

LEMELSON-MIT InvenTeams®

Lemelson-MIT InvenTeams

A Catalyst for STEM Learning

The importance of preparing students with STEM skills continues to increase as the workplace becomes more technical and problems become more complex. Today's educators understand this and are often searching for ways to enhance their teaching in these subjects and help a diverse group of students become more deeply invested in their learning to share their passion and excitement for STEM, and understand the importance of STEM's application in the real world.

The Lemelson Foundation, a champion for Invention Education, understood Invention Education's potential to act as a catalyst for STEM learning. The organization believed that STEM educators would greatly benefit from integrating Invention Education into their offerings, particularly given its focus on engaging students in real-world application of science, technology, engineering, math, computer science and other critical 21st Century skills through the process of inventing something meaningful to the students and the larger community.



Corine Peifer, 2014 Wallenpaupack Area High School InvenTeam in Hawley, Penn. Peifer and her team member, Kristian Sonstebj, represented their InvenTeam at the 2015 White House Science Fair, where they presented and showcased their invention to President Obama.

L-MIT InvenTeams At-A-Glance

- In-School Program
- Founded in 2004
- 15 Teams Annually
- 2,900 Student Participants to Date

In 2004, the Lemelson Foundation and MIT came together to create Lemelson-MIT InvenTeams®, a national grant-based initiative that focuses on inspiring high school students through the process of invention. Since then, more than 2,900 students from a diversity of socio-economic backgrounds across the U.S have participated in the program, many of whom have gone on to pursue degrees in STEM fields.

The Lemelson-MIT InvenTeams® Experience: Inspiring Students Through Invention

Each year, up to 15 teams, are selected to participate in the Lemelson- MIT InvenTeams® program receiving a grant for up to \$10,000. These teams are made up of students, teachers and mentors who come together to pursue a year-long invention project. Each project begins with students identifying a real-world problem to solve. These are community-based problems, such as a local environmental or a public health challenge, or problems that are more personal, like one faced by a classmate, or a loved one. Once teams determine the problem they want to solve, they apply a wide range of skills and knowledge, including creative thinking, computer science and STEM, with the goal of developing a working prototype.



A team from Salem, Oregon at EurekaFest, 2019, showcases their adaptive drinking cup for people suffering from dysphagia, a swallowing disorder which often affects stroke victims.

"By drawing on many different disciplines, the InvenTeam initiative helps shape well-rounded students who are better equipped to tackle the technological problems they will face in the modern workplace."

-Stephanie Couch, Executive Director of the Lemelson-MIT Program

In addition to integrating and enhancing learning in critical subjects, the InvenTeams initiative also focuses on developing important human-centered skills such as teamwork, empathy, inclusion and communications. InvenTeams often represent a diverse group of students that are coming together for the first time around a shared passion for problem solving. They learn together through an interactive, self-directed process, overcoming failed attempts, developing multiple iterations and ultimately designing a working product.

In addition to working with their teammates, the students also engage the broader community to inform and support their work. Teams collaborate with the intended users to ensure their inventions truly meet their needs. This helps build empathy in the students as they gain an appreciation of the needs and challenges of others. InvenTeams also connect with local businesses, academia, nonprofit organizations, and government officials to gain access to professional knowledge and resources that enrich the experience.

The program culminates at the end of the school year at EurekaFest, a national event where the InvenTeams gather to present their final prototypes to the greater Lemelson-MIT community. Teams fundraise to cover the cost of this trip, which has historically been hosted on the MIT campus. The trip to Massachusetts and exposure to a world-renown institution has its own impact on students – some of whom have never been on a plane before. The event is truly a celebration of invention where



Clara Mabour's 2018 InvenTeam tackled the challenge of disrupting the breeding of mosquitos to prevent the spread of fatal diseases such as Zika, malaria, and dengue fever.

teams representing local high schools across the country showcase their work. The diversity of inventions is a testament to the diversity of the individuals, ideas and communities involved. Past inventions have included:

- An offshore rip current alert to help protect swimmers in the Great Lakes
- An automated machine that cleans beach litter
- A device that helps disabled students open their school locker
- A publicly accessible laundry machine for people experiencing homelessness

In addition to the EurekaFest event, InvenTeams are celebrated in the media and at other high-profile events. In past years, winning teams have been invited to attend the White House Science Fair, while locally they are celebrated in parades and other community gatherings. The teams also benefit from national and local media coverage highlighting the team members and their inventions.

Six Core Tenets of Invention Education:



Environmental Sustainability & Diversity, Equity & Inclusion are the Foundation Core for Implementation

[Download the Invention Education Framework to learn more](#)

Educator Support

Leaders of Lemelson- MIT InvenTeams® understand that its success relies greatly on educators willing to put their time and passion behind this initiative. For this, they provide resources and support to educators, to ensure the educator experience is as impactful as the students'. Each InvenTeam educator receives a three-day professional development opportunity and ongoing peer-to-peer support from the Lemelson-MIT Program's invention education staff and a select group of experienced InvenTeam educators called 'Lemelson-MIT Fellows'. Lemelson-MIT also offers instructional resources, such as invention oriented curriculum guides and kits of materials, a growing array of programs offering direct instruction to students, and support for researching invention related programs.

Each InvenTeam is awarded up to \$10K to support a stipend for the teacher leads and other costs associated with their work, along with ideas for how to develop local partnerships to secure additional funds and in-kind support. Theses local partnerships often result in long-lasting relationships that help grow the school's invention culture beyond the grant year.

Finally, the program offers an inspirational spark that helps educators attract

and more deeply engage students in STEM learning. Following the success of one InvenTeam experience, educators are eager to participate in future years. The experience often serves as a catalyst for educators to get more involved in growing engineering and STEM curriculum at their schools, creating an opportunity to engage even more students in hands-on STEM learning.

InvenTeams Impact

- Approximately 2,900 students have taken part in the InvenTeam experience
- 257 schools reached
- 35% are girls (currently women represent only 10% of U.S. patent holders)
- 11 patents secured to date (39% of named inventors on IT patents are women)
- Media exposure within all InvenTeam communities
- \$196,275 additional dollars secured, on average, per InvenTeam to sustain invention education in the community after InvenTeams
- Nearly 100 elected officials have provided congratulatory proclamations or attended InvenTeam community events since 2010

Discover InvenTeams

- o For more information about InvenTeams visit lemelson.mit.edu/inventeams
- o For educator resources visit lemelson.mit.edu/resources

"The InvenTeam experience introduced me to real-world problem solving and was so profound that I dug into STEM when I got to college."

-Clara Mabour, 2012 InvenTeam member turned 2018 InvenTeam educator, both at Northeast High School, Oakland Park, FL

"It's very clear to me that the InvenTeam initiative has had a significant, positive impact on not only the student members of our two InvenTeams, but also the teachers involved, and in many ways our wider school community. InvenTeams helps you become a better teacher. I learned to raise my expectations for students and what they can do and how powerful the collaboration aspect is. The knowledge and enthusiasm you share is unmatched."

-Dan Schab, High-school Math Teacher, Michigan