

Nenana City Public School STEM Programs



K-12 Project Lead The Way

- PLTW programs implemented at NCPS
 - PLTW Launch (Grades K-6)
 - PLTW Gateway to Technology Program (Grades 7-8)
 - PLTW Biomedical Program (Grades 9-12)
 - Next Year - PLTW Engineering Program (Grades 9-12)
- PLTW is a nationally recognized STEM curriculum
- For more information on PLTW programs:
 - pltw.org

Higher Level Sciences

Physics

Chemistry

Principles of Biomedical Science (PLTW)

These science courses account for 36.5 % of all high school students

Intro to Engineering Design (PLTW): Fall of 2015

STEM Integrated Science Courses

A few projects of focus in HS Science

- Physics class students are designing a miniature electric house following study of circuitry, electric energy costs, and alternative solutions to high costs of energy in Alaska
- Project Lead the Way High School students completed unit about diabetes and its effects on the body and are designing a calorimeter to measure the caloric content in popular foods (e.g. potato chips)
- Junior high 8th Grade students completed sketches of playground equipment in the Design and Modeling Unit, printed the equipment (on the 3D Printer) designed and assembled the playground. The next step is to share the final playground model at the Board of Education Meeting in March.
- Physics class students focused on Work, Power, and Simple Machines and created Rube Goldberg Machines performs very simple tasks in a very complicated and over-engineered manner that includes chain reactions where one element triggers the next element and so on, ultimately triggering the final element

Higher Level Math

Geometry

Algebra 2

Pre-Calculus/College Algebra

Calculus

These math courses account for 30% of all high school students

STEM Integrated Math Courses

A few projects of focus in HS Math

- *Linear Systems of Equations Project* in which students called Alaskan phone companies to identify different plans as a basis for developing equation systems and then created a video of the best cell phone plan options that meet individual or family needs
- *Designing a House Project* in which students in geometry class researched different types of houses in Alaska's urban and rural areas and developed a model, using Google Sketchup and Minecraft programs. They also researched and designed futuristic housing concepts (for Alaska and other locations) that relied on physics concepts and energy efficient options.
- *Designing a Business Project* in which students applied newly learned rational functions to design a business in Nenana that will benefit the community and owners. They learned about advertisement and customer service, and decision-making based on simulated numbers. Students also tied in physics concepts of energy efficiency, while designing and constructing a building model.

STEM Integrated English Courses

A few projects of focus in HS English

- Implement Really Simple Syndication (RSS) readers to create customized news and information reading lists, and Google PowerSearching to supplement conventional methods to search for website information. This content, called a "feed," helps to synthesize blog posts for digital journal compositions.
- Use Google SketchUp software (<http://www.sketchup.com/learn/videos>) to build virtual 3D models and assemble *Lady or the Tiger* arenas; project also included a multi-page, typed explanation of how and why students designed arena, method of construction, and why they included items in the 3D model.
- Implement ***The Life of Pi*** activities in which students connected with Pi's search for the nature of life through curricular frameworks that seemed most meaningful, and applying diverse interests, backgrounds, and capabilities to solve the novel's intricacies. Students also selected, researched, and presented their personal enlightenment and intellectual discovery. *Life of Pi* has expansive application to other areas, including, marine biology and study of the sea life from the perspective of a drifting lifeboat.
- Grant writing project provided students with capacity in comprehensive grant writing, research, and strategies to fund proposals necessary to secure funding for programs, initiatives, and other organizational needs. Students learned to write a proposal, identify funding prospects, understand grant guidelines, and develop a compelling project narrative and budget. They also learned how to construct a clear and persuasive proposal that resonated with funders' priorities.

Aviation Program

- Provide real-world application of science and math
- Exploration of aviation careers in AK
- Provide students the opportunity to attain a private pilot license
- Give students a huge step in the UA's aircraft mech. program
- Provide students with a truly hands-on experience
- 3 FY 14 graduates gained aviation employment



Aviation Application Process

- Students apply in the spring before the new school year
 - Students complete application packet
 - Prerequisites
 - Application packet includes...
 - essays
 - teacher recommendations
 - signed commitment paper from students and parents
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Training for Our Own Instructor

- Collin Stone, NCPS teacher, is also taking program alongside students
 - Goals for Collin...
 - Private Pilot License (Completed May of 2014)
 - Flight Instructor License (In progress)
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Flight Simulator

- The Medallion Foundation is supporting the program by placing a flight simulator at NCPS
- Students and local pilots have access
- Newest edition, FAA approved for flight hours



Nenana City School gives aviation training a trial run

By Weston Morrow wmorrow@newsminer.com |
16 comments



Eric Engman/News-Miner

Nenana School District Aviation Program

Patricia Alexia of Nikolai taxis back to the hangar after doing several touch-and-go's with instructor Mike Morgan as students with the Nenana School District's Aviation Program work on their

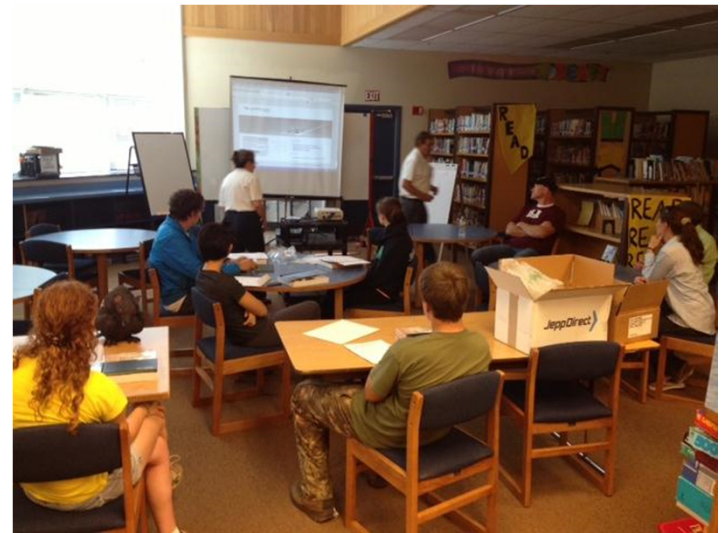
FAIRBANKS — Administrators at many of the country's largest high schools would likely drool about the possibility of creating an aviation program, but they might go into shock to learn a K-12 school serving only 200 students has beaten them to it.

When it comes to schools, smaller size usually means less range in course offerings, but Nenana City School — a school whose student body from kindergarten through 12th grade could fit on a Boeing 747 with half the airplane to spare — is trying to reverse that trend.

The Nenana City School serves kids in the community about an hour south of Fairbanks as well as students who come from many of

Aviation Program Components

- Introduction to Aviation
- Ground School Instruction
- Flight Instruction
- Aviation Mechanics



Canvas: Learning Management System (LMS)

Canvas is the learning management system (LMS) that brings all the K-12 classroom tools together.

- Fully implemented in grades 7-12 fall of 2015
- Student capabilities
 - work through curriculum on any device
 - submit homework, projects, exams
 - work collaboratively with other students
- Teacher capabilities
 - design standards-based curricula
 - develop assessments, projects, activities
 - grade from any device to provide real-time feedback