION FOR WOMEN GEOSCIENTISTS AWARD

## Mary Ballantine

"Ohio River Water: Creating a Selective Environment for Pathogenic Bacteria"





## BC PLUMBING COMPANY AWARD

#### Liam Amick

"Exploring the Creation of Sodium Lauryl Remediation Products"





#### CHURCHILL DOWNS ENGINEERING AWARD

### Josephine Carmack

"Exploring Horse Recognition & Memory of Human Facial Expressions"





#### GE ASIAN PACIFIC AMERICAN FORUM – CLEAR THINKER AWARD

#### **Kevin Brothers**

"Found: Reuniting Families Using Facial Recognition"





## GIBSON FAMILY AWARD

#### **Kevin Brothers**

"Found: Reuniting Families Using Facial Recognition"



#### HEXION, INC. COMMUNITY IMPACT AWARD

#### Shazia Shaik

"Driver Drowsiness Detection"





## HEXION, INC. CREATIVE AWARD

#### Ola Almaliki

"Neutrogena"





#### JEFFERSON COUNTY CONSERVATION DISTRICT AWARD

## Mary Ballantine

"Ohio River Water: Creating a Selective Environment for Pathogenic Bacteria"





#### JEFFERSON COUNTY CONSERVATION DISTRICT AWARD

#### Meredith Elder

"Does Building Shape Affect Heat Absorbance & Wind Resistance?"





#### KENTUCKY GAS ASSOCIATION AWARD

### Jacob Quinn

"Exploring the Energy Content of Biofuel Raw Materials"







#### KENTUCKY CHAPTER OF AIR & WASTE MANAGEMENT AWARD

#### Leo Rhinehart

"Using Piezoelectric Devices to Harness Pipe Outflow Energy"





#### KENTUCKY CHAPTER OF AIR & WASTE MANAGEMENT AWARD

## Frances Fendig

"Ethanol Production from Wasted Whey"





# LOUISVILLE CHAPTER OF THE SOCIETY FOR NEUROSCIENCE AWARD

## Vivien Englund

"Effect of Blueberries on Children's Short-Term Memory"





## LOUISVILLE WATER COMPANY AWARD

## Mary Ballantine

"Ohio River Water: Creating a Selective Environment for Pathogenic Bacteria"





# MARYAM'S CHARITY COMMUNITY SERVICE & SOCIAL BENEFIT AWARD

#### Leo Rhinehart

"Using Piezoelectric Devices to Harness Pipe Outflow Energy"





# MARYAM'S CHARITY COMMUNITY SERVICE & SOCIAL BENEFIT AWARD

## **Grady Amick**

"Safe Sleep: A Device to Detect & Prevent SIDS by Suffocation"





# MARYAM'S CHARITY COMMUNITY SERVICE & SOCIAL BENEFIT AWARD

## **Ahmad Ateyeh**

"Estimating the Effectiveness & Financial Practicality of Deploying a Space Mirror to Combat Climate Change"







## Liam Kirby

"Detecting Cracks in Heat Exchangers"





## Sophie Fabing

"Creating a Photothermal Coating Using Carbonized Biomaterials"





#### **Charles Hummel**

"The Effect of Air Fresheners on the Lung Microbiome"





#### Matilda Reinhart

"Does Acorn Extract as an Antimicrobial"





#### Leah Niemann

"Exploring Neurotoxin Shed & Neuroprotective Treatment"





## Julia Keeney

"Exploring Carbon Scrubbing with Different Materials"





#### Seth Niemann

"Milkweed: A New Material for Cleaning Up Oil Spills"





## Iris Apple

"Exploring Auditory, Learning & Memory in Plants"





## Hayden Ramsey

"Carpet Stain Protector: Source of Stem Cell Destruction in Children"





## **Emary Thomas**

"Exploring Noise Pollution, Weight Gain, and Predator Avoidance in Mystery Snails"







#### Joe Jaso

"Exploring the Velocity of Downslope Fires"







#### **Caroline Cotton**

"Exploring Combination Therapy for a Possible Cancer Treatment"







#### Shazia Shaik

"Driver Drowsiness Detection & Alarm System"





# MARYAM'S CHARITY GREEN OR ENVIRONMENTALLY FRIENDLY AWARD

#### Fahmeeda Mohammad

"RFID Readers - Protect Your ID Card from Theft"







## Mihir Duggal

"Biofuel is the New Fuel"





#### Jason Millard

"Exploring Differences in Gene Expression of Lung Cancer"





#### Rhyse Johnston

"Radon Mitigation: Remediating a Potential Health Threat"





#### **Drew Ashley**

"Airflow Modeling: The Removal of COVID-19 in Classrooms"





## Jacob Holtgrave

"Exploring Laterality of Cancer on Different Parts of the Face While Driving"





#### Chloe Nunn

"Toxic Screen Blue Light: Is Melatonin Depression to Blame?"





