# MEMORANDUM

June 21, 2022
Regular Board Meeting

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| **TO** | Board of Trustees |
| **FROM** | Shauna Boyce, Superintendent |
| **ORIGINATOR** | Scott Johnston, Associate Superintendent |
| **RESOURCE** | Katherine Mann, Division Principal, Indigenous Education and Numeracy |
| **GOVERNANCE POLICY** | Board Policy 1: Division Foundational Statements<br>Board Policy 2: Role of the Board<br>Board Policy 12: Role of the Superintendent |
| **ADDITIONAL REFERENCE** | BP 1: Vision, Foundational Statements<br>BP 2: Education Planning and Programming<br>*Education Act: 19-23, 33, 196-197* |
| **SUBJECT** | **SCIENCE, TECHNOLOGY, ENGINEERING, ARTS, MATH [STEAM] REPORT** |

**PURPOSE**

For information. No recommendation required.

**BACKGROUND**

The Board is charged with the responsibility of providing, for its students and their parents, an education system organized and operated in the students' best interests. It exercises this responsibility through setting of local educational policy and the wise use of resources.

**REPORT SUMMARY**

"STEAM" is a commonly understood acronym for Science, Technology, Engineering, Arts, and Math. Within the Alberta Programs of Study, the province provides for opportunities for students to explore Career and Technology Foundations, in advance of high school Career and Technology Studies. STEAM Projects enable students an opportunity to extend their learning through challenges that are aligned to career skills, including: business skills, communication skills, human services, resources and technology. This STEAM Report provides an overview of projects and skills in alignment to provincial outcomes.

Administration would be pleased to respond to any questions.

SJ:kz

# SCIENCE, TECHNOLOGY, ENGINEERING, ARTS AND MATH [STEAM] REPORT

## June, 2022

Presented to the Board of Trustees, June 21, 2022
Scott Johnston, Associate Superintendent, Education and System Services
Resources: Kathy Mann, Division Principal, Indigenous Education and Numeracy

*Our Students Possess the confidence, resilience, insight and skills required to thrive in, and positively impact, the world.*

## Background

This year, Parkland School Division shifted the Education Technology Facilitation focus to Science, Technology, Engineering, Arts and Mathematics (STEAM). This focus aligns with PSD's commitment to developing resilience and the related necessity of confidence in the ability to problem solve. This focus also relates to the tag line "Where the World Opens Up" as there continues to be an emphasis and marketability of skill sets in this area. The new draft of the Alberta Curriculum includes Computer Science as an explicit Organizing Idea where "Problem solving and scientific inquiry are developed through the knowledgeable application of creativity, design and computational thinking".

STEAM Projects support the Career and Technology Foundations [CTF] Program of Studies. The CTF program enables students to explore their interests as they learn about various career possibilities and occupational areas.

## Alberta Education Learning Outcomes

CTF is exploring interests, passions and skills while making personal connections to career possibilities.

- I explore my interests and passions while making personal connections to career possibilities.
- I use occupational area skills, knowledge and technologies.
- I follow safety requirements associated with occupational areas and related technologies.
- I demonstrate environmental stewardship associated with occupational areas.

CTF is planning, creating, appraising and communicating in response to challenges.

- I plan in response to challenges.
- I make decisions in response to challenges.
- I adapt to change and unexpected events.
- I solve problems in response to challenges.
- I create products, performances or services in response to challenges.
- I appraise the skills, knowledge and technologies used to respond to challenges.
- I communicate my learning.

CTF is working independently and with others while exploring careers and technology.

- I determine how my actions affect learning.
- I develop skills that support effective relationships.
- I collaborate to achieve common goals.

The CTF curriculum provides for occupational learning experiences in alignment with the Career and Technology Studies (CTS) courses available for high school students. CTF is not a prerequisite for CTS high school courses.

