

Robotics program finds success in Catalina Foothills schools

Logan Burtch-Buus, Foothills News | Posted: Wednesday, February 3, 2016 4:00 am

For over a decade, students in the Catalina Foothills School District have been planning, designing and building robots to perform a variety of different tasks as part of the FIRST Lego League. The educator who first introduced the program to the schools 15 years ago is Charlotte Ackerman, teacher leader for science and engineering practices at CFSD. Ackerman is also the coach the district's eight FLL teams.

The program utilizes Lego Mindstorms, a series of kits which contain the software and hardware necessary to create customizable robots to perform different tasks. Mindstorms can be found in both professional labs and on university campuses throughout the world and help to model experiments without money on more expensive and often valuable equipment.

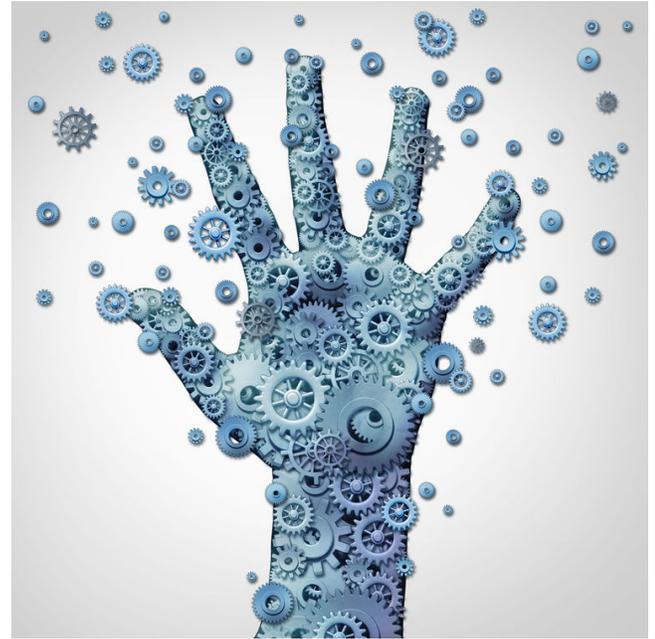
Ackerman believes the Lego Mindstorms have much more potential than use in a professional setting, though.

"A modular system that you can use to really design anything is really a very powerful educational tool," she said.

By creating a system that is both intuitively easy to understand and at the same time allow for endless experimentation, Lego Mindstorms are perfect for young, burgeoning minds.

Ackerman and the FIRST Lego League teams in Catalina Foothills have found a lot of success over the years when competing against over 300 other Lego teams in the state. Two Catalina Foothills robotics teams secured top honors at the 2014 Arizona First Lego League Championship.

During last year's regional tournament, several of the robotics teams took home major awards. The Esperero Canyon Middle School "Local Legends" were the overall winners, the Orange Grove Middle School "Sharps Relief" won robot design. The Sunside Drive "Box Bots," the Ventana Vista "Milk Dudes" and the "Local Legends" all won performance awards. During the state tournament, the "Local Legends" also secured the award for "Most Innovative Robot Design" and second place in "Robot



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Performance.” The “Box Bots” won the award for “Best Research Presentation” and the Canyon View “Wraptors” placed in the top third of robot scores.

Every year, the teams aren’t just tasked with creating a robot; they are challenged to solve a problem based on a real-world scientific issue. The Challenge, as it is called, is broken down into three parts: building the robot, solving the project through extensive research and the core values of participating in competition in a respectful and cooperative manner.

The challenge for 2015 was titled “Trash Trek.” As the name implies, each of the teams were tasked with researching and discovering ways to collect, sort and reuse different recyclable waste.

Jackson Tint, a freshman at Catalina Foothills High School, has been involved in Lego robotics for some time. For the “Trash Trek” challenge, he looked to tackle battery consumption. During the beginning of competition season, Tint said he began toying with the idea after changing out some dead batteries.

“I had noticed there was still charge left in them,” he said, though not enough to force a current into a device. Tint found a way to harness the power left over in batteries, and charge the energy through his circuit and oscillator. Tint said the idea was discovered by his younger brother, Josh, in a copy of “Popular Science.”

The critical thinking and problem solving skills required to solve such complex issues call for a sense of dedication to academic investigation some adults even struggle maintaining.

Even 15 years ago, when Ackerman began experimenting with Lego robotics, she knew she had found a meaningful tool. She began her program at Sunrise Drive Elementary School with a small group of gifted students, though success quickly led to interest by students and administrators alike. It took two years for Ackerman to become involved in FLL.

Ackerman said the Lego Mindstorms are not only a useful educational tool, but the system will also help prepare young minds for future careers. All of the basic principles for programming are present, but in a picture-based format so children will be able to understand.

When there is a need for more guidance, Ackerman said she will bring in outside experts, whether from local businesses like IBM, or parents of children who are in research or engineering fields to help teach the kids.

Though she has found success in building robots, Ackerman said she would like to also begin integrating coding into the school curriculum sometime in the future — all in an effort to improve Catalina Foothill’s ever-growing STEM (science, technology, engineering and math) based education programs.

Ackerman said STEM education builds “critical habits in the mind” like problem solving, planning and making adjustments, measuring and simply having patience during a project.

While all young children benefit from learning about science, Ackerman said girls in particular can

benefit from an early introduction to STEM education.

“When girls do it and they are successful at it, it develops confidence,” she said. “If we can build their confidence early and give them these opportunities, they can keep going.”

Just as important, allowing girls into the thought process will help even out what she said is the difference between how boys and girls solve problems. Boys build then design, whereas girls design then build. By bringing those two ideologies together, Ackerman believes children will really begin to develop the strength of both mindsets.

When it comes down to it, however, Ackerman has a very simple philosophy for her program.

“If children will work at something,” she said, “shouldn’t we give them the chance to do it?”

With responsibilities encompassing multiple schools in the district, Ackerman said the success of the program must also lie with the countless children and their families who have volunteered their own time over the years.