75TH ANNUAL

THE OHIO ACADEMY OF SCIENCE

STATE SCIENCE DAY

VIRTUAL 4.0, 2023

HOSTED BY

The Ohio State University

SPONSORED BY

AMGEN
Ohio's 529 College Advantage
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Broadcom Foundation
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Kent State University
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Wright State University’s Pre-Professional Health Program helps you successfully prepare for health professional schools and guides you through the application process when the time comes. Get help:

- Exploring healthcare professions that match your strengths.
- Preparing for your future—academic and non-academic health professional school requirements.
- Applying and taking entrance exams for health professional schools.
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Now in its 75th year and with more than 70,000 alumni, State Science Day is the pinnacle of student originated, inquiry-based science education for Ohio’s students. The academic equivalent of a state athletic championship, this year’s event is one of the largest of its kind in the nation. Drawing upon a base of over 10,000 students, 614 students in grades 5–12 from 187 schools will be evaluated on their scientific research and communication skills. They will compete for $400,000 in scholarships and awards.

First held in 1949, the 75th Annual State Science Day is sponsored by: The Ohio Academy of Science, The American Electric Power Foundation, Battelle, Broadcom, CAS, Charles River Laboratories, Kent State University, Kokosing, OhioEPA–The Ohio Environmental Education Fund, the Ohio Tuition Trust Authority–College Advantage, Amgen, and Taft.

https://ssd.ohiosci.org/

CONGRATULATIONS TO ALL EXHIBITORS
The investment of time in pursuing an independent research project in science pays generous returns to each student. By honoring hundreds of projects with nearly $400,000 in sponsored awards and scholarships, we seek to honor all exhibitors for their hard work. Please accept our sincere congratulations on your outstanding work and our encouragement to continue your interest in scientific research. Thank you for participating in this year’s State Science Day.

MICHAEL E. WOYTEK, Executive Director

FUTURE SSD DATES
To Be Announced
The foundation’s sponsored programs create volunteer opportunities for employees and mentors and strengthen social responsibility and global citizenship. A primary goal of the foundation is to encourage youth to learn coding as a skill and universal language of the future that opens opportunities for exciting careers in STEM fields. | broadbandfoundation.org

**AMGEN**
Amgen harnesses the best of biology and technology to make people’s lives easier, fuller, and longer. With roots in the biotech revolution, we are one of the world’s leading independent biotech companies—fighting the toughest diseases and helping millions of people globally. Amgen’s manufacturing capabilities ensure that we can reliably produce our life-saving products with the goal of reaching every patient, every time. Amgen’s new final assembly and packaging facility in Central Ohio will assemble, label, and package autoinjectors, vials, and syringes to support the growing demand for Amgen’s medicines. The new facility will be Amgen’s most digitall advanced facility, leveraging the latest innovations in manufacturing, while still prioritizing sustainability and minimizing environmental impact.

**BATTELLE**
Every day, the people of Battelle apply science and technology to solving what matters most. At major technology centers and national laboratories around the world, Battelle conducts research and development, designs and manufactures products, and delivers critical services for government and commercial customers. Headquartered in Columbus, Ohio, Battelle serves customers in the national security, health and life sciences, and energy and environmental industries. Battelle also is one of the nation’s leading charitable trusts focusing on societal and economic impact, vigorously supporting and promoting science, technology, engineering and mathematics (STEM) education. Battelle believes STEM education is an urgent national priority that requires bold goals, higher standards and greater accountability in our educational system to better prepare our nation’s K-12 students for careers in science and technology that ultimately enhance the U.S. innovation enterprise. | batelle.org

**BROADCOM FOUNDATION**
Broadcom Foundation’s mission is to advance STEM education and increase equity and access in STEM education, especially for young women and underrepresented youth. The foundation’s sponsored programs create volunteer

**CHARLES RIVER LABORATORIES**
At Charles River we are passionate about our role in improving the quality of people’s lives. Our mission, the excellent science that we perform, and our strong sense of purpose, guides us in all that we do. We approach each day with the knowledge that our research helps to improve the health and well-being of many individuals across the globe. Charles River Laboratories, which started as a one-man research models company, has grown into the world’s largest preclinical contract research organization with a network of facilities across North America, Europe and Asia. This includes three laboratories in Ohio; Ashland, Cleveland and Spencerville. The worldwide support network allows us to act as a steadfast partner to our clients, from early molecule discovery to IND submissions. For more than 70 years we have seen technologies advance and new diseases emerge. To address these challenges, Charles River has carefully grown our portfolio of companies so that we can strategically anticipate tomorrow’s drug development needs. While we can’t predict what the future holds, we continue to kindle the spark that inspired our founding: an urgency to advance human health by supporting our clients’ research, every step of the way. | criver.com

**KENT STATE UNIVERSITY**
Kent State University is the highest-ranked public university in northern Ohio on the Top Public Schools and Best National Universities lists by U.S. News & World Report. Kent State also holds the esteemed distinction of being one of only five institutions in Ohio to be recognized as an elite research university by the Carnegie Classification of Institutions of Higher Education. Kent State students are encouraged to pursue their passions and are supported every step of the way by the award-winning resources focused on everything from academic success to mental health and well-being. In fact, curious learners who have not identified a specific major participate in Kent State’s nationally recognized Exploratory program, which caters to students to help them confidently declare a major while staying on track to a timely graduation. With more than 360 programs of study and dedicated career exploration and development through access to internships and co-curricular experiences, students continue on next page
at Kent State are positioned for success and find that their academic interests turn into careers they are passionate about. Looking to stay close to home or prefer to learn abroad? Kent State’s eight campuses span Northeast Ohio, along with a College of Podiatric Medicine, a Twinsburg Academic Center and academic sites in major world cities such as New York City, Geneva and Florence. The addition of new learning environments from the sciences to the arts and the development of exciting new academic programs characterize Kent State’s focus on transformational educational experiences. | www.kent.edu

KOKOSING
Kokosing is one of the largest family-owned construction companies in the Midwest. Kokosing’s primary business lines include industrial, transportation, buildings, pipelines, environmental and marine work. Additionally, Kokosing owns construction material supply companies. Known for unwavering integrity and exceptional safety and quality, Kokosing’s companies provide extensive resources for its customers. Together with our team members, we invest our time and financial resources in the communities where we live and work. We strive to be socially and environmentally responsible and make a meaningful impact. | kokosing.biz

OEPA - THE OHIO ENVIRONMENTAL EDUCATION FUND
The Ohio Environmental Education Fund (OEEF), which is administered by Ohio EPA’s Office of Environmental Education, provides grants for projects that increase awareness and understanding of environmental issues in Ohio. | epa.ohio.gov/oee

OHIO TUITION TRUST AUTHORITY - COLLEGE ADVANTAGE, OHIO’S 529 COLLEGE SAVINGS PLAN
Recognizing the importance of higher education, Ohio became one of the first states in the country to offer a 529 college savings plan, starting in 1989. CollegeAdvantage, Ohio’s 529 Savings Program, encourages families nationwide to start saving for future college costs in a tax-advantaged manner that can build the account. Ohio’s 529 plan offers tax-free growth, tax-free withdrawals for qualified higher education expenses, and a deduction in state income taxes for 529 contributions per beneficiary, per year, for residents of Ohio. CollegeAdvantage sponsors two plans, the Direct 529 Plan or Advisor 529 Plan, that provide multiple investment options, including ready-made, age-based or ready-made, risk-based portfolios and FDIC-insured banking options. Contributions can start as low as $25 and there’s no fee to open a Direct 529 account. CollegeAdvantage is Ohio’s 529 College Savings Plan, but the account can be used at almost any school that a childdreams to attend. Funds in a 529 plan can be used in state, out of state, or out of country, at any university, college, or technical school that accepts federal financial aid. CollegeAdvantage is consistently highly rated by trusted industry resources such as Morningstar and SavingForCollege.com. | collegeadvantage.com

REAL SCIENCE IS... FASCINATING, EXCITING AND CLOSER THAN YOU THINK!

Did you know that Kent State University offers a world of educational opportunities in science, technology, engineering and mathematics through a variety of academic majors and hands-on STEM and innovation camps available to young learners as early as third grade?

Real science happens when students of all ages explore their STEM interests in Kent State’s top-rated makerspaces and state-of-the-art facilities alongside educators who are leaders in their fields of study.

Some of the colleges, also known as the “academic homes” of STEM majors, minors, certificates and youth summer programs at Kent State, include:

» Ambassador Crawford College of Business and Entrepreneurship
» College of Aeronautics and Engineering
» College of Arts and Sciences
» College of Education, Health and Human Services
» College of Nursing
» College of Public Health
» And all seven Kent State Regional Campuses

DISCOVER STEM EXPLORATION AND LEARNING OPPORTUNITIES FOR STUDENTS OF ALL AGES HERE:

WWW.KENT.EDU/EXPLORESTEM
INSPIRING THE NEXT GENERATION OF INNOVATORS

Innovation does not happen in a vacuum. To ensure that the pace of scientific innovation continues to improve the lives of countless individuals, we must support those who will make the next big discovery. The Amgen Foundation, the philanthropic arm of biotechnology company Amgen, is deeply committed to inspiring and preparing the next generation of innovators. By sparking a passion for science and supporting young people who pursue it as a career, we hope to fuel scientific innovation and create a brighter, healthier future for all.

Visit www.AmgenFoundation.org

Learn more about our latest initiative! Developed at Harvard and supported by the Amgen Foundation, LabXchange is a free, virtual lab experience that integrates digital instruction with mentoring opportunities.

Visit www.LabXchange.org

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On behalf of The Ohio Academy of Science, it is my pleasure to welcome you to our Virtual State Science Day 2023, where we celebrate your hard work and scientific achievements. After some challenging years during the pandemic, we are emerging with a rekindled curiosity, improved collaborative tools, and a new drive to advance scientific discovery.

The fields of science, technology, engineering, and mathematics remain instrumental in driving advancements around the globe. The breadth and complexity of the problems society now faces necessitates a broad pool of creative minds to tackle these emerging issues. Educators, formal or otherwise, who cultivate a passion for curiosity and problem solving through classroom and extracurricular pursuits are foundational to these successes. The projects presented are a testament to these efforts and highlight the creativity of our young scientists.

As I welcome you to our virtual State Science Day 2023, I would like to thank all the students, parents, teachers, school administrators, research advisors, volunteer judges, sponsors, and staff of the OAS for making this possible. Thanks for being part of this fantastic event!
Great Scientists
STEM from
Columbus State

- Hands-on, career focused instruction prepares you for STEM careers.
- Qualified students can earn a full tuition scholarship through the Future Scientists of Ohio Scholars Program.
- Join the STEM Club to meet peers and experts passionate about the field.
- Earn an associate degree, then receive guaranteed acceptance to a 4 year institution of your choice through our Preferred Pathway transfer partnerships.

