ANNUAL REPORT

SUBMITTED BY

MASSACHUSETTS ACADEMY OF MATH AND SCIENCE



JULY 2025

ANNE LUDES

DIRECTOR

CELEBRATING MORE THAN 30 YEARS OF EXCELLENCE

85 Prescott Street
Worcester, MA 01605-2610

(508) 831-5859
FAX: (508) 831-5880

July 3, 2025

It is my pleasure to present the 2025 Annual Report of the Massachusetts Academy of Math and Science. Our faculty and students have continued to cultivate innovation in teaching and learning through Math Modeling, Physics, STEM Research, Scientific and Technical Writing, Computer Science, Humanities, and Languages. Students have engaged in both individual and team-based science and engineering projects as well as rigorous project- and inquiry-based applications of learning in all subjects.

Mass Academy nurtures highly motivated, independent learners in grade 11 who participate successfully as full-time university students in grade 12. As we embark upon our 34th year as the Commonwealth's only secondary school of excellence, we are proud to be recognized by Niche.com for the eighth consecutive year as the top public high school in Massachusetts. We are also honored to be named by Niche.com yet again as having the best public high school teachers in Massachusetts.

Mass Academy students continue their commitment to addressing real-world challenges. Through the Apps for Good project, students effect meaningful change by developing web-based applications to solve critical problems in the local and global community. Our assistive technology project, done in collaboration with organizations including Seven Hills Foundation, Elder Services of Worcester Area, and Easter Seals, is a model of engineering combined with community partnership. In The Actuarial Foundation's Modeling the Future Challenge, student teams develop and present a mathematical model to predict how a technology or industry will change the future. Our commitment to project-based learning and real-world applications has continued to be a driving force of our program.

After two successful years of our "Junior Academy" last summer, the program will be expanding to include an additional cohort this year. In this summer program for underrepresented middle school students, participants engage in hands-on learning experiences, tour research labs, and meet STEM professionals. As we continue our efforts to strengthen the STEM pipeline in Massachusetts, we are confident the Junior Academy will make a powerful impact to engage students in STEM, helping them realize that STEM fields are accessible, rewarding, and open doors for their future.

The enclosed annual report highlights in detail how we are achieving these goals. Please contact me with any questions or to arrange a visit to observe our program in practice.

As we reflect on the last 33 years, I want to express my sincere gratitude for your continued commitment to this program. It is because of your support that we are able to offer high-quality programming for the students of the Commonwealth.

Sincerely,

Anne Ludes

Anne Ludes
Director

PROFILE

The Mass Academy of Math and Science is a school of excellence for one hundred academically accelerated 11th and 12th grade students in Massachusetts. We emphasize math and science within a comprehensive, collaborative, and interactive program. The rigor of junior year classes exceeds high school honors and AP and includes more than 1100 hours of instruction. Seniors complete a year of college, enrolling in classes full-time at Worcester Polytechnic Institute, a nationally ranked science and engineering school, thus making Mass Academy the only school in Massachusetts where all students attend a private university full-time as high school seniors.

HISTORY

The State Legislature of Massachusetts founded Mass Academy in 1992 as a school of excellence to serve academically advanced youth in grades eleven and twelve in math, science, and technology. To ensure a balanced curriculum, we offer an equally rigorous preparation in the humanities and world languages. The result is a junior-year program that is rich in project- and inquiry-based learning, technology, and collaboration, and a senior year program that is the same as the freshmen year at Worcester Polytechnic Institute. Overall, our small size—about one hundred students—and high expectations create a community that is serious yet flexible and demanding while remaining supportive.

CELEBRATING MORE THAN 30 YEARS OF EXCELLENCE

This year marked the 33rd anniversary of the founding of the Massachusetts Academy of Math and Science at WPI. We are honored to have the support of the students, families, community, and legislators of the Commonwealth of Massachusetts as we continue to promote high quality and innovative STEM education. We are equally grateful for the support and partnership with Worcester Polytechnic Institute, without whom Mass Academy may not exist. It is through this type of collaboration—which we promote throughout our programming—that we pave the way for students from all over Massachusetts to advance their learning further than they may have ever believed was possible.

ADMISSIONS

Each year the faculty selects approximately fifty students for the incoming junior class. New students are not admitted to the senior class. The applicant pool represents more than fifty schools, public and private, and fifty towns in Massachusetts. The acceptance rate is less than 30%. Candidates are typically high honors students in their home schools. Every year, students choose to leave their sending schools—where they are already excelling in their academics and beyond—to join Mass Academy and become a part of our school which boasts of a full year of coursework at WPI, a challenging yet collaborative academic program, and endless possibilities for project and research opportunities.

STATE, NATIONAL, AND INTERNATIONAL AWARDS, AND ATTENTION TO MISSION

- The senior Class of 2025 (of 49 students) produced **8** National Merit semi-finalists and **17** National Merit commended students, representing 51% of the graduating class.
- Mass Academy seniors attend classes full time at Worcester Polytechnic Institute. The average GPA at WPI for the Class of 2025 is **3.93**.
- Our students contributed over **6,050** hours of community service this year to schools, organizations, and individuals in need.
- **Three** seniors were selected to participate in the 2024 Massachusetts Junior Academy of Science (MJAS) Conference held in October at MIT.
- **One** Mass Academy senior was named a Scholar in the Regeneron Science Talent Search, selected from more than 2,500 applications.
- **One** student was selected as the winner of the 2024 Congressional App Challenge from Massachusetts' Second Congressional District by Congressman James McGovern. The student traveled to Washington, D.C. to present their project at a public showcase.
- A team of **five** students was awarded a Lemelson-MIT InvenTeams grant to continue their work developing an assistive device to translate text into Braille. This team was one of only eight selected from across the country.
- In the 2025 Massachusetts State Science and Engineering Fair (MSEF), Mass Academy students earned **two first place, one second place, two third place,** and **four honorable mention** awards, as well as **two special awards.**
- Mass Academy had **one** representative at the 2025 Regeneron International Science and Engineering Fair.
- **Ten** Mass Academy teams competed in The Actuarial Foundation's Modeling the Future Challenge. **All ten** Mass Academy teams were selected as semi-finalists, from 251 submissions.
- **Sixteen** Mass Academy teams competed in the High School Mathematical Contest in Modeling (HiMCM). A total of 1055 teams, representing 474 schools and 20 countries/regions competed. **One** Mass Academy team qualified for the 5-day International Math Modeling Challenge by scoring a designation of Meritorious on their paper.
- The **Mass Academy/WPI FIRST Robotics Team**, FRC 190, earned **first place** out of 190 teams in the New England region.

TEACHING AND LEARNING AT THE MASSACHUSETTS ACADEMY OF MATH AND SCIENCE

The mission of the Massachusetts Academy of Mathematics and Science is to address the changing needs of the technologically advanced community of the 21st century by pioneering a new vision of mathematics and science education embedded within the liberal arts. By creating a laboratory school focused on nurturing the potential of students with exceptional aptitude in mathematics and science, we have formed a community of learners committed to the following:

- Lifelong learning by providing tools, skills, and strategies for students to engage actively in their own education
- Evolving curricula which are project-based, interactive, and enhanced with technology
- Excellence and innovation in teaching practice, providing a model for schools in the Commonwealth of Massachusetts

The Commonwealth is truly fortunate to have this school of excellence that very clearly meets the needs of academically accelerated youth in Massachusetts. The Massachusetts Academy of Math and Science is the only school in the state whose students attend a university full-time as high school seniors.

The unique partnership between Mass Academy and Worcester Polytechnic Institute (WPI) makes available a wide variety of services and resources for Mass Academy students as they become actively engaged in their own education. The school's director is a strong champion of project-based learning and enthusiastically highlights the positive impact of Mass Academy's model on students interested in STEM fields. This mission is our way of life at Mass Academy. From the moment one walks through the door, it is evident that teaching and learning are inclusive, meaningful, authentic, innovative, and rigorous. Phrases such as "actively engaged in their own education," "interactive," "collaborative" and "inquiry-based" may be the goal at many schools but they are well-ingrained practices at Mass Academy.

Junior year at Mass Academy emphasizes inquiry-based and interdisciplinary learning that fosters both teamwork and independence. As seniors, these high school students utilize the skills and knowledge gained during their junior year to succeed at the college level at WPI. During both years, the students are challenged and supported by our caring, professional faculty.

The partnership between Mass Academy and Worcester Polytechnic Institute fosters a strong belief in students' abilities, promotes an appreciation for working collaboratively, and builds students' independence and self-advocacy skills to succeed academically at both the high school and university level. WPI is to be commended for its commitment to the success of Mass Academy. In addition, Mass Academy is proud of its work toward fulfilling the commitment to "excellence and innovation in teaching practice," and "providing a model for schools in the Commonwealth of Massachusetts." Continued funding by the legislature of the Commonwealth of Massachusetts makes this vision a reality. Anyone who has spent even a single day at Mass Academy understands the value of this investment.

NATIONAL MERIT AWARDS

High school juniors entered the 2025 National Merit Scholarship Program by taking the 2022 Preliminary SAT/National Merit Scholarship Qualifying Test (PSAT/NMSQT®), which served as an initial screen of program entrants. The nationwide pool of Semifinalists, representing less than one percent of U.S. high school seniors, includes the highest-scoring entrants in each state. The number of Semifinalists in a state is proportional to the state's percentage of the national total of graduating seniors.

