BARBARA HUGHEY: OK. So as Kristen said, I'm Barbara Hughey. I teach in the Mechanical Engineering Department at MIT. And I thought you might want to just see a little bit about me.

So I was more or less from New Jersey. I was born in Philadelphia, lived in New Jersey and outside of Philadelphia. There we go. I moved back and forth about every two and a half years. Briefly moved to Southern California when I moved. And in fact I was an undergraduate at Princeton where I went in as a physics major. I had always loved math and physics. I ended up coming out with an engineering physics degree in the mechanical and aerospace engineering department, which was awesome for what I'm doing now, and also for a lot of the research I did before I came back to MIT.

And then I came up to Boston to get my PhD in physics at MIT. Very highly esoteric subject that was great fun involving quantum mechanics, but not terribly useful. And then I worked for a couple small companies in the area mostly doing applications of particle accelerators to medicine. And actually a lot of it-- I know you're spending the day on sort of imaging and image processing-- I did a lot with positron emission Tomography images, magnetic MRI images, things like that.

And then in 2002 I came back to MIT to teach the undergraduate measurement and instrumentation class, where I basically teach students how to do experiments. And we have a project we call Go Forth and Measure, where each student picks their own project and does something. Actually, Kristen, what was your Go Forth and Measure? What was your go forth and measure project?

KRISTEN: Me?

BARBARA HUGHEY: You.

KRISTEN: Oh. So does anyone like to run here? Track? Awesome. Me too.

I took a pressure sensor and put it inside a sneaker, and I tried running on different surfaces and compared the impact of running on a treadmill versus running on concrete.

BARBARA HUGHEY: And we have a lot of really cool projects like that where people do everyday things that they're interested in, including food, things like that.

So anyways, back to the women's technology program. So I came to MIT in 2002. In 2006 I was asked to expand the existing women's technology program which was founded in 2002 in electrical engineering and computer science. So most of what you're doing today would fit more in that. And then we expanded it to mechanical engineering. And the goal is to spark high school girl's interest in studying engineering and computer science, which is I think exactly the goal of this program, too.

So our approach is to pick girls to pick students who are rising high school seniors who are really good and really interested in math and science, but don't really have a background in engineering. Have maybe heard of engineering, people maybe tell them you should think about engineering, but they don't really know what it is. They haven't taken a lot of engineering classes. They're just curious and not sure what they want to major in.

So we give them a four week exposure to engineering. There are two curriculum tracks, electrical engineering and computer science, and then the one that I run, which is mechanical engineering. I don't have a lot of time so I can't go into too much detail, but I'll be happy to answer questions about what we do in them.

They're mostly hands on classes, like what you're doing today. We of course-- especially mechanical engineering-- have to teach them a lot of physics, because you can't do much in mechanical engineering until you have physics. But physics is fun. It really is.

And then try to correct ideas about what engineers are like and what they do. And the students give us wonderful quotes, such as that they realize engineering has so much more depth and so many more applications.

Coming in they have some of the preconceptions that you might have, which is that engineers work alone, it's not very exciting, not very people oriented. But in fact it is. You work a lot in teams, as I think you're doing today. And you get to do a whole range of applications and make products that are helpful to people.

We also want to increase confidence of the students by exposing them to female engineers of all ages. Give them an opportunity to live away from home-- so it's four weeks living away from home. The students live in the MIT dorms. They live with MIT undergrads are recent graduates who help them with their homework, and also do social outings and everything. And the classes are taught by graduate students in mechanical engineering or EECS.

And-- I already said some of this-- so again, it's a hands on. There's 40 students in the EECS track and 20 students in the mechanical engineering track, so there's 60 students total. We have hands on lab classes with projects in mechanical engineering. We like to have a sort of capstone project at the end of each week, which ranges from building cranes that can sustain a certain amount of weight, through doing oral presentations, making a poster presentation.

And then there are two special final week presentations where the EECS students build DC motors, and the WTP-ME students build Rube Goldberg machines, which are basically just chain reaction machines. But the thing we do to make it possibly a little more interesting is they have to figure out what's going on in every step. So it's not just trial and error, they have to apply the design principles we've taught them. They have to use the physics and the science we've taught them to figure out what's going on, and then make their machine run.

And we also do a lot of faculty and industry guest speakers and tours. We also have, as I said, MIT students and recent graduates are the instructors and also the tutors that live with the students. And these are some photos from the motor building for the EECS. So this is actually the professor who runs it. They figure out the design of their motor, then they do all the machining. They build them in pairs. So that's one of the completed motors. And they use actually the mechanical engineering shop to do all this.

And then here's some photographs from ME the track where you see a Rube Goldberg machine. Dominoes are of course often used. Various types of trip wires and things. Usually pendulums and Slinkys used. And then there's a final step. They can decide. This one for their final step, they pulled aside a curtain that then showed a photograph of all the students and staff.

So since 2002-- reminder again, ME started in 2006, but EECS started in 2002. Up through last summer we've had 744 females finish the program. They all have a-- they say WTP has a big impact on them. Many of them-- as I'll share on the next slide-- many of them go into engineering. Some of them after going through WTP decide that they actually don't like engineering. It's not for them. That's a perfectly great outcome for us as well, because then they have learned and saved their parents money of sending them to an engineering school. They've learned, oh I don't really like engineering. I want to do something else.

So either outcome is fine. We just want to expose them and give them a real more realistic view of what engineering actually is. Many of them would not have thought of an engineering major or applying to MIT. And as you see, actually many of them end up majoring in either engineering or computer science. More than 60% of the alumni have majored or are majoring in engineering or computer science. Many others in science, math, there's a big bunch in business, and then a few of others.

So it's highly successful for its goal, which really is to get girls interested in majoring in engineering, or at the very least to let them know what engineering is about. And this is, I think, the class of 2014, probably. And that's our website.

And so if you have any questions-- no-- acknowledgements first.

I couldn't do this alone. There's a woman who runs the EECS program and the whole program. The ME program is funded by an amazing woman who is in her-- actually I think she just turned 80, who is a mechanical engineer. And she funds our program. And then various other people.

So, any questions? Nothing. OK.

OK, and if you are not-- I know there are some juniors here, which unfortunately have missed the deadline for this summer. But if you are not a junior, if you're an eighth, ninth, or 10th grader, look in around November of your junior year on that website right there and look for application information. And the applications are usually due at the beginning of January.

OK? OK.

[APPLAUSE]