To learn more, visit csc.edu/STEM
District Science Days

Participants for the 2023 District Science Day will register via ProjectBoard. Each of the 17 District Fairs will be held in-person. Be sure to visit your District's Science Day website for event schedule and additional information that may apply for the event. A virtual District Science Day will be held as “District 18”. Please check with your District to see if they have a registration deadline that is before February 28, 2023.

Registration site for all District Science Days: https://projectboard.world/oas

The deadline to have all required information in ProjectBoard for District Science Day is February 28, 2023.

District Science Days students eligible for State Science Day will have until April 2, 2023 at 11:59pm to register for State Science Day.

State Science Day Virtual 4.0

Judging for State Science Day will be virtual via ProjectBoard. Students can make changes, March 26-April 2, 2023, to any questions, photos, videos in ProjectBoard that were used at DSD before the State Science Day registration deadline. A non-refunded fee of $60.00 per student is due at the time of registration. On April 24, 2023, State Science Day results will be announced, and the students of Superior rated projects will receive an invitation to the State Science Day Celebration and Symposium to be held at The Ohio State University on Saturday, May 13, 2023 in the Student Union. If invited, students and family members will need to RSVP by May 1, 2023.
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<th># - Location and Date</th>
<th>Contact and Website</th>
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<td>1 – Edison State CC</td>
<td>Dr. Martin E. English - <a href="mailto:info@ohioumvsd.com">info@ohioumvsd.com</a></td>
</tr>
<tr>
<td>March 11, 2023</td>
<td><a href="https://www.ohioumvsd.com/">https://www.ohioumvsd.com/</a></td>
</tr>
<tr>
<td>2 – Univ of Toledo</td>
<td>Dr. Mark Camp - <a href="mailto:mark.camp@utoledo.edu">mark.camp@utoledo.edu</a></td>
</tr>
<tr>
<td>March 11, 2023</td>
<td><a href="https://www.utoledo.edu/nsm/district-science-day/">https://www.utoledo.edu/nsm/district-science-day/</a></td>
</tr>
<tr>
<td>3 – OSU Marion</td>
<td>Dr. Qudsia Tahmina - <a href="mailto:tahmina.1@osu.edu">tahmina.1@osu.edu</a></td>
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<tr>
<td>March 25, 2023</td>
<td><a href="https://osumarion.osu.edu/alumni-initiatives/initiatives/education/sciencefair/student-registration/">https://osumarion.osu.edu/alumni-initiatives/initiatives/education/sciencefair/student-registration/</a></td>
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<tr>
<td>4 – Ashland Univ</td>
<td>Dr. Jeffrey Weidenhamer - <a href="mailto:jweiden@ashland.edu">jweiden@ashland.edu</a></td>
</tr>
<tr>
<td>March 25, 2023</td>
<td><a href="https://www.ashland.edu/cas/mohican-district-science-day">https://www.ashland.edu/cas/mohican-district-science-day</a></td>
</tr>
<tr>
<td>5 – Univ of Akron</td>
<td>Dr. Ali Dhinojwala - <a href="mailto:aiy4@uakron.edu">aiy4@uakron.edu</a></td>
</tr>
<tr>
<td>March 18, 2023</td>
<td><a href="https://www.uakron.edu/wrsd/">https://www.uakron.edu/wrsd/</a></td>
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<tr>
<td>6 – Ohio Northern</td>
<td>Dr. Jamie Siders - <a href="mailto:j-siders@onu.edu">j-siders@onu.edu</a></td>
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<tr>
<td>March 25, 2023</td>
<td><a href="https://www.onu.edu/camps-and-events">https://www.onu.edu/camps-and-events</a></td>
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<tr>
<td>7 – Columbus State CC</td>
<td>Dr. Matthew Saelzler - <a href="mailto:msaelzle@cscc.edu">msaelzle@cscc.edu</a></td>
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<td>March 18, 2023</td>
<td><a href="https://www.cscc.edu/docs/science/">https://www.cscc.edu/docs/science/</a></td>
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<tr>
<td>8 – OU Lancaster</td>
<td>Dr. Sandra L. Doty - <a href="mailto:dotys@denison.edu">dotys@denison.edu</a></td>
</tr>
<tr>
<td>March 18, 2023</td>
<td><a href="https://district8sciencefair.webbly.com/">https://district8sciencefair.webbly.com/</a></td>
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<tr>
<td>9 – Zane State College</td>
<td>Ms. Kathryn Hooper - <a href="mailto:khooper@zanestate.edu">khooper@zanestate.edu</a></td>
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<tr>
<td>March 25, 2023</td>
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<tr>
<td>10 – Miami Valley CTC</td>
<td>Dr. Martin E. English - <a href="mailto:District10ScienceDay@gmail.com">District10ScienceDay@gmail.com</a></td>
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<td>March 25, 2023</td>
<td><a href="https://www.ohiosci.org/district-10/">https://www.ohiosci.org/district-10/</a></td>
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<tr>
<td>11 – Univ of Cincinnati</td>
<td>Mr. Rickey Terrell - <a href="mailto:ucsckifar@ucmail.uc.edu">ucsckifar@ucmail.uc.edu</a></td>
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<tr>
<td>March 11, 2023</td>
<td><a href="https://cech.uc.edu/about/southwest-ohio-science-fair.html">https://cech.uc.edu/about/southwest-ohio-science-fair.html</a></td>
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<tr>
<td>12 – Ohio Univ</td>
<td>Dr. Natalie Kruse - <a href="mailto:krusen@ohio.edu">krusen@ohio.edu</a></td>
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<td>March 25, 2023</td>
<td><a href="http://www.ohio.edu/scifair/">www.ohio.edu/scifair/</a></td>
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<td>13 – Kent State Univ - Tuscarawas</td>
<td>Ms. Laurie Donley - <a href="mailto:tuscsclienceday@kent.edu">tuscsclienceday@kent.edu</a></td>
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<td>March 4, 2023</td>
<td><a href="https://www.kent.edu/tusc/scienceday">https://www.kent.edu/tusc/scienceday</a></td>
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<td>14 – Univ Rio Grande</td>
<td>Dr. John Means - <a href="mailto:jmeans@rio.edu">jmeans@rio.edu</a></td>
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<td>March 25, 2023</td>
<td><a href="https://www.rio.edu/science-day">https://www.rio.edu/science-day</a></td>
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<tr>
<td>15 – Youngstown State Univ</td>
<td>Dr. Michael Serra - <a href="mailto:maserra@ysu.edu">maserra@ysu.edu</a></td>
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<td>March 18, 2023</td>
<td><a href="https://ysu.edu/lake-to-river">https://ysu.edu/lake-to-river</a></td>
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<tr>
<td>16 – Belmont College</td>
<td>Mr. Chris Clantz - <a href="mailto:cclantz@belmontcollege.edu">cclantz@belmontcollege.edu</a></td>
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<tr>
<td>March 18, 2023</td>
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<tr>
<td>17 – Wilmington College</td>
<td>Dr. Russell Kincaid - <a href="mailto:rkincaid@wilmington.edu">rkincaid@wilmington.edu</a></td>
</tr>
<tr>
<td>March 25, 2023</td>
<td><a href="https://www.wilmington.edu/science-day/">https://www.wilmington.edu/science-day/</a></td>
</tr>
<tr>
<td>18 – Virtual Science Day - OAS office</td>
<td>Mrs. Angela McMurry - <a href="mailto:amcmurry@ohiosci.org">amcmurry@ohiosci.org</a></td>
</tr>
<tr>
<td>March 25, 2023</td>
<td>Central Office Phone 614-389-2182</td>
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*Districts 8, 9, 12, 13, 14, 15, 16, and 17 registration fees are covered by a grant to the Voinovich School of Leadership and Public Service at Ohio University*
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Mr. Raymond A Heitger
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Mr. Thomas Richmond, III

Thank You Sponsors!

HOW TO BECOME A SPONSOR
If you, your company, foundation, or organization are interested in providing title sponsorship, general support, exhibits, scholarships, or sponsored awards, please contact:

Michael E. Woytek, Executive Director
The Ohio Academy of Science
5930 Wilcox Pl., Suite F
Dublin, OH 43016
Phone: (614) 389-2182
Fax: (614) 389-2470
E-mail: mwoytek@ohiosci.org
Website: ohiosci.org
Bowling Green State University provides students with opportunities to make change through innovative partnerships and high-impact research. BGSU is a place to belong, a place to excel.

Bowling Green State University has given me the opportunity to make a change.

- VICTORIA, ENVIRONMENTAL SCIENCE
2023 OFFICIALS

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Administrative Program Specialist: Ms. Alyson Gruber

Experience Ohio State for a Day

Love science? Fascinated by technology? The Ohio State University College of Food, Agricultural, and Environmental Sciences (CFAES) invites you to visit either our Columbus or Wooster campus to learn about opportunities to pursue majors in science and technology. With 21 bachelor's degree majors, 24 associate degree majors, and 34 minors, CFAES has what you're looking for. You're sure to discover your passion for science and technology!

Schedule a Columbus campus visit at go.osu.edu/cfaesvisit or a Wooster campus visit at ati.osu.edu/visit.

CFAES provides research and related educational programs to clientele on a nondiscriminatory basis. For more information, visit cfaesdiversity.osu.edu.
For an accessible format of this publication, visit cfaes.osu.edu/accessibility.
When I pull apart these big robots I’m like, “Wow, this is awesome.” And I want to go into my job and be excited to be there every day. So if I’m going to be excited about something I might as well make that my career.”

CYNTHIA CLEVELAND, OH

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CONGRATULATIONS TO OUR 2023 MULTI-YEAR STUDENTS

Each year, the Academy recognizes the students who achieve State Science Day attendance for four years or more. Congratulations to these students as this is an incredibly difficult honor to achieve. Student names are listed alphabetically followed by grade level.

7-year Awardee
Charley Clyne, 11
Julie Sebastian, 11
Emily Swope, 12
Wyatt Vick, 11

6-year Awardee
Kennedy Brehm, 12
Luca Gagliano, 12
Sadhil Mehta, 10
Bryn Morgan, 12
Marissa Shook, 12
Dana Stan, 10

5-year Awardee
Winnie Bodin, 9
Michael Ge, 10
Liam Hartley, 10
Kara Jones, 10
Addison Mullins, 10
Allison Payton, 9

4-year Awardee
Jacob Rice, 12
Aditya Varma Sangu, 8
Aviraj Soin, 8
Laasya Acharya, 10
Tarun Batchu, 9
Johan DeMessie, 12
Luke Doseck, 11
Kaitlyn Ernst, 11
Xinrui Han, 11
William Kohut, 11
2022 STATE SCIENCE DAY AWARDS

2022 DR. LYNN E. ELFNER YOUNG SCIENTIST Awardees

The 2022 Dr. Lynn E. Elfner Young Scientist awardees selected for outstanding projects in grades 5 to 8. All received a superior award. Student names are listed alphabetically followed by grade level.