The eight seniors from Mass Academy, **Cecilia Carbonell** (Dunstable), **Erica Dong** (Worcester), **Massimo Grisanti** (Mendon), **Rishab Nair** (Westborough)**, Armaan Priyadarshan** (Upton), **Abhinav Sharma** (Westford), **Daniel Shi** (Westborough), and **Samantha Wang** (Westborough), along with the other semifinalists, have an opportunity to continue in the competition for some 6,870 National Merit Scholarships worth more than $26 million.

Seventeen students from the Mass Academy of Math and Science at Worcester Polytechnic Institute (WPI) have been recognized as "National Merit Commended Students" in the 2025 National Merit Scholarship Program. A letter of commendation from the school and National Merit Scholarship Corporation (NMSC), which conducts the program, will be presented to these scholastically talented students.

The students are **Hartej Anand** (Framingham), **Samhitha Bodangi** (Shrewsbury), **Sophia Caramanica** (Westborough), **Derek Desrosiers** (Attleboro Falls), **Edward Goodwin** (Sturbridge), **Kruthi Gundu** (Shrewsbury), **Shivani Gupta** (Shrewsbury), **Anika Karre** (Shrewsbury), **Isha Nagireddy** (Shrewsbury), **Lindsey Paradise** (Dudley), **Rishi Patel** (Shrewsbury), **Gustavo Rodriguez** (Holden), **Rohan Sarikonda** (Shrewsbury), **Timothy Schowalter** (Holden), **Maya Sushkin** (Worcester), **Palak Yadav** (Medway), and **Ethan Zhou** (Harvard).

MASS ACADEMY SENIORS INVITED TO MJAS CONFERENCE

Three seniors from the Massachusetts Academy of Math and Science at Worcester Polytechnic Institute (Mass Academy) have been invited to register for the Massachusetts Junior Academy of Science (MJAS) fall symposium scheduled to take place on Saturday, October 21 on the MIT campus. Students were selected based on their outstanding performance at the 2023 Massachusetts Science and Engineering Fair or International Science and Engineering Fair.

The Mass Academy students recognized by MJAS and their research project titles are: Samhitha Bodangi: *Analyzing HLA Sequences to Predict Organ Rejection and Find Optimal Targets for Immunosuppression*; Sophia Caramanica: *Orthotic hand brace to improve range of motion in patients with cerebral palsy*; and Kayla Vallecillo: *Minimizing Fuel-Oxidizer Mixture Inhomogeneities in Rotating Detonation Engines.* The students conducted their research projects during the 2023-2024 school year as part of their STEM class taught by Dr. Kevin Crowthers at Mass Academy.

“We are very proud of our students for their achievements at the state and international fairs, as well as for this recognition by MJAS. The students’ professionalism throughout the research process has been exemplary. Our students represent the future of the STEM workforce and have demonstrated they have the curiosity, ingenuity, and skill to make a real impact,” said Anne Ludes, Director of Mass Academy. “For many of our students, this is their first experience with an independent research project. We are very fortunate to have amazing educators like Dr. Crowthers to help our students navigate the research process.”

The American Junior Academy of Science (AJAS) is a national honor society that recognizes high school students from across the country for their scientific research. The Massachusetts Junior Academy of Science selects delegates to participate in the AJAS national convention which will be held in February.

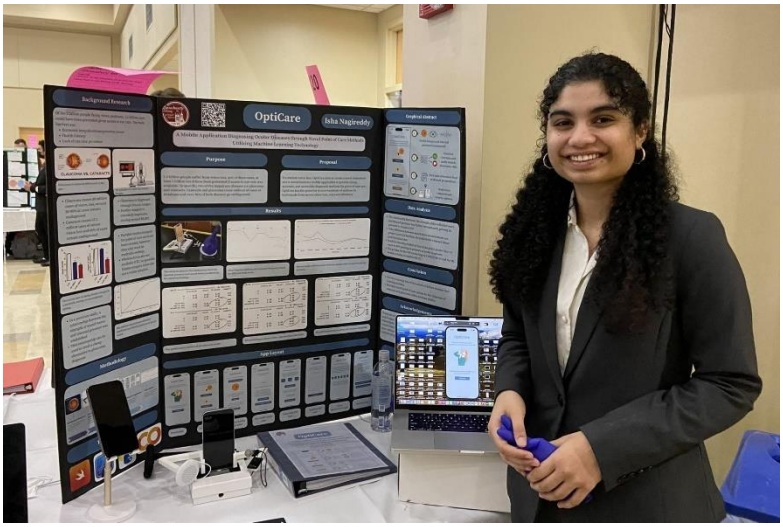

Samhitha Bodangi


Sophia Caramanica


Kayla Vallecillo

MASS ACADEMY SENIOR RECOGNIZED IN REGENERON SCIENCE TALENT SEARCH

Only 300 students worldwide honored by this prestigious program.



Isha Nagireddy, a senior at Massachusetts Academy of Math and Science at Worcester Polytechnic Institute (WPI), has been recognized by Society for Science as scholars in the Regeneron Science Talent Search 2025. Only 300 students were selected for this honor from nearly 2,500 applications from 795 high schools across 48 states, American Samoa, Guam, Washington, D.C., Puerto Rico, and 14 other countries. The scholars were chosen based on their outstanding research, leadership skills, community involvement, commitment to academics, creativity in asking scientific questions and exceptional promise as STEM leaders demonstrated through the submission of their original, independent research projects, essays, and recommendations.

Isha is from Shrewsbury, and her research is titled "*OptiCare: A Mobile Application Diagnosing Ocular Diseases Through Novel Point of Care Methods Utilizing Machine Learning Technology.*" She completed this project as part of her coursework in the STEM with Scientific and Technical Writing class at Mass Academy.

"Isha's commitment to using her talents to better people's lives is impressive," says Anne Ludes, Mass Academy Director. "We are so fortunate to have our amazing faculty and staff at Mass Academy and WPI who continually support students in their pursuit of academic excellence. Thank you to Dr. Kevin Crowthers, our STEM teacher, for providing authentic research opportunities for all our students."

The Regeneron Science Talent Search recognizes and empowers our nation's most promising young scientists who are generating innovative solutions to solve significant global challenges through rigorous research and discoveries. The competition provides students with a national stage to present new ideas and challenge conventional ways of thinking.

Now in its 103rd year, Society for Science has played a significant role in educating the public about scientific discoveries as well as in identifying future leaders in STEM. Regeneron has sponsored the Science Talent Search since 2017 as part of its deep commitment to supporting young scientists and future scientific innovation.

In addition to this year's honoree, over the past decade Mass Academy has had students selected as scholars in 2013, 2015, 2016, 2019, 2023, and 2024.

MASS ACADEMY STUDENTS RECEIVE LEMELSON-MIT GRANT

The Mass Academy team is one of only 8 teams in the country to earn this recognition.



A team of Mass Academy seniors has been selected as a recipient of a 2024 -2025 Lemelson-MIT Grant. In addition to grant funding, the team will also receive year-long support to build a technological invention to solve their identified problem. The students, Samhitha Bodangi, Derek Desrosiers, Abigail Figueroa, Kruthi Gundu, and Charuvi Singh, are the founders of Team DOT (Diversifying Optical Technology) and have been working on this project since spring of 2024. This grant will allow them to expand their team and continue to work on their design.

During junior year at Mass Academy, students work in groups to design and build assistive technology devices for the local community. For Team DOT, inspiration for an assistive technology project struck at Walkfit, a walking initiative created by visually impaired person (VIP), Liz Myska. Walkfit pairs sighted individuals with individuals with visual impairment to allow both to experience the world through new perspectives, bridging the divide between the sighted and the visually impaired. At the team's first WalkFit, they were blindfolded and experienced a few of the difficulties individuals with visual impairment encounter on an everyday basis.

VIPs face significant barriers when it comes to accessing written information in everyday surroundings. Therefore, learning braille helps increase accessibility, opening doors to education and employment opportunities for adolescents with visual impairment. Through research and conversations with individuals with visual impairment in our community, the students identified the limited availability of interactive and affordable educational tools for teaching braille, leading to a large gap in braille literacy rates. This challenge inspired them to create a solution that empowers VIPs to learn and engage with written information in a more accessible way while providing the opportunity for younger VIPs to learn and practice reading braille. By addressing this issue, the students hope to make a meaningful impact on braille literacy and the visually impaired community. Currently, Team DOT is continuing to work with organizations like Walkfit, the Massachusetts Association for the Blind and Visually Impaired, the Perkins Institute for the Blind, and the Massachusetts Commission for the Blind to improve their refreshable braille display prototype. During the creation of the device, they strive to work directly with VIPs to ensure that the device is tailored to their needs. As Team DOT looks ahead to EurekaFest, they're excited to showcase the progress they've made and continue learning from mentors and fellow inventors.



For the members of Team DOT, being an InvenTeam offers the chance to make an impact in the local community. "We feel privileged to be part of the InvenTeam initiative, which provides us with the support and resources to help the visually impaired community. Our InvenTeam—made up of 17 juniors and seniors—reflects this spirit, bringing together a diverse group of passionate individuals who are

united by a shared vision of innovation and service. We're proud to have the support of our school, local community, and the broader Lemelson-MIT network as we embark on this exciting journey."

To learn more about Lemelson-MIT, click here.

Please follow Team DOT's Instagram @mamsinventeam and visit their website, https://bit.ly/mamsinventeam, for more information and to stay updated with the team!

