

# NFPS STEAM

*Science, Technology, Engineering, Arts, and Mathematics*

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February 23, 2026

New Fairfield Public Schools

BOE Curriculum Subcommittee Presentation





## This evening's presentation:

- **Engineering: *Science curriculum connections***
- **Enrichment, Explorations, & Electives: *Robotics, Broadcasting, and more***
- **Engaging for the Future: *Forward thinking***





# NFPS Science Transfer Goals

## Students will use their learning to:

- Question and seek answers as they make sense of real-world phenomena.
- Model processes and systems from multiple perspectives for understanding and communication to others.
- Collect and analyze data in order to derive meaning and support or refute an argument or claim.
- Engage in innovative thinking and design processes that can lead to solutions for complex problems in our world.



# Elementary STEAM Lessons

Embedded learning experiences in science curriculum units at each grade level



## Unit 1 - Exploring Weather

How do weather forecasts help us? In this first unit of the year, kindergartners develop their observation skills as they notice the weather elements around them each day, including sun, wind, rain, snow, and temperature. They learn to organize this weather data and keep track of their observations to see patterns that describe seasons and patterns that allow for weather predictions. With this learning, they learn how to use observations to inform decisions that allow us to be prepared for severe weather events.

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## Kindergarten Weather Unit: Shade Structures

### Science and Engineering Practices: K

- Make observations (firsthand or from media) to collect data that can be used to make comparisons. (K-PS3-1) (K.WC.SEP.2.1)
- Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. (K-PS3- 2) (K.WC.SEP.4.1)

## How do you send a secret code?

Waves of Sound Unit

Pattern Transfer & Technology



Science - Grade 4

From Rube Goldberg machines to animals' senses, fourth graders build their modeling skills, use of evidence, and data analysis skills across this year of science as they study forms of energy in our natural world.

Science and engineering practices are developed in each unit throughout the year for fourth graders. These practices include:

- Asking questions and defining problems
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Constructing explanations and designing solutions to problems
- Making arguments based on evidence and data

## Grade 4 Structure, Function, & Information Processing Unit: Codes



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# Elementary STEAM Enrichment

## Video Broadcasting



## Coding / Robotics

## Film Production

## 3-D Club



# Grade 6 STEAM



## Unit 1: Magnetic Forces In Action

Students are introduced to the foundational concepts of magnetism through hands-on investigations, modeling, and engineering applications. The unit emphasizes engineering design principles as students iterate through design challenges, create detailed portfolios documenting their learning journey, and engage in reflective practices that connect their investigations to real-world applications. Students learn that magnetic forces act at a distance and follow predictable patterns, preparing them for deeper exploration of forces and energy.

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## Unit 2: Electric Forces In Action

Students investigate electric forces by exploring the mystery of why balloons stick to walls after being rubbed, developing explanatory models through PHET simulations that make invisible charges and electric fields visible. After experiencing the dramatic power of static electricity with a Van de Graaff generator, students transition from accumulated charges to flowing charges by discovering what makes circuits work through hands-on digital inquiry. They apply this understanding by constructing physical circuits and troubleshooting real electrical connections, ultimately integrating their knowledge of electric forces and circuit principles in an engineering design challenge where they create functional flashlight prototypes to meet the needs of a local business.

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# Grade 8 STEAM



## Unit 1: Shake-Proof Towers: Engineering Structures That Survive Earthquakes

Students act as structural engineers designing and testing towers to withstand the potential for "The Big One," they study how seismic waves move and how to analyze earthquake data. Through building challenges and shake-table testing, students explore stability. By combining wave science with engineering, students develop resilient buildings and resilient communities in earthquake-prone regions.

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## Unit 2: Seconds to Safety: Tsunami Engineering

Building on earthquake engineering knowledge from Unit 1, students investigate how underwater earthquakes generate tsunamis, with particular focus on Pacific Northwest tsunami risks from the Cascadia Subduction Zone. Students analyze tsunami wave properties, compare them to normal ocean waves, and explore how warning systems save lives. They investigate analog vs. digital communication systems, designing and testing warning technologies. Finally, students modify their earthquake-resistant towers to incorporate tsunami evacuation features, addressing multiple hazard requirements and experiencing the complexity of real-world multi-hazard engineering.

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and inheritance simulations, they learn how traits are passed on and how selective breeding can shape organisms over generations. Using this genetic knowledge, students make evidence-based decisions in an iterative design process to prototype a dog with traits suited to a chosen task and justify their final design.