#### Liam Kirby

"Detecting Cracks in Heat Exchangers"





## Ellery Reynolds

"Exploring & Remediating Vinyl Flooring Genotoxicity with Kentucky Plant Extracts"





### Molly Baldwin

"Microfibers Effect on Evaporation"

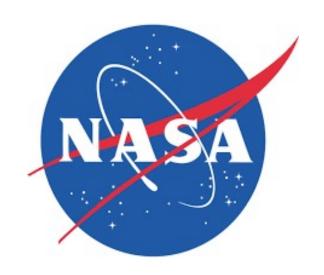




#### NASA EARTH SYSTEMS SCIENCE AWARD

#### Ifrah Shaik

"Microbial Fuel Cell"

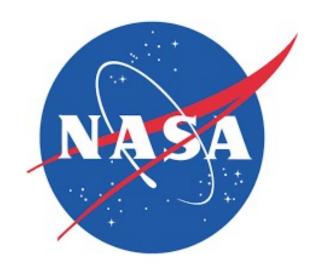




#### NASA EARTH SYSTEMS SCIENCE AWARD

#### Alice Vella

"Microfibers & Their Impact on Soil Dynamics"





# NATIONAL OCEANIC & ATMOSPHERIC ASSOCIATION AWARD

#### **Nate Shields**

"Exploring Seawall Designs & Wave Reflection"





### OFFICE OF NAVAL RESEARCH AWARD

#### Meredith Elder

"Does Building Shape Affect Heat & Wind Resistance?"





### OFFICE OF NAVAL RESEARCH AWARD

#### Claire Midland

"Can Common Supplements Inhibit Nattokinase?"





### OFFICE OF NAVAL RESEARCH AWARD

## **Emerson Wyatt**

"The Potential Synergistic Effects of Rose & Umibudo on a Representation of Cancer"





### OFFICE OF NAVAL RESEARCH AWARD

#### Olive Zitzer

"The Effect of Sucralose on Minnows"





#### RICOH USA, INC. AWARD

#### Thomas Galla

"Improving Dye-Sensitized Solar Cells with UV Paint"

RICOH imagine. change.



#### RICOH USA, INC. AWARD

#### Finn Oetken

"Exploring Ultrasound on the Production of Ethanol from Cellulose"

RICOH imagine. change.





#### **Kevin Brothers**

"Found: Reuniting Families Using Facial Recognition"







#### Mason Nunn

"Earthquakes: Exploring the Effects of Liquid Density on Liquefaction"





#### AMAZON INNOVATION AWARD

## Jet Sendaydiego

"Phyto-Fighters: Does the Concentration of Phenolic Phytochemicals in Fresh Produce Affect its Antioxidant Percentage?"





#### AMAZON INNOVATION AWARD

## Trenton Hogan

"Developing A Computer Algorithm to Buy & Sell Stocks"







#### Jason Zhang

"Novel Synthesis of Important Pharmaceutical Compounds Using Visible Light & a Photocatalyst"





# AMERICAN CHEMICAL SOCIETY AWARD

#### Lauren Cail

"Modification of Sodium Hydroxide Concentration & Additional Stressors in Small Batch Deacetylation of α-Chitin"





# AMERICAN CHEMICAL SOCIETY AWARD

## Krish Gupta

"Plasticizers: The Effects of Phthalates (DEHP) vs. Biological Substitute (DOTP) on Aquatic Biota"





# AMERICAN CHEMICAL SOCIETY AWARD

## Aliyah Allen

"How Does the pH of Different Additives Affect the Preservation of Fruit?"