MASS ACADEMY STUDENTS PARTICIPATE IN HIGH SCHOOL MATHEMATICAL CONTEST IN MODELING

Mass Academy had 16 teams (13 junior teams and 3 senior teams) compete in the HiMCM in November 2024. The teams worked diligently to prepare their papers on one of the two choices for modeling problems: “To Play or not to Play: Modeling Future Olympic Games” or “Examining the Environmental Impact of High-Powered Computing”. It was a memorable experience for our students and we are so proud of their dedication to completing this challenge. There were a total of 1055 teams, representing 474 schools and 20 countries/regions.

We had one team qualify for the 5-day International Math Modeling Challenge by scoring a designation of Meritorious on their HiMCM paper:

Team 15600: Raihan Ahmed, Vatsal Patel, Ashwin Sivagaminathan, Jotham Sserwadda

Check out the COMAP (HiMCM) competition site:

https://www.contest.comap.com/highschool/contests/himcm/index.html

MATHEMATICS AT MASS ACADEMY

It has been a busy year for the Math Team! I have listed some highlights from each of the competitions.

The Math Team captains are seniors Erica Dong, Rishi Patel, and Jared Rosen. They have organized practices for the team of 40+ students almost every Wednesday during A, B, and C terms. The practices have focused on developing math competition skills as well as teamwork and collaboration.

The Team: Each student listed competed in one or more of the competitions listed below.

The Seniors: Hartej Anand, Samhitha Bodangi, Sophia Caramanica, Adnan Dembele, Erica Dong, Hari Charan Raj Koornala, Vasudevan Lakshmanan, Rishab Nair, Sasha Nandyala, Rishi Patel, Armaan Priyadarshan, Keira Reid, Gustavo Rodriguez, Heidy Rodriguez, Jared Rosen, Rohan Sarikonda, Abhinav Sharma, Daniel Shi, Abhikhya Sonti, Maya Sushkin

The Juniors: Anshu Adiga, Raihan Ahmed, Varsha Alladi, Lilian Amer, Rishi Avadhuta, Jasmin Bella, Adel Benchemam, Ila Chakravarthy, Anh Dao, Vyshnavi Donthabhaktuni, Jessica Froment, Thomas Giolas, Hasini Gujjari, Daniel Harn, Sophie He, Ayaan Hegde, Andrew Kalashnikov, Lauren Kim, Hannah Lambert, Saketh Madhusudhan, Charlotte Martin, Lydia Metcalf, Maria Mischechkina, Niranjan Nair, Vatsal Patel, Luciana Piarulli, Sharvi Pujari, Sohini Saini, Ishana Saroha, Ashwin Sivagaminathan, Anika Sivasankar, Sriaditya Vaddadi, Caroline Walczak, Jackson Whitley, Adam Yanco

We had 8 students place in the top 25 for WOCOMAL participants: Rishab Nair, Sriaditya Vaddadi, Andrew Kalashnikov, Erica Dong, Adam Yanco, Raihan Ahmed, Sophie He, Jared Rosen

Rishab Nair received a scholarship award for his performance. The Matt Smith Scholarship of $100 was awarded to him for being the top-scoring senior in Varsity.

Thank you to everyone for participating and giving their best effort!

The Competitions

New England Math League: All juniors competed in this contest. The contest has six rounds of six one-point questions.

The top scorers for Mass Academy were Andrew Kalashnikov, Sriaditya Vaddadi, Adam Yanco, and Raihan Ahmed.

Check out the New England Math Competition site:

https://www.mathleague.com

Massachusetts Association of Math Leagues (MAML): Approximately 700 Massachusetts students competed in the MAML Olympiad Level 1 contest on October 17, 2024 (10 Mass Academy students).

The top scorers for Mass Academy were Andrew Kalashnikov, Niranjan Nair, Sriaditya Vaddadi, and Adam Yanco.

Based on their high scores, these 4 students competed in Level 2 of the contest on February 25, 2025.

Check out the MAML Competition site:

https://maml.org

High School Mathematical Contest in Modeling (HiMCM): Mass Academy had 16 teams (13 junior teams and 3 senior teams) compete in the HiMCM in November 2024. The teams worked diligently to prepare their papers on one of the two choices for modeling problems: "To Play or not to Play: Modeling Future Olympic Games" or "Examining the Environmental Impact of High-Powered Computing". It was a memorable experience for our students and we are so proud of their dedication to completing this challenge. There were a total of 1055 teams, representing 474 schools and 20 countries/regions.

We had one team qualify for the 5-day International Math Modeling Challenge by scoring a designation of Meritorious on their HiMCM paper:

Team 15600: Raihan Ahmed, Vatsal Patel, Ashwin Sivagaminathan, Jotham Sserwadda

Check out the COMAP (HiMCM) competition site:

https://www.contest.comap.com/highschool/contests/himcm/index.html

Worcester County Math League (WOCOMAL): Mass Academy had over 50 students compete in WOCOMAL this season. The four meets took place at Shrewsbury High School. Each student competed in 3 individual rounds and the team round. The results are recorded on the WOCOMAL site.

Mass Academy placed 2nd overall and 1st in small school! We had 3 of the 10 top scorers in WOCOMAL: Rishab Nair, Sriaditya Vaddadi, and Andrew Kalashnikov.

Check out the WOCOMAL competition site:

https://wocomal.org/contact/index.php

Massachusetts Association of Math Leagues State Meet: Based on our team's performance in WOCOMAL, Mass Academy received an invite to participate in the MAML State Meet. This took place on March 27th. We had one team of 5 students compete at this meet: Rishab Nair, Jared Rosen, Sriaditya Vaddadi, Andrew Kalashnikov, and Adam Yanco . Each student competed in 3 individual rounds and the team round. We placed 2nd in the Small Schools Division!

Check out the MAML competition site:

https://maml.org/

New England Association of Math Leagues Regional Meet: Based on our team's performance at the MAML State Meet, Mass Academy received an invite to participate in the NEAML Regional Meet. This took place on May 2nd. We had one team of 5 students compete at this Meet: Jared Rosen, Rishab Nair, Sriaditya Vaddadi, Raihan Ahmed, and Ishana Saroha. Each student competed in 3 individual rounds and the team round. We placed 3rd in the Small Schools Division.

Check out the NEAML competition site:

https://neaml.net/

American Math Contest (AMC12): Mass Academy had 24 students participate in the AMC 12B contest in November. We had 3 students qualify to participate in the American Invitational Math Exam, the AIME. This 15-question, 3-hour AIME took place on February 6th.

AIME Qualifiers: Raihan Ahmed, Andrew Kalashnikov, and Sriaditya Vaddadi

Check out the AMC12 competition site:

https://www.maa.org/math-competitions/amc-1012

Purple Comet: All Mass Academy juniors participated in the Purple Comet Math Competition on April 23rd. The contest is a 30-question, 90-minute team competition for high school students in teams of up to six.

Check out the Purple Comet competition site:

https://purplecomet.org/

MathWorks Modeling Challenge: Mass Academy had two teams compete in the 14-hour MathWorks Modeling Challenge during the March break. Each team consisted of 4 - 5 students who worked together to develop a solution to the problem "A Tale of Two Crises: The Housing Shortage and Homelessness". Only about 25% of the 643 teams that submitted papers were selected to advance to the second round of judging. Unfortunately, neither of teams were chosen to advance. However, we are very proud of them for their hard work and dedication in their submission of a viable solution paper.

Team 18001: Vishal Balagani, Vikhaash Kanagavel Chithra, Hari Charan Raj Koornala, Rohan Sarikonda,
Team 18002: Cecilia Carbonell, Sasha Nandyala, Keira Reid, Heidy Rodriguez, , Jared Rosen

Check out the MathWorks Challenge site:
https://m3challenge.siam.org/

Purple Comet: All Mass Academy juniors participated in the Purple Comet Math Competition on April 9th. The contest is a 30-question, 90-minute team competition for high school students in teams of up to six.

Check out the Purple Comet competition site:
https://purplecomet.org/

MASS ACADEMY JUNIORS PARTICIPATE IN MODELING THE FUTURE CHALLENGE

The Modeling the Future Challenge (MTFC), a program of The Actuarial Foundation, is a unique, project-based competition that encourages students to harness the power of data analytics and mathematical modeling to tackle real-world problems. Participants use cross-curricular skills and engage in collaborative efforts to make predictions about pressing topics like climate change, healthcare, technology and recommend solutions to affected stakeholders.

All Mass Academy juniors competed in this Challenge, working in teams of five. In December, each team submitted a project proposal to MTFC on a topic of their choosing, in which they implemented the five steps in the Actuarial Process. The Challenge was extremely competitive with a total of 251 teams entering from 37 different states. Only the teams that demonstrated exceptional potential for an actuarial research project were invited to the Project Phase of the Challenge. All 10 Mass Academy teams were declared Semi-Finalists and moved onto the Project Phase!