Abigail Alberta
Sam Alter
Ty Beard
Brady Beisner
Samuel Brown
Presley Burkholder
Jack Charlton
Jasmine Chen
Allie Depenbrock
Kierstin Drew
Omar Elbadawy
Tyler Feix
Kensie Funk
Natalie Gerstenberger
Cora Gutierrez
Neha Hariharan
Ava Kidd
Emmett Kinnison
Prem Koshal
Chloe Lucas
Clare McCabe
Sammy McGill
Elijah Moore
Finley Noel
Jane Odille
Coltrane Parsons
Emily Parsons
Raiden Quinn
Meg Riter
Cristian Schrock
Jillian Seibert
Maximilian Seifried
Scarlett Shupe
Kiahna Smith
Connor Sullivan
Sophia Szolosi
Jordan Thornburg
Kendall Wild
Avery Wyan
Carey Yant
Ryan Zand

THE 2022 GOVERNOR’S THOMAS EDISON AWARDS FOR EXCELLENCE IN STEM EDUCATION AND STUDENT RESEARCH

Anderson High School, Cincinnati
Anna High School, Anna
Archbishop Alter, Kettering
Bellbrook Middle School, Bellbrook
Big Walnut Intermediate, Sunbury
Bishop Flaget, Chillicothe
Bishop Leibold E&W Campus, Dayton
Buchtel Community Learning Center, Akron
Carroll High School, Dayton
Chardon Middle School, Chardon
Dayton Christian School, Miamisburg
East Richland Christian School, St. Clairsville
Ellet CLC, Akron
Hyre CLC, Akron
Holy Angels, Sidney
Holy Trinity, Avon
I Promise School, Akron
Incarnate Word Academy, Parma Heights
Lehman Catholic High School, Sidney
Litchfield Community Center, Akron
Miller South VPA, Akron
National Inventor’s Hall of Fam STEM HS, Akron
National Inventor’s Hall of Fam STEM MS, Akron
New Lexington Middle School, New Lexington
North High School, Akron
Northeastern High School, Springfield
Ottawa Hills Junior/Senior High School, Ottawa Hills
River Valley High School, Bidwell
St. Agatha-St.Aloysius, Cleveland
St. Albert The Great, N. Royalton
St. Charles Borromeo High School, Kettering
St. Francis Xavier, Medina
St. Jude, Elyria
St. Mary, Chardon
St. Mary Immaculate Conception, Wooster
St. Paschal Baylon, Cleveland
St. Peter, N. Ridgeville
St. Sebastian, Akron
St. Raphael, Bay Village
St. Rose, Perrysburg
Sts. Joseph & John Interparochial, St. Clairsville
Sylvania Northview High School, Sylvania
Turpin High School, Cincinnati
Unioto ES, Chillicothe
## Biotechnology & Biomedical Technologies

**Grades 10-12**
- 1st place – Kaitlyn Ernst, Laurel School
- 2nd place – Hans Swain, The University School
- 3rd place – Laksh Dhir, Dublin Coffman High School

**Grades 7-9**
- 1st place – Adharsh Narendrakumar, Birchwood School of Hawken
- 2nd place – Brooke Gemechu, Birchwood School of Hawken
- 3rd place – Cora Gutierrez, Tri-Village High School

## Advanced Materials

**Grades 10-12**
- 1st place – Destynn Keuchel, Hawken School
- 2nd place – Neil Tivakaran, 10 Carroll High School
- 3rd place – Kennedy Brehm, Bloom-Carroll High School

**Grades 7-9**
- 1st place – Evan Dan, Solon Middle School
- 2nd place – Ethan Corso, St Gertrude
- 3rd place – Nina Rando, St Rose

## Information Science & Technology Research

**Grades 10-12**
- 1st place – Mihai Crisan, Upper Arlington High School
- 2nd place – Mihir Vador, Dublin Jerome High School
- 3rd place – Kareem Fareed, The University School

**Grades 7-9**
- 1st place – Laasya Acharya, William Mason High School
- 2nd place – Carter Schrock, Bath Middle School
- 3rd place – Shriti Kutcherapati, Bethel Middle School

## Advanced or Alternative Energy

**Grades 10-12**
- 1st place – Emir Tali, William Mason High School
- 2nd place – Claire Loeffler, Bloom-Carroll High School
- 3rd place – Ethan Varner, Versailles High School

**Grades 7-9**
- 1st place – Bryce McEachen, 10-Carroll High School
- 2nd place – Rebecca Jacob, Solon Middle School
- 3rd place – Krisha Naik, Lakota Hopewell Junior School
2022 HAROLD C. SHAW MEMORIAL OUTSTANDING SCHOOL AWARD

A most-challenging prize, the celebrated Harold C. Shaw award is based on a rigorous group score of all participants from a school. The late Mr. Shaw (1915-1993) was a high school science teacher and long-time OAS Junior Academy Council member. Above, Mr. Shaw’s family members are posed with the awards at the 2018 State Science Day. Pictured (left to right) are Carolyn Shaw-Lowry, Gwen Shaw-Sailor, and Lisa Shaw-Eilerman.

2022 Harold C. Shaw Awardees

Anna High School – Anna
Archbishop Alter High School – Kettering
Athens High School – The Plains
Beaumont School – Cleveland Heights
Bellbrook Middle School – Bellbrook
Bloom Carroll High School – Carroll
Lincoln High School – Gahanna
Mason Middle School – Mason
St. Charles Borromeo School – Kettering
St. Columban School – Loveland
Summit Country Day School – Cincinnati
Sylvania Northview High School – Sylvania
Tippecanoe Middle School – Tipp City
University School – Shaker Heights
William Mason High School – Mason

THE OHIO TUITION TRUST AUTHORITY
2022 COLLEGE ADVANTAGE 529 PLAN AWARD

Ava Kidd – Liberty Township
Brady Beisner – New Madison
Emmett Kinnison – Chillicothe
Ethan Mullins – Wheelersburg
Grant Lee – Solon
Hala Hinch – Sylvania
Jad Hinch – Sylvania
John Adamsky – Martins Ferry
Jordan Thornburg – Centerville
Kara Stewart – Sidney
Mary Cunningham – Springfield
Omar Elbadawy – Cleveland
Quinton Smith – Ottawa Hills
Raiden Quinn – New Madison
Sophia Szolosi – Athens
Tarun Batchu – Powell
**SCHOLARSHIPS AND SPONSORED AWARDS**

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<tr>
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Thank You Award Sponsors and Judges!

The dedication and expertise of the judges makes it all possible! Above, the judge’s meeting in OSU’s St. John Arena at the 2019 State Science Day.
Education women in STEMM.

Choose Ohio First grants available.

If you’ve set your sights on a science career, your educational journey should begin at Ohio Northern University. Ranked No. 4 among Midwest regional liberal arts colleges by U.S. News & World Report in Best Colleges 2023. onu.edu/apply

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Ohio Northern University

If you’ve set your sights on a science career, your educational journey should begin at Ohio Northern University. Ranked No. 4 among Midwest regional liberal arts colleges by U.S. News & World Report in Best Colleges 2023.
onu.edu/apply
If you attended State Science Day as a student...

We welcome you to

JOIN

the State Science Day Alumni Association.

There are no fees to join.

Sign up here: https://form.jotform.com/OhioScience/science-day-alumni

Alumni Benefits.

* Be recognized for career accomplishments. (Annual and lifetime achievement awards.)
* Be portrayed as a career role model to inspire and mentor students.
* Be invited for their professional knowledge to provide benefits to The Ohio Academy of Science such as judging at State, district, and local science fairs, reviewing manuscripts and annual meeting abstracts for The Ohio Journal of Science, evaluating scholarship applications and STEM education program awards.

Ways to Support STEM education

* Be given the opportunity to support the Annual Fund or specific activities like State Science Day, and the alumni group.
* Be an advocate for STEM education.
* Provide testimonials as to the value of participating in local, District and State Science Days.
* Provide The Ohio Academy of Science with contacts for corporations, foundations, governmental agencies, professional societies, and educational institutions.

This we believe.

Tens of thousands of Ohio students over nearly 50 years have benefited from participation in youth science opportunities including local, District and State Science Days of The Ohio Academy of Science. Early life experiences—like these—get under your skin in a most powerful way. These students’ scientific and engineering knowledge and skills, as well as their academic accomplishments, were fostered by early access to professionals, public recognition of their work, and scholarships. Re-connecting these students—now or advanced—in meaningful STEM-related experiences such as judging and other interactions will bring them personal and professional satisfaction and merit The Ohio Academy of Science.
Letter to a Young Scientist

Science Pays in Many Ways

By James B. Short

James Short attended the Bryan (Ohio) City School District, where he had his first experience in science fairs. Following his formal education at The Ohio State University and Defiance College, he taught science at Gorham Fayette Local Schools for a quarter century. Understanding the transformative effect of science fair projects in his own life, during his teaching career he emphasized the importance of independent science projects for all students. The result was a legacy of high school students excelling in local, state, and national-level science fairs and science days—including the International Science and Engineering Fair. After retirement from teaching he has continued his involvement in science fair activities, and is currently the Director of the Northwest Ohio Science and Engineering Fair. During his long career he has come to understand the many ways that science education can benefit everyone in society. Mr. Short is a Fellow of The Ohio Academy of Science.

This message will encourage you to investigate science. If you are from my area of the state—northwest Ohio—you will probably have heard my standard statement: “Science pays in many ways!” If you have not heard this, let me explain.

Teaching not only furthered my opportunities to payback my love for science but also to keep receiving these payments.

Each year my projects became more involved and detailed, yet I was intrigued by the questions and situations that kept occurring. I was pushed to learn new mathematical, mechanical, and social skills. I met other students, teachers, and specialists. Each of these occurrences I see as a payment from science, since I was gaining information, knowledge, and social interaction.

Teaching not only furthered my opportunities to payback my love for science but also to keep receiving these payments. Yes, the salary of a teacher was much appreciated and needed; however, the payments have arrived by many different methods.

I re-started, and further developed, a local science fair in my school district. Grades 7 to 11 in science classes were required to have projects. The first year was so successful that one of the students was selected as a finalist at the International Science and Engineering Fair (ISEF) held in Minneapolis-St. Paul, Minnesota. What a payment, not only for me, but also for the student!

