

NUWSCOPE

Voice of the Naval Undersea Warfare Center, Newport Division

Newport Division named a “Top 100” company!

NUWC Newport Division was recently designated a “Top 100” company—with the likes of Capital One Financial Corp., Intel Corp., and Federal Express—by *Training* magazine. Selected from 800



corporate applicants, the Division was ranked one of the top companies that excel at developing human

capital, and was the only government agency to make the “Top 100.” To determine the *Training* “Top 100” a range of qualitative and quantitative data is assessed, including financial investment in employee development, the type and scope of training and development programs provided to employees, the quality of these programs and how closely such development efforts are linked to business missions, goals, and objectives.

“Employee training, distance learning, leadership development, knowledge
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sharing and other forms of educational workforce development contribute to the Division’s most valuable asset—its employees,” said Juergen Keil and Capt. Pat Bloomfield in a joint statement. “With cutting-edge technologies introduced

daily and fiscal challenges facing our organization, we are building a bridge to the future with a workforce well-equipped to face these challenges.” Keil and Bloomfield congratulated the Workforce
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A team from nearby Aquidneck Elementary School readied their robot for a timed run at the R.I. Robotics Competition held recently at NUWC. Coached by Gia Harrigan, Code OIP, they finished third in a field of 26 middle school teams. From left are: Michael Gubata, Cameron Harrigan, Patrick Fogerty, Trevor Kutsaftis, and Tucker Holmes.

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NUWC hosts robotics competition

by Jane Tracy

Walking into the front entrance of Building 80 on Saturday, January 26th, was like walking into a human beehive. Hundreds of youngsters, everywhere one looked, were in constant motion. They were swarming in the lobby, the gym, and the training rooms downstairs. After observing for a few minutes, it was apparent that all this motion had a purpose and that these kids were on a mission. A high-tech mission, in fact.

This was the Rhode Island Robotics Competition, the middle school level of the FIRST (For Inspiration and Recognition of Science and Technology) robotics competition held annually for high school age kids. NUWC, which has sponsored a FIRST team from Middletown High School for seven years, hosted the junior competition, also referred to as FIRST Lego League (FLL).

Other sponsors of the event were the
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R.I. Human Resources Investment Council, American Institute of Aeronautics, and the Office of Naval Research (ONR), which identified the theme for this year's Robotics Competition, Arctic Impact. The competition's "Challenge" related to a real-life situation experienced by SHEBA (Surface Heat budget of the Arctic) scientists during their 13-month mission to study global temperature changes in the arctic.

Teams from Massachusetts and Rhode



A member of the CABBDJS (sounds like cabbages) Team from Portsmouth Middle School sports the team's eye-catching team hat, a green cabbage leaf.

Island—27 in all—attended the regional tournament, the first ever held in the state. Ages ranged from 9 to 14 and teams consisted of up to 10 players and one adult coach. Using the Lego Mindstorms Robotics Invention Systems™ (a \$200 kit with 700 pieces), the teams design, build and fully program autonomous robots for this high-tech sporting event. The focus is on team building, creative problem solving, and analytical thinking.

This year's Challenge: In a race against time the team must rescue scientists on a research expedition who are in the path of an immense Arctic storm—and hungry polar bears. A simulated arctic surface on a 4' by 8' plywood sheet is the competition field and the objects—scientists, polar bears and equipment—are Lego elements. In addition to robot performance, the teams were judged on technical quality, and on a presentation to

a panel of judges about how they built their robot, and on their hypothesis developed from research on the problems of global warming. Special team awards were also given for: Creativity, Program-

ming Design, Robust Design, Technical Interview, Against All Odds, Team Spirit, Leadership, Headed In The Right Direction, and a Judges Award.

As the competition progressed to the final rounds the excitement and tension was palpable as kids, coaches, and parents screamed and cheered their teams on. A live video stream on a large screen displayed the action as many of the robots performed the

Challenge tasks within the two-minute time limit while some had disastrous malfunctions. Two teams learned the hard way that the auto focus feature of cameras being used during the competition had accidentally wiped out the robot's program (both use infrared beams and sensors). Other teams rallied to help them out and after some quick re-programming they were able to compete.

At the conclusion of the intense day-long competition two of the seven teams from Aquidneck Island placed in the top three. Team Extreme 2 from Gaudet Middle School, Middletown, coached by Janice Kowalczyk, placed second. In third place was the upset of the day, the youngest team in the tournament, Arctic Shadow from Aquidneck Elementary, Middletown. It was coached by NUWC's Gia Harrigan, Code 01P. The first place team hailed from Groton/Dunstable, Ma. Two other teams from Gaudet Middle School (Middletown), two from Thompson Middle School (Newport), and one from Portsmouth Middle School also competed.