Team Name – Team Members	Project Title
Team Skib – Jasmin Bella, Lauren Kim, Sharvi Pujari, Varsha Alladi, Sophie He	*Busting the Bias Behind Bars*
Pi-rates – Anika Sivasankar, Ishana Saroha, Avani Jain, Hasini Gujjari, Vyshnavi	*Fatal Scrolling: The Hidden Toll of Social Media on Mental Health*
Feel the Burn(s) – Jianna Bixho, Caroline Walczak, Lydia Metcalf, Ila Chakravarthy, Thomas Giolas	*Grape Expectations: The Real Cost of Spotted Lanternflies and Grape Production*
Team Sigma – Adel Benchemam, Sohini Saini, Anthea Sun, Jessica Froment, Grace Qiu	*From AFK to MVP: Crunching the Numbers to Respawn E-sports*
Data Diddlers – Noah Proctor, Jackson Whitley, Ashwin Sivagaminathan, Ayaan Hegde, David Baker	*The Breaking Point*
You GOMPEI for This! – Vatsal Patel, Jotham, Sriaditya Vaddadi, Anshu Adiga, Medhansh Choudhury	*Marketing the Market and Profiting from Prophecies: Using a Mathematical Model to Reduce the Risk of Stocks*
What the FUNCTION – Charlotte Martin, Anh Dao, Aarushi Khatri, Maria Mishechkina, Hannah Lambert	*Effects of Social Media on Behavior, Attention Span, and Academic Performance*
The Guys – Adam Yanco, Niranjan Nair, Mary O'Brien, Andrew Brown, Aansh Patel	*Concrete Ways to Reduce Carbon Emissions in Future Construction*
Less Than Three – Lilian Amer, Luciana Piarulli, Ravena Arun, Evan Cheng, Rishit Avadhuta	*You About Soil Erosion!*
Ctrl + Alt + Predict – Andrew Kalashnikov, Raihan Ahmed, Daniel Harn, Harshil Hari, Saketh Madhusudhan	*Coastal Lobstah Population Loss*

During the Project Phase, teams were mentored by professionals in the Actuarial Science field. At the end of this phase, they submitted a 25-page project report.

Check out this competition here: https://www.mtfchallenge.org/

About Modeling the Future

The Actuarial Foundation is a 501(c)(3) organization committed to changing lives through math education. Established in 1994, the mission of the Foundation is to enhance math education and financial literacy through the talents and resources of actuaries. The Foundation's vision is an educated public in pursuit of a secure financial future.

The Modeling the Future Challenge, a program of The Actuarial Foundation, is a real-world competition for high school students combining math-modeling, data-analysis, and risk-management into one exciting competition! To compete, students conduct their own research project modeling real-world data to analyze risks and make recommendations to companies, industry groups, governments, or organizations.

More information about the Modeling the Future Challenge can be found here:
https://www.mtfchallenge.org/

MASS ACADEMY OF MATH AND SCIENCE CYBERPATRIOT TEAMS

CyberPatriot is the National Youth Cyber Education Program created by the Air Force Association to inspire K-12 students toward careers in cybersecurity or other STEM disciplines. At the center of CyberPatriot is the National Youth Cyber Defense Competition. The competition puts teams of high school and middle school students in the position of newly hired IT professionals tasked with managing the network of a small company. In the rounds of competition, teams are given a set of virtual images that represent operating systems and are tasked with finding cybersecurity vulnerabilities within the images and hardening the system while maintaining critical services in a four-hour period. Students need to utilize their knowledge of networking, switches, routers, firewalls, TCP/IP protocols and architecture, and administration of various operating systems. They have to determine whether there are unauthorized users getting into the network, whether their passwords are strong enough or whether the firewall has holes in it. For every problem they identify and fix, points are awarded; however, points are deducted if there is a disruption to required services.



This season, Mass Academy had 27 students compete in CyberPatriot XVII. In all, over 5,000 teams registered to compete. All teams excelled in the competition rounds, demonstrating teamwork, critical thinking skills, and technical knowledge key to a successful career in cybersecurity. We were very impressed with the determination and persistence that all students showed uncovering and fixing vulnerabilities. All teams did a great job working together and putting in their best efforts.

Please join me in congratulating **Team Blue** #17-1819, **Rishit Avadhuta**, **Medhansh Choudhury**, **Harshil Hari**, **Niranjan Nair**, and **Jotham Sserwadda**, who received the **1st Place State Award – Platinum Tier**!

To see the results of all teams, click here.

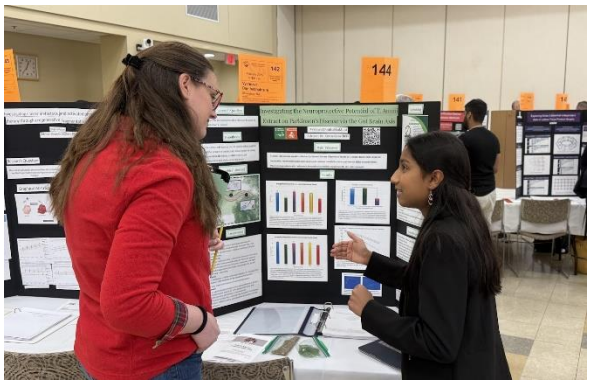
To see the results of all State Awards, click here.

MASS ACADEMY STEM FAIR

Each year, Mass Academy holds an annual STEM Fair. This is a day to celebrate the hard work, perseverance and commitment of our remarkable students as they showcase their independent research projects.



The annual STEM Fair is a very important event for our students and the entire Mass Academy community. This is not just an exhibition of a school project; it is at the core of our academic program. In fact, the Mass Academy mission highlights our goal of providing students with rigorous, relevant STEM learning experiences and authentic research. This event is an opportunity to celebrate our students' achievements and appreciate the curiosity, hard work, and perseverance of the members of the Class of 2026.



Special recognition goes to our students. They committed themselves to their research for more than eight months, cultivating their ideas and questions into their end results. Our students overcame many challenges along the way and strengthened their skills, knowledge, and confidence. They can—and should--be proud of their accomplishments. Words cannot express how proud we are of them.

We are incredibly grateful to our STEM teacher, Dr. Kevin Crowthers, as well as our faculty, seniors, alumni, and members of the WPI faculty and greater community who served as advisors and mentors and provided feedback. Their guidance and support lifted students when they needed it, challenged them to go further than they believed possible, and gave them confidence to pursue their passions. There is no limit to what our students can do, and the role these individuals played in these projects helped students to see that.

We also wish to thank the families of our students. Their encouragement and patience showed a belief in the students' abilities, enabling them to grow as researchers and problem solvers. The families were there to celebrate student successes on good days and offer words of reassurance when needed.

Lastly, thank you to our judges for being so generous with their time and for providing our students with valuable feedback. This project means so much to our students, and we are grateful to our judges for affirming these efforts of our young scientists, engineers, and mathematicians.

Student	City/Town	Project Title
Avani Jain	North Attleboro	*Pathophysiological Disruption of the Endothelial Glycocalyx by Microplastic Contamination*
Jasmin Bella	Holden	*Determining the Effects of Probiotics on Obsessive-Compulsive Disorder*
Niranjan Nair	West Boylston	*Using Contrastive Activation Addition to Combat Societal Biases in Language Models*
Lilian Amer	Holden	*Investigating the Role of Canonical Wnt Signalling in Dental Regeneration as Aided by FGF-2 (With Some Applications to Cancer Treatment)*
Anika Sivasankar	Grafton	*Using CNNs and Machine Learning to Diagnose Skin Cancer Moles*
Ashwin Sivagaminathan	Shrewsbury	*Parameter-efficient fine-tuning of Large Language Models in Math Education*
Ayaan Hegde	North Grafton	*Air Pollution Running Mask*
Adel Benchemam	Worcester	*Utilizing Automatic Speech Recognition to Create a Desktop Assistant*
Ravena Arun	Shrewsbury	*Using Math Modeling to Identify and Correct Gerrymandering*
David Baker	Grafton	*Using a 1-D CNN to Predict Epileptic Seizures using ECG Data*
Jianna Bixho	Holden	*Nanoparticle-Based Disruption of Biofilms: A Novel Strategy to Counteract Antibiotic Resistance*
Jotham Sserwadda	Framingham	*Smart Diverter for Rainwater Harvesting System*
Harshil Hari	Hopkinton	*Using AI image recognition to find flaws in syringes during the manufacturing process*
Caroline Walczak	Hudson	*An Emergency Braking System for Ski Patrol Toboggans*
Anthea Sun	Northborough	*Using Neoblast Proliferation in Bioprinted Scaffolds as a Model for Metastasis*
Ila Chakravarthy	Boylston	*Methylene Blue as a Way to Bypass the Compromised Complex I in Mitochondrial Disease*
Adam Yanco	Princeton	*Exploring Order-3 Maximal Independent Sets in Lattice-Torus Product Graphs*