I am a very “seasoned” citizen. I participated in my Local and District Science Days back in the 1960s. After graduating from The Ohio State University with a fisheries management major, and no employment possibilities, I attended Defiance College to obtain my teaching credentials. I was hired as half of the science teaching faculty at Gorham Fayette Local Schools (GFHS) and completed my employment in the same building and room(s) 25-years later.

Science Pays in Many Ways

My statement—science pays in many ways—has developed over these 60-plus years. My early 7th grade science project started the process by helping me become interested in all areas of science. (Before that time, all I wanted to do with science was to go fishing!) Now I was able to see all the necessary research, planning, writing, building, and practice needed. I was also forced to speak to my adult judges.

A Long Look Back

I am a very “seasoned” citizen. I participated in my Local and District Science Days back in the 1960s.
The local science fair participation was followed by district, regional, state, and international levels of presentation, display, and competition by my students. These students continued to prove that science pays in many ways: trips and major cash awards were won; they earned top placements in multiple categories of the middle and high school divisions of competition; plus they received many employment opportunities, lab experiences, book awards, and equipment awards.

For several years, students from our school won the highest or most Superiors at District Science Day at Defiance College. We usually had over 24 participants from our small school (about 600 students, K-12). After 25 years of teaching, the school had many ISEF finalists and student observers. The trophy case also displayed 4 prestigious Shaw Awards from the State Science Day. All of the advanced science day participants are considered champions; the payment they received was the knowledge gained in planning, making improvements to their projects, and the experience of the competition—as well as any added monetary awards.

How many students in a small school can be called state champions or even state qualifiers? At one time GFHS was in the top 10 schools sending students to the State Science Day, averaging about 6 students per year.

**The Payments from Science...**

**For the Teachers**

During my teaching years, I became involved with the District Science Day, State Science Day, and Regional Science Fair. I have been a district councilperson and a State Junior Academy council member. Currently I am the Director of the Northwest Ohio Science and Engineering Fair, which sends students to ISEF.

Payments I have received from working with students include:
1. Being invited by a regional student to attend, as their guest, a weeklong expenses-paid workshop at the Department of Energy’s Oak Ridge National Laboratory, Oak Ridge, Tennessee.
2. Being selected as one of the two Ohioans to be part of the 8-week Department of Energy Research Program at the Pacific Northwest National Laboratory in Pasco, Washington.
3. Being able to attend over 20 International Science and Engineering Fairs along with the top student-scientists in the world.
4. Being provided the opportunity to meet and talk with outstanding science educators from around the world.
5. Being privileged to meet Nobel laureates.
6. Being fortunate to witness my students’ successes and achievements associated with their projects.

**Not only was I invigorated with the success of my students but also the students were excited that they were able to finish a project of this magnitude—and achieve recognition for their academic efforts.**

**The Payments from Science...**

**Even More for the Students**

More specifically, here are some benefits that I have witnessed students achieving:
1. Receiving a $50,000 college scholarship (many).
2. Employment opportunities during the summer after they graduate high school.
3. Receiving $1,000 cash awards.
4. Receiving $500 cash awards.
5. Receiving a 4-year, $18,000 scholarship.
6. Introduction to a university with a subsequent enrollment into that university (scholarship).
7. One-week expenses-paid US Navy experience.
8. Full college tuition and research space.
9. Full college expenses from associated scholarships through PhD.
10. Early placement into advanced medical field education.
11. National recognition via television or radio broadcast.
12. Meeting famous people, such as Nobel laureates and a legendary football coach.
15. Improved self confidence.
Science Builds Many Key Life Skills

Science pays beyond the possible *glory* awards. Science fulfills the need for many skills including: organization, time management, materials procurement, planning, reading, writing, research, exploring new technologies, mathematics, verbal and visual presentation, data analysis, display planning and preparation, following rules, public speaking, analyzing media validity, patience, practice, and social interaction.

Here is a final story for you. I had a student who was very diligent and completed her science fair projects as instructed, although I knew she did not like the assignments. She went to college and as a senior was told that she had to have a senior project. I am guessing that she grumbled, but went ahead and prepared for the assignment as she had been taught back in middle and high school. After completion she wanted to get it out of the way, so she volunteered to go first. Her classmates were not happy with her; she set the expectations so high they had to scramble to even come close to her presentation. A display board, reports, pictures, and models were used—just like she had learned. She passed!

Yes, I have received many payments from science. But I am most happy for the payments that I see coming to young student scientists who put in the work, avoid the hazards that appear, and successfully complete and present their projects at a science day or science fair.

1 Address correspondence to James B. Short. Email: jamesb.short@gmail.com
<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
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<td>Mr Rajesh Acharya</td>
<td>Mason</td>
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<td>Mrs Bukola Adesanmi</td>
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<td>Dr Anna Adetona</td>
<td>Columbus</td>
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<tr>
<td>Dr Subhodip Adhicary</td>
<td>Columbus</td>
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<tr>
<td>Mrs Nkechi Akwari</td>
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<td>Dr Mark Ambler</td>
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<td>Mrs Faiza Anjum</td>
<td>Dublin</td>
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<td>Mrs Erica Arnold Nance</td>
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<td>Ms Vidheesha Arora</td>
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<tr>
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<td>Ada</td>
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<tr>
<td>Ms Maggie Biddle</td>
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<td>Mrs Vendala Blackburn</td>
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<td>Ms Deb Bogard</td>
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<td>Mr Doug Bowdle</td>
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<td>Mx Alissa Coonfield</td>
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<td>Dr Rachel Corrigan</td>
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<td>Ms Bethany Cox</td>
<td>Alliance</td>
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<td>Mr Thomas Daigler</td>
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<td>Dr Mark Dalmak</td>
<td>Canal Fulton</td>
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<td>Ms Bethany Davies</td>
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**Thank You Judges!**
Ms. Laalitya Acharya

Laalitya Acharya graduated from Mason High School, Mason, in the class of 2021. She is now studying biomedical engineering at Columbia University. During the summer of 2022 she is excited to have an internship at a major pharmaceutical company.

In elementary school, I entered my carrot-density project into our school science fair. Though I didn’t realize it then, that simple act would be the start of a lifelong love for STEM. From there I qualified for my regional science fair and State Science Day 6 times, the International Science and Engineering Fair (ISEF), and was the only finalist from Ohio at the Regeneron Science Talent Search (STS) in 2021. But even more than just awards, SSD gave me the opportunity to meet other like-minded students. Whether it was anxiously awaiting judging, running into old friends yearly, bonding through awful STEM puns (because all the good ones Ar-gon!), or meeting the most esteemed members of Ohio’s science community—State Science Day provided me with an incredible network and lifelong memories with new friends and colleagues. It has truly been an honor to compete alongside the smartest researchers across the state and to now be invited to write this reflection.

I would like to thank my family for cheering me on through all my scientific endeavors. I also thank Mr. Mike Woytek, Dr. Lynn Eifner, Ms. Dorie Gruber, Dr. Martin English, Mr. James Short, Mr. Philip Winchell, Ms. Pam Winchell, and the entire Ohio Academy of Science for their constant support of the students in Ohio. Lastly, I’d like to thank my engineering teacher, Ms. Bethany Jones, for always being a source of ideas, inspiration, and passion. Of course, a huge round-of-applause for all the students, parents, volunteers, and teachers who help to keep our passion for science alive! You are the lifeblood of science fair and I cannot wait to see how you change the world next!

Ms. Lauren Menke

Lauren Menke is an undergraduate student at Case Western Reserve University studying nutrition on the pre-medicine track. She is a four-time State Science Day Alumnus and participated while attending Versailles High School.

The day I was asked to write this blurb was also the day I broke a glass plate in front of a postdoctoral student at one of Cleveland Clinic’s research labs. Needless to say, science is a continual learning process.

When I think back to my first year of the science fair, I think of how much I have learned since then. The practice of reading research papers, synthesizing that information, and developing my own question—and a way to test it—was a challenging but also formative experience. Additionally, presenting my project, which always made me both nervous and excited, was great practice. Now, every time I have to give a presentation, I am able to draw on the skills I first trained through the science fair.

State Science Day not only builds skills but is also motivation for continued discovery. Each time I attended the SSD, I was impressed by others’ projects and became motivated to delve deeper in science. The science fair enabled me to explore a wide range of interests including projects about everything from eggs to insects. As I continue to participate in research, I continue to learn, but the foundations I learned through the science fair remain the same. I am grateful for my experiences from SSD and for the mentors who have encouraged me.

As you continue on your journey through science, don’t be afraid to make mistakes! It is the skills you learn along the way that carry you through in the future.
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https://ohiojournalofscience.org/
# Roster of Student Exhibitors

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Leilah Escalante
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Michael Esposito
Grade: 7  Individual project
St Thomas More, Cincinnati
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Carter Evanchan
Grade: 9  Individual project
Upper Arlington High School, Upper Arlington
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Isabella Everhart
Grade: 5  Team project
L. T. Ball Intermediate School, Tipp City
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Okemdi Eze
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Rielly Fabrizio
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Leilah Faith
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Maggie Faust
Grade: 9  Individual project
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Kate Fearon
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Caroline Ferguson
Grade: 10  Team project
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Rachel Finegan
Grade: 9  Individual project
Dayton Regional STEM School, Kettering
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Lacie Flint
Grade: 6  Individual project
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Cora Hargrove  
Grade: 12 Team project  
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Alex Harrison
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New Albany Intermediate School, New Albany
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Regan Herzog
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Global Impact STEM Academy, Springfield
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Francis Hirsch
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Max Hoffman
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Claire Holcomb
Grade: 11  Individual project
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Lani Hollinger
Grade: 12  Team project
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- **Effect of Sling Length on Trebuchet Throwing Distance**
- **Fertilizer Frenzy!**
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- **What Cleaner Is Best For Surgical Instruments In A Veterinary Clinic?**
- **The Study of Soil Fertility Nutrient Influence on Yield**
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Chloe Johnson
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Juliana Johnson
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Halle Jones
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Ethan Keyes
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Natalie Lang  
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<td>Ella Lopez</td>
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<td>Evelyn Lorensen</td>
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<td>Joshua Lothrop</td>
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<td>Theo Lovett</td>
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<td>Gracelyn Lyon</td>
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**Individual Projects**

- **Does Temperature affect a golf ball bounce?**
- **Fish Tank Filters**
- **Freeze Thrower**
- **What energy drink will affect plant growth the most?**
- **Are Fingerprints Inherited?**
- **The Role of Sex Hormones on the Increase of Diet-Induced Blood Glucose and Weight Gain in Mice**
- **Which Natural Preservative Works Best**
- **Soda’s Effect on Tooth Enamel**
- **Base Level Blood Sugar**
- **How Does Dry Time Affect A Macaron Shells Bite Force**
- **Activator Battle**
- **Growing Sugar Crystals**
- **Altering an Alkaline Electrolyzer to Enhance Hydrogen Production**
- **Device for Assisting the Visually Impaired**
- **Keep That Cap On!**
- **How Do Different Dairy Varieties Curate Outside Of Recommended Temperature**
- **Written Showdown: Artificial Intelligence vs. 6th Grader. Can Teachers Tell the Difference?**
- **Frozen Meltdown**
- **Activator Battle**
Kenan Maaieh  
Grade: 12  Individual project  
Ottawa Hills High School, Ottawa Hills  
Behavioral Effects of Depression in Reserpine-Induced Depression Zebrafish Models

Moses Mabarak  
Grade: 9  Individual project  
Archbishop Alter, Kettering  
Fluoride Protection on Teeth

K.J. Mack  
Grade: 8  Individual project  
Sacred Heart of Jesus, Wadsworth  
To Blink or Not to Blink

Lea MacMichael  
Grade: 8  Individual project  
Geneva Middle School, Geneva  
Antimicrobial Activity of Bee Propolis

Esme Mahoney  
Grade: 6  Individual project  
Wheelersburg Middle School, Wheelersburg  
Can Jumping Spiders Learn?

