



Board Meeting Date: 11/13/2023

Title: S.T.E.A.M. Update

Type: Discussion

Presenter(s): Jody De St. Hubert, Director of Teaching and Learning; Dr. Randy Smasal, Assistant Superintendent; Mark Carlson, Curriculum Coordinator; Dr. Cara Rieckenberg, Highlands Elementary Principal; Allison Knoph and Laurie Holland, Concord Elementary Teachers

Description: This board report is intended to provide a status update on the work of the elementary S.T.E.A.M. design team. The report provides background on the work of this team prior to and since the last board update provided in the spring of 2023.

Recommendation: No recommendation is being made at this time. This item has been prepared for board discussion.

Desired Outcome(s) from the Board: Please bring forth questions you have for the presenters.

Attachment(s):

- See Presentation [Slide Deck](#)

Background Information

Process:

An Elementary design team started working on defining Marquee S.T.E.A.M. programming in Edina, in the spring of 2022. Dr. Anne Marie Thomas from the University of St. Thomas helped with initial vision design aligned to the Edina Strategic Plan. Dr. Thomas also supported the refinement of critical design elements in order to create an equitable experience for each and every Edina elementary scholar. She provided real world examples and inspired the team to think creatively about what this initiative would mean for Edina.

Elementary S.T.E.A.M. programming supports the following initiatives in the strategic plan.

Strategy A: Advanced Academic Excellence, Growth and Readiness

1. Design and deliver curriculum, instruction and assessment focused on content rigor, critical thinking, student engagement and continuous Improvement to assure academic achievement and student growth.
2. Provide a coherent and differentiated educational experience that effectively engages, appropriately challenges every student academically.

Strategy B: Ensure an Equitable and Inclusive School culture

2. Create a school culture that enhances learning and fosters a sense of belonging for all students through our values of integrity, compassion, courage, commitment, appreciation and responsibility.
3. Support Equity by Identifying and Eliminating Structural Barriers to Success.

Strategy C: Foster positive learning environment and whole student support

4. Create environments that are conducive to learning and facilitate constructive student interaction.

Strategy E: Engage Parents, Schools and Community

4. Leverage Partnerships with Community groups, businesses local and state government agencies and individuals to strengthen and Foster relationships with eps.

The design team members include:

- Zach Baker
- Caitlin Bickel
- Jenna Courtney
- Matt Flugum
- Leanne French-Amara
- Marissa Friedrich
- Jamie Hawkinson
- Jermey Kigin
- Allison Knoph
- Lizabeth Ortiz Perez
- Zach Prowell
- Lynnea West
- Krista Winkel
- Laurie Holland

- Rebecca Huberty
- Ashly Krohn
- Deb Richards
- Leah Byrd
- Mark Carlson
- Jody De St Hubert
- Dr. Cara Rieckenberg
- Dr. Anne Marie Leland
- Dr. Ann Marie Thomas
- Dr. Randy Smasal

The critical design elements include

- multiple cornerstone or model S.T.E.A.M. units at each grade level
- the use of Mystery Science as a curriculum base with alignment to Science Standards
- a focus on inquiry
- alignment to and repackaging of standards from multiple disciplines to support integration
- authentic learning experiences that connect to real world issues, challenges and problems
- partnerships with professional scientists, engineers, artists and mathematicians
- professional learning and support for teachers
- mentorship support between elementary aged students and Edina high school seniors

The team discussed the need to create an equitable experience for elementary scholars across schools balanced with the unique resources each school has to offer. The result of that discussion using our IROD decision making framework was to create a plan that does both; common cornerstone units across grade levels that serve as STEAM guideposts for design while leveraging resources at each site. Translation of materials will need to occur to make the units readily accessible for Normandale French Immersion school. As a result, all students in all Edina elementary schools would complete two, common, high level S.T.E.A.M. units at each grade level (12 in total throughout the K-5 elementary program).

Units designed by Edina teachers will include the above mentioned critical design elements. The direct connection with the Mystery Science Curriculum will reduce the impact on teachers as they plan for the science components/standards and will help support the implementation of cornerstone integrated units.

