



# Pearl Creek STEAM K-5 Magnet School Proposal

## Rationale and Justification:

2022-2026 Fairbanks North Star Borough (FNSB) Comprehensive Economic Development Strategy identifies the **FNSB School District's commitment to increasing Science, Technology, Engineering, Arts, and Math (STEAM) education** in the district as its **top strategy** for laying our community's educational foundation for a healthy workforce and economy<sup>1</sup>.

At the same time, FNSBSD's student enrollment has been steadily declining as enrollment in homeschool programs run by other school districts is rising<sup>2</sup>. These homeschool programs offer attractive STEAM curricula that emphasize student and family choice in project-based learning<sup>3,4</sup>.

**We propose an efficient and cost-effective transition of Pearl Creek Elementary School to a STEAM Magnet School to:**

1. Fulfill FNSBSD's committed work toward increasing STEAM education in our community for our workforce development, and
2. Offer another attractive school choice option to compete for our area students and grow our district student enrollment.

## Vision:

Pearl Creek Elementary STEAM Magnet students engage in interdisciplinary project- and place-based learning and use critical thinking, creativity, and innovation to solve real world problems and develop the confidence and skills necessary for a technologically advanced future.

## Core Components<sup>5</sup>:

### ***Enrollment Management-***

We will recruit families through social media, flyers, word of mouth and utilizing district communication protocols. Our initial focus will be to recruit Fairbanks families who are currently not enrolled in the school district to help increase district funding levels and reverse declining

district enrollment trends. We will adjust enrollment goals over the long term to shift greater effort towards equity, diversity and access to students throughout the district. To maintain a robust and sustained recruitment effort, we will leverage an advisory council (described below in “community engagement”) to advance enrollment strategies and meet our short and long term enrollment goals, which we will determine collaboratively with FNSBSD.

### ***Curriculum and Instruction-***

Our vision is to continue to deliver our high standard of core reading, writing and math content areas, and weave STEAM throughout these subject areas. Our staff is already well seasoned in this style of integrated, multidisciplinary teaching. In addition, we will innovate in our weekly schedule to provide daily “walk-to-STEAM” choice exploration courses for students to take deep dives into the areas of their interest, which we will call “iSTEAM” (Figure 1). On Fridays, half of the school day will be dedicated to “Lab,” which will allow for deeper engagement from the iSTEAM courses in longer experiments, tinkering, making, or field trips. Each iSTEAM course and lab will be tightly aligned with Next Generation of Science Standards and the FNSBSD school curriculum. Students would be given the opportunity to not only be consumers of science and STEAM lessons, but also collectors and interpreters of data. We will provide professional development opportunities quarterly for staff to continue to build skills in STEAM integration, novel technologies, and current science and art trends, drawing from our extensive existing partnerships and future emergent partners.

***Family Engagement-*** Our current STEAM programming draws on strong parent involvement for facilitating our annual STEAM night, our annual STEAM student project fair, aiding in field trips and classroom projects, and facilitating many of our afterschool clubs. On average, parent and community volunteers operate 6-8 afterschool clubs each quarter at no extra cost to the School district, and we anticipate this number growing as a STEAM Magnet school. At the core of our family engagement strategy is strong communication with our families. Our facebook and website are well visited, and we maintain weekly communication newsletters from both the principal and each individual teacher. Pearl Creek’s PTO is also a strong network for family, teacher, and administrator engagement, and our PTO is highly successful at fundraising toward school goals.

