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MEMORANDUM

TO: Members, Utah State Board of Education

FROM: Martell Menlove, Ph.D.
Chief Executive Officer

DATE: August 8, 2014

ACTION: STEM Schools

Background:
H. B. 150 *Science, Technology, Engineering, and Math Amendments*, 2014 State Legislative Session, called for the STEM Action Center to work cooperatively with the State Board of Education to designate schools as STEM schools, where the schools have agreed to adopt a plan of STEM implementation in alignment with criteria set by the State Board of Education and the STEM Action Center Board.

Key Points:
The State Board of Education and the STEM Action Center Board need to designate the criteria for schools to adopt a plan of STEM Implementation.

Anticipated Action:
Teaching and Learning staff will present a proposal for the Board of Education to consider in collaboration with the STEM Action Center Board.

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Utah STATE OFFICE of Education

Proposed Criteria for Becoming a USOE/STEM Action Center Identified STEM School

August 8, 2014

Science, technology, engineering and math (STEM) education is best sustained by supporting both individual content areas and integrated experiences. Mathematics and science build the foundation for students to apply learning in technology and engineering coursework. In turn, technology and engineering process support learning and application of science and mathematics. Integrated coursework and projects can be used to support both the academic core standards and the career and technical program standards. Furthermore, all four work together as students engage in design challenges, laboratory experiences, and internships with rapidly growing STEM companies. STEM education requires an integrated learning approach where engineering is valued as more than activities in academic courses, where technology is seamlessly integrated throughout, and where there are high expectations for achievement in mathematics and science.

In order to support local initiatives that are attempting to meet the requirements of STEM education in Utah, the Utah Legislature is supporting designation of STEM schools. Utah Code 63M-1-3204 States in part that:

> *"The STEM Action Center as funding allows shall: work cooperatively with the State Board of Education to designate schools as STEM schools, where the schools have agreed to adopt a plan of STEM implementation in alignment with criteria set by the State Board of Education and the board;"*

The following criteria are proposed to be used to evaluate STEM schools. These criteria are based on similar statewide efforts in Texas, North Carolina and the highly successful Utah Dual Immersion schools.

Proposed criteria for an exemplary STEM School:

1. **Curriculum** - STEM Curriculum is selected based on Utah Core Standards. Curriculum has an articulated interconnectedness between science, technology, engineering and math. Curriculum and instruction is coordinated between the various aspects of STEM. Projects form a substantial part of the curriculum.
2. **Leadership** - Leadership has created clear definitions and a vision of STEM teaching and learning as it applies in the local school and as informed by state, national, and global efforts. Collaboration exists between community, industry and other education partners. Efforts are made to connect to national and global efforts.
3. **Assessment** - Assessments are ongoing, authentic and cross-curricular. They are project-focused and performance-based. Rubrics for projects are provided and articulate with the goals of the assessment. Formative assessment informs summative assessment and teaching efforts.
4. **Professional Learning** – STEM-focused professional learning is fully implemented. Professional development aligns with Utah's requirements for professional learning (Utah Code 53A-3-701) and aligns with Utah Core Standards and Utah Effective Teaching

Standards. Learning communities and learning networks are integrated into efforts for personal growth and school wide growth.

5. **Teaching** - Teaching is conducted with a focus on STEM concepts, processes and thinking. Teachers coordinate lessons, ideas and planning among one another with a mechanism in place for doing so in both formal and informal ways. Incentives exist for supporting one another. Correlations among various aspects of STEM are articulated and explicit. Faculty demonstrates content competency in all areas of STEM and have relevant endorsements. Efforts are made to support content sharing
6. **Student Engagement and Equity** - There is solid evidence for engagement of all demographics in the local community. Efforts are connected and follow a coherent research-based plan. Efforts show a deep understanding of STEM equity issues and needs. Students are regularly involved in planning and conducting learning activities. Students are regularly engaged in the actual doing of science, mathematics and project-based learning.
7. **Community** - There is an established community of practice regarding STEM learning and STEM teaching. Events, activities and opportunities for involvement help students, teachers, parents and community members learn about and support STEM education in the school.
8. **Facilities** - Spaces are available for collaboration and project work. Facilities have been adapted or designed for STEM Learning. Facilities reflect a focus on STEM learning efforts. Facilities reflect student design and input in the use of the facilities. Materials and equipment follow safety protocols. Obvious efforts have been made to make resources available to students for use in learning, design and project efforts.
9. **Strategic Alliances** - Alliances exist between the school and strategic partners. Parents and parent groups are involved in the school process and decision making. Business, industry and other community partners work together to promote STEM learning and career awareness. Long term partnerships are formed and supported through ongoing efforts. Partnerships are evaluated at least annually and additional partnerships are formed to support emerging needs and opportunities. Teachers have ongoing relationships with industry partners and engage in externships.
10. **Advancement and Sustainability** - A five-year plan includes each of the criteria for an effective STEM school. Strengths and weaknesses are identified. Plans are in place to address weaknesses with evidence and research supporting the plan. Strengths are examined for the purpose of continued improvement. Future efforts and trends are examined and ongoing renewal is planned for.

Proposed Process:

- School writes a STEM Schools Plan Document. This should include evidence of their current state and their plans for improving each of the ten criteria.
- A rubric for the above criteria with a scale from 0 (no evidence) to 5 (exemplary) will be used to evaluate the schools.
- A committee made up of members or designees representing the Utah State Board of Education and STEM Action Center Board will evaluate the plans and possibly conduct an onsite visit to verify the status of the schools.

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