#### AMERICAN PSYCHOLOGICAL ASSOCIATION

## **Anna Kersting**

"The Effect of Musical Keys on Human Emotions"





#### AMERICAN PSYCHOLOGICAL ASSOCIATION

#### Jack & Matt Marrillia

"The Effect of Exercise & Video Games on Standardized Tests"





# ASM MATERIALS EDUCATION FOUNDATION

#### Jedidiah Tillman & Yafet Zewdie

"Testing 3D Printing Material as an Alternative to Common Construction Materials"





### BC PLUMBING COMPANY AWARD

## Camryn Moss

"The Effects of Water Contaminants on Louisville Water Sources"





#### GE ASIAN PACIFIC AMERICAN FORUM – CLEAR THINKER AWARD

### Jason Zhang

"Novel Synthesis of Important Pharmaceutical Compounds Using Visible Light & a Photocatalyst"





#### **GIBSON FAMILY AWARD**

# Tania Vergara-Gongora "WAIT!!! Can You Actually Drink That?"





#### HEXION, INC. COMMUNITY IMPACT AWARD

## Samyuktha Jaganathan

"Does Brain Volume Change in Patients with Dementia"





### HEXION, INC. CREATIVE AWARD

## Lillian Long

"Sound to Color"





# JEFFERSON COUNTY CONSERVATION DISTRICT AWARD

# Christopher Nguyen

"How the Environment Affects Plant Growth"





#### KENTUCKY GAS ASSOCIATION AWARD

### Jaxson Liening

"The Effect of Coatings on Metal Corrosion"





# KENTUCKY SOCIETY OF PROFESSIONAL ENGINEERS AWARD

# Ryan Floyd "Roller Conveyor"





# KPFF ENGINEERING ACHIEVEMENT AWARD

# Addison Lilly

"Towers"









### Krish Gupta

"Plasticizers: The Effects of Phthalates (DEHP) vs. Biological Substitute (DOTP) on Aquatic Biota"





## OFFICE OF NAVAL RESEARCH AWARD

## Veenasravani Pendyala

"The Effects of Acetaminophen on Components of the Gut Microbiome"





### OFFICE OF NAVAL RESEARCH AWARD

#### Samirah Salifu

"The Discovery, Analyzation, and Characterization of Novel Mycobacteriophage PetiteSangue"





## OFFICE OF NAVAL RESEARCH AWARD

### Jason Zhang

"Novel Synthesis of Important Pharmaceutical Compounds Using Visible Light & a Photocatalyst"

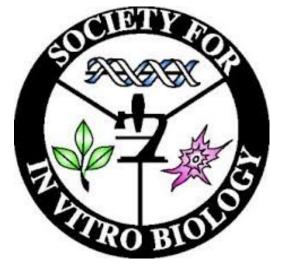






## Aliyah Allen

"How Does the pH of Different Additives Affect the Preservation of Fruit?"





# SOCIETY FOR IN VITRO BIOLOGY AWARD

# Jet Sendaydiego

"Phyto-Fighters: Does the Concentration of Phenolic Phytochemicals in Fresh Produce Affect its Antioxidant Percentage?"





#### STOCKHOLM JUNIOR WATER PRIZE

# Calvin Floyd

"Can Whiskey Be Removed from Water?"





#### STOCKHOLM JUNIOR WATER PRIZE

# **Emily Weigel**

"Characterizing Soil Composition to Reduce Water Usage"







#### STOCKHOLM JUNIOR WATER PRIZE

# Hailey Lin, Wilson Ni & Anqi Li "Plants in Soil Versus Crystals"





#### U.S. AIR FORCE ACHIEVEMENT AWARD

### Sahil Krishnani

"Developing Autonomous Drone Hardware & Software Using Rpi and Python/SwiftUI"





#### U.S. METRIC ASSOCIATION AWARD

# Kayla Dermody

"Does Adding Weight Affect a Paper Airplane's Travel?"





#### U.S. METRIC ASSOCIATION AWARD

### Logan Lewis

"Particle Suspension Withing Light Medium"







#### **Andrew Park**

"An Algorithm to Estimate Lithium-Ion Battery Lifetime"







### ANIMAL SCIENCES MIDDLE SCHOOL

## Sophie Garrett

"Taste, Smells & Temperature: Do They Matter to Dogs?"





