

# SAGE CREEK DESIGN TEAM

## *Preliminary Program Recommendation/Rationale*

The Sage Creek Design Team recommends adding a STEM (Science, Technology, Engineering, and Mathematics) program focus to the comprehensive a-g curriculum that will be required of all CUSD students beginning with the graduating class of 2017. This recommendation is not made lightly; it is only made after gathering a significant amount of research, listening to numerous presentations and “expert” guest speakers, and participating in multiple school site visits. This information gathering process has spanned more than ten months during which time our team wrestled with questions such as, “Why STEM?” and “What exactly is a STEM-focused school?”

First, we’ll attempt to address the first question, “Why STEM?” from two different points of view. From a global perspective, the U.S. has been overtaken in developing STEM expertise, ranking 29<sup>th</sup> of 109 countries in percentage of 24-year-olds with a mathematics or science degree. Until recently, U.S. industry has been able to make up for this shortfall in STEM degree holders by hiring scientists and engineers from overseas, but this is no longer tenable, sustainable, or desirable! On a more personal level, in the last decade, growth in STEM jobs was three times greater than non-STEM jobs. Additionally, it is projected that STEM jobs will grow about two times faster than other jobs in the next ten years. In recent studies, about 66% of students cite intellectual challenge, good salaries, and job potential as reasons for choosing to enter a STEM related field. Parents, in the same study, cited US economic competitiveness and more innovation as reasons to support their students’ interest in the aforementioned areas. Finally, in this light, it is our belief that a STEM program focus has the potential of creating a larger number of students who are truly STEM-qualified and who ultimately end up pursuing STEM majors and careers. We also believe that we can change the “identity” of *who* does STEM. By providing STEM opportunity structures, not just “coursework” but mentoring, support structures, real world experience, and opportunities for priority or guaranteed college admissions, we can aspire towards more STEM confidence, interest, and success.

Next, we’ll try to paint a picture of what we think an *inclusive* STEM-focused school should look like. Throughout our research, it has become clear that there is no one, common definition but can be summed up as:

“...an *interdisciplinary* approach to learning where rigorous academic concepts are coupled with real-world lessons as students apply science, technology, engineering, and mathematics in contexts that make connections between school, community, work, and the global enterprise enabling the development of STEM literacy and with it the ability to compete in the new economy” (Tsupros, Kohler, & Hallinen, 2009).

Ideally, it would be a place where curriculum is designed around collaborative learning environments and the project-based learning model – implementing the practice of integrating projects across grade levels and subject areas. For example all students’ science courses might be sequenced such that they are co-enrolled in an interdisciplinary Physics/Algebra II program

simultaneously. Furthermore, teachers in the core curricular areas may collaborate to coordinate several units around STEM-based themes and interdisciplinary projects.

Technology would be integrated with a 1 to 1 student:device ratio with the capacity to imbed online learning opportunities. Industry-school partnerships designed to provide critical career awareness and professional skills to high school students would be an integral part of the curriculum. On-going professional development focused on project-based learning and a schedule that would allow for weekly collaboration would be essential to the success of the program.

After much deliberation and research into several programs, we believe Project Lead the Way (PLTW) is the elective pathway program of choice that will enable us to create this type of learning environment. PLTW has proven successful in transforming instructional practices to supplement, but not supplant, the core curriculum, while generating more integration among the core subject areas and providing “real world” applications of key concepts, particularly in STEM related subjects.

In several national studies, PLTW students showed significantly higher achievement in mathematics on national assessments when compared to their peers. This outcome is also true for PLTW students in reading and science as well. Further, PLTW students were significantly more likely to complete four years of mathematics.

PLTW offers two high school curricular programs: *Pathway to Engineering* and *Biomedical Sciences*. **It is our recommendation that the initial focus be on the Biomedical Sciences with the intent of expanding to include a pre-engineering program shortly thereafter.** Towards this end, we also recommend the inclusion of a robotics program.