Braden Malone  
Grade: 9  Individual project  
Northeastern Middle/High School, Springfield  
Taste This

Ashley Malsch  
Grade: 7  Individual project  
St Columban, Loveland  
Loveland Water Quality

Brinley Mann  
Grade: 6  Individual project  
Alliance Middle School, Alliance  
Shocking Vegetables

Gabriella Maranzana  
Grade: 7  Team project  
Bishop Flaget School, Chillicothe  
Can Dogs See Color?

Kate Marhefka  
Grade: 6  Individual project  
St Vincent De Paul, Mt Vernon  
Adhesive Strength

Lilly Markley  
Grade: 5  Team project  
New Albany Intermediate School, New Albany  
Basketball Bounce

Allie Martin  
Grade: 9  Team project  
The University School, Shaker Hts  
How Different Water Conditions Affect Phaseolus vulgaris Germination

Charlie Martin  
Grade: 8  Individual project  
The University School, Shaker Hts  
How to Defend Against Electromagnetic Pulses (EMP)

Elise Marullo  
Grade: 5  Individual project  
St Mary Immaculate Conception, Wooster  
Ice Melting

Sierra Matamoros  
Grade: 8  Individual project  
Decolores Montessori School, Greenville  
Fabric softener and how it changes the flammability of fabric

Eliza Maxwell  
Grade: 12  Individual project  
Miami Valley CTC, Englewood  
Does Sour Candy, Gummy Candy or Brown Rice Make The Body Perform Better During Athletic Performance?
Sammy McGill
Grade: 8  Individual project
St Mary, Lancaster
The Effect of Color and Music on Blood Pressure and Heart Rate

David McLoughlin
Grade: 11  Individual project
Carroll, Dayton
House Price Prediction Using Regression Techniques

Judah McMurray
Grade: 6  Individual project
Cincinnati Classical Academy, Cincinnati
Infinity Mirror

Riley McNeal
Grade: 8  Individual project
Global Impact STEM Academy, Springfield
Does Hand Sanitizer Kill Raw Chicken Bacteria?

Julia McNeill
Grade: 7  Individual project
Bishop Flaget School, Chillicothe
Does Spicy Food Elevate Body Temperature?

Ella McQueen
Grade: 9  Team project
Ottawa Hills High School, Ottawa Hills
How does the different types of water affect algae cellular respiration?

Emily Meckler
Grade: 12  Individual project
Mentor High School, Mentor
The Effectiveness of Various Solvents at Removing Contaminants from Forensic Glass and Plasticware

Sancty Mehola
Grade: 5  Team project
New Albany Intermediate School, New Albany
Basketball Bounce

Sadhil Mehta
Grade: 10  Individual project
Tippecanoe High School, Tipp City
A Quantitative Study of Different Metal-Air Batteries Are they the best options for our future?

Haasini Mendu
Grade: 10  Individual project
William Mason High School, Mason
GlaucNet: A Machine Learning Approach to Glaucoma Detection

Sullivan Meneghetti
Grade: 7  Individual project
St Joseph, Avon Lake
Building a Bioplastic for the Future: An Examination into the Strength of Starch-Based Bioplastics

Izzy Mercer
Grade: 7  Individual project
Global Impact STEM Academy, Springfield
Which Fabric is Most Stain Resistant?

Alex Merryman
Grade: 11  Team project
Olentangy Liberty High School, Delaware
A Replacement for Styrene Butadiene in Tires

Kathryn Mershad
Grade: 10  Individual project
Archbishop Alter, Kettering
Measuring the production of biogas through the decomposition of different biomasses

Bree Metzler
Grade: 12  Individual project
Anna High School, Anna
Glucose Consumption and Electrolyte Absorption

Kendrick Meuer
Grade: 12  Team project
Northwestern High School, W Salem
Football Helmet Project

Alexander Mian
Grade: 12  Individual project
Ottawa Hills High School, Ottawa Hills
Detecting 355 Promoter & NOS Terminator to Identify Mislabeled GM Food Products

Emma Michael
Grade: 8  Individual project
Put-In-Bay High School, Put-In-Bay
What are the Effects of Different Shampoos and Conditioners?

Sean Michaelis
Grade: 8  Team project
St Mary, Lancaster
Telling Temperature by Touch

Nevan Miley
Grade: 8  Individual project
Decolores Montessori School, Greenville
Baby In a Box

Abram Miller
Grade: 8  Individual project
East Richland Christian Schools, St Clairsville
Effects of Improper Washing on Fire Resistant Fabric

Alexander Miller
Grade: 9  Individual project
Fairland High School, Proctorville
Multitasking
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<td>East Richland Christian Schools, St Clairsville</td>
<td>The Comparison of the Effectiveness of Different Types of Mulch</td>
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<td>Don’t Go Breaking My Heart</td>
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<td>How Bull Sperm is Affected When It is Stored in Different Temperatures</td>
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<td>Acidic Devastation: Effects of Acid Rain</td>
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<td>Alexia Morgan</td>
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<td>Miami Valley CTC, Englewood</td>
<td>Activation of Rectus Femoris During Various Types of Squats</td>
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<td>The Crystal Radio; How to Get a Crystal Clear Signal</td>
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<td>The Beat of My Heart</td>
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<td>What Drink Has the Most Electrolytes</td>
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<td>Water Quality and Bacteria: Distinguishing the Good from the Bad</td>
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<td>Sanath Mungamuru</td>
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<td>The Effect of Magnetic Radiation on Milk</td>
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<td>Mary Murphy</td>
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<td>St Mary, Lancaster</td>
<td>Jiminy Crickets!</td>
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</table>
Grant Muvunyi  
Grade: 8  Individual project  
Bishop Leibold E And W Campus, Dayton  
*To Infinity and Beyond*

Diya Naik  
Grade: 12  Individual project  
New Albany High School, New Albany  
*Analyzing Nuclear Size Trends in Isotopes Using Proton Elastic Scattering Data*

Krisha Naik  
Grade: 9  Individual project  
Lakota Central, West Chester  
*Alternate clothes drying method can reduce impact of Climate change*

Jennifer Najem  
Grade: 7  Individual project  
Bishop Leibold E And W Campus, Dayton  
*Chromatic Adaptation*

Owen Nardell  
Grade: 5  Team project  
New Albany Intermediate School, New Albany  
*What’s the Best Golf Ball for a Youth Golfer*

Adharsh Narendrakumar  
Grade: 9  Individual project  
St Ignatius High School, Cleveland  
*An Automated Device that Measures and Observes the Capillary Refill Time of a Patient*

Caitlin Neidhard  
Grade: 10  Individual project  
Carroll, Dayton  
*The Effects of Misleading Information on Eyewitness Testimony*

Jack Nelson  
Grade: 8  Individual project  
The University School, Shaker Hts  
*How do sunglasses affect the accuracy of eye trackers?*

Lorelai Nelson  
Grade: 5  Individual project  
Northwestern Elementary School, W Salem  
*Effects of Freezing on Plant Life*

Curtis Ngidari  
Grade: 11  Individual project  
Dayton Christian School, Miamisburg  
*Comparison of Water Purification Methods*

Grace Nguyen  
Grade: 11  Team project  
Olentangy High School, Lewis Center  
*A Replacement for Styrene Butadiene in Tires*

Addison Nichols  
Grade: 7  Individual project  
Sacred Heart of Jesus, Wadsworth  
*Soap and Water Vs. Hand Sanitizer*

Camryn Nichols  
Grade: 8  Individual project  
Hilltop High School, W Unity  
*Does Temperature Affect a Football’s PSI?*

Trystyn Nicolai  
Grade: 9  Individual project  
Northeastern Middle/High School, Springfield  
*How do germs affect the human body?*

Audrey Nixon  
Grade: 9  Team project  
Ottawa Hills High School, Ottawa Hills  
*The Effect of Water Temperature on Algal Growth*

Brooke Nolletti  
Grade: 8  Team project  
Northwestern Middle School, W Salem  
*Wacky Worms!*

Jillian Norman  
Grade: 8  Individual project  
Sacred Heart of Jesus, Wadsworth  
*Testing the Thickness of the Glomerulus*

Francesca Nuss  
Grade: 12  Individual project  
Eastland Career Center, Groveport  
*Apple Cider Vinegar: An Accessible Treatment for Bacterial Folliculitis?*

Lillian Obhof  
Grade: 7  Individual project  
St Francis Xavier, Medina  
*Stains! Stains! Stay Away! Which Fabric is Most Stain Resistant? Can We Protect Our Clothes?*

Owen O’Connell  
Grade: 7  Individual project  
Bishop Leibold E And W Campus, Dayton  
*Parachute Drop*

Chloe O’Hara  
Grade: 7  Individual project  
All Saints, Cincinnati  
*Does Caffeine Affect Plant Growth*
BETWEEN OPPORTUNITIES AND PROGRESS, THERE ARE CONNECTIONS

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ROSTER OF STUDENT EXHIBITORS (CONT.)

