

South Central STEM Hub Newsletter

**GREATNESS
STEMS
FROM IOWANS**

Drake
UNIVERSITY

SOUTH CENTRAL IOWA REGION GOVERNOR'S STEM ADVISORY COUNCIL



Governor Terry Branstad visits Greenwood Elementary School students during a press conference to launch the new STEM logo and branding. Katie Pilcher, second grade teacher, leads the windmill experiment.

Governor Launches New STEM Logo and Public Relations Campaign



Governor Terry Brandstad launches the "Greatness STEMS from lowans" campaign

Governor Terry Branstad launched STEM's new awareness campaign at Greenwood Elementary School on December 9. Aimed at providing information and increasing interest in the areas of science, technology, engineering and math, Branstad noted only 26 percent of all Iowans know what the acronym means.

"In the real-world," said Branstad, "our youth will need to solve problems that don't come with answers,"

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Visit Robot Bell Ringer as Grateful Team Gives Back

at Greenwood Elementary School in Des Moines. Principal Eric Huinker, teachers and students celebrated the event.

Branstad has enlisted the help of Pinterest creator, Ben Silbermann, who will appear in upcoming marketing ads. The program includes

billboards, t-shirts, tool kits, logos, public service announcements and public relations materials. Branstad said the campaign "will help all Iowans become more STEM literate students."

In an economy where 80 percent of new jobs fall into STEM-related fields, Branstad said he's "priming the STEM career pipeline." He said that currently there are 10,000 unfilled STEM-related jobs in the state.

The governor's initiative to fund science and math scale-up programs makes sense for Iowa's students, communities and businesses. He said that currently, there are 10,000 unfilled STEM-related jobs in the state. Under Lt. Governor Kim Reynolds, the STEM Advisory Council has worked over a year to address these issues.

In the first year, 38,000 students benefited from the initiative's programs. This year, over 100,000 students will be impacted, and Branstad hopes that number will continue to grow. "Iowa has become a national model for STEM programs," he added.



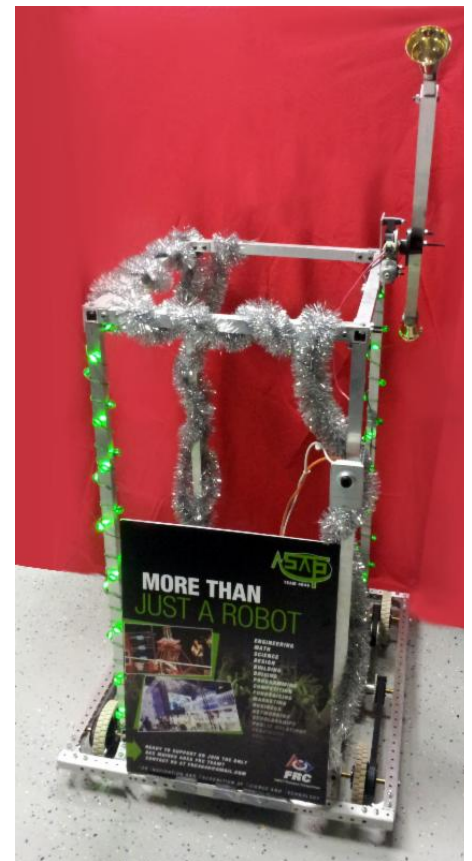
With money from a STEM Scale-Up Grant, Greenwood students study engineering by testing how much weight in bolts their paper designs can carry.



SC STEM Hub's coordinator and Iowa native, Dr. Sarah Derry, spoke about area STEM successes and the Council's hopes to reach students across the state.

Greenwood Elementary, a STEM Scale-Up Grant recipient, hosted the event. "Greenwood implemented Engineering in Elementary in one classroom in first through fifth grades last year," said SC STEM Hub Manager, Dr. Sarah Derry. "This year, they trained an additional 12 educators in the curriculum. Scale-up money provided sub-pay for six of those educators. Greenwood financed the others, spending school money on STEM programming. That's an important step toward long-term sustainability."

The state is specifically looking for ways to include more real-world experiences, encourage girls and minorities to participate and develop STEM opportunities in rural areas. Because, as Branstad stated, "We're all in this together."