### ANIMAL SCIENCES MIDDLE SCHOOL

#### Olive Zitter

"The Effect of Sucralose on Minnows"





### ANIMAL SCIENCES MIDDLE SCHOOL

#### Jacob Mulvihill

"The Effect of COVID-19 on Gorilla Behavior"





### ANIMAL SCIENCES HIGH SCHOOL

#### Jessica Davila

"The Effect of Music on A Dog's Behavior"

#### **Sponsored By:**







#### **ANIMAL SCIENCES HIGH SCHOOL**

#### Maia Kuehne-Seeber

"The Impact of Ultrasonic Frequencies on Eisenia Fetida Earthworms"

**Sponsored By:** 







2021



#### ANIMAL SCIENCES HIGH SCHOOL

### **Andrew Bumps**

"How Cognitive & Social Capacities Differ in Different Shark Species, and How These Capacities Impact Each Species' Interactions with Humans"

#### **Sponsored By:**







## BEHAVIORAL & SOICAL SCIENCES

**MIDDLE SCHOOL** 

#### Bianca Cristobal

"Finding Anxiety from Coronavirus & Pods"

**Sponsored By:** 









**MIDDLE SCHOOL** 

# Owen Singer

"Exploring How COVID-related Stress Affects Reaction Time & Symptoms"

**Sponsored By:** 









**MIDDLE SCHOOL** 

## **Brian Bouldin**

"Measuring Depression in Adults During the Era of COVID-19"







**HIGH SCHOOL** 

## Anthony Rice, Jr.

"No Music vs. Classical Music (Speed Division): Does Music Help with Students' Concentration on Tests?"

**Sponsored By:** 









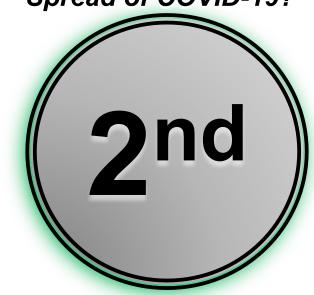
**HIGH SCHOOL** 

# Giovanni Akpaglo

"Following The Guidelines: How Do Select Retail Have an Effect on How People in My Community Follow the CDC Guidelines to Stop/Prevent the Spread of COVID-19?"

**Sponsored By:** 







**HIGH SCHOOL** 

## Monica Amaya

"What Effect Does Traditional vs. Nontraditional Settings Have on a Student's Mental Health?

**Sponsored By:** 







## BIOCHEMISTRY MIDDLE SCHOOL

## Jarren Patton

"Antibacterial Weaponry"

**Sponsored By:** 

In Honor of Dr. Nancy Keck





#### **BIOCHEMISTRY**

MIDDLE SCHOOL

# Ellery Reynolds

"Exploring & Remediating Vinyl Flooring Genotoxicity with Kentucky Plant Extracts"

**Sponsored By:** 

In Honor of Dr. Nancy Keck





## BIOCHEMISTRY MIDDLE SCHOOL

## Agnes Loeser

"Discovering the Effects of Ragweed on Amylase"

**Sponsored By:** 

In Honor of Dr. Nancy Keck





#### BIOCHEMISTRY HIGH SCHOOL

## Aliyah Allen

"How Does the pH of Different Additives Affect the Preservation of Fruit?"

**Sponsored By:** 

In Honor of Dr. Nancy Keck





#### **BIOCHEMISTRY**

**HIGH SCHOOL** 

## Krish Gupta

"Plasticizers: The Effects of Phthalates (DEHP) vs. Biological Substitute (DOTP) on Aquatic Biota"

**Sponsored By:** 

In Honor of Dr. Nancy Keck





**MIDDLE SCHOOL** 

# Lucy O'Brien

"Effects of Music on Heart Rate"

**Sponsored By:** 

In Honor of Dr.
Robert Ackland &
John Kurt
Brueckner





**MIDDLE SCHOOL** 

# Vivien Englund

"Effect of Blueberries on Children's Short-Term Memory"

**Sponsored By:** 

In Honor of Dr.
Robert Ackland &
John Kurt
Brueckner







**MIDDLE SCHOOL** 

## Leah Niemann

"Exploring Neurotoxin Shed & Neuroprotective Treatment"

**Sponsored By:** 

In Honor of Dr.
Robert Ackland &
John Kurt
Brueckner





**HIGH SCHOOL** 

## Leidis Escarret Medel

"What Effect Does the Reduction of Caffeine Have on Adolescents in Comparison to Adults on Their Hemodynamics?"