Grace Qiu	Westborough	*The impact different frequencies play on the behavioral response of ASD-induced Drosophila melanogaster*
Rishit Avadhuta	Shrewsbury	*Implementation of the Graphlet Screening Method in Genomic Analysis Using Hail*
Sriaditya Vaddadi	Westborough	*A Machine Learning Approach to Optimizing the Tensile Strength of Starch-Based Bioplastics*
Anshu Adiga	Shrewsbury	*Targeting Tau Protein Neurofibrillary Tangles Using Ginger-Derived Nanovesicles in C. Elegans*
Luciana Piarulli	Dudley	*Music and its Effects on One's Ability to Operate a Motor Vehicle*
Hasini Gujjari	Shrewsbury	*Evaluating the Effects of Curcumin-Coated Gold Nanoparticles on Survival and Motor Functions in a Parkinson's C.elegans Model*
Ishana Saroha	Shrewsbury	*The synergistic effect of combining natural compounds 1,8-cineole (Eucalyptol) and Naringenin with 11 antibiotics of different drug classes*
Mary O'Brien	Auburn	*Investigating the Effects of Amyloid Plaques on Oxidative Stress throughout the Life Cycle of Caenorhabditis elegans*
Noah Proctor	Oxford	*Reducing Freshwater Waste on Farms Through Automatic Irrigation*
Lydia Metcalf	Charlton	*Computationally Modeling the Ability of Cyclodextrins to Bind Short-Chain PFAS*
Aarushi Khatri	Acton	*Development of a Smart Touch System for Surgical Robots Using Hybrid Soft Robotics for Force Sensing and Enhanced Feedback*
Anh Dao	Westford	*Utilizing Saccharomyces cerevisiae to develop a system of mutualistic wastewater treatment with both chemical and biological treatments*
Evan Cheng	Worcester	*Point, Nap, and Match: The impact of Nap Conditions on Tennis Performance*
Charlotte Martin	Worcester	*Stair Climbing Wheelchair that Maximizes Speed and Minimizes Stress*
Hannah Lambert	Shrewsbury	*A Meta-analysis of Endometriosis Biomarkers using GWAS*
Sohini Saini	Worcester	*Effects of Blue Light on Circadian Rhythms in Drosophila Melanogaster*
Lauren Kim	Lexington	*Predicting Vitiligo Antigens Utilizing Machine Learning*

Aansh Patel	Grafton	*Optimizing Subway System Headway Efficiency with Wait Times and Resource Management using Simulations*
Saketh Madhusudhan	Shrewsbury	*Investigating the role of hsf-1, skn-1, and daf-16 in regulating oxidative stress response in C. elegans*
Vatsal Patel	Westborough	*The Synergy of Probiotics and Prebiotics: A Novel Approach on Depression*
Andrew Kalashnikov	Needham	*Developing non-Machine Learning algorithms for determining when to buy and sell on the stock market*
Sophia Caramanica	Shrewsbury	*Orthotic hand brace to improve range of motion and reduce pain in low-functioning children with cerebral palsy.*
Harshil Hari	Hopkinton	*Using AI image recognition to find flaws in syringes during the manufacturing process*
Thomas Giolas	Boylston	*The Progression of Sensorimotor Regions and Default Mode Network Deactivation With Musical Background.*
Sophie He	Southborough	*A Novel Approach to the Capture of CO2 Directly from the Air Using Metal-Organic Frameworks*
Varsha Alladi	Acton	*Unraveling the Role of GABAergic Dysfunction in Catatonia: A GABAergic Investigation in Drosophila*
Maria Mishechkina	Boylston	*Solar Powered Water Purification Device Utilizing Membrane Distillation Methods*
Andrew Brown	Mendon	*Using Pattern Recognition and Low Density EMGs for Refined Digit Control in Transradial Myoelectric Prosthetic*





WORCESTER REGIONAL SCIENCE AND ENGINEERING FAIR

Twelve Mass Academy students advanced from the STEM Fair to compete in the 70th Worcester Regional Science and Engineering Fair (Region II) on March 7th. Congratulations to the following students who will compete in the Massachusetts Science and Engineering Fair (MSEF) on April 4th at Gillette Stadium.

3rd Place Award Winners

Ishana Saroha
The Synergistic Effect of Combining Natural Compounds 1,8-cineole (Eucalyptol) and Naringenin with 11 Antibiotics of Different Drug Classes

Sophia Caramanica
Orthotic Hand Brace to Improve Range of Motion and Reduce Pain in Low-Functioning Children with Cerebral Palsy
United States Air Force Certificate of Achievement

Honorable Mention Awards

Vyshnavi Donthabhaktuni
Investigating the Neuroprotective Potential of T.Ammi extract on Parkinson's Disease via Gut-Brain Axis Modulation

Grace Qiu
The Impact Music Genres Play on the Behavioral Responses of Drosophila melanogaster
Nancy A. Degon Student Research Grant Recipient

Noah Proctor
Automatic Irrigation Using Soil and Weather Data
NOAA Pulse of the Planet Award

Ravena Arun
Using Math Modeling to Identify and Correct Gerrymandering

Avani Jain
Pathophysiological Disruption of the Endothelial Glycocalyx by Microplastic Contamination

Niranjan Nair
Using Contrastive Activation Addition to Combat Societal Biases in Language Models
The Yale Science & Engineering Association Most Outstanding Exhibit in Science, Technology, Engineering, and Mathematics

Maria Mishechkina
Solar Powered Water Purification Device Utilizing Membrane Distillation Methods

Jianna Bixho
Nanoparticle-Based Disruption of Biofilms: A Novel Strategy to Counteract Antibiotic Resistance

Click here to view the complete list of 2025 WRSEF Region II High School Fair Winners.

MASSACHUSETTS SCIENCE AND ENGINEERING FAIR



Twelve Mass Academy students competed in the Massachusetts Science and Engineering Fair (MSEF) held at Gillette Stadium in Foxborough, MA on Friday, April 4. Congratulations to the following students who received placement in MSEF this year.

FIRST PLACE

Vyshnavi Donthabhaktuni*: *Investigating the Neuroprotective Potential of T.Ammi extract on Parkinson's Disease via Gut-Brain Axis Modulation*
American Society of Microbiology, Northeast Branch Microbiology Award; *Massachusetts ISEF delegate

Avani Jain: *Pathophysiological Disruption of the Endothelial Glycocalyx by Microplastic Contamination*

SECOND PLACE

Niranjan Nair: *Using Contrastive Activation Addition to Combat Societal Biases in Language Models*

THIRD PLACE

Varsha Alladi: *Unraveling the Role of GABAergic Dysfunction in Catatonia: A GABAergic Investigation in Drosophila*

Sophia Caramanica: *Orthotic Hand Brace to Improve Range of Motion and Reduce Pain in Low-Functioning Children with Cerebral Palsy*
Wolf Greenfield Patent Award

HONORABLE MENTION

Noah Proctor: *Automatic Irrigation Using Soil and Weather Data*

Saketh Madhusudhan: *Investigating the role of hsf-1, skn-1, and daf-16 in regulating oxidative stress response in C. elegans*

Maria Mishechkina: *Solar Powered Water Purification Device Utilizing Membrane Distillation Methods*

Grace Qiu: *The Impact Music Genres Play on the Behavioral Responses of Drosophila melanogaster*

Each year thousands of students in Massachusetts experience the professional practices of working scientists and engineers through the development of independent research projects. MSEF supports the students and their teachers with a portfolio of tools (webinars, handbooks, volunteers, etc.) that facilitate and enhance their research. Through the process, students hone their critical thinking skills, learn through both successes and failure, and help solve local and global challenges. The Fair is the showcase, celebrating both the journey and the project completion.

Advancing science and engineering literacy since 1949, the Massachusetts Science & Engineering Fair (MSEF) was founded by the American Academy of Arts & Sciences, MIT professors, and a group of pioneering K-12 science educators.

Click here to view the complete MSEF High School 2025 Awards List.

2025 APPS FOR GOOD FAIR

WHAT IS APPS FOR GOOD

"Our goal is to transform the way technology is taught in schools; to empower students from all backgrounds to seize the opportunities of our digital age and create solutions to the problems they care about, using technology."

~ *Rodrigo Baggio, CDI Apps for Good, Founding Chairman & Founder CDI Global*

WHAT WE DO

Students work together as teams to find real issues they care about and learn to build a mobile, web, or social app to solve them. Like professional entrepreneurs, students go through all key aspects of new product development, from idea generation, technical feasibility, and programming to product design, deciding on business models, and marketing. Students become real-life entrepreneurs.

WHAT OUR STUDENTS LEARN

The curriculum teaches coding and the fundamentals of the digital world, while also developing skills in problem solving, creativity, communication, and teamwork. With a focus on solving real issues that matter to young people, our students learn the full software product development process in a hands-on way.

WHY APPS FOR GOOD EXISTS

We want to build a new global generation of problem solvers and creators: students who can create, launch, and market new products that change the world. We believe that technology can be a great equalizer and a massive force for good to transform lives and communities around the world.

Our annual Apps Fair took place on Thursday, May 15th. Student teams displayed their posters and presented their projects during a public showcase.







