

ORANGE COUNTY
BOARD OF EDUCATION

AGENDA ITEM ABSTRACT

Meeting Date: May 12, 2014

AGENDA ITEM No. 14-05-11

ACTION ITEM: (Y/N) N

SUBJECT: Science, Technology, Engineering and Math (STEM) Initiative Report

INFO. CONTACT: Dr. Amanda Hartness/Anne Purcell PHONE: 919-732-6121

- ATTACHMENTS: 1. Becoming a STEM School – What are the Objectives?
2. N.C. STEM School/Program Attributes

PURPOSE: To provide an update to the Board of Education on the STEM initiative started in the fall of 2013 at C.W. Stanford Middle School.

BACKGROUND: STEM is the acronym for science, technology, engineering and mathematics. STEM education is 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, 2009).

In the spring of 2013 the Board of Education was asked to provide funding for C.W. Stanford to begin a focus on STEM Education in grades 6-8. Transitioning C.W. Stanford to a STEM school allowed for the EiE (Engineering is Elementary) program at Central Elementary to continue for rising 6th grade students who had learned the Engineering Design Process. C.W. Stanford was already utilizing many aspects of STEM and wanted to expand the program from Central Elementary to C.W. Stanford Middle to provide consistency for students as they transitioned.

The attached document *Becoming a STEM School – What are the Objectives?* was presented to the Board when C.W. Stanford was approved to explore STEM possibilities. Each objective is followed by a statement indicating how the goal has been met this school year. The attached document *North Carolina STEM School/Program Attributes* outline attributes that must be met for a school to become a STEM school in North Carolina, all of which C.W. Stanford is currently working toward. Further explanation will be provided on Monday evening.

Staff will highlight accomplishments during the past year.

| | | |
|--------------------------|--------------------|--|
| FINANCIAL IMPACT: | \$5,000.00 | Professional Development |
| | \$4,000.00 | Materials & Supplies |
| | \$1,000.00 | STEM Theme Items |
| | <u>\$4,000.00</u> | Exploring Biotechnology Materials & Supplies |
| | \$14,000.00 | Total |

*Funding was provided through state CTE and local curriculum funds.

RECOMMENDATION(S): The Superintendent recommends the Board of Education hear information about the STEM program at C. W. Stanford Middle and continue to support the program with additional funding needs.

Becoming a STEM School – What are the Objectives?

Objective 1 – Focus on Science, Technology, Engineering and Math to better prepare students for high school and higher education.

Goal Met – Teachers have incorporated all areas into teaching through Problem Based Learning, collaborative learning, speakers on Friday mornings that discuss their education in engineering, biotech, medical and other fields within STEM. Students have come from Duke University.

Objective 2 – To expand Orange County Schools' commitment to STEM education and continue the process began with EiE at Central Elementary.

Goal Met – Students were placed from CE into classes together for science. The Engineering Design Process has been used in the 6th grade classrooms.

Objective 3 – To expand our use of technology through the use of innovative resources and a focus on Problem Based Learning while making learning more student centered, less teacher centered. This would be a focus across **all** the curriculums.

Goal Met – Much more collaborative learning in all classes. Teacher begins and students work together on projects, class work, and assignments.

Objective 4 – Connecting student learning to careers.

Goal Met – Career Fair for 7th grade, STEM talks for all students.

2013-2014 other accomplishments:

Bio-tech class started and has gotten great reviews from the students and teacher.

Teacher interest in STEM is high; some more than others, but interest is there.

New STEM coordinator has been hired and will begin on May 19.

PLW Flight and Space core course arranged for 2014-2015 through Mr. Lewis Technology class.

To Do:

Work and plan with new STEM coordinator during summer. PD ready in fall for all staff.

Build and nurture a relationship with PLW directors at Duke and OH5 PLW teacher.

Foster relationships with RTP and others for Flight and Space course. Example - GE Aviation.

North Carolina STEM School/Program Attributes

| North Carolina Department of Public Instruction's NC STEM Attributes * | Early → | Developing → | Prepared ● | Model ● |
|--|------------|-----------------|---------------|------------|
| Integrated Science, Technology, Engineering and Mathematics (STEM) curriculum, aligned with state, national, international and industry standards | | | | |
| 1) Project-based learning with integrated content across STEM subjects | | | | |
| 2) Connections to effective in- and out-of-school STEM programs | | | | |
| 3) Integration of technology and virtual learning | | | | |
| 4) Authentic assessment and exhibition of STEM skills | | | | |
| 5) Professional development on integrated STEM curriculum, community/industry partnerships and postsecondary education connections | | | | |
| 6) Outreach, support and focus on underserved, especially females, minorities, and economically disadvantaged | | | | |
| On-going community and industry engagement | | | | |
| 7) A communicated STEM plan is adopted across education, communities and businesses | | | | |
| 8) STEM work-based learning experiences, to increase interest and abilities in fields requiring STEM skills, for each student and teacher | | | | |
| 9) Business and community partnerships for mentorship, internship and other STEM opportunities that extend the classroom walls | | | | |
| Connections with postsecondary education | | | | |
| 10) Alignment of student's career pathway with postsecondary STEM program(s) | | | | |
| 11) Credit completion at community colleges, colleges and/or universities ** | | | | |

*Attributes define essential components central to 21st Century Skills

**Not required for Elementary or Middle Schools - For High Schools Only