#### **Sponsored By:**



Alumni Club of Louisville, KY





**HIGH SCHOOL** 

# Bhanusri Satyavolu

"Xylose as an Alternative Sugar for Diabetes"

#### **Sponsored By:**



Alumni Club of Louisville, KY





**HIGH SCHOOL** 

# Sammy Finewood

"Vegetarian Diet"

#### **Sponsored By:**



Alumni Club of Louisville, KY





**MIDDLE SCHOOL** 

## **Ester Line**

"Factories Affecting Forehead Temperature, Thermometer Readings, and Accuracy"





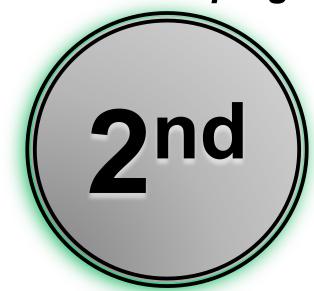


**MIDDLE SCHOOL** 

## Maryam Alsaadi

"The Effect of Beehive Wax Frame on the Human Brain While Sleeping"







**MIDDLE SCHOOL** 

### Laura Petruska

"Comparing Different Hydrogels to Make Axonal Conduits"







**HIGH SCHOOL** 

## Aiden Roe

"Making Prosthetics More Available"

**Sponsored By:** 

Dinsmôre





**HIGH SCHOOL** 

## **Braxton Frazier**

"How to Recognize & Reduce Liver Rejection in Transplant Patients"

**Sponsored By:** 

Dinsmôre





**HIGH SCHOOL** 

# Krithik Nadimpally

"Can a Microbial Fuel Cell Produce Enough Electricity to Power a Light Bulb?"

**Sponsored By:** 

Dinsmôre





# CELLULAR & MOLECULAR BIOLOGY

MIDDLE SCHOOL

## Sarah Jenkins

"E-Cigarettes: Exploring Negative Health Impacts Across Future Generations"







# CELLULAR & MOLECULAR BIOLOGY

MIDDLE SCHOOL

## **Emerson Wyatt**

"The Potential Synergistic Effects of Rose & Umibudo on a Representation of Cancer"









# CELLULAR & MOLECULAR BIOLOGY

MIDDLE SCHOOL

## Hayden Ramsey

"Carpet Stain Protector: Source of Stem Cell Disfunction of Children"







# CELLULAR & MOLECULAR BIOLOGY HIGH SCHOOL

### Aditi Kona

"Characterization of Insulin-degrading Enzyme: Using Molecular Visualization Systems to Understand Substrate Recognition in Type 2 Diabetes & Alzheimer's"

**Sponsored By:** 

STITES & HARBISON PLLC









# Maxwell Holtgrave

"Exploring the Durability of Cooking Oils"

**Sponsored By:** 







## Aicha Faiz

"Adsorption: Dyeing Fabrics with Kool-Aid"

**Sponsored By:** 







## Liam Amick

"Exploring the Creation of Sodium Lauryl Sulfate Remediation Products"

**Sponsored By:** 





#### CHEMISTRY HIGH SCHOOL

# Jet Sendaydiego

"Fighters: Does the Concentration of Phenolic Phytochemicals in Fresh Produce Affect its Antioxidant Percentage?"

**Sponsored By:** 







## Lauren Cail

"Modification of Sodium Hydroxide Concentration & Additional Stressors in Small Batch Deaceylation of α-Chitin"

**Sponsored By:** 







## Jason Zhang

"Novel Synthesis of Important Pharmaceutical Compounds Using Visible Light & A Photocatalyst"

**Sponsored By:** 





#### COMPUTATIONAL **BIOLOGY & BIOINFORMATICS**

**MIDDLE SCHOOL** 

## Jason Millard

"Exploring Differences in Expression of Lung Cancer"

**Sponsored By:** 









#### COMPUTATIONAL **BIOLOGY & BIOINFORMATICS**

MIDDLE SCHOOL

# Jacob Holtgrave

"Exploring Laterality of Cancer on Different Parts of the Face While Driving"

**Sponsored By:** 









#### COMPUTATIONAL **BIOLOGY & BIOINFORMATICS**

**HIGH SCHOOL** 

# Samyuktha Jaganathan

"Does Brain Region Volume Change in Patients with Dementia?"