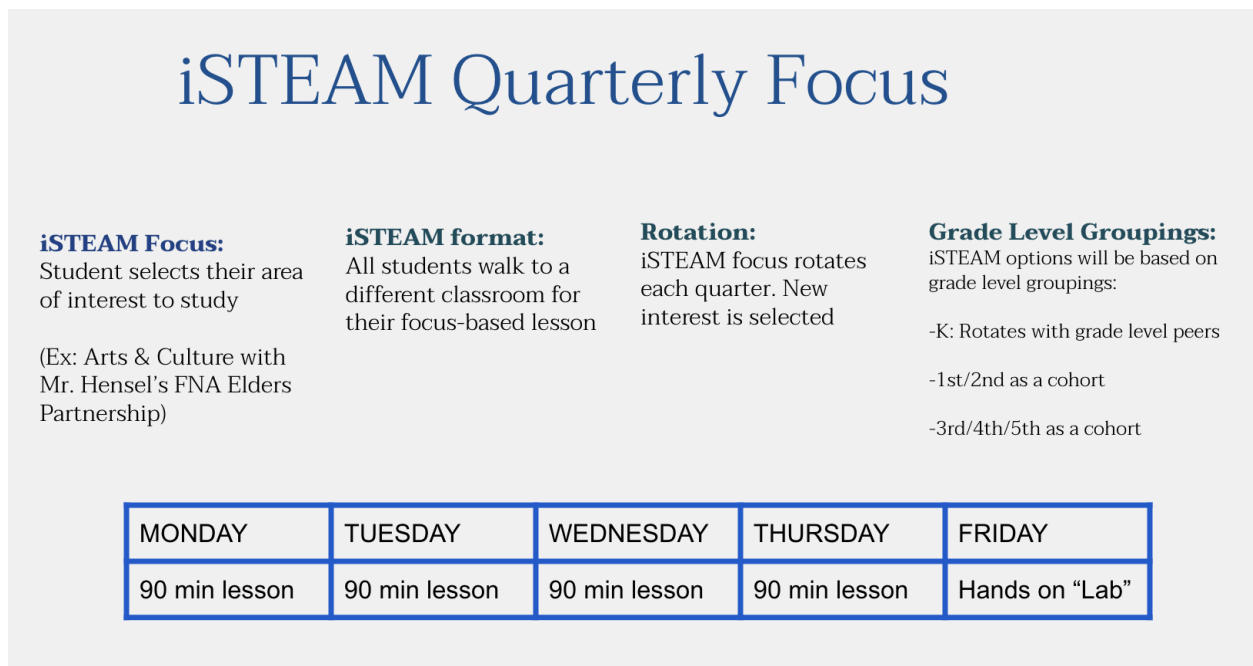
***Community Partnerships -*** We build on a decades long strength in community STEAM partnerships (Appendix A). In addition to leveraging the cost-efficiency of the many thousands of dollars of in-kind support from these partners, we will have an advisory council of parents, teachers, and community stakeholders (FNSBSD leaders, STEAM program providers in the Fairbanks area, and STEAM workforce sector representatives) to help guide our program development and ensure it meets the workforce and education needs of our community.

***Diversity and Equity-*** The Pearl Creek STEAM magnet model seeks to increase area-wide access to the rich STEAM programming our school provides and the new structural components we plan to innovate, should this proposal be successful. Curriculum, enrichment activities, family engagement and community partnerships are mindfully designed around equity across race, socioeconomic status, gender, culture and ability. Notably, our after-school care through Thrive

and after-school club program provides increased accessibility to the STEAM model for working families. Our long-standing partnership with FNA through teacher Jesse Hensel, provides Alaska Native cultural grounding and role models in STEAM practices, and our Special Education and ER program ensures students of all abilities gain from STEAM learning.

## Program Structure:

**School Day-** We would create a school structure that supports deep dives into the areas of exploration by allowing students to choose their interest area, while teachers facilitate specific focus classes everyday. In addition, we would like to create learning labs or field work experiences every Friday where we partner with outside agencies, and the University, to bring scientists and experts into the classroom to learn and deepen our knowledge (Figure 1).