WHEN: Saturday, December 21

TIME: 8AM - 12PM

WHERE: Merle Hay Mall, Des Moines
Sears inside entrance

First Robotics Team, ASAP 4646, will give back to the community who supports them with donations, so the team will be bell ringing for the Salvation Army at M Hay Mall.

So what makes this event special? The ROBOT will be RINGING THE BELL! If you're out and about, come visit this team.

Volunteers Needed

Please help the STEM Council select next year's Scale-Up programs!



NEW VIDEO!: "Greatness STEMs from Iowans"

This video and other media pieces not only teach the acronym for STEM, but also share the important message that much of Iowa's future success depends upon these areas of study.

STEM Happens

STEM Teacher Champion: Linda Urbas

A few days each week, Linda Urbas begins her day at 7am and goes home around 9pm. During the hours in between, she teaches 7 periods of 6 preps; sponsors Science Club and a competitive VEX Robotics team; takes care of a tarantula, mouse, turtle, guinea pig, and fish tank; and writes grants in hopes of filling her students' minds with the wonder of science.

Why does she do all this? To teach her Melcher-Dallas 6-12 grade students how to love learning. "I know our education system has not always been what the students need," says Urbas. "They need to learn how to learn, and high achievers like to learn."



We need at least six individuals from each region to help evaluate proposals from service providers who would like to be a STEM Scale-Up program for the 201 fiscal year.

Please consider volunteering.

We ask that evaluators commit approximately **5 hours** of time between January 23 and February 24.

- 1 hour (or less) for a **webinar** to discuss the evaluation process (January 24, then archived and available online)
- 4 hours (approx.) to **review and score** proposals (completed individually)

Review timeline:

- * **January 1** -- all potential volunteer evaluators must have expressed an interest by this day
- * **January 20** -- deadline for service providers to submit proposals
- * **January 23** -- evaluators notified of assigned proposals
- * **January 24** -- Webinar to discuss the evaluation process with evaluator volunteers
- * **February 10** -- Deadline for evaluators to submit proposal scores

The South Central region needs **at least one individual** from each of the following stakeholder groups:

- Business
- Informal Education
- K-12 Formal Education
- Faculty/Higher Education
- Local Government/Elected Officials
- Parent



Linda Urbas, Melcher-Dallas dynamo, answers a group's question as they calculate the energy consumed by a student-designed home.

Scale-up Grants: Urbas has earned several scale-up grants from the SC STEM Hub over the past two years: Project Lead the Way, A World in Motion, KidWind and the Carolina curriculum. Her classroom is a busy bee hive of hands-on learning. Urbas even reaches across the hall to form interdisciplinary units with the language arts teacher, who instructs how to read a textbook, and the math teacher, who provides a vocabulary for data and graph interpretation.

Urbas says how lucky she is to be in a small rural school. She knows every student by name and eats lunch with a majority of the teachers. Still, she wishes for more collaboration time. She's the only full-time science teacher in the district.

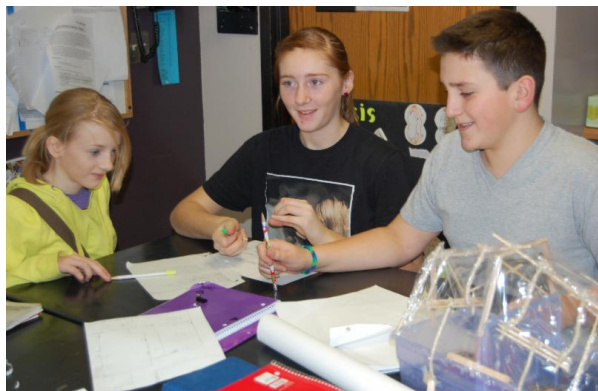
A Typical Friday Morning: Urbas greets students as they file into her

room. During second and third periods, classes work on a unit called *Investigating Circuit Design*. They collaborate in small groups to come up with a dream-house floor plan, assess where the most energy is used, and devise ways to track energy use in their own appliances.



Each student drew a circuit plan of his or her house and then combined their own homes into a dream house. Most of those dream homes added a media room and swimming pool.

