**Community Math Literacy Initiative**

**Milestone 02**

**Suggestions for Community Involvement**

Coordinated by Flagstaff’s STEM Consortium and Flagstaff Forty Educational Task Force

**Mission:**

Develop a community-wide response to increase mathematics literacy and achievement, specifically addressing student success in meeting grade level expectations in mathematics\* and exhibiting readiness for higher education mathematics courses.

\*In 2013, 68% of third graders and 55% of eighth graders in Flagstaff met grade level expectations in 2012-13.

[Arizona Daily Sun article summarizing the local schools performance on the 2013 AIMS exams](http://azdailysun.com/news/local/education/flagstaff-students-hold-their-own-on-aims-tests/article_8b1895b6-fad1-11e2-9f73-001a4bcf887a.html)

**Milestone Goals:**

1) Identify and clearly state the root causes of the poor performance.

*2) Determine cost effective and simple solutions that work with and enhance the existing education infrastructure. Also determine metrics that can be used to judge effectiveness of the solutions.*

3) Develop community support for the identified solution(s) and funding sources.

4) Implement the solutions.

5) Using pre-determined metrics, review impact of the solutions.

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Summary of Community-Centric Recommendations from January 15th Meeting, Consultation with Flagstaff Chamber of Commerce Education Committee and Other Sources:

Building Students’ Skills & Persistence:

* Math/STEM Camp:

By providing a learning environment for students who are struggling, as well as those who would like to improve their math skills, the camp could reinforce the foundation that students need for future success. In addition to reinforcing mathematical concepts that the students have already been exposed to, course work can incorporate study skills and practice solving word problems.

The camp could be housed at NAU and open to all local students. The activities would not be limited to mathematics and could incorporate traditional camp staples, with up to 50% of the time devoted to classroom learning.

The camp counselors can be high school students who are taking advanced math courses. The counselors can be good role models to the students, as well as aides in the classroom to the teacher.

The camp can be expanded to include lab experiments into topics that interests kids (biology, aeronautics, astronomy, etc…) and then a third portion that incorporates the mathematics behind the scientific field.

* Math Competitions:

Encourage classrooms to participate in contests that use challenging, but age appropriate, word problems. In order for students to learn persistence and analytical thinking, they need practice and an encouraging environment. Classrooms could earn activities – field trips, pizza party – by a certain percentage of students submitting answers and students who do well (defined by improvement, effort, correct answers) could earn recognition. The problems could be interdisciplinary, which gives exposure to scientific concepts at the same time. The problems would require work to be shown and the degree of assistance would be limited. By not stressing correct answers, but an honest attempt, students practice important skills and can apply positive peer pressure on their classmates to do the work and not feel bad about themselves if they struggled.

* Study and Organization Skill Program for Students:

Invest in summer programs for students entering sixth and ninth grades to learn and practice study and organizational skills. Learning to start work early so that you can get help if you need it, remove distractions when studying and organize yourself so that you can access materials readily are important skills any college student needs to be successful. If the students learn the skills at a much younger age, it can help them be more efficient with their time and balance the demands of homework, extra-curricular activities and sleep. BASIS schools have offered a similar program to incoming students for several years.

Improving Professional Development:

* Math Camp w/Applied Teacher Professional Development:

The math camp described above, plus a tie into teacher training. For optimal learning on the part of the teacher, he/she spends part of the day in their professional development course and then one to two hours teaching students. The classroom time with the students can be used to hone the skills covered during their course, while receiving feedback and further instruction from a coach and the opportunity to assess what works with a learning community.

Encourage Individual Classrooms or Schools to Try New Methods:

* Reward/Incentivize whole classrooms/schools who show improvement and/or high achievement:

Rewarding a school or classroom either monetarily, with equipment or something else entirely (recognition or an activity) for improvement, and/or high performance, may not be expensive and could motivate students to improve. The method for improvement would not be proscribed, but options and resource could be made available to those that want to strive for the reward(s). This would not be a competition amongst schools or classrooms, but a reward for setting high, yet attainable, goals and reaching them.

Improve Parents Ability to be Resources:

* There was a sense that there is a significant percentage of parents who themselves struggled with mathematics and may not have the skill set or confidence to assist their children with their homework. This sometimes leads to parents allowing their children to look for an easy way out and to short circuit the learning process by not allowing them to struggle.
* Educating parents on why a strong mathematics background is important for all children, and informing them that solving difficult problems where the student can struggle is part of a good math education, can make them an important ally in our cause to improve math literacy and achievement. In addition, teaching parents proper study habits so that they can encourage those same habits in their children may help the students’ learn more effectively and efficiently at home. This information and skills could be passed to the parents through informational packets and/or sessions after school for parents and children to learn about and practice proper study skills.
* Some ways of improving the dynamic between parents and teachers were discussed. The current relationship for some teachers and the parents of their students is strained which can be detrimental to the students’ success. By engendering more explicit community support for teachers– advertising, whisper campaigns – the teachers and parents may be better able to work together for the good of the students.
* Help parents bring math into the home the way reading has been done in the past.
* Encourage parents to meet their children’s teachers in all topics. It was noted that those meetings allow the parent to connect with the teacher personally and that connection helps throughout the school year.

Grow support for the Arizona College and Career Readiness Standards:

* The new standards are very, very promising for the future of education. They are based on proven techniques and a wealth of data. Unfortunately, the transition from AIMS may be rocky and difficult for students, parents and teachers. By building support and understanding amongst the community, who are likely to see the students’ passing rate decline due to the more rigorous exams, we can provide the teachers the breathing room and encouragement necessary for them to learn and apply the new standards. How to grow the support amongst the community was not discussed in detail at the meeting.

Foster Interest in Mathematics:

* Hosting a Mathematics Bee.
* A “math festival” that was part of the larger science festival. Have a “math night” as part of the spring STEM club celebrations.
* Have a city wide celebration of Pi Day. Focus on games and activities centered on math concepts, such as Pi, for the elementary and younger ages. Include discussions and activities in Math classes at all grades regarding how Pi was determined and its implications. This can be expanded to other ratios, constants and equations that have notable influences on our lives.