

The Decombustors

A Year in InvenTeams

by Jessica Hatch

Imagine a device that first responders could use to extinguish and contain a fire. About the size of a football, this device is made up of a pin and gears attached to a tear-shaped canister. The responders could pull the pin on the device and throw it into a burning room. A fire-suppressant chemical would cover the room, allowing firefighters to enter safely and put out the remaining flames.

This was the idea my team proposed for the Lemelson-MIT InvenTeams Program, a national initiative where high school students work together to create an invention, apply for a grant to create a prototype, and possibly pursue a patent. While coming up with our idea for this firefighting device and fine-tuning our proposal were hard work, my teammates and I learned that our real challenges were just beginning.

Last year, my chemistry teacher introduced me to the InvenTeams club at our school. Our InvenTeam had seven members who, like me, had an interest in math and science. We were brainstorming possible inventions when one of our team members suggested a “reusable firefighting device.” Right away, we all knew that this was going to be our project. Not only would the device have applications in our community, but it could also save lives around the world.

At first, we had no clue what the device would look like. We only knew that when thrown into a room on fire, it would release a chemical to put out the fire. So, in September and October of 2006, we spent all our energy researching existing patents; looking up fire codes, fire types, and ways to extinguish flames; figuring out exactly how our device would work; and organizing all our findings and plans into a proposal.

Grant for Grenades

In November, we received a letter from Lemelson-MIT: we were one of 20 teams to win a grant worth approximately \$10,000, which would allow us to create a prototype for our reusable firefighting grenade. Team meetings on Tuesday and Thursday afternoons and additional research at home soon became the norm in every team member’s life. Everything centered on the goal of completing a prototype by the following June for the InvenTeams Odyssey, an event that would showcase the work of all 20 InvenTeams at the Massachusetts Institute of Technology.

Shortly after we received news of the grant, CISCO Systems became our sponsor. A local company, CISCO was looking to become involved with their community and to get people excited about the engineering process. Our mentors from CISCO were great at letting the team solve the problems, ever mindful not to take control of the project. Instead, the mentors mentioned useful websites for fire-retardant chemicals and suggested other companies they thought might be willing to help our project.

A Test of Teamwork

Our team broke up into groups: chemical research, design, computer simulation, media relations and marketing, and the test group. Everyone chose as many as three groups to join. One of my groups was the test group. Our job was to look for ways to test the efficiency of the prototype once it was built. We came up with test and safety procedures, bought a tent to simulate a room, and looked into the possibility of testing in a fire situation. Safety procedures we investigated included safety goggle use and the handling of the device’s tank when it was pressurized, not pressurized, and after

Team members prepare to present their reusable firefighting device at the Odyssey at MIT.





The Acton-Boxborough InvenTeam inside the pop-up tent that they used to test their invention.

discharge. Testing these procedures helped ensure that everyone on the team was safe.

As press secretary and a member of the media relations group, I also worked on drawing interest to our team's work. I contacted local newspapers, radio stations, and other media outlets. I got to know every detail about the entire project. Any extra time I had at meetings was spent asking the engineering group about how the device works, what needs to be done for testing, and other design questions. Over the course of one year, I learned how to manage my schedule, speak to reporters, write formal e-mails, and communicate with organizations and companies. I came to really enjoy learning about engineering and communicating the findings to the general public.


I remember the day the machine parts came in from the manufacturing company and the first time we set up the pop-up tent in the physics classroom that was our workspace. That day, we were able to start affixing the parts we had designed (the gears, negator spring, and chain) to the CO₂ tank. Everyone was excited about the huge milestone of having a near-working device.

100 X FUN

As June loomed closer, the team worked even harder to complete the prototype, finish progress reports, and finalize the presentation to give at MIT. And we had to decide on a name for our invention. Since the word "grenade" alarmed so many people, we had to think of another one. "The Decombustor" was mentioned in passing at a meeting and everyone laughed, but the name stuck.

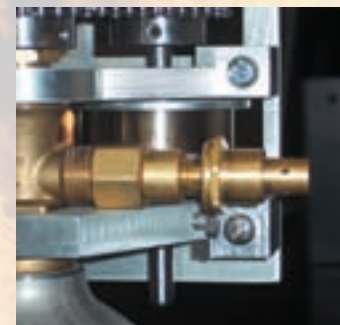
June arrived, final exams were over, and finally we were at the Odyssey with high school students from all over the country. The week passed in a whirlwind of activities. From the first barbeque to the final dinner banquet, every second was full of seminars, lab tours, presentations, games, interviews, dinners, and parties.

Throughout the week, I must have explained the inner workings of the negator spring and gears of our device at least 100 times to the showcase attendees. Even so, I couldn't stop smiling, especially after three of my teammates and I finished the formal eight-minute presentation that we had been preparing for two months. I was happy not because the presentation and stress were over, but because I felt so good about sharing with the world something we had worked so hard on.

Now I am a senior with college on the horizon. I have one last year on my school's InvenTeam, and I know this year is going to be even better than last. We have learned from mistakes, and we know how to work as a team. This year's goals—to build a second prototype, to attain a patent, and to market the device—are going to challenge us. More hard work is ahead of us, and I know I will enjoy every minute. 



Jessica Hatch is a senior at Acton-Boxborough Regional High School. In addition to math and science, she enjoys playing tennis, hanging out with friends and family, black-and-white photography, and reading great fantasy books.



To learn more about Lemelson-MIT InvenTeams, see page 26.