The STEM Story

Welcome to our report on the 2015 Summer STEM Institute. A special thanks to KSU’s Dean Mercer and C&I Department Chair Todd Goodson and Manhattan-Ogden USD 383’s Carol Adams, Chris Herald, Larry Liotta, Deb Nauerth, and Duke Harmon. We also want to thank our generous donors who helped make the STEM institute a possibility for 40 USD 383 students and 40 KSU COE students. Without their support, the Institute would never have happened.

~Lori Goodson

For the fifth year, Manhattan-Ogden USD 383 School District and Kansas State University’s Curriculum and Instruction Department in the College of Education teamed up to provide the STEM Institute, funded through a $1.7 million U.S. Department of Defense Education Activity Grant to USD 383. Held June 1-27, STEM involves middle schoolers attending a variety of STEM-related classes in the College of Education’s Bluemont Hall and other campus buildings. Additionally, KSU COE Core Teaching Skills students get teaching experience by assisting with the classes.

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Here are some of the key numbers from the Institute:

- 54 KSU secondary education students (from 12 content areas) participated. Music, 16; Social Studies, 10; English, 6; Agriculture, 6; Chemistry, 5; Math, 3; Business, 2; Art, 2; Biology, 1; Modern Languages, 1; FACS, 1; and Physics, 1 (compared to 28 students last summer).
- 2 weeks of intensive “front-loading” of Core Teaching Skills content to allow for...
- 4 weeks of uninterrupted classroom time with the middle-school students.
- 348 USD 383 students participated (compared to 305 students last year).
- 26 USD 383 teachers and administrators helped lead the program.
- 8 hours of quality planning time between the KSU students and the USD 383 teachers.

By the Numbers

<table>
<thead>
<tr>
<th>Classroom</th>
<th>Class</th>
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<tbody>
<tr>
<td>BH 107</td>
<td>Outdoor Biology</td>
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<td>BH 108</td>
<td>GPS</td>
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<td>BH 111</td>
<td>Monster Storm</td>
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<td>BH 112</td>
<td>Need for Speed</td>
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<td>BH 123</td>
<td>Science of Sports</td>
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<td>BH 217</td>
<td>3D Printing</td>
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<td>BH 225</td>
<td>Wind Energy</td>
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<td>BH 242</td>
<td>Solar Construction</td>
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<td>BH 256</td>
<td>Electronic textiles</td>
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<td>BH 257</td>
<td>Roller Coasters</td>
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<td>Justin 115</td>
<td>Chemistry of Candy</td>
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<td>Trotter Hall 301</td>
<td>Vet Med</td>
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<tr>
<td>Shellenberger 311</td>
<td>Hollywood Science</td>
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<td>Shellenberger 301</td>
<td>CSI</td>
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<td>Shellenberger 204</td>
<td>Flour, Food, and Fido</td>
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<tr>
<td>Seaton 254H</td>
<td>City of Minecraft</td>
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<tr>
<td>Nichols 122</td>
<td>Mission to Mars</td>
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<tr>
<td>Nichols 128</td>
<td>Video Game Design</td>
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</table>
Circles, in which students shared successes, their own learning moments, and concerns. It was apparent through these Socratic Circles that the students enjoyed the opportunity to learn in a true classroom. They made comments about how impressed they were that their cooperating teachers could respond to a variety of classroom situations quickly and calmly. They spoke of how they were able to make connections with students quickly and how a simple visit with a student can mean so much.

And, as evidence of their dedication to teaching, in a power outage where, due to the circumstances, the KSU students were dismissed, nearly all of them came back voluntarily once power returned to the building to help teach their classes.

KSU students completed two weeks of Core Teaching Skills instruction, followed by four weeks of field experience helping teach a variety of courses to students in grades five through nine.

Additionally, they met with Core instructors Lori Goodson, Amanda Lickteig, and Kaylee Myers throughout the month of June. On Tuesday and Thursday mornings throughout their field experience they met to stay updated regarding projects, such as the portfolio, and to provide opportunities to share their classroom experiences. Fridays, when the Manhattan-Ogden USD 383 students were not attending classes, the KSU students met with their Core instructors. They also worked in two micro-teaches per team of three or four students.