Here is a list of the applications developed by the project teams this year:

College Cooks *David Baker, Luciana Piarulli, Ashwin Sivagaminathan* College Cooks is a recipe-sharing app for students, featuring simple recipes with a five- ingredient limit. Users can easily upload, search, and view meals making cooking approachable for those with minimal experience.
CostGo *Andrew Kalashnikov, Sharvi Pujari, Grace Qiu, Sriaditya Vaddadi* CostGo helps users decide if a Costco membership is worth purchasing using a personalized, input-based mathematical model. By entering details like family size and store distance, users receive a score and recommendation tailored to their situation.
DiaBite *Varsha Alladi, Lilian Amer, Adel Benchemam, Ishana Saroha* DiaBite is a mobile app that helps people with diabetes plan meals using ingredients they already have, offering recipes and nutritional insights for a healthier lifestyle. It also supports caregivers by simplifying meal prep and ensuring dietary needs are met, making it useful for anyone aiming to eat healthier.
Dishcovery *Ayaan Hegde, Niranjan Nair, Anika Sivasankar* Dishcovery is a personalized recipe app that considers allergies, dietary needs, and user preferences to help people explore global cuisines and discover new meals. Its mission is to inspire cooks with fresh ideas when they are unsure what to make.
Drowsy Drivers *Medhansh Choudhury, Daniel Harn, Caroline Walczak* Drivers may struggle to stay awake and need ways to stay alert. This app connects drivers via hands-free voice calls using a matchmaking system integrated with Android's calling features, so they can talk and help keep each other awake.
Dyscalculating *Evan Cheng, Vyshnavi Donthabhaktuni, Jessica Froment* Our app helps middle and early high school students with dyscalculia solve one-variable linear equations by breaking problems into color-coded, step-by-step tasks with interactive checklists. This guided approach builds understanding and confidence in math.
Eureka! *Hasini Gujjari, Charlotte Martin, Aansh Patel* Physics can be challenging due to its complexity. Eureka! is designed to help high school students grasp key physics concepts through detailed explanations, interactive simulations, and quizzes at the end of each lesson to reinforce learning.
Help Me Help You *Thomas Giolas, Saketh Madhusudhan, Adam Yanco* Community service is rewarding; however, many volunteers struggle to find the right organization, and organizations often have trouble recruiting help. This app solves both problems by letting volunteers filter opportunities based on their preferences and allowing organizations to share information and attract interest making it easier for everyone to give back.

KALBRA – Gamified SAT
Ravena Arun, Andrew Brown, Lauren Kim
Our application transforms CollegeBoard SAT math questions into a turn-based combat game where players take on the role of a monkey battling a gorilla. Players can choose to attack, heal, or surrender each action triggered by correctly answering SAT questions.

Lush
Jasmin Bella, Avani Jain, Jackson Whitley
Lush is an app for outdoor enthusiasts committed to protecting the environment. Designed with National Park visitors in mind, it gamifies trash collection through reporting, cleanup tracking, and leaderboard incentives, encouraging users to leave nature better than they found it.

MAMSGPT
Anh Dao, Hannah Lambert, Noah Proctor
MAMSGPT is a chatbot designed to help prospective students, families, and curious individuals easily access information about MAMS. By answering school-related questions directly, it saves users from having to navigate the website's extensive resources, making information quick and accessible.

Maps for Good
Raihan Ahmed, Ila Chakravarthy, Anthea Sun
Our mission is to build a platform that empowers people with disabilities to confidently navigate their environments. Exploring new places can be challenging, especially when accessibility is uncertain. We help users find nearby amenities like benches, accessible restrooms, and parking, while encouraging them to share experiences with the community.

Not Later
Rishit Avadhuta, Harshil Hari, Maria Mishechkina
Not Later is an app designed to help elementary and middle school students build responsibility by completing tasks like homework and chores. With separate student and parent views, students can create tasks that, once approved and completed, earn stars. These stars can be redeemed for parent-managed rewards, encouraging motivation and reducing procrastination.

RePlate
Anshu Adiga, Sophie He, Aarushi Khatri
RePlate is a food redistribution app that aims to address food insecurity and commercial food waste in the U.S. It connects food suppliers with pantries and banks by allowing surplus food to be listed, viewed, and claimed in real time, streamlining the redistribution process.

SchMAMS
Jianna Bixho, Lydia Metcalf, Jotham Sserwadda
SchMAMS is an app that streamlines communication during the creation of schedules for students and staff at Mass Academy. It serves as a central hub for faculty to submit their requests and requirements, allowing both the director and faculty to view all scheduling needs in one place while planning.

Variny Project Planner
Mary O'Brien, Vatsal Patel, Sohini Saini
Long-term projects require strong time management, and the Variny Project Planner is here to help. This personalized calendar app automates scheduling to help users consistently make progress and stay on track with their goals.

ENGINEERING HELPING PEOPLE

We believe client-driven, project-based learning provides meaning and impact for our Mass Academy students and the greater community. Our juniors complete a STEM II/Assistive Technologies engineering project each spring. Students spend one and a half terms working in teams to develop and build a working prototype of their product for their client. In May, each team presents their product during a public showcase. Many of our teams continue to improve their products during the summer and beyond so they can deliver the best possible working model to their clients.



The theme for the past several years has been Assistive Technologies. Students design and build assistive devices to help clients with disabilities in their communities achieve their goals. Mass Academy has developed highly successful partnerships with Seven Hills Foundation, Easter Seals, and Elder Services of Worcester Area. It is through these important partnerships that our students can provide this assistance to so many clients.

Examples of this year's projects include: **FrostyFit**: A portable cooling device for prosthetics, **SureStep**: An assistive device to navigate stairs with a medical walker, and **Circuit Brush**: An assistive toothbrush.

Team Members	Project Title
Adel Benchemam, Ila Chakravarthy, Andrew Kalashnikov, Aansh Patel, Grace Qiu	Circuit Brush: An assistive toothbrush
Lydia Metcalf, Mary O'Brien, Luciana Piarulli, David Baker	An assistive device to detect obstacles
Anh Dao, Adam Yanco, Daniel Harn, Evan Cheng	An affordable Braille printer using UV-based ink
Caroline Walczak, Jianna Bixho, Anthea Sun, Thomas Giolas	Raising Cane: An assistive walking device
Niranjan Nair, Raiham Ahmed, Andrew Brown, Sriaditya Vaddadi	FrostyFit: A portable cooling device for prosthetics
Ayaan Hegde, Noah Proctor, Ashwin Sivagaminathan, Jotham Sswerwadda	A switch-activated garden watering system
Vyshnavi Donthabhaktuni, Avani Jain, Sophie He, Jasmin Bella	An assistive eating device for individuals with tremors
Ishana Saroha, Sharvi Pujari, Lauren Kim, Aarushi Khatri	SAIL Home Management System: An assistive device that utilizes geofencing for individuals with Primary Progressive Aphasia
Jessica Froment, Hannah Lambert, Charlotte Martin, Sohini Saini	Reinventing cosmetics for individuals with visual impairments
Jackson Whitley, Harshil Hari, Varsha Alladi, Hasini Gujjari, Anshu Adiga	Sensory Overload Detector
Rishit Avadhuta, Saketh Madhusudhan, Medhansh Choudhury, Vatsal Patel	Auris Glasses: An assistive device to provide directional cues
Ravena Arun, Lilian Amer, Maria Mishechkina, Anika Sivasankar	SureStep: An assistive device to navigate stairs with a medical walker

FOREIGN LANGUAGE FILM FESTIVAL

Each May, the Mass Academy juniors present original films they scripted, acted in, directed, recorded, edited, and produced as part of their Spanish and French language classes under the supervision of their teacher Mrs. Julia Wildfong. These films are showcased at the Annual Foreign Language Film Festival. During this months-long project, students communicate only in their target language—Spanish or French—for the entirety of their collaboration, from story development through final editing. This is another example of the way Mass Academy teachers and students embed technology throughout the curriculum and, in this case, use the expressive means of film production.

DAY OF DIVERSITY CELEBRATION

In January, Mass Academy held its annual Day of Diversity. As part of this celebratory event, students wrote and illustrated six-word stories explaining their views on race, ethnicity, and identity; enjoyed a potluck lunch; shared an aspect of their family's history; and delivered cultural performances and demonstrations. This Mass Academy tradition offers an inclusive means of celebrating individual backgrounds, building community, and experiencing diverse cultures. This event would not have been possible without the hard work and dedication of our Humanities teacher, Mrs. Kristen Small. Thank you to Mrs. Small and all juniors for their roles in this wonderful celebration.



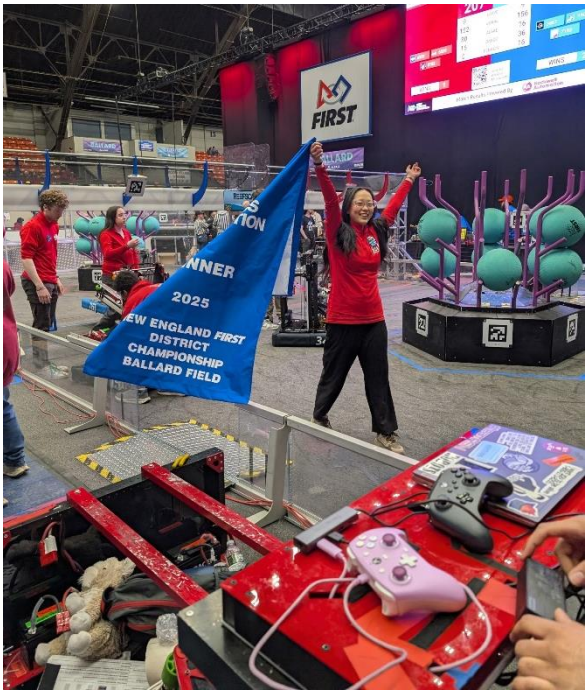




FIRST ROBOTICS / TEAM 190

Mass Academy is home to TEAM 190, World Champions of *FIRST* Robotics in 2007. The mission of FIRST Robotics is to inspire young people to be science and technology leaders by engaging them in exciting mentor-based programs that build science, engineering, and technology skills; that inspire innovation; and that foster well-rounded life capabilities including self-confidence, communication, and leadership. The “Varsity Sport for the Mind," FIRST Robotics combines the excitement of sport with the rigors of science and technology. Under strict rules, limited resources, and strict time limits, our team builds and programs a robot to perform prescribed tasks against a field of competitors.

