![Edina Public Schools - Defining Excellence]

Title: Programming Update for K-5 STEAM

Type: Discussion

Presenter(s): Jody De St Hubert, Director of Teaching and Learning; Mark Carlson, Curriculum Coordinator

Description: Program updates provided in this report speak to progress on Strategic Initiative A. Advancement of Excellence, Growth and Readiness. The first subpart of this initiative includes the design and delivery of curriculum, instruction and assessment focused on content rigor, critical thinking, student engagement and continuous improvement to assure academic achievement and student growth. The second subpart is to provide a coherent and differentiated educational experience that effectively engages and appropriately challenges every student academically. The report provides data and background to show how Early Learning-5 STEAM programming is enhancing this strategic initiative across the district.

Recommendation: No recommendation is being made at this time. This presentation is an informational update for the board.

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

Background Materials:
April 15th STEAM Board Update (pages 18-22)
Edina STEAM One Pager

Appendixes:
Appendix I: Portrait of a Well-Rounded Edina Graduate
Appendix II: STEAM Lesson Design Rubric and Checklist

STEAM Update

The STEAM update includes the following sections:
- STEAM Design Team Contributors
- EPS STEAM Programming Model
- Implementation Science
- Timeline and Next Steps
- Budget Considerations

Design Team

Educators that have contributed to the design process include:
- Zach Baker
- Caitlin Bickel
- Brianna Carlson
- Jenna Courtney
- Matt Flugum
- Leanne French-Amara
- Jamie Hawkinson
- Laurie Holland
- Rebecca Huberty
- Ashly Krohn
- Jermey Kigin
- Allison Knoph
- Molly O'Keefe
- Lizabeth Ortiz Perez
- Zach Prowell
- Marissa Walsh
- Lynnea West
- Krista Winkel
- Deb Richards
- Leah Byrd
- Mark Carlson
- Jody De St Hubert
- Dr. Cara Rieckenberg
- Dr. Anne Marie Leland
- Dr. Ann Marie Thomas
- Dr. Randy Smasal

Key Components of the Edina STEAM Programming Model:

The STEAM Design Team has defined STEAM work for Edina Public Schools based on four key concepts. As work continues our goal is to provide students with educational opportunities that center around these concepts.

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.

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 opportunities to apply previous learning.

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.

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

STEAM Programming will have three layers when fully Implemented:

To help focus the work, the Design Team decided to take a layered approach. This approach allows for a consistency of opportunities for all Edina students while still leveraging the uniqueness of our buildings and talents within those buildings in the process. Below is a brief description of the three layers:

Layer 1: Strong Foundation in Literacy and Numeracy

This layer forms the bedrock for work for all other STEAM work. This layer is foundational and allows for the use of the four key concepts of STEAM as students will need to use their abilities to obtain information, apply critical thinking, and communicate results. This layer will be consistent across all six buildings through pedagogy and resources such that all Edina students will have a similar experience at all six buildings.

Layer 2: Cornerstone Projects

Each grade level will have a Cornerstone Project that is developed by Edina teachers for Edina teachers. These projects will begin with lessons from Mystery Science as the basis for the project. Each project will have 10-14 lessons, and will address standards across multiple subjects. They are developed using a rubric based upon the four key components. When STEAM programming is fully implemented, these projects will be in all classrooms across the district. This layer allows for a consistent experience with STEAM programming for all students.

Layer 3: Building Level Development

This layer is still in the design phase of development. The idea of this layer is for teams of educators in each building to begin to develop additional lessons, units and projects based on the four key concepts. This may take the form of buildings choosing themes to build off of as they begin the development process.

Implementation Science

As we engage in continuous improvement in our programming in Edina Public Schools (EPS) we use Implementation Science to inform our review process and ensure success with any change. Implementation Science helps to effectively translate proven educational practices into real classroom application, considering the specific context of each school and district. As we define and develop Edina STEAM, we have utilized Implementation Science.
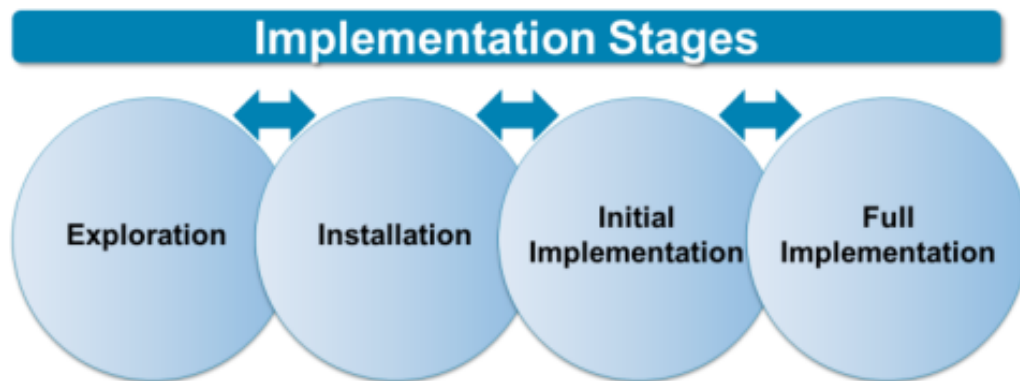
Each layer of Edina STEAM is at a different point in the implementation process. The first foundational layer of literacy and numeracy is in full implementation. From the perspective of STEAM programming we have a strong foundation of literacy and numeracy in place across our K-5 classrooms. Both of these curricular areas will still go through curricular review cycles as MDE redefines standards, however as a foundational layer they are fully implemented as the consistency across buildings and with curricular resources is embedded into our system. We will always be in continual improvement with this layer.

