South Central STEM Hub Newsletter

Thanks for a STEM-tastic Year!

*Greatness STEMs from you...*

Thank you!

Dear STEM Friends,

What a great year! It was a pleasure to visit your classrooms, clubs and activities. We met students and educators who were excited about learning, and that makes all of this worthwhile.

Recent numbers provide proof your efforts are paying off! Students who participated in 2012-13 Scale-Up programs funded through the Iowa Governor’s STEM Initiative scored better on Iowa Assessments: 10 percentage points higher in math and 8 percentage points higher in science.

Next year promises to be even better! Funding has been awarded for 2014-15 Scale-Ups, five iExplore Festivals are in the works and STEM is taking on a life of its own in communities across Iowa. If you’d like to see a complete list of Scale-Ups awarded in the south-central region, please click [HERE](#) and scroll down to the table.

What? You’re worried you’ll miss us over the summer? Come visit STEM Day at the Iowa State Fair on August 17. Business, industry, schools and hubs from across the state will host booths full of great learning opportunities for people of all ages. Look for more information coming in our July and August newsletters.

As always, let us know if you have questions or need help—we’re here to serve. Thanks for all you do for Iowa’s kids!

Have a great summer,
Dr. Sarah Derry, SC STEM Hub Manager
Lisa Morlock, SC STEM Hub Associate

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- **Submit Your STEM Event**

### Attention: Engineering is Elementary Scale-Up Awardees

**Complete EiE training AND earn credit!**

**WHAT:** Engineering and Outdoor Environments: Excellent Educational Resources in STEM Featuring the Engineering is Elementary curriculum series

**WHEN:** 9am-3pm June 25 and 26 and via webinar in August

**WHERE:** Roe Center 130 at Central College, Pella, IA. Some activities at Lake Red Rock

**WHO:** Offered in partnership with the Army Corps of Engineers, Grand View University’s Jacobson Center for Innovation in Education, Central College’s Center for Community-Based Learning, and the 3M Visiting Wizards

To sign up: [CLICK HERE](#) and type in Heartland Activity #: 

https://ui.constantcontact.com/visualeditor/visual_editor_preview.jsp?agent.uid=111743458306&format=html&print=true
Women in Math and Computer Science is one of Drake's newest groups. They hope to take the Hour of Code into metro schools, giving students an introduction to computer coding.

**Year-end iExplore Festival Features**

**Drake's Hour of Code**

Computer coding is getting a lot cooler thanks to Drake's newest club: Women in Math and Computer Science (WiMaCS). The club's mission is to pull more women into these academic areas, but group members are quickly becoming role models for both females and males interested in coding. They hosted their first event, an Hour of Code, on May 10, from 10-11AM.

During the hour, students worked on a website that teaches coding through video-game scenarios. To move up levels, students must master certain coding skills and language. After the hour, the club hosted a snack and encouraged students to introduce themselves.

The club began through student interest. Meredith Moore, a Drake junior, had an internship at another school. That school's WiMaCS chapter took in all of the interns. "It was a great community builder, and I wanted to bring that same feeling back to Drake. Our mission is to promote the community, social

**Meet NHS’s Abby**

Abby Espinosa-Gonzalez Bellolio is a junior at North High School, where she involved in many activities, from Student Council to orchestra to track.

She serves as a great role model to students across the state and believes everyone has the possibility to make a positive change in the world.

"I encourage every student to dream big," says Abby, "and understand that the sky is the limit. That, no matter what situation they are experiencing, with hard work and perseverance they will accomplish everything they set their mind to."

She's also very involved with STEM education. This year, she participated in the District and State Science & Technology Fair of Iowa and NASA Explorers. She even earned the opportunity to travel to Florida this summer and present her project on Testing the Viscosity of Nutritional Supplements at NASA!
and professional development of women in computer science."

Dr. Tim Urness, Drake computer science professor and WiMaCS co-sponsor, said, "I think young girls have a negative stereotype around computer coding. It's important to get them interested early, so they don't close down that academic path."

