A Message from Science Foundation Arizona

Science Foundation Arizona is honored to be working side-by-side the seven programs selected as Helios STEM Schools. This program’s key premise is that STEM education is an integrated, interdisciplinary approach to learning that provides problem-based and relevant experiences for students. Ultimately the initiative will support the successful implementation of Arizona’s College and Career Ready Standards and the anticipated Next Generation Science Standards.

Now in our second year of the program, we see each school or district transforming its approach to STEM education in a way that addresses its particular needs and builds on its unique advantages. These programs are already showing signs of becoming STEM models that can be used statewide. In each newsletter the schools describe their progress and share lessons learned, expressing appreciation to everyone contributing to the programs’ successes.
On February 20, 2015, twenty-two Intel engineers visited Barcelona Middle School to take part in the 14th Annual Intel Engineering Day.

The Intel engineers, led by Monty Carson, Intel Business Manager, visited every 4th – 8th grade classroom at Barcelona Middle School. In each class they did a presentation on engineering and the importance of pursuing a college degree. The engineers also led students in an engineering design competition where the students designed and built miniature clay boats. The boats had to be constructed to hold as much mass as possible. To measure the mass, the students used pennies, which were later donated to the Foundation for the Future Penny Drive. Later in the event, three students from each classroom participated in an egg-drop competition and the Barcelona students had lunch with the engineers. All in all, over 650 students participated in the event and all had a great time. It was an outstanding day of developing future STEM professionals.

The Intel Corporation and the Alhambra Elementary School District have had a long partnership to promote the field of engineering, the importance of attending college, and the problem-solving processes that are the core of the engineering profession. This relationship also includes a financial donation each year as Intel matches the volunteer hours their engineers put in with funds donated to help further STEM education in the Alhambra Elementary School District. In the past, this event has been held at numerous other schools within the district including Catalina, Cordova Middle, Granada East, and Montebello.

Barcelona Middle students and Intel engineers look on as egg drop competition is underway.
Altar Valley School District
Kathryn Zanin, STEM Coordinator

Over the past few months the teachers in the Altar Valley School District have been trained to use a specialized writing program presented by the Clark Consulting Group. Part of the writing process teachers are learning consists of a four-frame model in which teachers identify four sequential pictures to be used in the creation of a paragraph related to the topic illustrated. Teachers are using science ideas and concepts as their springboard for identifying pictures. The use of the four-frame model has increased students’ ability to write an effective paragraph.

In addition, in January teachers continued to explore how they might incorporate more STEM activities into their FOSS kit lessons. Teachers collaborated with their teacher teams and STEM Coordinator to increase the rigor and relevance of science concepts being taught across all grade levels PK through eighth grade.

Finally, as part of their dedication to continuing their understanding of STEM, five teachers and two administrators attended the annual Math Educators Appreciation Day (MEAD) sponsored by the University of Arizona’s Center for Recruitment and Retention. The day was filled with engaging hands on math lessons presented by practicing classroom teachers. When asked about their experience at the MEAD Conference, Sarah Key a 4th grade teacher said, “It was great! I brought back lessons which I was able to implement into my STEM unit right away.” Similarly, first grade teacher Anna Rodriguez beamed, “The MEAD conference was very fun yet informational! The classes that I attended had hands on activities that applied to my grade level(s). Some classes even gave out materials to take back to class to use in a lesson. For example, one presenter gave out magnetic pattern blocks and went over how to create word problems for students to solve with the blocks. I cannot wait to try using the magnetic pattern blocks with my third grade tutoring class!” Jane Adams a third grade teacher said, “I wished the conference was longer. Everything I learned was useful and could apply to my STEM lessons.”

Overall the past two months have been a time of growth and reflection for our teachers as they experience and apply new learning to their STEM units.
There have been so many exciting STEM events going on in Bagdad School District these past few months. This article provides a sample of the STEM activities going on in Bagdad School District.