The second layer, Cornerstone Projects, is currently at the installation phase for grades 3-5 and in Exploration for PK-2. We have developed 3 cornerstone projects that will be utilized in some classrooms across the district. The projects that have been developed are the following:

> 3rd Grade: Design a Home for Pollinators
>> Question: How can we design an environment to help pollinators thrive?
>> Description: Students will learn about pollinators, plants, gardens and life cycles, and use these learnings to design a garden home for pollinators.

> 4th Grade: Waves of Sound
>> Question: How can Music be created?

Description: Students will build an understanding of how vibrations and waves relate to sound. This will include an exploration of how various instruments incorporate sound and will be tied to the EHS Pops concert and the instrument selection process.

5th Grade: Science in Space

Question: How can we design a science experiment to be done in space?

Description: This project will involve students designing a science experiment that can take place in space. They will investigate the various decisions and learnings that are needed to do this. Students will consider a consistent theme of "how might this work the same, or differently, in space?"

The third and final layer of building level development is early in the exploration as we begin to consider how we can design this layer. We will be bringing a team together to help with the design of this layer and consider questions of support and resources for this transformation. This third layer work will begin in the 25-26 school year.

Next Steps:

Below is a timeline for the next steps needed to fully implement Edina STEAM:

Tasks	24-25	25-26	26-27	27-28
Initial Implementation 3-5 Cornerstone Projects	■			
PD for 3-5 teachers to support implementation	■			
Building level STEAM lesson development		■	■	■
Full Implementation of 3-5 Programming		■		
Continued refinement and improvement 3-5		■	■	■
Development of PK-2 Cornerstone Projects		■		
Initial Implementation of PK-2 Cornerstone Projects			■	
PD for PK-2 Teachers to support implementation			■	
Continued refinement and improvement PK-2			■	■
Full Implementation				■

When fully implemented, Steam programming will have a strong foundation of math and science to prepare students to apply their learning through a Cornerstone STEAM Project in all grades. In addition, buildings will expand STEAM programming based upon the definition of STEAM. How this will look, is still in the Exploration phase of Implementation Science.

Budget Considerations:

A critical component to review during exploration is financial capacity. During the exploration phase of STEAM Cornerstone Project development the following were determined to be costs that would be incurred:

- Expert consultation
- Design team compensation
- Project development compensation
- Material costs
- Partnership costs

Estimated costs over a three year period of time for Cornerstone Project development in grades 3 through 5 from 2022 to 2025 are:

- Expert consultation: Estimated Total - $12,000
- Design team compensation: Estimated Total - $8,000
    - Substitute Teachers for Full Day Sessions: $4,000
    - Additional Meeting Time Outside of Contracted Day: $4,000
- Project development compensation: Estimated Total - $12,000
    - STEAM Project writing compensations: $12,000
- Estimated additional costs for the development of K-2 Cornerstone Projects - $50,000-$60,000
- STEAM material costs: This is dependent on the Cornerstone Projects themselves, so this line item is under development and is being created within the Teaching and Learning capital budget. With capital budget changes in 2023-24 and 2024-25, the shift to full implementation in 2025-26 not only supports added time for professional development, but also added time for responsible fiscal planning.
- Partnership cost:
    - This is also under development for Cornerstone Projects in 3rd and 4th grade.
    - EdFund has been a critical partner in supporting the 5th grade Space Cornerstone Project costs and will continue to do so into the future.

Appendix I:

Edina Public Schools
DEFINING EXCELLENCE

Portrait of a Well-Rounded Edina Graduate

- MOTIVATED LIFE-LONG LEARNER
- ACADEMICALLY PREPARED
- INNOVATIVE THINKER AND PROBLEM SOLVER
- GLOBALLY COMPETENT INDIVIDUAL
- EFFECTIVE COMMUNICATOR AND COLLABORATOR
- RESPONSIBLE AND ENGAGED CITIZEN

ACADEMICALLY PREPARED
- Demonstrates foundational academic knowledge in Reading, English Language Arts, Mathematics, Social Studies, Science, Technology, Engineering, and the Arts.
- Masters and applies standards aligned to challenging and rich curricula.
- Identifies, understands, and solves complex issues.

GLOBALLY COMPETENT INDIVIDUAL
- Possesses a diverse and informed world perspective, including understandings of world geography, history, economics, social issues, cultures, political structures and environmental conditions.
- Engages in multiple opportunities to broaden language knowledge and application.
- Embraces the individual and cultural dignity of all people and actively seeks multicultural interactions.