The following *Working Definitions* are being used by the elementary STEAM design team:

S.T.E.A.M. is an acronym for Science, Technology, Engineering, Arts and Mathematics. It is a framework for planning student learning experiences that serves to better simulate how disciplines interact in the world outside of schools. By integrating standards from these disciplines into authentic and relevant learning experiences, students will develop critical thinking skills, creative problem solving skills and will achieve a deeper level of learning. The integration approach also provides a more realistic pathway for elementary teachers to meet the many standards that are assigned to them to teach. By leveraging the connections across standards, the learning experience becomes more powerful for our elementary scholars.

Inquiry: Inquiry is an approach to learning that involves a process of exploring the natural or material world, asking questions, making discoveries, and testing those questions in the search for new understanding. It is driven by creativity, curiosity, and play that leads to **authentic** learning.

Authenticity: Authentic learning means students are engaged in solving meaningful, real world issues and problems. In Edina, Authenticity is grounded in purpose, allows for multiple entry points, and creates **integrated** opportunities to apply previous learning. Citizen Science programs are a great source of real world studies and data collection. The Student Spaceflight Experiment Program offers a real design challenge to test the effects on microgravity on biological, chemical and physical systems.

Integration: Integrated learning environments connect different areas of study or different topics in the same area of study by cutting across subject matter or topic matter silos. In Edina, Integration promotes flexible and critical thinking while offering multiple methods for students to demonstrate knowledge, skills, and competencies. Integration serves as a vehicle to make learning more engaging and powerful than when concepts are taught in isolation. This type of learning is more real world. To support integration, **partnerships** are needed.

Partnership: Partnerships are widespread collaborations and connections across students, classrooms, subject areas, schools and the Edina community. Partnerships with professional scientists, engineers, artists and mathematicians bring content expertise into the elementary classroom and offer an early opportunity for career exposure.

Implementation Steps:

Professional Learning and support for teachers implementing S.T.E.A.M. has been an extensive topic of discussion with the design team. Elementary teachers need training on inquiry, questioning strategies, integration techniques and also need time to prepare to teach the grade level cornerstone units. We estimate five days of professional learning needed which could include summer and/or school year cohorts of teachers. Training and support would start with grade 3-5 teachers during the 2024-25 school year. A K-2 design team would begin during the 2025-26 school year, with training and support for K-2 teachers in 2026-27.

Budget Planning

Two expenses anticipated with implementation of K-5 S.T.E.A.M. programming includes professional training for teachers and materials/equipment costs for specific units. The professional learning will include 5 days of training for each teacher. Different formats and timelines for implementing the training are currently being considered. A combination of summer training dates and professional development days in the school calendar will be used to support the training. A partnership with EdFund is being discussed as a strategy to support professional learning for teachers.

As the units are being developed we are planning for reasonable expenses which will need to be supported within existing Teaching and Learning budgets. The most recent purchase of the Mystery Science curriculum provides strong support for the development of S.T.E.A.M. units. A more detailed budget projection will be provided to the board at a future meeting.

Summary and Next Steps:

Elementary S.T.E.A.M. programming offers families a unique opportunity for their child to study real world problems and challenges while working alongside professional scientists, engineers, artists, technicians, and mathematicians. The integrated cornerstone units will offer students at every grade level multiple opportunities for robust learning and career exposure. Working on authentic or real world issues and challenges offers a high level of engagement through meaningful and relevant work. Additional data collection will be incorporated from high school students to shape the direction and design of the cornerstone units.

When students move into the secondary level they will have the opportunity to pursue a robust offering of elective course options and continue their learning at deeper levels. Once they arrive at Edina High School, scholars will have the opportunity to put their learning into practice through internships/apprenticeships and will be able to demonstrate their learning through a credentialing process. Edina S.T.E.A.M. programming offers another way to open doors for young scholars by exposing them to career opportunities, engaging them in critical thinking and developing creative problem solvers that will impact their community and preparing them for opportunities ahead.

In reviewing metro area schools and discussions with MDE science staff, there are currently no other school districts who have such a model for STEAM integration in place. As a result, families interested in providing their child with a robust S.T.E.A.M.focused elementary experience, will seek out Edina Schools.