Learning that is foundational to careers and technologies, promotes the development of literacy, numeracy and other competencies, while exploring a occupational areas in five clusters:

1. Business,
2. Communication,
3. Human Services,
4. Resources, and
5. Technology.

CTF challenges are intended to integrate at least two occupational areas. The opportunities, presented as challenges, enable students to experience the interconnectedness of skills, knowledge and technologies within a variety of occupational areas.

Students engaging in CTF challenges or tasks, alternate between the processes of planning, creating, appraising and communicating in non-linear manner.
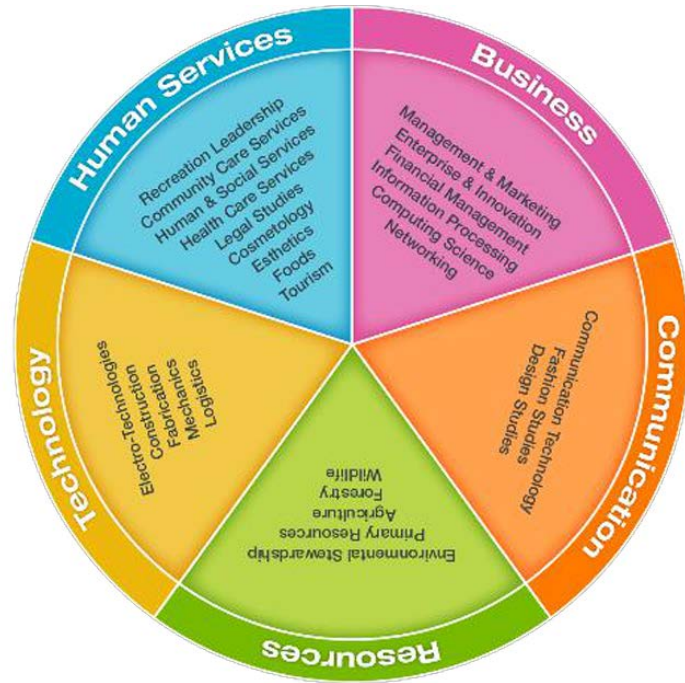
## STEAM Projects

Project work in the area of STEAM provides many benefits to students. Steam projects often involve guided inquiry where students learn how to ask thoughtful questions, uncover new ideas, build upon background knowledge and apply what they have learned. Many STEAM projects involve teamwork and thoughtful dialogue in which students converse and exchange ideas while problem solving. Students learn how to determine responsibilities, engage in compromise, listen and encourage others.

Through STEAM projects, students learn how to help each other, and figure out how to use their various strengths and competencies to create/complete projects. Cross-curricular projects engage different parts of students' brains so they see the activity/project through different lenses (focusing on details while also learning to see the bigger picture). Students must solve in more creative, non-linear ways (not formulaic). They involve hands-on learning experiences (ie. building and fixing) and there is the encouragement of girls to explore STEAM fields.

STEAM projects show students how varied the arts are, and how they are integral to products that involve engineering, technology and mathematics. Students are given the opportunity to be innovative or share innovative ideas for school and their local community. Students connect their projects to skills that will serve them in the future.
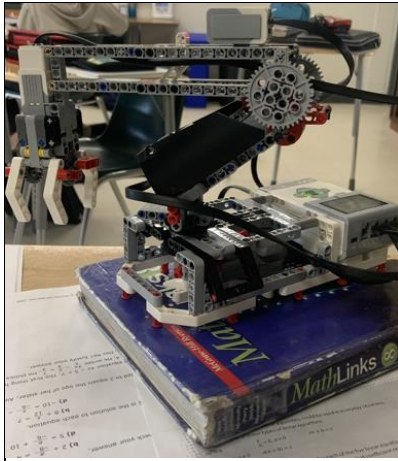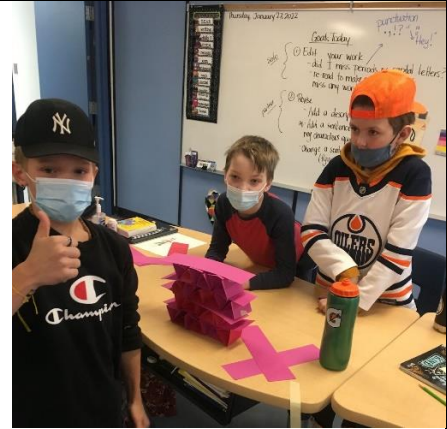
During the week of June 13-24, PSD showcased a virtual STEAM Expo.