**Pumpkin Chunkin**
The high school competed in Mortimer Family Farm’s annual ‘Pumpkin Chunkin’ competition in Dewey, Arizona, where they won first place for longest distance and best design. Two CTE instructors, Mr. Rotteger and Mr. Rose facilitated the design, build and fabrication of two amazing trebuchets. Mr. Rose’s class engineered and constructed a post and beam counterweight trebuchet that won best design, while Mr. Rotteger’s class fabricated a floating arm trebuchet that won longest distance.

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**Arizona State University Discover-E Day**
*By: Naina Misra – 6th grade student*

On February 6th, 2015, a group of freshmen, sophomores, and myself went on a field trip to ASU for Discover-E Day. After a 3-hour long trip, we finally arrived at the ASU Technological Innovation building. There we went to a science convention in the Cooley Ballroom, featuring many new inventions and ideas created by some of the students of ASU, including a hover-bot and a computer-controlled air-filtering device. After that we went outside and saw trebuchets launch basketballs into the air. We made mini cars out of empty water bottles, and we saw a couple of other really interesting activities. Tech 101 was probably the most interesting part of the day, since we experimented with light and sound in photography, and saw the room through an infrared camera. A couple of students even tried out a few very interesting things, such as walking on the floor with no shoes, leaving warm footprints on the carpet, and finding out clear glass is opaque in infrared light. After Tech 101, we started to head back home. All in all, it was a really interesting day, with more than a few new “Discover-E’s”.

**Aviation Academy**
Bagdad’s sixth grade teacher Mr. Milton has started an after school Aviation Academy. As he explains, “We plan on training with Microsoft Flight Simulator Software, constructing and flying a radio controlled aircraft, and launching water powered rockets. The Aviation Academy will finish with a field trip to Embry Riddle Aeronautical University in Prescott, Az.”
Congress School District

Stephanie Miller, Superintendent

Hooray for Science, Technology, Engineering, and Math (STEM)! The Science Foundation Arizona Grant, with grant funding by the Helios Foundation, helps support five targeted areas in the Congress School District.

This is the second year of a three-year grant. And grant activities the past few months have included the following:

**After School Programs**
The STEM Club students, grades K-1, have completed the Lego Robotics Program for this year. Students worked on building skills and understanding in the areas of building, programming, sensors, and gears.

The STEM Drama Club students, grades 3rd through 8th Grades are working on developing their acting skills. We look forward to a “Journey through the Solar System” play performance in March.

**Voicethread**
Voicethread continues to be used in classrooms to document and support developed projects. In addition, certain classes have used VoiceThread to share video presentations to all classrooms on the subject of creativity.

**ST Math**
Congress Elementary School students continue to reach their pacing goals for syllabus completion.

**Defined STEM**
The creators of Defined STEM are supporting identified staff to present at conferences about shifting to a STEM culture and how Defined STEM supported the STEM cultural shift at Congress Elementary School.

**Other Grant Related Activities**
During the first week of February, the school hosted its first Preschool through 8th Grade STEM Family Night. Last year the school hosted a middle school STEM Night. This year, similar to last year, was a great success. Students in all grades were able to share what they have learned in the areas of Science, Technology, Engineering, and Math.
The past couple of months at Killip Elementary School have been busy and productive with a keen focus on professional development and community partnerships. Our grade-level teams continue to meet during our weekly “Collaborative Team Time” to review data, plan curriculum, and discuss instructional strategies.

On January 28th we hosted our Annual STEM Celebration for our STEM partners. Attendance at the event was diverse with representation from top-level Flagstaff STEM business/industry leaders, superintendents and board members from FUSD and the Coconino County education offices. In addition, members from Flagstaff’s STEM City executive board, Science Foundation Arizona, teachers from across the district, and families from Killip were all in attendance. At this event we presented on our success turning the vision from year 1 of the project into a reality this year.

This success includes the fact that we currently have all students at Killip engaged on a daily basis in integrated STEM units. By the end of year 2 all Killip students will spend at least 15 weeks in integrated STEM instruction. On average students at Killip receive 21 weeks of integrated STEM instruction and out of a 37-week school year, and our 1st graders spend 33 weeks learning to read and write through STEM content.

