

## I, Robot & The Young Engineer

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In the movie *I, Robot*, the character played by Will Smith didn't much care for robots. But I can tell you about thousands of high school kids who are budding engineers because of them.

Think back.

What made you decide to become an engineer? It probably wasn't a class you took in high school. I don't know of a public high school in America that offers a class in engineering.

But in many high schools in America, there is what amounts to an engineering club, it's called *FIRST* Robotics.

This club has no school-funded budget; no paid teachers; it's not part of any high school curriculum; and yet, it is fostering young engineers in droves.

These are kids who otherwise might never have pursued a career in engineering. In fact, some of these kids might never have graduated high school.

As an example, there's a high school in Las Vegas, Nevada, where more than 50% of the students drop out and fail to graduate. Yet 89% of the students who participated in *FIRST* Robotics received diplomas. And 90% of them went on to attend 4-year colleges, many earning bachelors of science in engineering.

So how does *FIRST* Robotics ignite these young minds? By challenging students to build a working robot from a common kit of parts in a mere six weeks.

Every budding mind wants to know how things work. *FIRST* Robotics gives him or her that opportunity. Students can put theory to work to make something happen. That kind of experience is the hook that pulls many a would-be drop-out into a lifetime of learning.

## A Bit of History

*FIRST* (For Inspiration and Recognition of Science and Technology) was the brainchild of Dean Kamen, an inventor and entrepreneur driven by a passion for science and technology. He created *FIRST* in 1989 to help young people experience that same passion. *FIRST* is a not-for-profit charity that develops programs to encourage students to pursue a career in science, technology, engineering or math (what educators call STEM).

One of those programs, *FIRST* Robotics Competition (*FRC*), started in 1992. Called "The Varsity Sport for the Mind," *FRC* involves teams of 25+ students who are given six weeks to design, build and program robots that must perform prescribed tasks against a field of competitors.

That first year, 28 teams competed in a New Hampshire high school gym.

For the 2012 competition, 2,400 teams (about 60,000 high school students) are expected to compete in a series of district, regional, and qualifying events, culminating in the *FRC* championship in St. Louis, Missouri, April 25-28, 2012.

## On With the Games

What curious young mind could resist competing in games with names like Logo Motion, Lunacy, Rack 'N' Roll, Toroid Terror, or Stack Attack?

At the beginning of the competition, each team gets a big kit of parts. All the kits contain the same items, but how those components come together into a working robot is entirely up to the team. The robots are as individual as the teams themselves.

Teams are guided and helped by mentors -- volunteers who donate their time, skills and experience to help the kids design and build their robots.

Just like in the real world, teams are constrained by time, money, and the limits of their talents. As one mentor puts it, the initial reaction is usually "not enough time, not enough money, too big a challenge."

Besides building and programming their robots, the teams have to raise funds, design a team brand, and develop teamwork skills. In fact, one of the goals of the program is to develop in the kids an attitude of gracious professionalism. Even as they compete with one another, teams help other each out by loaning parts or helping solve problems.

And you might think that *FRC* is just for guys. Not so. About 30% of the participants are girls. In fact, there are several all-girl teams.

*FRC* culminates in a championship event, where the teams that have made it through various levels of competition go up against one another. The championship tournament is attended by thousands of people, and the excitement and fervor

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among team members, mentors, parents, friends, and onlookers is comparable to a mini-Super Bowl.

## The Making of an Engineer

A big lament in our industry is, “Where will our next crop of young engineers come from?”

*FRC* is part of the answer, but the program needs mentors – ideally, engineers who have hands-on experience in industry and can offer real-world solutions to the students.

My company, Gates Corporation, saw the value in *FIRST* Robotics about seven years ago. We started out by donating synchronous belts and sprockets for the kit of parts. We encouraged our field sales and application engineering departments to help out individual teams. Altogether, we’ve donated more than \$1 million in parts and scholarships to the program, and we are currently a Crown sponsor.

I’m not telling you this to toot our own horn. Gates, like any other company that depends on finding and keeping talented engineers, realized that engineers don’t just spring out of the woodwork.

That’s why *FRC* is so valuable. It nourishes the seed that grows our future engineers. It teaches them real-world engineering, and business, and teamwork – all the skills that make not just a good engineer, but a good employee.

So how can you help?

Perhaps you know an engineer who has retired recently and is looking around with that wide-eyed stare that means, “What do I do now?” Tell him or her about *FIRST* Robotics.

You can also get your company involved -- it’s in their interest, after all. With a healthy crop of engineers graduating from our schools, your company will have the opportunity to pick from the best and brightest, instead of spending the millions of dollars it will take to train and develop talent inside the corporate walls.

Perhaps you would like to volunteer.

You can learn about *FIRST* by visiting [www.usfirst.org](http://www.usfirst.org) [1]. If you’d like to see what Gates is doing with *FRC*, visit [www.gates.com/first](http://www.gates.com/first) [2]. And if you’d like to see how one team from Nevada made it all the way to the championship, check out the Cimarron-Memorial High School team from Las Vegas at <http://www.team987.com/> [3].

*What are your thoughts? Post your comments below or send them to [boman@gates.com](mailto:boman@gates.com) [4].*

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## Links:

- [1] <http://www.usfirst.org/>
- [2] <http://www.gates.com/first>
- [3] <http://www.team987.com/>
- [4] <mailto:boman@gates.com>