#### **Sponsored By:**









# EARTH & ENVIRONMENTAL SCIENCE

**MIDDLE SCHOOL** 

### Joe Jaso

"Exploring the Velocity of Downslope Fires"







**MIDDLE SCHOOL** 

#### Jackson Briley

"Effect of Foliage & Sound Barriers on Near Road Pollution Levels"







**MIDDLE SCHOOL** 

#### Alice Vella

"Microfibers & Their Impact on Soil Dynamics"







**HIGH SCHOOL** 

#### Kameron Jones

"Asthmatic Air"

#### **Sponsored By:**



Linebach • Funkhouser, Inc. environmental compliance & consulting









**HIGH SCHOOL** 

#### Ashlyn Smith, Addie Flora & Sophie Schleuning "Road Salt Alternatives"

#### **Sponsored By:**



Linebach • Funkhouser, Inc. environmental compliance & consulting







**HIGH SCHOOL** 

#### **Blanaid Craig**

"The Effects of the Sun's Energy on Containers Filled with Water & Covered With Various Materials"

**Sponsored By:** 



Linebach • Funkhouser, Inc. environmental compliance & consulting









#### Rihaan Kapoor

"A Functional COVID-19 Mask Which Monitors & Predicts Illness"









#### Fahmeeda Mohammad

"RFID Readers - Protect Your ID Card From Theft"









#### Logan Lewis

"Particle Suspension Within Light Medium"





MIDDLE SCHOOL

#### Finn Oetken

"Exploring Ultrasound on the Production of Ethanol from Cellulose"





MIDDLE SCHOOL

#### **Annika Chadha**

"Hydrogen Production through Electolysis of Water Using Alkaline Battery, Photovoltaic Solar Panel, & Organic Anthocyanin Solar Battery"





MIDDLE SCHOOL

#### Leo Reinhart

"Using Piezoelectric Devices to Harness Pipe Outflow Energy"





**HIGH SCHOOL** 

## Mihir Duggal

"Biofuel is the NEW Fuel!"





# ENERGY: SUSTAINABLE MATERIALS & DESIGN HIGH SCHOOL

Juan Carlos Ramos Vega

"How Can We Leave Fossil Fuels Behind?"





# ENERGY: SUSTAINABLE MATERIALS & DESIGN HIGH SCHOOL

#### **Andrew Park**

"An Algorithm to Estimate Lithium-Ion Battery Lifetime"





**MIDDLE SCHOOL** 

#### Meredith Elder

"Does Building Shape Affect Heat Absorbance & Wind Resistance?"







**MIDDLE SCHOOL** 

#### Luke Conway

"The Effect of Tubercles and/or Extensions on a Submarine's Skin Friction"







**MIDDLE SCHOOL** 

#### Mason Nunn

"Earthquakes: Exploring the Effects of Liquid Density on Liquefaction"







**HIGH SCHOOL** 

#### **Addison Lilly**

"Towers"







**HIGH SCHOOL** 

#### Abdullah Al Rawi

"The Effect of the Material of Reinforcement on the Strength of Sand"

**Sponsored By:** 







2021

**HIGH SCHOOL** 

#### **Michael Pratt**

"Developing a High-Torque Electric Drive System for a Centrifugal Air Compressor"







### **ENVIRONMENTAL ENGINEERING**

**MIDDLE SCHOOL** 

#### Rhyse Johnston

"Radon Mitigation: Remediating a Potential Health Threat"







### **ENVIRONMENTAL ENGINEERING**

**MIDDLE SCHOOL** 

#### Josie Dunn

"Textile Dye Remediation Using Fish Bones"







## ENVIRONMENTAL ENGINEERING

**MIDDLE SCHOOL** 

#### Julia Keeney

"Exploring Carbon Scrubbing with Different Materials"







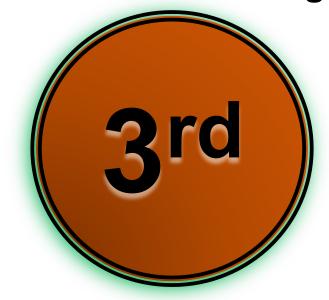
## ENVIRONMENTAL ENGINEERING

**HIGH SCHOOL** 

#### **Emily Weigel**

"Characterizing Soil Composition to Reduce Water Usage"







#### **ENVIRONMENTAL ENGINEERING**

**HIGH SCHOOL** 

# Tania Vergara-Gongora "WAIT!!! Can you actually drink that?"









## ENVIRONMENTAL ENGINEERING

**HIGH SCHOOL** 

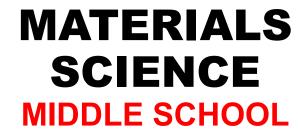
#### **Ahmad Ateyeh**

"Estimating the Effectiveness and Financial Practicality of Deploying a Space Mirror to Combat Climate Change"