"This year science is a lot more fun," said Neil, a seventh grader. "It's more work, but better. It doesn't really seem harder, but it might be."



During fourth period Project Lead the Way, eighth graders discuss the difference between precise and accurate measurement. Then they get into groups, select 10 different items in the room, get assigned an instrument of measurement, measure those 10 items and record their individual results.

NOTE: Evaluators should not be affiliated with any current or proposing Scale-Up programs. This is to avoid any potential conflict of interest.

Evaluator volunteers will shape the future of Iowa STEM! Please email Sarah Derry at sarah.derry@drake.edu by January you are willing to volunteer.



Technology Scholarships for 2014 Graduates

Students who will be enrolling in an Iowa community college, university, or college next fall in a tech-related program are invited to apply for one of NINE \$1000 scholarships.

Note that active HyperStream students be given bonus points.

For more information, contact Tamara Kenworthy at tamara@technologyiowa

Make Learning Come Alive!

Students choose which home appliances they will study for run-time information. Some were faced with the challenge of measuring a

wall of windows with small calipers, while some measured a swimming fish with a yard stick. During the next lesson, students will compare measurements and decide which tools were most effective for which items.

"I like learning this way," said Mercedes, an eighth grader. "It's difficult, but better than doing a typical assignment."

Urbas's excitement about science and learning is contagious. "The best thing we have here is a close relationship with students," says Urbas. "Students need to learn how to learn in a way that's best for them." And the philosophy seems to be working. In an informal survey of students, it was unanimous: everyone looks forward to science class.



The SC STEM Hub has a curriculum library of kits and materials that area educators can checkout!

Kits, Equipment and Guides

K-6

- * Windmills
- * Patterns All Around
- * Engineering Inspired by Nature
- * Jettoy
- * Skimmer
- * Straw Rocket
- * Gravity Cruiser

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 Solar Ovens
- * Designing Lighting Systems



Fourth period students learn about accuracy versus precision. Then they test the concepts by measuring objects around the classroom. From waste baskets to windows--every millimeter matters.

Science Fridays in Ms. Innis' Kindergarten



Kindergarteners at Norwalk's Oviatt Elementary school learn that retesting is important when conducting an experiment.

Josie Innis knows this: you're never too young to study science, and her kindergarten class at Norwalk's Oviatt Elementary does just that every Friday. With the help of an SC STEM Hub grant for A World in Motion's *Rolling Things*, students learn about distance and weight.

"Science is the most natural focus in a classroom," says Innis. "I have never met a child who wasn't curious about learning something new."

Innis found time for STEM on Friday afternoons. "I always try to use [extra time] for a science/math/problem solving opportunity and connect that to our language arts program. The ELA program doesn't drive my thinking; problem solving and higher order thinking skills do."

So what do Fridays with Ms. Innis involve?

Predicting:

The unit began with students making predictions on which of the three cars they tested (a sedan, convertible and truck), would push a crash box located at the bottom of a ramp the farthest.

Testing:

Students then conducted their own tests, and the class concluded that the truck pushed the crash box the farthest.

Reporting:

Students created a histogram to summarize the class prediction for which vehicle would push the crash box the greatest distance. Each student selected a sedan, truck, or convertible sticker to add to the appropriate histogram column.

Reviewing:

Dr. Jack Gittinger, a community volunteer, facilitated a repeat test. They discussed the importance of doing more than one trial to have good

- * 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
- * Everyday Engineering
- * Exemplary Science for Building Interest in STEM Careers
- * Integrating Engineering + Science in Your Classroom
- * Introduced Species
- * Teaching Science in the 21st Century
- * Teaching Science in the Two-Year College
- * Technology -Based Inquiry for Middle School
- * Technology in the Secondary Science Classroom
- * STEM Student Research Handbook

THE FINE PRINT:

- Kits may be checked out for 6 weeks.
- All consumable kit materials must be replaced by the educator.
- Prior to classroom use, some kits require teacher training.
- If you're interested in these materials, please email Sarah C at: scstemhub@drake.edu

data. "Engineering and Technology are the *applications* through which we can teach Math and Science," said Gittinger, a science and education professor at Simpson College, the director of GeoGebra and Innis' husband. Another bonus: AWIM offers a 25 percent discount to educators who find a community volunteer.