"Putting the pulleys and gears together so that they would be strong enough to do the job was the toughest part," said Sarah Skelly of the second place Team Extreme 2. Also tough was

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Program tied to future of national security

When NUWC's Tom Kowalczyk (Code 01) spoke to the Robotics Competition coaches and teachers last fall he highlighted why he—and the Navy—are so committed to these programs. An excerpt follows:

"I have on my desk the recently released (May 2001) Phase III report of The U.S. Commission on National Security/21st Century. The commission is co-chaired by Senator Gary Hart and Senator Warren Rudman, and the purpose of the Commission is "to redefine national security in this age and to do so in a more comprehensive fashion than any other similar effort since 1947."

Here is one quote from the foreword of the report that talks about the dangers America faces: "We have concluded that, despite the end of the Cold War threat, America faces distinctly new dangers, particularly to the

homeland and to our scientific and educational base. These dangers must be addressed forthwith."

We experienced one of the dangers to the homeland last week [September 11th]. We can see the impact immediately, the loss of life, the loss of meaningful employment, and the list goes on. The danger to our educational base is not as easy to see but I'll rely on another quote from the report to bring home the opinion of the commission that this danger to the educational base is on the same scale as terrorism: "The capacity of America's educational system to create a 21st century workforce, second to none in the world, is a national security issue of the first order."

The robotics initiative was, is and always will be about 21st century workforce skills, and is as important to the future of our nation as securing the homeland from the threat of terrorism."

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figuring out how to design and program the robot for each of the challenges. "There were no instructions!" said Skelly as the rest of the team nodded agreement.

The group started on the project in October and met two times per week, then added Saturdays. "Kids had to understand that being on the team required dedicating 180 minutes per week," said Monteiro. We began with 13 or 14 kids and ended up with seven." Those who stuck with it benefited in various ways. Skelly said she learned how to program while team member Ben Welch said he learned building skills. Kelsey Montero took on the responsibility of being in charge of the presentation.

After their first experience in the

Robotics Competition these bright and articulate kids were enthusiastically talking about next year. "We'd like to

compete again with the same team members," said Skelly, "and we definitely want to do the high school level competition when we are old enough."

In addition to promoting kids' interest in science and technology as outlined by the FIRST organization, event director Tom Kowalczyk, Code 01, emphasized the program also has to do with ensuring our country nurtures the science and technology base required to maintain our national defense. "It may look like a high energy robotics competition but the beef under the sizzle is the recapitalization of America's strength in science and education," said Kowalczyk. "It seems particularly relevant now, given the events of September 11th."

To learn more about FIRST and its

"The FLL process is, in every way, a microcosm of a real business. You start out with a problem, not enough resources, you don't know what the competition is doing and you have to invent, design, develop, prototype, rebuild and deliver a working solution."

—FIRST founder,
Dean Kamen



With nerves of steel, Sarah Skelly helped guide Team Extreme 2, from Gaudet Middle School, to high scoring performances that put them in second place.

programs visit www.usfirst.org.

Volunteers are needed on April 5-6 for the statewide Robotics Park event for students in Peace Dale, R.I. Contact Janice Kowalczyk, 841-5583, kowalcjn@ride.ri.net.

How to build a robot

The robotics technology used in the junior robotics program, the Lego Mindstorms Robotics Invention System™ was the result of a 10-year collaboration between Lego, the plastic building blocks invented by a Danish carpenter in the 1930s, and the MIT Media Labs. An autonomous microcomputer, RCXä, that can be programmed using a PC, is the heart of each robot. The RCX serves as the brain of the robotic inventions by using light and touch sensors to take input from its environment, process data and signal output motors to turn on and off. After users build their robot from 700+ Lego elements, they create a program for their invention using RCX Code, a simple but powerful programming language. The next step is to download their program to the RCX using a special infrared transmitter. Creations then can interact with the environment, fully independent from the computer. Learn more at www.legomindstorms.com.



Volunteers who ensured the smooth running of the Robotics Competition included, from left, Janice Kowalczyk (Rutgers University), Tammi McVay (NUWC), Dave Schuller (NUWC), Betsy Daniels (FIRST), and Jim Dolan (PROSOFT). (All photos this event by Jim Travassos, Code 543)