This year’s team earned the top ranking out of 190 teams in the New England region and went on to compete at the FIRST 2025 Championship in Houston, Texas.





MASS ACADEMY HONORS INSPIRATIONAL EDUCATORS

In December, juniors at the Massachusetts Academy of Math and Science at WPI expressed their appreciation to teachers who have made a difference in their lives through the annual Mass Academy Teacher Appreciation Day. Each student created a personal video message for their chosen educator and sent the message—along with a letter, small gift, and video message from Director Anne Ludes—to express their gratitude for the educator's contribution to the student's educational and personal journey. Teachers from schools across Massachusetts and beyond were honored for their contributions to their students' success.

The juniors, the honored teachers, and their representative schools are listed below.

Kathryn Roberts	Shrewsbury High School	nominated by	Anshu Adiga
Bavi Emani	Westborough High School	nominated by	Raihan Ahmed
Brian Dempsey	Acton Boxborough Regional High School	nominated by	Varsha Alladi
Jennifer Spencer	Brookline High School	nominated by	Lilian Amer
Justin Winn	Shrewsbury High School	nominated by	Ravena Arun
Kimberly Plourde	Shrewsbury High School	nominated by	Rishit Avadhuta
Alicia Rossley	Grafton High School	nominated by	David Baker
Jennifer Connelly	Tahanto Regional High School	nominated by	Jasmin Bella
Caroline Rossi	South High Community School	nominated by	Adel Benchemam
Diane Rocha	Notre Dame Academy	nominated by	Jianna Bixho
Caterina Manser	Miscoe Hill Middle School	nominated by	Andrew Brown
Matthew Hager	Tahanto Regional Middle/High School	nominated by	Ila Chakravarthy
Mike Perron	Doherty Memorial High School	nominated by	Evan Cheng
Bennett Ahearn	North Andover High School	nominated by	Medhansh Choudhury
Joseph Poynton	Westford Academy	nominated by	Anh Dao
Curtis Bellemer	Shrewsbury High School	nominated by	Vyshnavi Donthabhaktuni
Anna Rivero	Russian School of Mathematics	nominated by	Jessica Froment
Francene Gleason	Tahanto Regional Middle/High School	nominated by	Thomas Giolas
Andrew Frassa	Shrewsbury High School	nominated by	Hasini Gujjari
Iliya Koptsiovsky	Pi Math School - Northborough	nominated by	Harshil Hari
Mrs. Olsen	Canton Luce Elementary School	nominated by	Daniel Harn
Sanaa Okacha	P. Brent Trottier Middle School	nominated by	Sophie He
Charles Abdella	Saint Johns High School	nominated by	Ayaan Hegde
Gloria Rice	North Attleboro High School	nominated by	Avani Jain
Scott Blanchette	Needham High School	nominated by	Andrew Kalashnikov
Brian Dempsey	Acton Boxborough Regional High School	nominated by	Aarushi Khatri
Sarah Legge	Lexington High School	nominated by	Lauren Kim
Anthony Uglialoro	Oak Middle School	nominated by	Hannah Lambert
John Brocki	Shrewsbury High School	nominated by	Saketh Madhusudhan
William Letendre	Flagg Street School	nominated by	Charlotte Martin
Melinda Stewart	Tutor	nominated by	Lydia Metcalf
Francene Gleason	Tahanto Regional High School	nominated by	Maria Mishechkina
Suzanne Crowley	Sanborn Elementary School	nominated by	Niranjan Nair
Vincent Benacchio	Auburn Public High School	nominated by	Mary O'Brien
Abigail girard	Grafton high school	nominated by	Aansh Patel
Anna Makovoz	Advanced Math and Science Academy	nominated by	Vatsal Patel

Sherri Hoffman	Dudley Middle School	nominated by	Luciana Piarulli
Cassandra Ladd	Oxford High School	nominated by	Noah Proctor
Eric Wisneski	Stanley Elementary School	nominated by	Sharvi Pujari
David Baillie	Worcester Academy	nominated by	Grace Qiu
Vincent Simmarano	Doherty Memorial High School	nominated by	Sohini Saini
Patricia Busso	Shrewsbury High School	nominated by	Ishana Saroha
Peter Rawstron	Music and Arts (Westborough)	nominated by	Ashwin Sivagaminathan
Jo-Ann Buckley	Grafton Middle School	nominated by	Anika Sivasankar
Samuel Squillace	Retired	nominated by	Jotham Sserwadda
Daniel Strickland	Algonquin Regional High School	nominated by	Anthea Sun
Chris Gildea	Mill Pond School (Westborough)	nominated by	Sriaditya Vaddadi
Raquel Gelber	AMSA	nominated by	Caroline Walczak
Katelyn Russell	Bromfield School	nominated by	Jackson Whitley
Joshua Pikovsky	Worcester East Middle School	nominated by	Adam Yanco

COMMUNITY SERVICE

Each Mass Academy student is required to contribute a minimum of 50 hours of community service per year. This service represents an opportunity for the students of Mass Academy to acknowledge the support of the citizens of the Commonwealth by giving back through service to others. Community service projects meet a range of needs and include teaching STEM lessons at local schools, offering free activities at STEM Saturdays, teaching English to immigrant adults, working for Habitat for Humanity, supporting environmental cleanup efforts, assisting with the Special Olympics, mentoring local refugees, working in hospitals, and assisting in food pantries and homeless shelters. This year, Mass Academy students exceeded **6,000** hours of service to the community.







MASS ACADEMY EXPANDS ITS "JUNIOR ACADEMY" SUMMER PROGRAM

STEM education in the broader sense – beyond our brick walls – is incredibly important to us. We can only teach 50 juniors and 50 seniors per year, but we can extend our reach through engagement with students and educators, both locally and throughout the Commonwealth.

We believe participation in STEM opportunities must begin at an early age if we are to ensure access to advanced STEM programs like Mass Academy. To help strengthen the STEM pipeline, we are committed to supporting and directly providing rigorous, high-quality learning opportunities for students in elementary and middle school so that more students, particularly those from underserved populations, will feel prepared and confident to explore programs and careers in STEM fields.

During the school year, much of our work is done through educational outreach and community partnerships, including near-peer tutoring at local schools, visits to schools to deliver hands-on STEM lessons, mentoring and STEM enrichment at community-based organizations, and STEM Saturdays for school-aged children and their families at local libraries.



We are also proud to announce that we are expanding the Junior Academy program launched in 2023 for middle school students. The first two cohorts will be returning, and a new group of rising 7th graders will be starting their Junior Academy experience. The students participate in a two-week program that focuses on math intervention, literacy, and hands-on STEM programming. Participants tour research labs and meet real scientists. We are confident the Junior Academy will make a powerful impact to engage students in STEM, helping them realize that science, technology, engineering, and mathematics are not only accessible to them, but they are fun and rewarding and open doors for their future.





PROFESSIONAL DEVELOPMENT ACTIVITIES JULY 2024-JUNE 2025

Mass Academy has provided well over **800** hours of professional development this year in many areas including STEM education, technology, physics, mathematics, school leadership, and service learning. An important part of the mission of Mass Academy is to promote excellence in teaching through advancing and providing high quality professional development to K-12 educators. Below is a partial list of professional development provided by Mass Academy:

- One-week professional development course for middle school science teachers: Inquiry Based Science with an Emphasis on Science Fair
- Support for student teachers in science and STEM fields through classroom observations
- Training for middle school educators on student engagement strategies
- Member of Advisory Council for national STEAM education consortium
- Development and submission of model exemplary lessons focused on transdisciplinary learning
- Co-facilitation of STEAM education professional learning community
- Consultation for instructional technologies innovators
- Consultation for university development of a STEM teacher preparation program (Chemistry)
- Modeling coding, robotics, engineering, and STEM activities to students and teachers in local elementary and middle schools, providing access to lessons and resources
- Innovation Fellow for the Innovation Collaborative, providing consultation and support to the national organization on the implementation of professional development programming focused on transdisciplinary and culturally relevant curriculum and instruction
- Member of the board of directors (clerk) for Massachusetts Science and Engineering Fair, Inc.
- Host to Massachusetts high school to learn about computer science education and project-based learning
- Co-facilitator for a full-day teacher workshop on getting science fair ready
- STEM Career Fair guest speakers
- Physics Education Research Group
- Host to Massachusetts educators for school visits and classroom observations
- Participant in STEM Education Showcase at Worcester Polytechnic Institute, providing demonstrations and resources for educators
- Members of two NEASC visiting teams for school accreditation
- Teacher resource room for educators to use our collaboration space, access our resources including instructional materials and STEM kits, and receive support for curriculum development
- Training on eliminating bias in hiring practices
- Training on time management, prioritization, and stress management
- Team dynamics workshop
- Career coaching, including how to successfully navigate a job search, resume writing, and interview skills

Massachusetts Academy of Mathematics and Science
Teachers and Administrators 1992-2024

