

Introducing Tech Corner

Tech Corner is a new feature column in the newsletter. It highlights new and innovative uses of technology and the Council Rock teachers who make it happen.

Goodnoe's Tuesday STEM Club

For the inaugural article of "Tech Corner," Citizens For Education had an opportunity to visit and speak with students in the STEM (Science, Technology, Engineering, and Math) Club run by teachers Mrs. Maryann Molishus, Mr. Noel Marcus, and Ms. Lauren McCulley at Goodnoe Elementary School. The STEM club members include approximately fifty 4th and 5th graders. This STEM Club is one of three at Goodnoe.

STEM Clubs are an international movement to provide students the chance to explore aspects of science, technology and math outside of the normal curriculum based instruction. The learning takes place without any pressure of being tested or graded. Goodnoe's membership is open to all students and aims to motivate and build confidence in those who struggle with STEM subjects, and provide an outlet and place for collaboration for those who already show aptitude.

Planning for the STEM club at Goodnoe started with staff and parents over the past summer, although, due to the weather constraints, it did not start meeting until February of this year. While the future operational details of Goodnoe's STEM clubs are still being tweaked, this year the one in this article meets one day a week on Tuesdays for about 6 weeks. The 5th graders are meeting in lieu of recess, and the 4th graders in lieu of eating lunch in the cafeteria. Students submitted applications, and because of the volume of interested students, there are plans to accommodate another set of students for a second session directly after the current one is finished. The other two Goodnoe STEM Clubs meet on Fridays with their teachers, Mrs. Pat Millen and Mrs. Joanne Lawall and membership comes from the students in their classes.

The Club in action during their second meeting enthusiastically worked together, using 4 specific hands-on educational activities: *K'NEX* Educational Kits, *K'NEX* Computer Design Software, *Scratch*, and a 3-D Printer.

- ***K'NEX* Educational Kits** - The majority of STEM Club members split into small groups to build with *K'NEX* Educational Kits that included a motor. Most *K'NEX* Kits were provided by the Intermediate Unit, supplemented with a few additional kits purchased with funds from Goodnoe's building budget. Students worked in teams of 4 and at the end of the meeting one team displayed their collaborative design of an environmentally friendly people-mover, inspired by this year's challenge in a State wide *K'NEX* competition. One couldn't help but be caught up in the excitement as the student-designed and built people-mover went across the classroom floor.
- ***K'NEX* Computer Design Software** - A few other students were working with a *K'NEX* product with an "Education Computer Control Interface." Using the software included, students can write programs to control on-screen *K'NEX* models, download it into the interface's memory and use it to operate student built *K'NEX* models. Once again, we saw students working collaboratively to make their models work.
- ***Scratch*** - At least three club members were using the few laptops available for a program called *Scratch*. *Scratch* is a free programming language developed at MIT where students can program interactive creations by simply snapping together graphical blocks, without using any traditional programming languages. *Scratch* helps students learn to think creatively, reason systematically, and work collaboratively. The three students who were using *Scratch* helped one another with their programs. Students can save their work and build on it during the next club meeting.
- **3-D Printer** - The STEM Club also has the use of a 3D printer on loan from the school's provider of printers. 3D printing is a key technology in STEM education. It has the ability to allow students to solve real problems with physical solutions. It also provides teachers with 3 dimensional visual aids that can be used in the classroom, particularly to illustrate complex concepts. Fifth grade student, Marissa Cohen explained how the printer is used and the end results of her project. She made a door stop with 3D raised letters/number of "A13" (to identify the classroom) on the top hoping it could be a practical prototype for use in Goodnoe's classrooms, but soon realized it was hollow and wouldn't work. She is now trying to solve her problem using the software for the 3d printer to make a heavier door stop. She designed other projects which could also be used by her fellow students in the classroom.

STEM inspires independent and collaborative learning. An example was a self-initiated project completed by a 4th grader, Audrey Robb after her first STEM meeting. Interested in lunar vehicles and space probes, Audrey did independent research online to design a space probe. Because she didn't have *K'NEX* at home, she proceeded to build her version by using Lego's, and proudly showed and explained it to teachers, visitors and fellow STEM members. Audrey included several features, such as magnetic eyes, a compartment for spare parts, a device to help the probe stay afloat in water, and an arm to pick up samples. In every STEM Club activity, the one constant factor was the collaboration of students working together to achieve their goals. It provided an excellent atmosphere where each student is a vital part of the group.

Goodnoe's STEM Club Teacher, Mrs. Maryann Molishus not only fosters the cooperative, non-competitive interaction of Goodnoe's STEM Club members, she also brings the fruits of her own quest for continual learning. Mrs. Molishus spends her own money to go to teaching and education workshops, and her staff website is filled with resources for students and parents, as well as for other teachers.

Mrs. Molishus has been awarded, recognized, and honored beyond Council Rock for being an outstanding teacher. As a "Star Discovery Educator" she has attended, at her own expense, week long residential teaching workshops on digital education and stays in touch with teachers she has met from all over the country. In 2008 she was awarded the title of "Milken Educator." This prize has been called the "Oscars of Teaching" and includes a \$25,000 gift. In 2009 she was named Holy Family University's "Teacher of the Year."

Citizens For Education would like to thank Mrs. Molishus for her talents, her dedication to teaching and her innovative uses of technology that have benefited so many students. The honors that Mrs. Molishus has received are dwarfed by all the rewards the many students get from having her as their teacher.