Michael O’Keeffe  
Grade: 6  Individual project  
St Francis Xavier, Medina  
*Seeing Why We’re Different: DNA Extraction Using Household Materials*

Nathan Olmstead  
Grade: 6  Individual project  
St Charles Borromeo, Kettering  
*Solar Powered RC Car*

Luke Oue  
Grade: 6  Team project  
St Charles Borromeo, Kettering  
*Electromagnetism*

John Page  
Grade: 5  Individual project  
New Albany Intermediate School, New Albany  
*Do Images Influence Opinions?*

Paisley Paige  
Grade: 5  Individual project  
Unioto Elementary, Chillicothe  
*Breaking Bridges*

Rowan Palmer  
Grade: 10  Individual project  
Liberty Union High School, Baltimore  
*The Effect of Birth Order on Mental Health*

Samhita Paranthaman  
Grade: 7  Individual project  
Mason Middle School, Mason  
*Utilizing a cost-effective tool to Identify Harmful Algal Blooms (HAB) in a Fresh water Ecosystem*

Shiven Parikh  
Grade: 9  Individual project  
Dayton Regional STEM School, Kettering  
*Cracked It!*

Fiona Parks  
Grade: 6  Team project  
Zane Trace Middle School, Chillicothe  
*Power To The Mouth!*

Deepthisri Paruchuri  
Grade: 10  Individual project  
Olentangy High School, Lewis Center  
*Multiclass Skin Lesion Classification Using MobileNet Convolutional Neural Networks and Diagnosis*

Divyasree Paruchuri  
Grade: 9  Individual project  
Olentangy High School, Lewis Center  
*Utilizing a cost-effective tool to Identify Harmful Algal Blooms (HAB) in a Fresh water Ecosystem*

Rhea Pasupuleti  
Grade: 10  Individual project  
Dayton Regional STEM School, Kettering  
*Healthy Hydroponics: The Compost Contribution*

Keeran Patel  
Grade: 8  Individual project  
Incarnation, Centerville  
*Light Speed*

Katelyn Patterson  
Grade: 8  Individual project  
Global Impact STEM Academy, Springfield  
*Which Cleaner Eliminates the Most Bacteria off of a Phone Surface?*

Katelyn Patterson  
Grade: 8  Individual project  
Global Impact STEM Academy, Springfield  
*Which Cleaner Eliminates the Most Bacteria off of a Phone Surface?*

Chevelle Payne  
Grade: 7  Team project  
Zane Trace Middle School, Chillicothe  
*Activator Battle*

Griffin Payne  
Grade: 7  Team project  
Kilbourne Middle School, Worthington  
*What Drink Has the Most Electrolytes*

Allison Payton  
Grade: 9  Individual project  
Zane Trace High School, Chillicothe  
*Water Bottle Temperature*

Aditya Pendse  
Grade: 6  Individual project  
New Albany Intermediate School, New Albany  
*Thermo Magnetico*

Micah Perry  
Grade: 8  Individual project  
Decolores Montessori School, Greenville  
*Can AI Improve Mental Health?*

Jack Peterson  
Grade: 11  Individual project  
Upper Arlington High School, Upper Arlington  
*Volatile Profile of Cotton Candy Grapes*

Lena Pianfetti  
Grade: 9  Team project  
Turpin High School, Cincinnati  
*How Different Water Conditions Affect Phaseolus vulgaris Germination*

Olivia Pickerrrell  
Grade: 7  Individual project  
Bishop Leibold E And W Campus, Dayton  
*Bright Reactions*
### Roster of Student Exhibitors (Cont.)

<table>
<thead>
<tr>
<th>Name</th>
<th>Grade</th>
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<th>School/Location</th>
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<tr>
<td>Natalie Pierson</td>
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<td>L. T. Ball Intermediate School, Tipp City</td>
<td>Guinea Pigs: Food Color Preference</td>
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<td>Rudolph (R.J.) Pilny</td>
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<td>Individual</td>
<td>Sacred Heart of Jesus, Wadsworth</td>
<td>What's the Best Bat: Wood or Metal?</td>
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<td>Amy Pinkerton</td>
<td>9</td>
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<td>Bloom-Carroll High School, Carroll</td>
<td>Air Pressure and How It Effects a Soccer Balls Flight</td>
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<td>Ananya Pise</td>
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<td>Hyatts Middle School, Powell</td>
<td>Understanding the Effects of Heat on Enzymes to Aid Health Research</td>
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<td>Jashwin Pisini</td>
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<td>Olentangy Shanahan Middle School, Lewis Center</td>
<td>Stealthy Planes and How They Stay Undetected!</td>
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<td>Lillian Pistole</td>
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<td>Minford Middle School, Minford</td>
<td>What Makes Ice Melt Fastest?</td>
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<td>Ethan Plageman</td>
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<td>Space Engineering: Designing a Hydrophilic Object that Submerges in Water Under Conditions of Microgravity</td>
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<td>St Albert The Great, N Royalton</td>
<td>Covid and Benford’s Law</td>
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<td>Charlie Pochet</td>
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<td>Luke Potts</td>
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<td>Operation Clean</td>
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<td>Finley Powell</td>
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<td>The effect of temperature on the absorption rate and size of clay</td>
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<td>Dhruv Prasanna</td>
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<td>Henry Karrer Middle School, Dublin</td>
<td>Aerodynamics</td>
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<td>Matthew Preston</td>
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<td>Bloom-Carroll High School, Carroll</td>
<td>How Does B-12 Vitamin Compare to Caffeine in Stimulatory Effectiveness</td>
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<td>Matthew Preston</td>
<td>12</td>
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<td>What Common Substance Melts Ice the Fastest?</td>
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<td>Emmaline Rambler</td>
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<td>Miller-South Visual Performing Arts, Akron</td>
<td>Do You Hear What I Hear: Testing Pitch Perception in Students</td>
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<td>Will Randall</td>
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<td>Allison Rankin</td>
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<td>The Effect of Types of Paper Airplanes on the Distance the Plane Goes and Time it Stays in the Air</td>
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<td>Do Certain Foods Absorb More Bacteria Than Others?</td>
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<td>Food Allergies: Oral Immuno-Therapy vs. Avoidance</td>
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<td>Jessica Raymond</td>
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<td>How is Algae Affected by Nitrate and Phosphate</td>
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<td>Aaron Rea</td>
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<td>St Paul, Salem</td>
<td>Do Plants React to Music?</td>
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Isaac Reash
Grade: 8 Individual project
St Paul School, Westerville
The Effect of the Salinity of Water on Grass Growth

Craig Reed
Grade: 12 Team project
Northwestern High School, W Salem
Football Helmet Project

Nathan Reynolds
Grade: 11 Individual project
Dayton Christian School, Miamisburg
Development of Osteoarthritis in Dogs

Jacob Rice
Grade: 12 Team project
Arcanum High School, Arcanum
Quality Assurance

Sawyer Ridge
Grade: 6 Team project
Tippecanoe Middle School, Tipp City
Wash Those Hands

Elyse Ridgway
Grade: 7 Individual project
All Saints, Cincinnati
Does Age Effect Reaction Time

Kate Riegel
Grade: 10 Individual project
Archbishop Alter, Kettering
The Effect of Different Concentrations of Salty Road Runoff on Soybean Germination and Growth

Amyah Riley
Grade: 5 Individual project
Freedom Elementary School, West Chester
Bring Me a Drink!

Nicholas Ristau
Grade: 8 Team project
St Mary, Lancaster
Telling Temperature by Touch

Angela robb
Grade: 9 Individual project
Bloom-Carroll High School, Carroll
Effects of Tight Bras on Girl's Tidal Volume and Vital Capacity

Makenzie Robison
Grade: 7 Individual project
St Columban, Loveland
Ultraviolet Ultra Harmful

Stephen Roddy
Grade: 9 Individual project
Northeastern Middle/High School, Springfield
The Possible Effects from Goats Listening to Music

Christopher Rodriguez
Grade: 9 Individual project
Bloom-Carroll High School, Carroll
Does the Amount of Cornstarch in a Material Effect the Biodegradability?

Olivia Rodriguez
Grade: 9 Individual project
Carroll, Dayton
Fading Comparison of Natural Versus Chemical Dyes

Kamryn Roe
Grade: 7 Individual project
Bishop John King Mussio Central Junior High School, Steubenville
How Accurate are Gender Prediction Tests?

Will Rond
Grade: 7 Individual project
St Agatha, Columbus
My Heart Is Burning

Megan Rosenberg
Grade: 7 Individual project
Bishop Leibold E And W Campus, Dayton
Light the Way

Sofie Rumman
Grade: 12 Individual project
Ottawa Hills High School, Ottawa Hills
Associations between PCS and PCL and Development of PTSD after mild traumatic brain injury after MVC

Cash Russell
Grade: 5 Individual project
Northwestern Elementary School, W Salem
What Type of Bridge is the Strongest?

Zach Sabin
Grade: 7 Individual project
Bishop Leibold E And W Campus, Dayton
Smooth Operation

Pranavi Sahoo
Grade: 7 Individual project
John Sells Middle School, Dublin
Let Artificial Intelligence Help you on Your Backpacking

Clare Salem
Grade: 10 Individual project
Beaumont School, Cleveland Hts
The Size of a Knowledge Base & AI Accuracy

Anthony Salerno
Grade: 7 Individual project
St Peter, N Ridgeville
The Taste of Color
ROSTER OF STUDENT EXHIBITORS (CONT.)

Aditya Varma Sangu
Grade: 8  Individual project
Olentangy Shanahan Middle School, Lewis Center
Hydrogen power

Jared Sargent
Grade: 11  Individual project
Carroll, Dayton
Sound Wave Reduction For Roller Coasters

Jayla Sartin
Grade: 9  Individual project
Northeastern Middle/High School, Springfield
Can Aquaponics Have The Ability to Purify Contaminated Water and Suitable for Sustaining life.

Taylor Schindley
Grade: 12  Individual project
Mentor High School, Mentor
Comparing Effectiveness of Verbal and Visual Prompting on Verbal and Nonverbal Students with Autism

Liam Schnettler
Grade: 7  Individual project
St Columban, Loveland
Preventing Mold In Carved Pumpkins

Ethan Schuler
Grade: 10  Individual project
Home Schooled, 3D Printed Combat Robot

Emilia Scribben
Grade: 9  Individual project
Global Impact STEM Academy, Springfield
How Does Sugar Content in Bananas Differ When Ripe, Unripe, and Overripe

Julie Sebastian
Grade: 11  Individual project
Bethel High School, Tipp City
You Snooze, You Lose

Ali Sedige
Grade: 11  Individual project
Ottawa Hills High School, Ottawa Hills
The Effects of Aeration Induced Stress on Zebrafish Learning, memory, Aggression, and Anxiety

Maximilian Seifried
Grade: 6  Individual project
St Mary Immaculate Conception, Wooster
Should Farmers Blast Mozart?

Rithvan Senthiil
Grade: 6  Team project
Eversole Run Middle School, Plain City
Aerodynamics

Phoebe Setzekorn
Grade: 7  Individual project
St Hilary, Fairlawn
How pill bugs react to mechanical stimuli

Reyan Shariff
Grade: 12  Individual project
Ottawa Hills High School, Ottawa Hills
Quality of Life Serves as a mediator between PTSD and Pain Catastrophizing

Stella Sharp
Grade: 9  Individual project
Carroll, Dayton
The Effect of Dirt Debris Collected in Golf Clubs on the Flight of the Ball

Tristan Sheets
Grade: 10  Individual project
Benjamin Logan High School, Bellefontaine
Electrolysis Efficiency

Suneha Shelke
Grade: 12  Individual project
Sylvania Northview High School, Sylvania
A Study of the Complex of Human Protein IRF3 and Viral Protein (SARS-Cov-2) ORF7a

Madelyn Shenberger
Grade: 7  Individual project
Ashland Christian, Ashland
Does Noise Affect Eye-Hand Coordination?