#### Isaac Stroud

"Creating Fire Retardant CO<sub>2</sub>-Scrubbing Hydrogels"







#### MATERIALS SCIENCE MIDDLE SCHOOL

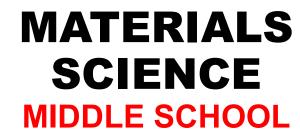
### Sophie Fabing

"Creating a Photothermal Coating Using Carbonized Biomaterials"









#### Eli Oetken

"Creating Bricks from Different Insulations"









### Nathan Wright

"Sustainable, Eco-Friendly Alternatives for Asphalt & Concrete in Sidewalks"







# MATERIALS SCIENCE HIGH SCHOOL

#### Jaxson Liening

"The Effects of Coatings on Metal Corrosion"









#### Jedidiah Tillman & Yafet Zewdie

"Testing 3D Printing Material as an Alternative to Common Construction Materials"









#### **Gus Reinhart**

"Mathematical Analysis of COVID-19 Positive Case Data Using the Fibonacci Sequence"







#### MATHEMATICS MIDDLE SCHOOL

### Max Longmeyer

"Fractal Analysis of Lightning Strikes: Same Storm vs. Same Terrain"







#### **MICROBIOLOGY**

**MIDDLE SCHOOL** 

#### **Kate Stewart**

"Do We Know What We're Buying: Exploring Kombucha's Bacterial Contents"





#### **MICROBIOLOGY**

**MIDDLE SCHOOL** 

#### **Neil Patil**

"The Mouthwash Wars: Which Mouthwash is the Most Efffective Disinfectant for Toothbrushs?"





### MICROBIOLOGY MIDDLE SCHOOL

# Mary Ballantine

"Ohio River Water: Creating a Selective Environment for Pathogenic Bacteria"







### Jazmin Bunch

"The Effect of Different Cleaning Methods on Bacteria in Books"









# Veenasravani Pendyala

"The Effects of Acetaminophen on Components of the Gut Microbiome"









### Samirah Salifu

"The Discovery, Analyzation, and Characterization of Novel Mycobacteriophage PettieSangsue"







# PHYSICS & ASTRONOMY

**MIDDLE SCHOOL** 

#### Nora McDonald

"Does the Price of Sunglasses Affect the Amount of UV Protection it has?"







# PHYSICS & ASTRONOMY MIDDLE SCHOOL

### **Gavin Thomson**

"Predicting Fluid Pressure Using Sound Patterns"







# PHYSICS & ASTRONOMY

**MIDDLE SCHOOL** 

## Penelope Harris

"Exploring How Weathering & Temperature Affect the Performance of Golf Balls"







# PHYSICS & ASTRONOMY HIGH SCHOOL

# Jessica Nguyen

"Fly Up to the Sky with Newton's Laws"







# PHYSICS & ASTRONOMY HIGH SCHOOL

# Dane Paprocki

"How to Make a Piano Sing"







# PHYSICS & ASTRONOMY HIGH SCHOOL

#### Kayla Dermody & Owen Morgan

"Does Adding Weight Affect a Paper Airplane's Travel?"







#### PLANT SCIENCES

MIDDLE SCHOOL

#### **Eva Donis**

"Does Plastic Leachate Affect the Germination & Growth of Plants?"









#### PLANT SCIENCES

**MIDDLE SCHOOL** 

### Drew Koon

"Exploring Plant Decision Making in Phototropism vs. Gravitropism"







#### **PLANT SCIENCES**

MIDDLE SCHOOL

ris Apple
"Exploring Auditory, Learning & Memory in Plants"









### PLANT SCIENCES HIGH SCHOOL

# Christopher Nguyen

"How the Environment Affects Plant Growth"







### PLANT SCIENCES HIGH SCHOOL

#### Chancelle Messe

"The Effect of Vibrations on the Growth of Plants"









### PLANT SCIENCES HIGH SCHOOL

# Suchita Tipirneni

"Mosaic Madness"







# ROBOTICS & INTELLIGENT MACHINES

**MIDDLE SCHOOL** 

### **Eric Kim**

"Robotic Basketball Shooter"







# ROBOTICS & INTELLIGENT MACHINES

**HIGH SCHOOL** 

## Seth Jennings

"Can a Machine Learn to Chat, Will it be Better as Soft-Coded or Hard-Coded?"