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KSU Students Benefit from Core Class, Intensive Field Experience

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Our COE/383 Family Recipe

Here’s how to create a successful institute:

54 KSU COE Students
348 Manhattan-Ogden USD 383 Students
26 USD 383 Teachers/Administrators
1 KSU Faculty Member
2 Graduate Students
10 COE Classrooms
1 (unexpected) Power Outage

Combine all ingredients. Mix well. Add a few dashes of fun, curiosity, and excitement.
Thanks to generous donors, KSU COE offered 80 scholarships: 40 $200 scholarships for KSU students taking the Core Teaching Skills course and 40 $50 scholarships (half the cost of the STEM Institute) for Manhattan-OgdenUSD 383 students in grades 5-9 (5th grade, 4 scholarships; 6th grade, 16; 7th grade, 12; 8th grade, 6; and 9th grade, 2). Here are some examples of narratives they wrote for their application.

Donors Support Our STEM Project

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I want more information so I have some stuff to tell my classmates and have a lot of fun. I also want to learn more about Tech. I also enjoy seeing all the students on campus. I think they are a great role model for me, and I can see my college in 15 years.
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Imagine a little kid holding a screwdriver and a hammer taking apart old desktop computers at his father’s office over the summer. Unable to fix these behemoths, the boy is undeterred. Goes home to watch the discovery and science channels. The kid you are thinking of was me when I was about six years old. This is similar to many of my summers in some ways. While exploring on my own was fun and sparked my curiosity I look forward to learning with others in the summer STEM program. So naturally I have developed interest in many of the attributes of STEM topics. For my career path I would like to become an engineer, preferably a nuclear engineer.

I was just starting to think, yeah only 7 weeks of school left! Then I saw the STEM program topics and instead I was excited to have another 4 weeks of class in the summer through this opportunity. STEM Courses, such as 3D printing and Drone Technology are really interesting and could be helpful in further developing my curiosity. Opportunities such as this expand my knowledge, but are also valuable in finding my interest in these fields.
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Hello! My name is (name redacted), and I would like to attend STEM because I am really interested in the things they teach there. I am in 9th grade, and my favorite thing to do is to build the NXT robot. One time I built a car with a catapult mounted on top from complete scratch. Then I programmed it to go through an obstacle course. I also think that with the technology of the 21st century the skills you learn there will apply and be useful to me because my dream career is to become an engineer.
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I am applying for this scholarship because I did the STEM program last year and I really enjoyed it. My favorite week at STEM was the week I did robotics. I love engineering and technology because they are my favorite subject is science. I also believe that women need to be more involved in the STEM careers. So when I’m older I hope to be an engineer or a computer scientist. Thank you for your time and considering me for the scholarship.
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My favorite class is LA. I am looking into being a vet so I need to take some science classes. I also want to look into other options as well. I don’t know what engineering, but my dad challenges me to learn something new every day and this will help them.

(My mom wants me to do something nutritional!)
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I would like to attend this STEM program because it is an opportunity I have never been to a camp with so many activities. I have never been to a camp with so many activities that I was sitting on the couch watching TV. I could be doing this camp having fun instead. It’s also fun that I am going to be an engineer because there is going to be so many different people from all kinds of schools and I can go to more social fun coming from this camp because I am going to make a lot of new friends. I also think that the best activity because it would be so much fun to investigate. My favorite lab was watching the show and finding the electricians. I picked it because it was fun and easy, and I love animals. My favorite thing about this activity is that we get to visit a vet, see what they do, and do real lab experiments. This is why I want to attend this camp.
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During an incredibly informal ceremony in front of her summer Core students, GTA Amanda Lickteig (ABD) received the KSU COE Outstanding Graduate Teaching Assistant Award from Dr. Goodson. Amanda, who was unable to attend the official award ceremony, completed her second summer of STEM. She was a key piece in the success of the KSU portion of the institute. She has accepted a position at Emporia State University, which she will begin in August upon successful completion of her dissertation. We will miss her, but we are grateful that she has helped train her “replacement,” Kaylee Myers, who is a great addition to the KSU STEM team.