Extending:

Students made predictions on which ramp height influenced crash box impact most, and Mrs. Innis created another histogram to summarize the class predictions. They tested how far the truck pushed the crash box when released from the top of the ramp.

Ms. Innis hopes to foster curiosity and a love of learning. "As a lifelong learner," she said, "I don't let my lack of competence stop me from trying new things. I do have a passion for science and that gives me confidence... It doesn't bother me to tell my kids I don't know something. That we can learn together what we want to know."

And what better way for these kindergarteners to learn how to be lifelong learners than to see it modeled by their teacher.



Ms. Innis' class records results on a histogram.

Cowles Students Shine at Science Fair

SCI of Iowa Job Opening VP Science Learning



SCIENCE
CENTER
OF IOWA
& BLANK IMAX
DOME THEATER

The Vice President Science Learning is an integral part of SCI-Iowa's growth and will play a key role in defining the future of the organization and advancing STEM learning programs for all audiences.

For details visit:

<http://www.sciowa.org/about/employment>

On solid ground with STEM Volunteers



Thanks to Dr. Jack Gittinger's volunteer efforts, these kindergarteners work with a college science professor. In addition, the school received a discount when purchasing curriculum materials.

STEM needs you!
Want to share your skills and story
your community?



This seventh grader's project looks at the alternative of using corn husks instead of salt to maintain icy roads and sidewalks. "The salt gets into the environment and water systems. It's a real problem." While the corn husk solution didn't work as well as salt, she's not deterred. "I'm going to continue to look for other options."

Inspired by family experiences, the desire to make a difference, classroom topics or natural curiosity, students participating in the fourth annual Cowles Elementary Science Fair proved great scientists come in all sizes. Beginning in kindergarten and continuing through eighth grade, every student in a building is invited to participate in this special day.

Heather Anderson, first-third grade looping teacher, coordinates the event. "I went to another school, saw their science fair, and thought: we can do that. I'm always looking for opportunities for our kids."

Once a student has an idea, he or she poses a question, researches the topic, forms a hypothesis, performs scientific testing, develops a conclusion and suggests further study.

But the project doesn't end there. Students then create a visual detailing their work and present their project at the science fair. Participants are evaluated by community judges.

Primary classes feature simpler projects with crayon-written titles and photographs. "I say start as young as you can," says Anderson. Older students have projects so sophisticated that they relate to a career area they wish to pursue. One student interested in medicine tested how quickly bacteria became resistant to antibiotics.

Go to the [SC STEM Hub website](#) and click "Find a Scale-Up near you!" the list of schools awarded '13-'14 Scal Up programs. Contact a school in your community to see how you can help.

You will also find a calendar of STEM events and other ways to get involved!



The scale-up program Defined STEM is available to the entire South Central Iowa Region.

This online resource provides common core standards-aligned performance tasks, literacy tasks, and real-world video to enable students to see the relevance of what they are learning.

Defined STEM is available to formal and non-formal educators in South Central Iowa.

To obtain your unique login and start using this resource, contact Brad Furber at brad_furber@definedlearning.com

Spread the word about STEM EVENTS in your community!



Visit the South Central STEM [Calendar](#)

After participating in this science fair, Anderson said, "I want students to have a really good understanding of the scientific method and see the world through a more scientific mind. That is my hope."



The best projects from Cowles go on to compete at the district level.

[To submit your STEM event, click here!](#)



Events

Happy Holidays from the SC STEM Hub!
Don't miss these events in the New Year:

- Jan 20 [SC STEM Advisory Board Meeting](#), Johnston
- Jan 20 [5PM Deadline for Service Provider Proposals](#), Online
- Jan 25 [NGSS and Environmental Ed Seminar](#), Ames
- Feb 13 [State Advisory Board Meeting & STEM Day](#), DM
- Feb 24 [ELA Scale-Up Applications Open](#), Online
- Mar 11 [iExplore Festival](#), Ottumwa
- April 1 [iExplore Festival](#), Pella
- May 2 [Deadline for LEA Scale-Up Applications](#), Online

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