Response to our STEM event was very positive and has started conversations about what a STEM community is and what roles we all play in that idea. It also started a conversation with other FUSD Elementary schools discussing the different ways we all approach STEM. Having built solid processes and systems for designing curriculum we have turned our attention to increasing the rigor of our units. Through Northern Arizona’s Center for Science Teaching and Learning (CSTL) we have begun to explore the 5E Learning Cycle and the Buck Institute’s format for Project Based Learning. We provided a series of whole staff PD on 5E, PBL and the Educational Change process. We have since then engaged our 1st and 5th teams in grade level planning with coaching from CSTL. Our goal is to learn how to structure a STEM unit so that its overall scope and sequence includes a culminating project and that the individual learning activities within that unit align with that project, but also follow the 5E learning cycle.

Year two of our HSSP program has been both challenging and rewarding and we are eager to pursue progress in both the areas of professional development and community collaboration and partnership.
U. S. Interior Secretary, Sally Jewell, visited Salt River Elementary School on Tuesday, February 10, 2015. Secretary Sally Jewell visited Salt River as part of a ‘listening tour’ as part of President Obama’s plan to improve opportunities for Native American youth. The tour is part of the President’s Native Youth Initiative (Generation Indigenous) that focuses on removing barriers that stand between Native youth and their opportunities to succeed. The overall goal is to hear, directly from Native youth on how to strengthen federal policies to improve youth outcomes.

Salt River Elementary school (SRE) was honored to be one of two host schools the Secretary visited during her Arizona trip. Christopher Manual, a sixth-grader at SRE led Secretary Jewell on a tour. Some of Christopher’s highlights during her visit were his robot that he built with his robotic team and the new tablet lab that was purchased with a grant from Science Foundation Arizona. During her address to the student body, Secretary Jewell asked students what their favorite subjects were and students made it clear that STEM was at the top of their list of favorites. Way to go Salt River Elementary!!

*Stem Coordinator, Lynette Charlie takes a selfie with Secretary Jewell and her first graders.*

*Sixth grader, Christopher Manuel shows off the new STEM tablet lab to Secretary Jewell.*
An exciting new program is blossoming in Yuma School District One: iTEAM KiDS have begun training teachers in implementing technology.

As we have implemented the use of iPads and interactive whiteboards in our HSSP and other STEM initiatives, we have noticed that teachers need on-going, close-at-hand support for using technology. Many teachers are reluctant to try new applications without the assurance of immediate help when glitches arise. To meet this need, District Educational Technology Specialist Christa Fairman has organized and guided a team of students, third grade and up, at each district school. Funds from HSSP and other grants pay for a teacher at each school to meet with the iTEAM KiDS for two hours a week before or after school. The students have learned a variety of tech-related skills, such as coding, educational gaming, and using a variety of web-based platforms and iPad apps for creating lessons or presentations and performances to deepen and showcase learning in content areas and to develop digital citizenship.

On February 13, our iTEAM KiDS kicked off the all-day district-wide professional development day. Three teams of three students from each of the District’s seventeen schools made presentations at four sites, attended by teachers and administrators from across the District. Teachers then returned to their own campuses for additional training on blended learning. Teachers’ oral and written comments demonstrated the excitement and confidence generated by the student presentations. Teachers could all name some new website, app, or twist on their technology use that they were anxious to try. The general attitude was: “If the kids can do it, so can I, and now I know I have support.”

iTEAM KiDS student presentations were featured on the front page of the local daily paper, Yuma Sun; here is the web link: http://www.yumasun.com/news/teaching-tech-to-teachers-yuma-students-instruct-the-instructors/article_f1bec46c-bae1-11e4-bc79-6bc21f42099c.html

iTEAM KiDS are continuing to learn new tech skills so that they can be available during the school day to assist teachers throughout their schools with implementing technology in their classrooms. The district is actively negotiating with potential partners and developing grants to continue and enrich this successful pilot program in future years.