Dalton Shepherd
Grade: 7  Individual project
Clay High School, Portsmouth
Which drink has the most sugar?

Laney Shepherd
Grade: 7  Individual project
Clay High School, Portsmouth
Dirty Money

Gavin Sheppard
Grade: 10  Individual project
The University School - College Prep, Chagrin Falls
Creating A Machine Learning Model to Predict Nick Chubb’s Rushing Yards

Bryan Shin
Grade: 9  Individual project
Solon High School, Solon
Rational design and testing of blood-brain-barrier shuttle peptide
ROSTER OF STUDENT EXHIBITORS (CONT.)

Jack Shindollar  
Grade: 7  Individual project  
St Mary Immaculate Conception, Wooster  
Testing Soil Erosion

Marissa Shook  
Grade: 12  Individual project  
Ansonia High School, Ansonia  
Reducing Bacterial Contaminants  
Found on Mobile Phones

Amaan Siddiqi  
Grade: 9  Individual project  
Lake Ridge Academy, N Ridgeville  
Designing a Rechargeable Pacemaker

Zia Siegel  
Grade: 6  Individual project  
Hilltop Elementary School, W Unity  
How the Presence of Worms Affect the Growth Rate of Lettuce Plants

Corinne Simpson  
Grade: 9  Individual project  
Archbishop Alter, Kettering  
The Chemistry of Flour and its Physical Effects on Sugar Cookies

Liam Skeans  
Grade: 8  Individual project  
St Charles Borromeo, Kettering  
Pinhole Camera

Heather Slaby  
Grade: 8  Individual project  
Liberty Union Middle School, Baltimore  
Effectiveness of Fidgets

Maddie Slosar  
Grade: 11  Individual project  
Bloom-Carroll High School, Carroll  
Investigating the Antibacterial Tendencies of Synthetic and Natural Antibiotics

Stephen Sly  
Grade: 12  Team project  
Jefferson Area Sr High School, Jefferson  
How Horn Angle Effects Note Clarity

Bradyn Smith  
Grade: 8  Individual project  
Bishop Flaget School, Chillicothe  
Does Color Have an Affect on Reaction Time?

Mya Smith  
Grade: 12  Team project  
Akron Early College High School, Akron  
Effects of European Earthworms on Tomato Plant Growth

Parker Smith  
Grade: 7  Team project  
Zane Trace Middle School, Chillicothe  
Fish Tank Filters

Quentin Smith  
Grade: 5  Individual project  
Chillicothe Intermediate School, Chillicothe  
What Makes Bones Stronger or More Flexible?

Carley Snider  
Grade: 8  Team project  
New Lexington Middle School, New Lexington  
Do Concussions Affect an Athlete’s Memory?

Eden Snow  
Grade: 6  Individual project  
Holy Angels, Sidney  
Which Kind of Softball Bat Hits a Softball the Farthest?

Ziynat Sodikova  
Grade: 8  Individual project  
St Mary, Lancaster  
Fungus Coexistence

Aviraj Soin  
Grade: 8  Team project  
Miami Valley School, Dayton  
Design a System to Create Light On Demand Using Self Sustaining Biological Organisms

Dhilen Soin  
Grade: 7  Team project  
Miami Valley School, Dayton  
Design a System to Create Light On Demand Using Self Sustaining Biological Organisms

Lucas Soin  
Grade: 9  Individual project  
Archbishop Alter, Kettering  
Insulation Design Challenge

Maeve Soltesz  
Grade: 6  Individual project  
St Raphael, Bay Village  
Electric Electrolytes

Anna Spohler  
Grade: 11  Team project  
Global Impact STEM Academy, Springfield  
Different Water Filtration Systems and How Effective They Are

Dana Stan  
Grade: 10  Individual project  
New Albany High School, New Albany  
Parasitic Elements: Forging New Connections

Stephen Stange  
Grade: 11  Individual project  
Bloom-Carroll High School, Carroll  
The Effectiveness of Different Metals on Inhibiting Bacterial Growth
Cameron Stanley
Grade: 5  Individual project
Valley Christian School, Youngstown
*What is the best way to ripen a banana faster?*

Graham Stecker
Grade: 7  Individual project
St Mary Central, Martins Ferry
*Model Rocket Aerodynamics: Stability*

Wyatt Stephens
Grade: 5  Individual project
St Mary Central, Martins Ferry
*Does salinity affect the rate of evaporation?*

Braydon Stine
Grade: 6  Individual project
St Mary Immaculate Conception, Wooster
*Equine Nutrition*

Reese Stiver
Grade: 7  Individual project
Zane Trace Middle School, Chillicothe
*Music Beats*

Vinny Stocco
Grade: 8  Individual project
St Paul School, Westerville
*Under What Conditions Will Superworms Eat The Most Plastic?*

Owen Stoddard
Grade: 6  Individual project
Cincinnati Classical Academy, Cincinnati
*How Does Water Depth Effect a Tsunami’s Velocity?*

Mason Strahler
Grade: 5  Individual project
St John, Marietta
*How does ethanol affect the runtime of a motor?*

Brodie Strawser
Grade: 12  Individual project
Miami Valley CTC, Englewood
*Effects of Different Length Naps on Cognitive and Athletic Performance*

Ella Strimpel
Grade: 5  Individual project
Trinity Lutheran, Toledo
*Ready, Set, Erode!*

Dean Strong
Grade: 6  Individual project
Chillicothe Intermediate School, Chillicothe
*Which Basketball Bounces the Highest?*

Mackenzie Susor
Grade: 6  Individual project
Jackson Memorial Middle School, Massillon
*The Effect of Sleep on Mathematics*

Natasha Sutter
Grade: 7  Individual project
Chardon Middle School, Chardon
*Cultivating with Compost*

Claire Sutton
Grade: 5  Team project
L. T. Ball Intermediate School, Tipp City
*Eruption Height of Coke and Mentos*

Hans Swain
Grade: 11  Individual project
The University School - College Prep, Chagrin Falls
*The Effect of Excess Dietary Iron on Intestinal Tumorigenesis*

Emily Swope
Grade: 12  Individual project
Bloom-Carroll High School, Carroll
*The Effect of Lactic Acid Bacteria on the Growth of Soybean Plants*

Daniel Szczepanski
Grade: 7  Individual project
St Columban, Loveland
*Insulation: Which One is Best*

Joshua Szolosi
Grade: 11  Individual project
Athens Middle School, Athens
*The Mobile Game Experience*

Afhan Taha
Grade: 11  Individual project
Mentor High School, Mentor
*Hyperthermic Chemotherapy Effects on CD8+ T Cell Populations in Ovarian Cancer Bearing Murine Models*

Zehra Nazli Tali
Grade: 7  Individual project
Mason Middle School, Mason
*Testing the Strength of Paper*

Arya Tangirala
Grade: 7  Team project
Olentangy Shanahan Middle School, Lewis Center
*The Effect of Magnetic Radiation on Milk*

Elizabeth Theobald
Grade: 11  Individual project
Archbold High School, Archbold
*Trihalomethane Occurrence and Formation within Water Distribution Systems Impacting Public Schools*

Chaz Thomas
Grade: 8  Individual project
New Lexington Middle School, New Lexington
*Can My Robotic Arm Lift 1 Pound?*
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ROSTER OF STUDENT EXHIBITORS (CONT.)

Paul Thomas  
Grade: 7  Individual project  
Our Lady Of Perpetual Help, Grove City  
*What are the Effects of Different pH Levels on the Structural Stability of Wood?*

Carter Thomes  
Grade: 5  Team project  
New Albany Intermediate School, New Albany  
*Which Color Do Dogs Like Best?*

Arissa Thompson  
Grade: 7  Individual project  
John C Dempsey Middle School, Delaware  
*Kaboom! What Was That Sound? A Meteor!*

Hannah Thompson  
Grade: 7  Individual project  
Mother Teresa Catholic, Liberty Twp  
*Flour Power*

William Thompson  
Grade: 7  Individual project  
Bishop Flaget School, Chillicothe  
*What Effect Does Temperature Have on Battery Lifespan?*

Darelle Thornton  
Grade: 11  Individual project  
Firestone Community Learning Center, Akron  
*Novel Radical Copolymerization of CO2: Addressing Polymerization Challenges and Climate*

Tess Thornton  
Grade: 7  Team project  
Kilbourne Middle School, Worthington  
*How is Algae Affected by Nitrate and Phosphate*

Victoria Thumm  
Grade: 5  Individual project  
John F. Kennedy Catholic Lower School, Warren  
*Testing Organic Lawn Fertilizers*

Emily Timmerman  
Grade: 9  Team project  
Ottawa Hills High School, Ottawa Hills  
*The Effect of Water Temperature on Algal Growth*

Neil Tivakaran  
Grade: 11  Individual project  
Carroll, Dayton  
*Effect of Organic Enzymes on Gluten Degradation using ELISA Testing*

Aria Tomb  
Grade: 5  Team project  
L. T. Ball Intermediate School, Tipp City  
*Eruption Height of Coke and Mentos*

Ian Truebenbach  
Grade: 6  Individual project  
Miami View Elementary, S Charleston  
*How much protein is available to pigs after digestion?*

Marley Turner  
Grade: 7  Individual project  
Bishop Leibold E And W Campus, Dayton  
*Sticky Science Situation*

Kelsey Ulery  
Grade: 5  Individual project  
Valley Christian School, Youngstown  
*What Is The Effect Of Different Colored Lights On Plant Growth*

Ela Van Oss  
Grade: 7  Team project  
Tippecanoe Middle School, Tipp City  
*Just Heat It: Determining How Color Affects the Production of Thermal Energy Through Absorption of Light*

Dylan Vance  
Grade: 10  Individual project  
Benjamin Logan High School, Bellefontaine  
*The Presence of Microplastics Within Indian Lake, Logan County*

Nivrithi Varghese  
Grade: 11  Individual project  
Sylvania Northview High School, Sylvania  
*Harnessing associative phase separation for the facile sensing of food freshness*

Sydney Vermilion  
Grade: 9  Individual project  
Upper Arlington High School, Upper Arlington  
*Effects of Micro-plastics on the Growth of Soybeans*

Autumn Vick  
Grade: 6  Team project  
Zane Trace Middle School, Chillicothe  
*Feces Fertilizer*