Next year, the club hopes to host more Hour of Code festivals and take their knowledge out into the schools. Dr. Deborah Kent, Drake math professor and WiMaCS co-sponsor, said, "The students are really interested in mentoring, and they're looking forward to the fall. Our goal is to expose as many people as possible to coding."

According to US News, the average computer programmer makes $80,000 a year, and the field is growing for both women and men. "It's an empowering idea that you can give a machine instructions and it will do it," says Kent.

Looking for a way to learn coding this summer? Kent suggests visiting: [http://www.codecademy.com](http://www.codecademy.com).

Meredith Moore, in blue, drove the initiative to start Drake's Women in Math and Computer Science Club. She hopes to create a sense of community within the college departments and inspire young people to consider these academic areas.

Collins-Maxwell's Hyperstream Team: Small but Mighty!

In the future, she hopes to become a chemical engineer. She credits much of her success to NHS teachers. "Mr. Ch and Mrs. Spencer have motivated me and helped shaped my goals in a major way," says Abby.

She has this advice to offer other kids who are interested in STEM activities: "Dream big and surround yourself with positive people. When you put in the effort and work hard, anything is possible."

With so many accomplishments at such a young age, it's easy to see that, indeed, anything is possible for Abby.

Be a STEM Mentor!

Drake sophomore, WiMaCS member and computer science major Katie Roth says, "You don't have to be the stereotypical math student. I did nothing computer science related in high school, and now I really like it."

STEM Needs You!

Why do Drake professors Dr. Deborah Kent and Dr. Tim Urness volunteer for STEM?

Their students, math and computer science majors at Drake, want to reach out to K-12 schools. "The students are really interested in mentoring," says Kent. "Drake's Hour of Code is a way to do that."

If you'd like to mentor, visit STEM's
Richard, a sophomore and Robotics programmer, is involved in five spring activities, but makes time for Hyperstream. "I plan on becoming an engineer," says Richard, "so this will help me gain experience with that."

At Collins-Maxwell High School, students have to be hardworking and willing to participate in lots of activities. With only 120 students in grades 9-10, many balance academics with sports and clubs, including the school's Hyperstream Team. Right now, four students compete on the Robotics team and three on the Multimedia team.

Cherrine Bates and Jon Aldrich sponsor Collins-Maxwell’s Hyperstream team. Aldrich is in his second year as the adviser and spends a minimum of four hours a week after school. "I enjoy watching what the students do and seeing them develop from a creative aspect," he says.

For example, the Multimedia team developed a website for the school's speech club. Austin, a junior, works on the website. "It's awesome," he says.

Looking for summer curriculum
Check out materials through the SC STEM Hub's Library!

The Skimmer Kit was a great draw at SCI's Girls in Science Festival.

Details: Materials may be checked out for 6 weeks. They can be picked up and returned at Drake University's School of Education. Please replace any consumables you use.

Note: Some kits require teacher training.

If you're interested, please email Sarah Derry at: scstemhub@drake.edu

Kits, Equipment and Guides
K-6
* Windmills
* Patterns All Around
* Engineering Inspired by Nature
* Jettoy
* Skimmer
* Straw Rocket
* Gravity Cruiser
"I absolutely love technology, and I want to go into software design for a career."

So, how does such a small team pull together such great results? Dustin, a junior, explained that every person in the group is important. "We have separate jobs. I'm the designer," he says.

This team is open to everyone. "One of the coolest parts," adds Aldrich, "is that they know more than I do. They're teaching me and each other more than I teach them." And that's ideal for this student-led club.

Dani (right), a senior, conducts any research needed for the group. "I've always found pleasure in finding information and summarizing it." Those skills will come in handy, as her future plans include a degree in psychology that crosses into law enforcement.