Teacher/Admin.	*Position*	*Hometown*	*Term*
Abrams, Joshua	Mathematics	Roslindale	6/94-6/99
Barnes, Andrew	STEM-Engineering-Visiting	Shrewsbury	8/18-6/19
Barney, Michael	Director/Co-Director	Lunenburg	8/11-12/21
Barys, James	Mathematics	Oakham	1/00-6/13
Bonneau, Jacklyn	Science	N. Grosvenordale (CT)	6/95-7/19
Borowski, Maria	Technical Writing-Visiting	Millbury	8/13-6/16
Brunner, Adam	Engineering-Visiting	Providence, RI	8/17-6/18
Burke, Dana	Computer Science-Visiting	Upton	8/10-6/11
Burns, Kristen	Mathematics	Auburn	7/22-present
Chase, Maureen	Physics	Hadley	7/22-present
Cochran, Erin	STEM-Engineering	Ludlow	8/19-12/19
Connell, Richard	Physics/Engineering-Visiting	Shrewsbury	8/14-6/16
Contonio, Brooke	Science-Visiting	Paxton	8/03-6/04
Collins, Peter	Math-Visiting	Auburn	8/07-6/08
Cote, George	Mathematics-Visiting	Millbury	8/93-6/94
Crowthers, Kevin	Technical Writing-STEM	N. Smithfield, RI	8/19-present
Curran, Shiobhan	Technical Writing-STEM	Worcester	8/16-6/19
Daukas, Stephen	Computer Science-Visiting	Shrewsbury	8/02-6/03
Degon, Nancy	Science-Visiting	Auburn	6/92-6/93
Dodge, Misty	Science-Visiting	Leicester	8/01-6/05
Durkin, John	Assistant Director	Worcester	8/93-6/98
Ellis, William	Science	Worcester	8/03-6/22
Ennis, Kathleen	Humanities	Newton Highlands	8/93-6/99
Ferrell, Theloise	Humanities	Ashburnham	7/99-6/05
Gagne, Kenneth	Technical Writing	Worcester	8/01-6/05
Hamos, James	Director	Shrewsbury	7/97-6/99
Harris, Liz	School Wellness Counselor	Sutton	8/24-present
Harrison, Gray	Science-Visiting	Jefferson	8/00-6/01
Harvel, Kyle	Science-Visiting	Nashua, N.H.	8/12-6-13
Higgins, Patricia	Humanities-Visiting	Acton	8/00-6/01
Hillman, Kay	World Language-Visiting	Fitchburg	8/02-6/03
Horton, Jerry	Science-Visiting	Worcester	8/03-6/05
Johnson, Rachel	Mathematics/STEM	Framingham	8/16-6/17
Johnson, Robert	Mathematics-Visiting	Haverhill	8/93-6/94
Kallagher, David	Mathematics-Visiting	Westminster	5/92-6/93
Kelley, Zederick	Computer Science-Visiting	Needham	8/01-6/02
Kelly, Timothy	Guidance	Holden	6/95-4/03
Knittle, Robert	Mathematics-Visiting	Worcester	1/00-6/01
Lamarche, Pauline	Principal	Worcester	5/92-11/03
Lang, Karen	Computer Science	Worcester	8/03-6/14
LeBlanc, Phillip	Science-Visiting	Thompson (CT)	8/02-6/03
Lippold, Heidi	Chemistry-Visiting	Shrewsbury	8/01-6/03
Ludes, Anne	Director	Framingham	7/21-present
Ludt, David	Humanities	Shrewsbury	7/05-7/20
Luzader, William	Science	Brockton	9/93-6/98
Melehov, Victor	Science-Visiting	Jefferson	5/92-6/93
Medeiros, Nicholas	STEM-Visiting	Northbridge	10/22-3/23
Menard, Jean-francois	World Language	Westford	7/95-6/07
Padmanabhan, Anita	Math-Visiting	Ayer	6/09-6/10
Post, Lisa	College Counselor	Holden	08/04-present
Reardon, Audrey	Operations Manager	Worcester	7/05-7/21
Reizes, Sonia	World Language (PT)	Lexington	6/93-5/95
Regele, Thomas	Math	Worcester	8/11-6/22
Salvatelli, Robert	Director/Assoc Dir	Leominster	8/99-12/12
Schneider, Raymond	College Counselor	Leicester	8/04-12/11

Small, Kristen	Humanities	Sutton	8/17-present
Smith, Erin	STEM-visiting	Lunenburg	8/13-6/14
Stachelek, Amanda	Math-Visiting	Sunderland	8/05-6/07
Stafford, Kenneth	Robotics	Auburn	7/99-6/20
Steneson, Margaret	Science	Norton	8/93-5/95
Sumner, Judith	Science Technical Writing	Worcester	8/07-6/15
Sun, Ivy	World Languages (PT)	Sutton	8/95-6/96
Taricco, Angela	Computer Science	Shrewsbury	8/14-present
Theriault, Julie	Operations Manager	Worcester	8/21-present
Tokaya, Gregory	Math-Visiting	Southborough	8/10-6/11
Traver, Robert	Principal	Harvard	8/03-6/11
Turner, Warren	Physics-Visiting	Springfield	8/01-6/02
Vargas, Stanley	Science	Worcester	7/99-6/01
Vetter, Leah	Director	Lexington	10/92-1/97
Weaver, Shari	Science	Millbury	8/12-6/15
Wiberg, Derek	Science-Visiting	Arlington	8/01-6/02
Whitmore, Andrew	Physics-Visiting	Holden	8/05-6/07
Wood, Paul	Physics-Visiting	Holden	8/07-6/08
Julia Wildfong	World Language	Clinton	6/06-present
Wittels, Norman	Computer Science-Visiting	Brookline	8/00-06/01

COLLEGE MATRICULATION
CLASS OF 2026

Hartej Anand	WPI
Megan Ashun	MIT
Vishal Balagani	University of Maryland
Samhitha Bodangi	Case Western University
Sophia Caramanica	WPI
Cecilia Carbonell	Wellesley College
Adnan Dembele	WPI
Anthony DeRosa	Coast Guard Academy
Derek Desrosiers	University of Toronto
Erica Dong	Stanford University
Nicholas Eck	WPI
Abigail Figueroa	Case Western University
Nicholas Giza	WPI
Edward Goodwin	Dartmouth College
Massimo Grisanti	University of Notre Dame
Kruthi Gundu	MIT
Shivani Gupta	Ohio State University
Vikhaash Kanagavel Chithra	University of Illinois Urbana-Champaign
Anika Karre	University of California Los Angeles
Justin Keyo	University of California Berkeley
Yerin Kim	University of California Los Angeles
Hari Charan Raj Koornala	University of Massachusetts Amherst
Vasudevan Lakshmanan	Georgia Institute of Technology
Isha Nagireddy	Cornell University
Rishab Nair	University of California San Diego
Sasha Nandyala	Northeastern University
Claire Newcom	Smith College
Lindsey Paradise	Cornell University
Rishi Patel	New York University
Shaurya Patni	Cornell University
Shaina Premraj	University of Massachusetts Amherst
Armaan Priyadarshan	Dartmouth College
Keira Reid	University of Massachusetts Amherst
Gustavo Rodriguez	University of Michigan
Heidy Rodriguez	University of Massachusetts Lowell
Jared Rosen	University of California San Diego
Rohan Sarikonda	University of North Carolina Chapel Hill
Timothy Schowalter	University of Massachusetts Amherst
Abhinav Sharma	Georgia Institute of Technology
Daniel Shi	Emory University
Charuvi Singh	University of Massachusetts Amherst
Matthew Smith	Clemson University
Abhikhya Sonti	University of Connecticut

Maya Sushkin	WPI
Kayla Vallecillo	University of Illinois Urbana-Champaign
Samantha Wang	Olin College
Dylan Whiting	Washington University in St. Louis
Palak Yadav	Barnard College
Ethan Zhou	University of California Berkeley

SCHOOL FUNDING -7061-9624

Mass Academy is funded out of the Department of Elementary and Secondary Education budget and is the only publicly funded high school in Massachusetts not funded through Chapter 70. In 2013 and 2015, the Mass Academy budget was subjected to a Governor's 9C budget cut. In FY13, the cut was restored through a STEM grant. In FY15, the 9C reduction of $21,000 was not restored, resulting in staffing cuts. The same happened in FY18 (a 1% cut of $14,000). In FY19, a $200,000 increase was requested, of which $100,000 was granted. In FY21, the Governor's budget was reduced by 1%, resulting in a $15,000 cut, bringing our budget to $1,485,000. FY22 was back to $1,500,000 and, thankfully, was not reduced during the year. Our hope is that the trajectory of the funding of Mass Academy keeps up with the funding of the public high schools in the Commonwealth.

Historically, Mass Academy's budget has not kept up with inflation. This makes it challenging to maintain high quality instructional staff when costs are increasing and yet funding remains level. It most certainly creates additional barriers when Mass Academy works diligently to maintain its mission of remaining at the forefront of teaching and learning in the fields of science, mathematics, engineering, and computer science.

None of the accomplishments contained in this report would be possible if it wasn't for the Massachusetts Legislature's commitment to this program. We cannot thank you enough. With the Mass Academy budget subject to legislative vote every year, we depend on our elected officials to make it all happen. During FY22, we were faced with major budget challenges that, if not resolved, would have ultimately resulted in staff cuts. In a program of this size, that is devastating. Legislative approval of a budget increase for FY23– bringing our total budget to $2M– made all the difference, both for sustaining our existing program and for expanding our outreach to students and educators so Mass Academy can provide substantive academic enrichment to strengthen the STEM pipeline. For FY24 and FY25, Mass Academy received level funding of $2M. We are grateful to—and counting on—the Massachusetts Legislature to keep us moving forward by approving appropriate levels of funding for FY26 and beyond so we can continue to maintain our existing program and support as many students–and their teachers– as possible. The future of our program is in your hands.

Thank you for your support.