Wyatt Vick  
Grade: 11  Team project  
Zane Trace High School, Chillicothe  
*The Investigation of Effects of Various Preservatives on Color in Fresh Pork*

Madison Vineyard  
Grade: 8  Individual project  
Immaculate Heart Of Mary, Cuyahoga Falls  
*What Age Group Has The Dirtiest Hands?*
Dawson Vocke  
Grade: 5  Team project  
L. T. Ball Intermediate School, Tipp City  
*Evaluation of Heights with Hydroelectricity*

Giada Vqqalentine  
Grade: 8  Individual project  
St Paul School, Westerville  
*The Effect of a Growing Medium on Plant Root Growth*

Lily Wagner  
Grade: 7  Individual project  
St Aloysius School, Bowling Green  
*Stressed Out?*

Jacob Wakefield  
Grade: 12  Team project  
Northwestern High School, W Salem  
*Redesigning The Lyre and Flip-Folder*

Noah Wallace  
Grade: 5  Individual project  
Unioto Elementary, Chillicothe  
*Amazing Planes*

Paige Walter  
Grade: 12  Individual project  
Northwestern High School, W Salem  
*Effect of Algae-Based Bioreactor on Carbon Presence in the Atmosphere*

Nathan Wang  
Grade: 11  Individual project  
Seven Hills School, Cincinnati  
*Toxicity of per- and polyfluorinated alkyl substances (forever chemicals) in the annelid Lumbriculus*

Weining Wang  
Grade: 11  Individual project  
The University School - College Prep, Chagrin Falls  
*Investigating hydrogen production enzyme using gaming GPUs*

Mrunmayi Warade  
Grade: 11  Individual project  
Solon High School, Solon  
*A novel approach to modify Vancomycin to treat antibiotic resistance*

Elison Ward  
Grade: 7  Team project  
Bishop Flaget School, Chillicothe  
*Which Shampoo Protects Colored Hair the Best?*

Logan Ward  
Grade: 9  Individual project  
Global Impact STEM Academy, Springfield  
*How do different welds change the strength of the bond?*

Keita Watson  
Grade: 11  Individual project  
Upper Arlington High School, Upper Arlington  
*Oral bacterial control: antimicrobial properties of herbal and peptidic antioxidants*

Leah Wawzkiewicz  
Grade: 7  Individual project  
Holy Trinity, Avon  
*Northeast Ohio River Pollution Levels: Source vs. Mouth*

Hayden Weaver  
Grade: 5  Individual project  
East Richland Christian Schools, St Clairsville  
*Strength of different brands of trash bags*

Gracie Weber  
Grade: 5  Individual project  
Fairfield Christian Academy, Lancaster  
*Does Time Matter? Testing the 5 Second Rule*

Hunter Weber  
Grade: 11  Team project  
Jefferson Area Sr High School, Jefferson  
*How Horn Angle Effects Note Clarity*

Abby Webster  
Grade: 11  Individual project  
Global Impact STEM Academy, Springfield  
*Do People With Different Backgrounds Have The Same Understanding of Agricultural Laws?*

Kenley Weikart  
Grade: 5  Individual project  
McKinley Elementary School, Lisbon  
*Heat It: How Does Color Affect Heating by Absorption of Light?*

Frances Weinberg  
Grade: 9  Individual project  
Beaumont School, Cleveland Hts  
*Testing How Different Preparation Methods Affect Vitamin C Level in Bell Peppers*

Carolyne Weis  
Grade: 7  Individual project  
Buckeye Valley Local Middle School, Delaware  
*Which Battery is Best?*

Rex Werner  
Grade: 6  Individual project  
Terrace Park Elementary School, Terrace Park  
*Foods Electricity*

Delia Wetherell  
Grade: 7  Individual project  
Bishop John King Mussio Central Junior High School, Steubenville  
*What Melts Ice the Fastest?*
ROSTER OF STUDENT EXHIBITORS (CONT.)

Maggie Wheeler
Grade: 11  Individual project
Hilltop High School, W Unity
*The Strength of Threads and Stitch Types on Cotton Fabric*

Easton White
Grade: 5  Individual project
Unioto Elementary, Chillicothe
*The Relationship between Air and Water Quality*

Grace Whitmore
Grade: 11  Individual project
Global Impact STEM Academy, Springfield
*The Effect of Non-Native and Native Milkweed Species on Monarch Butterfly Chrysalis Development*

Robert Whittington
Grade: 9  Individual project
Zane Trace High School, Chillicothe
*Fungi Magi*

Clara Wiant
Grade: 9  Individual project
Northeastern Middle/High School, Springfield
*The Color of Baking*

Evelyn Wiget
Grade: 6  Team project
Zane Trace Middle School, Chillicothe
*Germy Dryers*

Braylon Wilcox
Grade: 5  Individual project
Charles Huber Elementary School, Huber Hts
*Football Weather Temperatures!*

Kendall Wild
Grade: 7  Individual project
Bloom-Carroll Middle School, Carroll
*Stain Away II*

Leo Wingert
Grade: 5  Team project
Independence Elementary School, Liberty Twp
*Gas: Silent but Deadly, The Creation of CO2*

Leah Wiseman
Grade: 6  Team project
Zane Trace Middle School, Chillicothe
*Power To The Mouth!*

Michelle Witschey
Grade: 8  Individual project
Sacred Heart of Jesus, Wadsworth
*How Does Temperature Affect the EV of Luminol*

Avalon Woconish
Grade: 10  Individual project
Beaumont School, Cleveland Hts
*Invasive Invasion: A Study on Lawn Fertilizer and Invasive Species in Horseshoe Lake Park*

Cyerra Wollett
Grade: 8  Team project
Alexander Jr. / Sr. High School, Albany
*Ankle foot orthosis*

Amelia Wong
Grade: 12  Individual project
Mentor High School, Mentor
*Examining the Effects of Social Factors and Treatment Options on the Wellbeing of those with SMA*

Aviva Wood
Grade: 9  Individual project
Athens High School, The Plains
*Using Natural Indicators to Create a Prototype of a Cost-Effective Smart Bandage*

Meghan Worpenberg
Grade: 8  Individual project
St Columban, Loveland
*Does the Amount of Time that You Cure Concrete Make it Stronger?*

Joseph Wright
Grade: 11  Team project
Dayton Regional STEM School, Kettering
*Charge Up with Your Downspout: Perfecting a Hybrid Hydroelectric System*

Joshua Wright
Grade: 7  Individual project
Bishop Leibold E And W Campus, Dayton
*Amazing Anti-Magnets*

Karis Wright
Grade: 11  Team project
Arcanum High School, Arcanum
*What detergent is to DYE for*

Teddy Wright
Grade: 7  Individual project
St Mary Immaculate Conception, Wooster
*Is a Corked Bat Better?*

Lucas Yang
Grade: 8  Individual project
Global Impact STEM Academy, Springfield
*Can Plants Purify Water*

Addison Young
Grade: 7  Individual project
Ashland Christian, Ashland
*Does eye color affect low light vision?*
Ryan Zand
Grade: 7  Individual project
New Albany Middle School, New Albany
Impacts of High Salinity on Plant Water Absorption

Catherine Zbinden
Grade: 9  Individual project
Wayne High School, Huber Hts
The impact of pH on the spherification of food

Gordon Zeitz
Grade: 11  Individual project
The University School - College Prep, Chagrin Falls
Improving the Efficiency of Small-Scale Hydroelectric Power by Modifying the Turbine Shape

Jiaxin Zhou
Grade: 12  Individual project
Howland High School, Warren
The Effect of Air Circulator on Indoor Air Quality

Sophie Zhuang
Grade: 11  Individual project
Dublin Jerome High School, Dublin
Identification of Biomarkers for Cartilage Damage in Osteoarthritis by RNA-seq & Proteomic Analysis

Charles Zierolf
Grade: 8  Individual project
St Columban, Loveland
Can A nerf dart stop an asteroid

Ishani Zimmerman
Grade: 12  Individual project
Mentor High School, Mentor
Improving the Electrical Output of Solar Cells using Peltier Coolers and Heat Sinks

Alex Zimnes
Grade: 7  Individual project
Our Lady Of Perpetual Help, Grove City
Battle of the Cups

Jo Zulia-Davis
Grade: 6  Individual project
The Plains Intermediate School, The Plains
Impact of Sound on Kids’ Attention

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About the Governor’s Awards

First established in 1985, under Gov. Celeste’s Administration, The Governor’s Thomas Edison Awards for Excellence in Student Research and STEM Education are presented to Ohio students, schools, and teachers who extend STEM education beyond traditional classroom activities. Award certificates are presented to each school and a press release recognizes each of the school’s STEM teachers for this high achievement.

School and Teacher Awards

The Governor’s Thomas Edison Excellence of STEM Education recognizes teachers and schools that focus on STEM education and provide additional opportunities for youth science beyond the classroom.

Criteria for School and Teacher Awards

1. Conduct a local science fair with 12 or more students and have two or more of these students participate at the 2023 District Science Day -OR- have 6 or more students participate at the 2023 District Science Day.

2. Students must participate in at least one more youth science opportunity beyond the classroom: State Science Day, Believe in Ohio, Regional Science and Engineering Fairs, Regeneron Science Talent Search, Regeneron International Science & Engineering Fair, MATHCOUNTS, JSHS, B-WISER Camp, Engineer-for-a-Day Program, TSA:TEAMS, OM, Physics Olympics, Science Olympiad, Invention League, or other structured, STEM-related youth activities at museums and nature centers, extensive field experiences, and mentorships at colleges and industries.

3. Documentation: The principal must write and personally sign a cover letter on school letterhead that lists the teacher or members of the teaching team most responsible for participation in the student activities. The cover letter from the principal, a two-page summary and DOCUMENTATION should not exceed 20 pages. Complete application packages must be uploaded in PDF format by July 20, 2023.

   ● Provide a maximum two-page summary description with attached documentation as to how and to what extent the school’s program(s) meet(s) the Academy’s definition of STEM education. The summary needs to present a compelling case for your application. See What is STEM Education?

   ● Include a table or matrix that identifies and affirms the specific roles or contributions of each teacher nominated.

   ● Due to the page limitation, it is not necessary to include copies of certificates earned by students. Instead, use this space to summarize what students have accomplished, show examples of how the school provides continuity between grades and schools, discuss the number of students your programs reach, how your programs meet the curriculum standards, etc. You are encouraged to provide links to news stories that reviewers could also view.

The entire application should not exceed 20 pages. Each submission must include (1) a cover letter, (2) two-page summary, (3) documentation. Complete application packages must be uploaded in a single PDF format by July 20, 2023.

For complete information on these awards visit:
https://www.ohiosci.org/scholarship-opportunities/department-of-development/
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