

School Board Meeting: November 28, 2011

Subject: Science Technology Engineering Math Magnet School - Tatanka

Presenter: Don Metzler

SUGGESTED SCHOOL BOARD ACTION:

Recommend Board approval of the designation of Tatanka Elementary as a Science Technology Engineering Math (STEM) magnet.

DESCRIPTION:

Background – History:

The Northwest Suburban Integration School District #6078 (NWSISD) approached the district to create an elementary STEM program. NWSISD was created in 2001 in response to the State of Minnesota’s Desegregation Rule. Specifically, NWSISD was established based on the identification of the Brooklyn Center and ISD 279 - Osseo Area Schools as racially isolated entities as defined by the Desegregation Rule. NWSISD’s goals are to assist member districts in creating culturally inclusive learning environments, and to help create inter-district interactions among students, staff and parents that improve inter-cultural competency and increase student achievement. With the support of NWSISD, Buffalo-Hanover-Montrose currently operates an Arts Magnet School at Buffalo High School. To meet the goals of NWSISD and the school district, Tatanka will become a STEM magnet. Currently, STEM magnet schools are the most sought after magnet programs in the NWSISD.

Tatanka has been examining the STEM focus for the school since January 2011. STEM has been assessed and discussed through the Tatanka Teaching and Learning Council, staff meetings, STEM school visits, and parent focus groups. Staff and a parent visited Weaver Lake Elementary in Maple Grove and Monroe Elementary in Brooklyn Park to meet with staff and look at current STEM programs. In May, Tatanka held three focus groups with parents to share the STEM philosophy and to solicit parents’ comments and feedback. In August of 2011, Tatanka received a \$200,000 grant to plan for the implementation of a STEM magnet school program. In September, the staff met to identify staff learning objectives for the school year and began reviewing engineering standards and curriculum. Overall, the staff and parents are interested in pursuing a STEM option for the school.

Rationale for proposal:

President Obama has begun the "Educate to Innovate" campaign. He believes that reaffirming and strengthening America’s role as the world’s engine of

scientific discovery and technological innovation is essential to meeting the challenges of this century. A growing number of jobs require STEM skills, and America needs a world-class STEM workforce to address the “grand challenges” of the 21st century, such as developing clean sources of energy that reduce our dependence on foreign oil and discovering cures for diseases. Success on these fronts will require improving STEM literacy for all students; expanding the pipeline for a strong and innovative STEM workforce.

Tatanka is looking at becoming a STEM school to be sure the school is meeting state standards and preparing students with 21st Century Skills. The 2009 MN Academic Standards in Science include a strong emphasis on engineering that was not present in the 2003 standards. The added focus of engineering across academic areas supports these new standards and emphasis. The 21st Century Skill areas include Core Subjects and 21st Century Themes, Learning and Innovation Skills, Information, Media and Technology Skills, and Life and Career Skills. The specific learning and work skills partially include creativity and innovation, critical thinking and problem solving, communication and collaboration, information literacy, communications and technology literacy, flexibility and adaptability, initiative and self-direction, leadership and responsibility, etc. These are the life and academic skills students will need to be successful. The teaching of these skills will be enhanced through a STEM focused challenge learning approach.

Program implications:

The STEM magnet at Tatanka will be a full school implementation. As a school, Tatanka will continue to teach the state standards and the district curriculum but will overlay them with a STEM theme. Ways to enhance the district supported curriculum will be examined in those STEM areas of learning. With the full school implementation, Tatanka will provide STEM focused instruction to all students. Tatanka currently supports a district-wide program for students with significant autism needs, the district Quest program for students with academic gifted needs, students with English language needs, and general education students. These students will all participate in the STEM focused learning. The STEM focus will provide the students another avenue to gain academic and learning skills through an inquiry or challenged based learning with an increased focus on problem-solving skills. The expectation is students will increase their academic achievement in the STEM and inquiry based learning areas to support their overall academic achievement.

The Tatanka staff has already identified some instructional components to add STEM value to the curriculum beyond the standard district curriculum. Each grade level has identified two or three engineering curriculum kits from Engineering is Elementary to compliment the district science curriculum and to support state standards. These value added components will be piloted at each grade level this year for implementation next year. As the plan for the STEM program implementation is developed, staff will identify other value added components to integrate into the curriculum to support a STEM focus.

Staff training will be required in the area of inquiry or challenge-based learning. A concept developed by Apple, Inc., challenge-based learning is a collaborative learning experience in which teachers and students work together to learn about compelling issues, propose solutions to real problems, and take action. The approach asks students to reflect on their learning and the impact of their actions, and publish their solutions to a worldwide audience. Training in inquiry-based learning is available through a variety of sources including the Science Museum of Minnesota, Hamline University, and The Works: A Hands-on Museum of Engineering. Additional teacher work on the integration of STEM concepts into the current curriculum will be part of the planning process.

Financial implications:

The initial planning stage will be funded through a \$200,000 grant from the NWSISD. This will fund additional staff training, curriculum development time for teachers to integrate STEM concepts into the current curriculum, a STEM focused curriculum like Engineering Is Elementary, additional technology, materials to develop an engineering/science lab, and additional needs as identified through the planning process.

If Tatanka adds six additional classrooms to enroll up to 120 students from NWSISD, there will be costs associated with the start up of new classrooms. These costs may include classroom furniture, technology, and curriculum. Start up costs per classroom will be approximately \$10,000. Long-term to meet the needs of approximately 650 students, Tatanka will need additional learning spaces.

Ongoing funding will be provided through the NWSISD budget provided to the district. This funding will be used to support the continuous need for staff development, curriculum integration and development, and additional material required to support STEM concepts.

Evaluation:

The program will be evaluated using the current Buffalo-Hanover-Montrose evaluation system for school programs. The Building Improvement Plan goals and results will be used to assess and report progress to the school board.

Additionally, the school will evaluate the individual student learning using standards-based reporting for science and engineering portions of the program.

Currently, these areas are not specifically assessed on the individual student report cards. Staff and parent surveys and focus groups will be administered to monitor the implementation of the program and to respond to identified needs.

The school leadership team will complete a self-assessment using the NWSISD Magnet School Performance Review Rubric to make necessary adjustments and modifications to the program. Finally, the school will examine ways to assess and report 21st Century Skills to students, families, and the community.

Next steps:

Tatanka will begin a planning year for STEM with the goal to offer the STEM program for the 2012-2013 school year.

Space is an additional concern to be addressed for Tatanka to add a STEM program. Tatanka's space is currently in full use for the current program.

Developing a STEM program with NWSISD will require space for twenty students at each grade level for an additional 120 students. Tatanka will need additional space or to reduce the current population to accommodate the additional students. Lab spaces to support engineering and additional science education will be necessary to support the program.

Or, under the description area the following might appear in lieu of the items listed under the description or as additional clarification:

Attachments:

Attachment A: Magnet School Proposal Narrative

Attachment B: Magnet School Proposal Professional Development
Timeline

Attachment C: Locally Funded Magnet Budget Proposal

Attachment D: STEM Goals TES 2011.2012

Attachment E: STEM Proposal Discussion Notes 11.2011