**Figure 1. Proposed school day structure with iSTEAM embedded in the schedule.**

**Afterschool programming:** Our parents and community partners provide quarterly afterschool clubs, which are very popular and fill entirely within minutes! We have long standing connections and relationships with UAF and with outside organizations that would only continue to grow as we provide students with a robust academic experience. Some of the examples of our partnerships, but not limited to, are the Permafrost Tunnel, US Fish & Wildlife Service, AK Department of Natural Resource, City of Fairbanks (Stormwater Pollution), Project GLOBE, One Tree Organization, Calypso Farms, BLM Fire Service and the UAF Volcanology department.

**Community Programming:** We will continue to offer our outstanding STEAM community fair, which draws more than a thousand people to Pearl Creek each year, and packs the house! This

draws on many of our existing partnerships listed above and in Appendix A, and also allows us to cultivate new STEAM partnerships in the community.

## Impact and Evaluation

This innovative approach would allow students to have hands-on learning experiences in a learning environment that is intentional about our connection with STEAM.

We would need no additional resources from the school district and would rely on our creativity in planning and collaboration, in addition to utilizing our partners throughout Fairbanks.

Our “logic model” or “theory of action” would promote positive outcomes such as increased student engagement in STEAM fields, improved STEAM skills, and higher rates of post secondary STEAM educational pursuits with higher rates of proficiency as measured by the Alaska Star Statewide Assessment in all subject areas.

### Key components of Pearl Creek’s STEAM Magnet School Logic Model:

#### Inputs:

- **Human Resources:** All staff teaching STEAM courses, dedicated STEAM lab, guest speakers from our community, UAF and parent volunteers
- **Financial Resources:** Fundraising by the school for specialized equipment, field trips and potential UAF grant money to help with staffing labs
- **Community Partnerships:** Collaboration with local businesses, UAF, and more (please see attached partnership list)

#### Activities:

- **Project-Based Learning:** Designing and implementing hands-on STEAM projects aligned with curriculum standards with a culminating capstone Project/Field Trip specific to each grade level
- **Inquiry-Based Instruction:** Encouraging critical thinking and problem-solving through open-ended investigations, again using the NGSS framework to science inquiry
- **Interdisciplinary Units:** Integrating STEAM concepts across different subjects, ie. math, reading, writing and social studies
- **Mentorship Programs:** Pairing students with community professionals and UAF college students
- **Competitions and Exhibitions:** Participating in STEAM challenges and showcasing student work in quarterly family nights and with capstone projects

## Outputs:

- **Student-developed prototypes:** Tangible results from design thinking projects
- **Presentations and portfolios:** Demonstrating acquired knowledge and skills through presentations, digital portfolios and a capstone project specific to each grade level
- **Increased participation in STEAM competitions:** Higher student involvement in external STEAM challenges, i.e. robotics competitions, science fair, and other challenges.
- **Community outreach events:** Sharing student projects and engaging the broader community in our Family nights and community events such as Food Bank participation

## Outcomes:

- **Improved STEAM knowledge and skills:** Increased student proficiency in science, technology, engineering, and math concepts, as determined by AK Star Science and Math tests
- **Enhanced critical thinking and problem-solving abilities:** Students demonstrating advanced critical thinking and problem-solving skills
- **Positive attitudes towards STEAM careers:** Increased interest in pursuing STEAM-related fields in higher education
- **Greater diversity in STEAM pathways:** Attracting a wider range of students to pursue STEAM careers and participation in Kids 2 College work through UAF

## Important Considerations:

### **Data Collection:**

We will use the AK Star Reports in Science and Math, student surveys, FNSBSD School Climate data and participation rates in STEAM activities.

### **Continuous Improvement:**

Pearl Creek will quarterly evaluate the effectiveness of the program and make adjustments based on data analysis, as well as, parent and student feedback.

### **Stakeholder Engagement:**

Involving parents, community members, and community partners in the design and implementation of the STEAM magnet program



## Appendix A. Existing Community Partnerships with ongoing commitment for in-kind financial support

Our long-standing partners provide us with instructional support, classroom instruction, instructional supply kits and learning activities, and field trips. Below is a listing of some of our existing and committed partnerships.