Play Dough Collides with Science in Pam Heward's Classroom

6-8
* Gears
* Fuel Cell
* Glider

9-12
* Light Sensor
* Motion Detector
* Labquest 2
* Voltage Probe
* TI Light Probe
* Temperature Probe
* pH Sensors

Educator Books and Materials
K-5
* Sally Ride Science Program (space)
* Designing Knee Braces
* Designing Bridges
* Designing Water Filters
* Designing Walls
* Designing Plant Packages
* Designing Maglev Systems
* Improving a Play Dough Process
* Replicating an Artifact
* Designing Alarm Circuits
* Designing Lighting Systems
* Cleaning an Oil Spill
* Designing Submersibles
* Designing Parachutes
* Evaluating a Landscape
* Designing Model Membranes
* Designing Hand Pollinators
* Making Work Easier
* Seeing Animal Sounds
* Safe Removal of Invasive Species
* Engineering Bubble Wands
* Family Science
* Push, Pull, Go
* Student Notebook Blank
* Plant Growth and Development
* Motion and Design
* Soil
* Sound
* Ecosystems
* Changes: liquid, solid, gas

7-12
* Exploring the Nature of Light
* Studying the Development and Reproduction of Organisms
* Exploring Plate Tectonics
* Exploring the Properties of Matter
* CASE Training Notebook

NSTA Teacher Resources:
* The Case for STEM Education
Twice a week, second graders in Pam Heward's classroom look forward to their hands-on science class. Heward was awarded an Engineering is Elementary Scale-Up, and the kids are hard at work "inventing" the perfect play dough recipe.

"Students love it," says Heward of the hands-on approach. She adds that this project works with all levels of learners.

In small groups, students create various batches of play dough, some high-quality and some low-quality. Once they make two test groups, the building begins. Today, they're working on a snowmen.

"I like that we get to play, but it's also how a real chemical engineer works on things," says Owen.

Besides building, students engage in class discussions, group decision making and recorded observations. "I can tell this is high-quality," says Jade, "because it's not falling a part."

By the end of class, students have an understanding of the engineering process and a snowman sitting in the middle of their small groups. And a few of them ask when they'll get to work on their play dough project again.

Inspiring STEM

* Meet North High School's STEM Champion

John Chai
Chai's student, Abby, is featured in the right side column. She credits Chai (pictured in the center with Governor Branstad and Lt. Governor Reynolds) as an important influence in her STEM success.

John Chai teaches science classes at North High School in Des Moines, Iowa. He's also a member of the SC STEM Hub's Advisory Board. Chai's influence and interest in education reaches well-beyond his own classroom. Here's a recent interview with one of Iowa's premier science teachers.

Q: Why is it important for students to have a solid STEM education?

A: Not all students will become scientists and engineers, but it's important for all students to have a quality STEM education. No matter their career choice, STEM literacy enhances their lives. To have an understanding of scientific concepts and processes is to have an understanding of the world around you. To be able to think like an engineer is to have the ability to problem solve.

Not all students need to be able to solve Coulomb's Law or have the steps of the cell cycle memorized, but to be able to solve problems, think critically, and make informed decisions within our STEM-immersed world is a necessity.

Q: What can teachers do to promote this type of learning?

A: To promote this, teachers should always keep an eye on the big picture. Having the ability to solve a problem, find an answer to a question, or apply knowledge to a new situation is much more useful than the ability to recite Newton's Laws of Motion. People will get through life just fine without having memorized the order of the planets, but they won't without the ability to think.
June 9-13 FREE! Climate Change and Ag Workshop, ISU
June 23-25 TI-Nspire Workshop, Johnston High School
June 25-26 Engineering and Outdoor Environments, Pella
July 7-10 AP Summer Institute, UI
July 14-17 STEM Innovation and Entrepreneurship, UI
July 20 IMPACT Middle School, UNI
July 21-25 Engineering Design for K-12 Sci Classroom, UNI
Aug 17 STEM Day at the Iowa State Fair, Des Moines