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Today's young students are the 'Engineers of Tomorrow'

Amanda K. Lowe , Daily Times

Children from across Rhode Island will be spending the rest of the year building and programming robots.

They will be entering a competition in January in which their robots will be required to perform specific tasks.

The efforts are part of the FIRST LEGO League (FLL) competition, for which 48 teams of children will create robots to compete.

One of the teams participating in the competition is the Engineers of Tomorrow (EOT). EOT is a group of children ranging in age from 9 to 13 years old.

EOT consists of 10 children from Rhode Island. Calder Brown, 13, of Providence; Kyle Inman, 13, and Shane Inman, 11, both of Gloucester; Harry Johnson, 12, of Warwick; Julia Smith, 11, of Cranston; Alex Stein, 12, and Markus Stein 11, both of Barrington; Mike Valdes, 12, and Miranda Valdes, 10, both of Warwick; and Andrew Wallace, 11, of North Providence.

All the students on the team are home-schooled by their parents except Alex and Markus Stein who attend Barrington public schools.

EOT is based in Warwick and is coached by Mary Johnson. She said she began coaching the team at the request of her son, Harry Johnson.

"When I was 6 years old, my mom took me to see the FLL competition and, wow, was it cool," said Harry Johnson, 12. "My jaw dropped to the floor right at the beginning of the competition and I was amazed at the whole thing. When I came home, I started nagging my mom about starting a team and she told me that I could join a team when I turned 9, the minimum age requirement for the competition."

Mary Johnson said, when Harry turned nine, she could not find a team for him to join.

"We did not have any luck finding a team for him to join because most teams are based in middle schools and the only home-school team in the 2004 season was based in South County and not accepting new members," Mary Johnson said. "So I asked a couple of his home-schooled friends if they were interested, and we formed a team."

Mary Johnson said, early in the team's first year, they realized they needed a mentor to help the team better understand the engineering concepts.

"I started networking to see if I could find a college student to help," Mary Johnson said. "Through friends, I met Dr. Matthew Stein, an associate professor in the School of Engineering, Computing, and Construction Management at Roger Williams University. I expected him to maybe refer an undergrad to help us, but he showed up at a team practice session with his two sons, and he has been with us ever since."

Yesterday, EOT gathered at Mary Johnson's home to start its final preparations on its project for the FLL competition to be held Jan. 13.

"The FLL is a worldwide LEGO robotics tournament for ages 9 to 14," Mary Johnson said. "The FLL is designed to engage kids in a sports-like competition and encourage them to develop real-world math, science, and technology skills."

According to Mary Johnson, the competition has three parts. Each team has three months to build and program a robot to compete for points in an obstacle course called the Robot Game; each team chooses a research topic related to the annual theme and prepares a presentation to share its research; and each team defends its engineering and programming choices at a technical review judged by professional engineers and programmers.

"FLL is an international program for children that combines a hands-on, interactive robotics program with a sports-like

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atmosphere. Teams consist of up to 10 players with the focus on such things as team building, problem solving, creativity, and analytical thinking," Rebekah Gendron, RI FLL tournament director, said. "Each September, a new challenge is unveiled to FLL international teams across the world. Over the course of eight weeks, they strategize, design, build, program, test, and refine a fully autonomous robot capable of completing various missions using the LEGO MINDSTORMS technology." This will be EOT's third year entering the competition. Last year the team finished third overall and the year before it won awards for its research project and received fourth place in the Robot Performance, Mary Johnson said.

"The challenge was announced in mid-September and we've been meeting since then to design and program our robot and work on the research presentation," Mary Johnson said. "We meet between 3 to 6 hours a week. The theme this year is Nanotechnology, and the EOT are developing ways to use nanotechnology to help people with food allergies."

At their meeting yesterday, the EOT members were working together to choose a robot for the competition and to put together their presentation.

"We've each made our own robot and now we are working to combine all of our work and narrow it down to one robot because that is all we are allowed to enter into the competition," said Michael Valdes. "We are having some problems right now because all of the programs we created are so comprehensive we have found that we can't get them all to fit on one robot, so we are working on that, too. We are also putting the final touches on our research project which is about using nanotechnology to help people with allergies."

Miranda Valdes spent the day working on costumes for the group's presentation.

"Each team has to do a presentation for their research project and we decided to do a skit," Miranda Valdes said. "In our skit, we are demonstrating a nanobot that can take away molecules and atoms in the air that cause allergies."

The team is provided with a field kit for the obstacle course by paying an entry fee to the FLL. Its other equipment comes from the kids paying an annual fee. Mary Johnson teaches classes in LEGO robotics within the home-schooling and gifted communities and uses those fees to also purchase supplies.

"I have been looking for corporate sponsors, but it's difficult," Mary Johnson said. "It is so time consuming and my primary concern is coaching these kids not trying to find the funds."

Besides the FLL competition, EOT has participated in numerous other events.

"We have participated in Robotics Park, a K through 12 robotics exhibit which is held every spring and is hosted by CCRI. This year we are also going to participate in Botfest in Lowell, Massachusetts, in March," Mary Johnson said. "Both of these events are expos, not competitions. The kids work on robotics projects individually or in pairs and display and demonstrate them at the events."

On Jan. 9, EOT is participating in an FLL demonstration for the Society of Mechanical Engineers at North Safety in Cranston. The FLL encourages teams to share their research with the local community, Mary Johnson said.

"We still have so much work to do. We basically have to do everything except the props for our skit and the presentation," Harry Johnson said. "We are working from five standardized robots that are all similar in structure and we have to combine them. It takes a lot of team work and a lot of hard work."

The EOT is one of 48 teams participating in this year's FLL competition. There are two other teams from the area participating as well - The Nanobots from Coventry and the St. Rose of Lima School in Warwick.

"Teams organize in many different ways. Some are school teams coached by teachers such as Technology Education teachers, math and science teachers, and some elementary teachers. Some school teams are started and coached by parents who have a kid in the school that wants to get involved. Other parents coach home-school teams or neighborhood teams," Gendron said. "The majority of the Rhode Island teams are in the school-coached by a teacher category but the home-school and neighborhood teams are increasing."

This year's FLL competition will be held on Jan. 13 from 11 a.m. to 4 p.m. at Roger Williams University.

The winner of the FLL competition will represent Rhode Island at the FLL World Festival in Atlanta, Ga., in April.

"There are many awards and trophies given in many different categories from the actual Robot Game to judging areas such as technical and programming, research, and teamwork," Gendron said. "The winner of the tournament is the team that, across the board, scores the highest in all four of those categories. They receive the champions award. They are also entitled to participate in the FLL World Festival held at the Georgia Dome in Atlanta. The Rhode Island Champion Team will join about 100 other teams from the United States and all over the world."

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