Throughout the year, schools have the opportunity to share the great work that is happening in this area.

## STEAM Challenges

### Design Support Structures

Build a tower using the triangle shape aka a truss bridge, to hold up different weights.
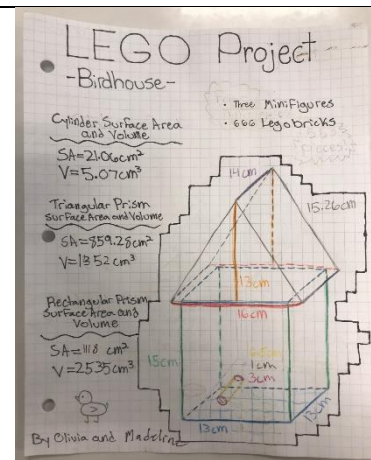




**Code a dance for their Robot.**

This group went one step further and synchronized it to music!

### Estimation based on Surface Volume

Students were challenged to plan and create a prototype of a LEGO Ideas set.

They estimated the number of bricks and mini-figures that would be appropriate for their set based on the surface area and volume of their creation.

Students were challenged to design and test catapults.

### DIVISION-wide
### All year

Students have access to 15 STEAM-based CTF challenges that were developed last school year - challenge, project and showcase are included. They continue to be used throughout this school year

**Solar Oven Challenge**

How can you harness solar energy to cook for you? In many places around the world, solar ovens are used to cook food with the sun. In North America, they are mostly used for camping, solar oven cooking groups and hobbyists. If you have an effective solar oven, you can cook just about anything you'd cook in a regular oven.

**Car Design Challenge**

What do you gain from taking a risk? When designing a car, can the change of a line give the vehicle more function? What makes a car faster than another? How can you empathize with the needs of those who will use the car? How will cars evolve in the future?

**AI Chatbot Challenge**

While people might once have associated AI with robots or chess playing, today's students often interact with AI chatbots on a daily basis. AI chatbots like Siri, Alexa, Cortana, and Google Assistant are commonly found on students' smartphones, computers, and home devices, but how much do students know about how they work and how they can be used?

**CTF 7-9: Make a Tiny Home Challenge Rubric**

| | Developing | Proficient | Excellent |
|---|---|---|---|
| **Tiny House Plan** | Plan includes one of the required components. | Plan includes three of the required components. | Plan includes all four of the required components. |
| **Floor Plan** | Floor plan is difficult to read, lacks labels, is unorganized, total square footage contains many errors, and design is lacking in creativity. | Floor plan is easy to read, clearly labeled, organized, total square footage is determined with few to no errors, and design contains a lot of creativity. | Floor plan is extremely easy to read, clearly labeled, extremely organized, total square footage is determined with no errors, and design is extremely creative. |
| **Interior Décor Sample Board** | Very few materials were used. Less than half of the required components are present. Board is disorganized and messy, and pictures of samples are not completely glued. | All materials were used. More than half of the required components are present. Board is neatly organized and attractive, and pictures and samples are securely attached. | All the required materials were used with additional measures added. All components are present. Board is very neatly organized, extremely attractive and easy to read. Pictures and samples are securely attached, and the board shows creativity. |
| **Model of Tiny House** | Construction appears careless or haphazard. Many details | Construction was careful and accurate for the most part, but | Great care was taken in the construction process so the |