### ***Founding Classes***

The group deliberated over the benefits of opening with freshmen only or with freshmen, sophomores, and juniors together. **The final recommendation from the Design Team is for Sage Creek HS to open with a freshman and sophomore class.** This would afford the opportunity to build the core course offerings over time. The freshman class would be larger than the sophomore class the first year. Enrollment would be limited based on capacity within a four-year plan.

### ***Extra & Co-Curricular Offerings***

**The Design team believes SCHS should offer a full array of electives.** These will combine traditional elective offerings with new and unique opportunities (classes that are not currently offered at CHS) as this will be a “selling point” for the school. Electives should be offered in the following categories: World Languages, Visual and Performing Arts, Media, Science and Technology, Social Science, and Career Education. In addition, the team believes a strong effort should be made to develop STEM internships and externships in the community.

Recognizing that world language will become a graduation requirement in 2013-14, the team recommends offering at least three languages: Mandarin, Spanish, and Sign Language. Additionally, courses should be offered in fine arts, dance, and music composition. We also believe theater arts, orchestra, and/or band should be made available at SCHS.

As enrollment grows, the Design team believes it would be beneficial to expand elective opportunities into the areas of web programming, app design, and computer game programming. AVID was identified as a “must have” elective.

**The recommendation is to derive the clubs with a thematic focus centered with seven core sections: service, fine arts, cultural, science/tech, associated student body (ASB/ASG), yearbook, and activities (physical).** Time to establish these clubs is needed as students and teacher sponsors get acclimated to the new school.

In the area of sports, the team recognizes that athletics will grow as the school population grows. It would not be wise or prudent to expect to compete at all levels, in all sports, immediately. Instead we believe the initial offerings should parallel the founding classes. **Therefore, we recommend opening with freshmen and JV CIF teams, covering a variety of boys’ and girls’ sports, which may include:**

Season	Boys	Girls
Fall	Cross Country* Football* Water Polo*	Cross Country* Field Hockey Golf Tennis* Volleyball*
Winter	Basketball* Soccer* Surfing* Wrestling	Basketball* Soccer* Surfing* Water Polo
Spring	Baseball* Golf Lacrosse* Swim/Dive Tennis Track & Field* Volleyball	Softball* Gymnastics* Lacrosse Swim/Dive* Track & Field

\*a top three choice as indicated by the student survey

As the student population expands to include grades 9-12, the expectation is that there would be a full offering of all CIF sports based on student demand and interest.

***Bell Schedule***

**The general consensus was for the trimester, modified with a release (early release or late start) one day/week.** The Design Team feels the trimester provides greater opportunities for a STEM-based program. Components of a trimester are as follows:

- Students would have five periods a day for approximately 70 minutes each
- Teachers would teach four periods a day

- Allows students to take additional electives, including seminar courses during the 3<sup>rd</sup> trimester to prepare for CST/AP tests
- Builds in credit recovery opportunities for students that need it
- Stable schedule allows for student internships and community college courses
- Less expensive than a 4x4 schedule
- Release could coincide with Carlsbad High to allow for professional development opportunities, especially with the lack of funds for District-wide articulation meetings

### ***Lottery Language***

**Based on the Board's decision to declare both high schools "choice," eighth grade students will have the opportunity, each spring, to declare their high school of choice.** The students would be making a minimum of a one-year commitment to attend the school they selected. However, once enrolled, the student would remain at their school of choice until which time they elect to submit an application to change schools during any subsequent open enrollment period.

In the event that student requests for either high school exceed capacity (predetermined), a fair and impartial lottery system would need to be implemented according to Board adopted policy. The Design Team's recommendation is that preference be given for multiples (twins, triplets, etc.) and siblings of currently enrolled students.

### ***Conclusion***

As with any new program, time is of the essence. It takes time to plan, train, and develop the capacity and culture that will give the best chance of yielding the desired results. This will not happen overnight. Therefore it is the opinion of this Sage Creek Design Team that it is imperative that the principal identify his teacher planning team for Sage Creek High School as soon as possible so that they may take ownership of the next phase of the implementation process, taking ideas and turning them into reality – recognizably, an enormous task. These teachers will drive additional curricular choices as they develop the climate and culture of this comprehensive, project-based learning focused school.