# ROBOTICS & INTELLIGENT MACHINES

**HIGH SCHOOL** 

### Sahil Krishnani

"Developing Autonomous Drone Hardware & Software Using Rpi and Python/SwiftUI"









### **Kevin Brothers**

"Found: Reuniting Families Using Facial Recognition"

**Sponsored By:** 

In Honor of Dr. Nancy Keck







### Louie Murr

"Using Artificial Intelligence (AI) to Improve Students' Attentiveness in Online Learning"

**Sponsored By:** 

In Honor of Dr. Nancy Keck







### Shazia Shaik

"Driver Drowsiness Detection"

**Sponsored By:** 

In Honor of Dr. Nancy Keck







### **Tanner Aslan**

"How VR Games are Made"







#### SYSTEMS SOFTWARE HIGH SCHOOL

### Samuel Smallwood

"Smart Home Control"









# Karthik Nadimpally

"Developing an Image-Based Encryption Method Using Javascript"







**MIDDLE SCHOOL** 

# Harrison Jeffreys

"Do Artificial Sweeteners Create AGEs & Affect Stem Cell Function in Children?"





**MIDDLE SCHOOL** 

## **Drew Ashley**

"Airflow Modeling: The Removal of COVID-19 in Classrooms"





**MIDDLE SCHOOL** 

## **Charlotte Connally**

"Kentucky Native Plant Mugwort Extract and Magnets: Adjunct Cancer Therapy"





**HIGH SCHOOL** 

## Lilly Cruikshanks

"Do Fish Have Similar Caffeine Effects Compared to Humans?"

#### **Sponsored By:**

Carbide Industries







# LRSEF SCHOOL AWARDS JUNIOR

### **Nur Islamic School**





# LRSEF SCHOOL AWARDS JUNIOR

#### J. Graham Brown Middle School





# LRSEF SCHOOL AWARDS JUNIOR

### St. Francis of Assisi School





# LRSEF SCHOOL AWARDS SENIOR

# Central High School





# LRSEF SCHOOL AWARDS SENIOR

# **Ballard High School**





# LRSEF SCHOOL AWARDS SENIOR

# Eastern High School







#### DEPARTMENT OF DEFENSE STEM LEADERSHIP PRIZE

### Fahmeeda Mohammad

"RFID Readers – Protect Your ID Card from Theft" Nur Islamic School of Louisville, Louisville, KY





### LEMELSON EARLY INVENTOR PRIZE

### **Charlotte Connally**

"Kentucky Native Plant Mugwort Extract & Magnets:
Adjunct Cancer Therapy"

St. Francis of Assisi School, Louisville, KY





### **Drew Ashley**

"Airflow Modeling: The Removal of COVID-19 in Classrooms" St. Francis of Assisi School, Louisville, KY





## Sophie Fabing

"Creating a Photothermal Coating Using Carbonized Materials" St. Francis of Assisi School, Louisville, KY





## **Emerson Wyatt**

"The Potential Synergistic Effects of Rose & Umibudo on a Representation of Cancer" St. Francis of Assisi School, Louisville, KY





#### FIRST BUILD SCHOLARSHIP AWARD

### Veenasravani Pendyala

"The Effects of Acetaminophen on Components of the Gut Microbiome"





#### FIRST BUILD SCHOLARSHIP AWARD

### Samuel Smallwood

"Smart Home Control"





## Samyuktha Jaganathan

"Does Brain Region Volume Change in Patients with Dementia?" Ballard High School, Louisville, KY





#### Aditi Kona

"Characterization of Insulin-degrading Enzyme: Using Molecular Visualization Systems to Understand Substrate Recognition in Type 2 Diabetes and Alzheimer's"
North Oldham High School, Goshen, KY





#### **Andrew Park**

"An Algorithm to Estimate
Lithium-Ion Battery Lifetime"
Gatton Academy of Science & Mathematics,
Bowling Green, KY

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a Haier company





### Samirah Salifu

"The Discovery, Analyzation, and Characterization of Novel Mycobacteriophage PetiteSangsue" Gatton Academy of Science & Mathematics, Bowling Green, KY



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### Jason Zhang

"Novel Synthesis of Important Pharmaceutical Compounds using Visible Light and a Photocatalyst" Gatton Academy of Science & Mathematics, Bowling Green, KY

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The "LRSEF Winners Circle Drive-By," sponsored by Churchill Downs, will held at the Churchill Downs Track on Saturday, March 20, 2021 for students to come and pick up their awards. Time & additional details will be sent out later to all award winners.