Program	Agency Sponsor	Key contact for Pearl Creek Partnership	Type of support provided
Salmon in the Classroom	ADF&G	Eric Anderson	Teacher professional development, In-classroom instruction, field trips
Energy and Conservation activities	Renewable Energy Alaska	Colleen Fisk	Teacher professional development, In-classroom instruction, field trips
Extreme Climate Studies	National Renewable Energy Laboratory (NREL)	Bruno Grunau	field trips, STEAM Night
Global Learning and Observations to Benefit the Environment (GLOBE) Program	University of Alaska Fairbanks International Arctic Research Center and NASA	Dr. Katie Spellman, Chris Villano	Teacher professional development, In-classroom instruction, field trips, After-school club
Museum of the North	University of Alaska Fairbanks	Jen Arsenau, Elisabeth Padilla, Nan Werdin	Teacher professional development, field trips, kit checkout
Fly Tying Club	Midnight Sun Flycasters	Steve Sandquist	After-school Club
Improv Comedy Club	Parent	Molly Proue	After-school Club

Skiing, Running, Basketball, Soccer, Volleyball Afterschool Clubs	Parent	Annual Parent and Teacher Commitment	After-school Club
Deep Sea Pressure Experiments on Icebreakers	UAF Marine Science Department	Dan Nabor	In-classroom instruction
Fiber arts, visual arts, ceramic arts, knitting, sewing and crafts Clubs	Annual Parent and Teacher Commitment	Annual Parent and Teacher Commitment	After-school Clubs
Engineering in the Classroom			Instructional Kits
Ag in the Classroom	Fairbanks Soil and Water Conservation District	Melissa Sikes	
Smoke Jumper Demonstration	BLM Alaska Fire Service	Nick Biedscheid	School Assembly
Kids Don't Float AK	AK Dept. of Natural Resources	Office of Boating Safety	In-classroom instruction
Stormwater Pollution	City of Fairbanks	Environmental Analyst	In-classroom instruction
School Garden Program	Calypso Farm and Gardens	Tom Zimmer and Susan Willsrud	Summer Camp program, garden support, in-classroom instruction, field trips
Wilderness Survival	Gates of the Arctic NP	Fairbanks Alaska Public Lands Information Center	field trips



Rocket Building/ Aerospace	UAF Engineering Department	Katelin Avery	Field Trips, STEAM night
Drone Flying	UAF ACUASI	Cathy Cahill	Field Trips, STEAM night
Volcano and Geology Activities	UAF Geology Department	David Harvey, Dr. Elisabeth Nadin	Field trips, In-classroom instruction, afterschool club
Earthquake Simulator & department tour	UAF Geophysical Institute	Dr. Carl Tape	Field Trips
Project ONE Tree	UAF Department of NAtural Resources and Environment	Dr. Jan Dawe	Field Trips, in-classroom instruction, teacher professional development
Creamer's Field	Alaska Department of Fish and Game and Alaska Song Bird Institute	Mark Ross, Tricia Blake	Field Trips
Permafrost Tunnel	USARMY CEERD-CRREL (USA)	Gary Larsen	Kits
Wildfire Walk	UAF International Arctic Research Center, Alaska Fire Science Consortium	Dr. Sarah Trainor, Dr. Katie Spellman	In-Classroom instruction, Field trip
Muskox and Bison Farm	UAF Large Animal Research Center	Caitlin Lenahan	Field Trips
Boreal Forest Ecosystems	UAF Biology Department and Bonanza Creek Schoolyard LTER	Dr. Anya Kade, Dr. Elena Sparrow	In-classroom instruction, Field Trips, after-school clubs
Alaska Weather	NOAA and UAF International Arctic research Center	Dr. Peter Bieniek	In-classroom instruction

Alaskan Wildlife	U.S. Fish and Wildlife Service	Julia Field	After-school club, in-school instruction, field trips
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#### Works Cited:

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