RESPONSIBLE AND ENGAGED CITIZEN
- Demonstrates a high level of integrity and ethical action.
- Applies knowledge and education for the good of the community.
- Demonstrates empathy, compassion and open-mindedness.
- Accepts responsibility for personal choices and actions, including impact on others and learns from mistakes.
- Applies the social-emotional skills of self-awareness and self-management to lead a healthy and well-balanced life.

EFFECTIVE COMMUNICATOR AND COLLABORATOR
- Communicates effectively as a listener, speaker, writer, and responder through appropriate and timely communication platforms (digital, print, video, and social media).
- Possesses strong social and interpersonal skills, including verbal, nonverbal, and conflict resolution.
- Works effectively with others in academic and social settings, both as a leader and a contributor.

INNOVATIVE THINKER AND PROBLEM SOLVER
- Thinks and produces creatively, both collaboratively and independently.
- Demonstrates intellectual curiosity.
- Critically analyzes and evaluates information sources.
- Adapts to changing demands.

MOTIVATED LIFE-LONG LEARNER
- Understands personal interests and passions, while valuing continuous learning and seeking opportunities for growth.
- Understands own needs as a learner and advocates appropriately.
- Persists when faced with challenge or adversity.
- Actively researches opportunities, sets personal learning goals, makes choices that support long-term aspirations and successful transitions.

Appendix II:

STEAM Unit Rubric

Criteria/Definition	1	2	3	4
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. The 5E Instructional Model is the framework of Inquiry in Edina.	The unit does not incorporate any elements of inquiry instruction.	The unit incorporates some elements of inquiry instruction, such as providing students with opportunities to ask questions, but lacks student directed learning and is primarily teacher directed. Some evidence of the use of the 5e instructional model.	The unit incorporates inquiry elements throughout, with students having clear opportunities to ask questions, and includes some student directed learning. Most elements of the 5e instructional model are evident.	The unit is highly inquiry-based and driven by student curiosity, with students having multiple opportunities to ask questions, design and implement investigations, and analyze data to draw conclusions.The 5e instructional model is fully used.
Authenticity 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.	The unit does not incorporate any authentic elements.	The unit incorporates some authentic elements, such as using real-world data or problems, but could be more authentic.	The unit incorporates real-world data or problems, or provides students with opportunities to apply their learning in real-world contexts; however it may have limited impact outside the classroom.	The unit is authentic, incorporating multiple authentic elements including the arts or PE standards. The students will understand how their work impacts the greater community.
Integration Connects different areas of study. In Edina, Integration promotes flexible and critical thinking while offering multiple methods for students to demonstrate knowledge, skills, and competencies.	The unit does not integrate Science standards with standards from any other subject areas.	The unit integrates Science standards with standards from another subject area, is missing standards from the arts or PE and/or the integration is superficial.	The unit integrates Science standards with standards from another subject area and the arts or PE standards in a meaningful way, with clear connections between the standards.	The unit integrates Science standards with standards from another subject area and standards from the arts or PE in a highly meaningful way, with deep connections between the standards.
Professional Partnership Partners: ● District, Community, Global STEAM Professionals ● Content expertise in the classroom through professionals in the field ● Career Exposure	Unit provides no potential partnership opportunities.	The unit incorporates a professional partnership, but the partnership is not well-defined or does not advance the objectives to the unit.	The unit incorporates a well-defined professional partnership that does not advance the objectives to the unit.	The unit incorporates an exemplary professional partnership that advances the objectives to the unit and provides students with a unique learning experience.

Checklist for Lesson Design

- **Standards Articulation**
  - ☐ Clearly articulate specific standards that will be assessed for learning in the unit. (should be between 3 and 6 standards)
  - ☐ A list of other grade level standards that students will apply or practice during the unit.
- **Project Narrative**
  - ☐ A general overview of the project with a brief description of what the students will be doing in the unit. This should help interest the reader in the unit. Similar to the unit overview in the Mystery Science Pacing Guide
- **Lesson Outline** (Should be 10-14 45-60 minute lessons that focus on the core outcome try not to include pre-work as the lessons)
  - ☐ An overview of what students will be doing in each lesson of the unit. Example
  - ☐ This should include learning targets for the lesson
  - ☐ Connections to the overall unit.
- **Formative Assessment**
  - ☐ Check ins for student learning occur frequently throughout lessons/units of study.
- **Teacher Resources**
  - ☐ Slide Deck, Peardeck or other presentation tool that has clear teacher notes embedded throughout the presentation explaining the 'why', background etc.
  - ☐ Any additional teacher resources
  - ☐ Supplies needed for the unit
- **Student Resources**
  - ☐ Any resources students will need for each lesson, worksheets, graphs, maps, links to readings, videos, etc.
- **Final Product or Assessment:**
  - ☐ A link describing the final product which allows students to choose a way to demonstrate their learning. OR
  - ☐ A link to the assessment should be included.
  - ☐ A checklist/guide/rubric for assessing the product.
- **Mystery Science**
  - ☐ Clearly state what lessons from Mystery Science will be part of the unit.