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## Unit 2: Data Trends and Predictions

In this unit, students apply engineering design principles to plan a trip given specific constraints. Students define criteria (cost, convenience, pet well-being) and constraints (budget, time, pet policies) as they collect and analyze data. Using spreadsheet tools to organize information and create visualizations, students evaluate trade-offs between traveling with a pet versus arranging alternative care. They develop evidence-based recommendations using the Claim-Evidence-Reasoning framework and present their optimized solutions. This project mirrors how engineers use data to make informed decisions when designing solutions within real-world limitations.

[VIEW](#)

# Grade 7 STEAM

Students act as engineers as they create a "Perfect Pooch" for a real-world job. Through modeling, Punnett squares,

# Science and Engineering Practice Standards

## Grade 8 STEAM connections (Unit 2)

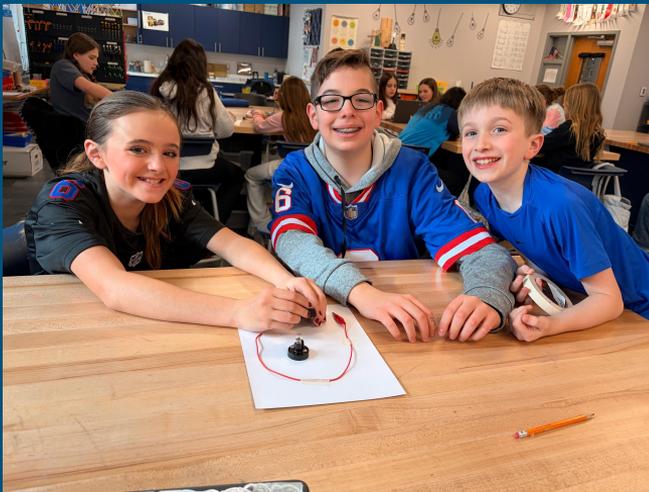
### Science and Engineering Practices

#### Next Generation Science Standards

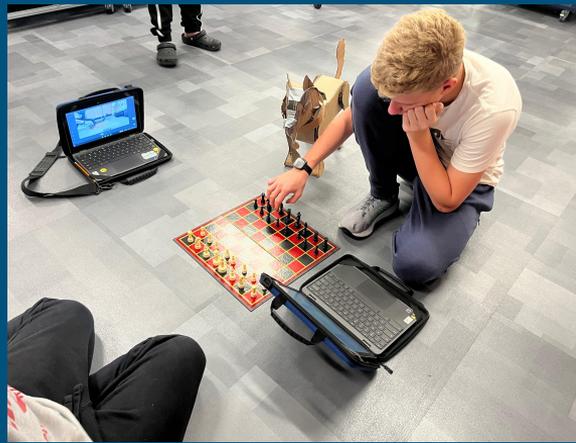
#### Science and Engineering Practices: Middle School

- Science knowledge is based upon logical and conceptual connections between evidence and explanations. (MS-PS4-1) (*MS.WER.SEP.4.1*)
- Define a design problem that can be solved through the development of an object, tool, process or system and includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions. (MS-ETS1-1) (*MS.ED.SEP.1.1*)
- Evaluate competing design solutions based on jointly developed and agreed-upon design criteria. (MS-ETS1-2) (*MS.ED.SEP.4.1*)

## Grade 6 STEAM



# Grade 7 STEAM

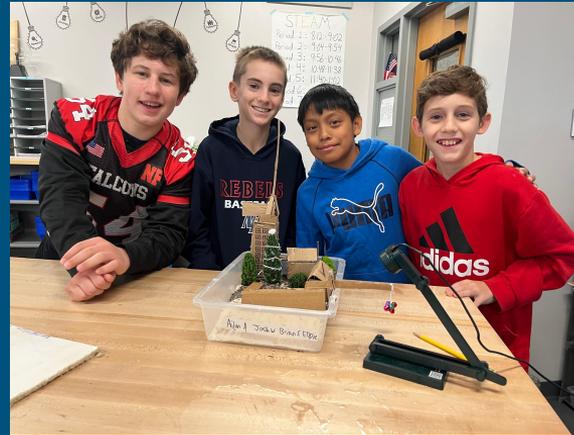


L.A 4 days All for \$2,870.50



Destination	L.A	\$3,000.00	3 people, 4 Nights
Expense Category	Estimated Cost	Actual Cost	Notes - (destination, details, links)
Flight	\$900.00	\$738.00	Travology, Delta
Hotel	\$1,000.00	\$720.00	Travology, Los angles airport marriot
Food	\$300.00	\$400.00	(estimate daily spending × number of days)
Activities	\$500.00	\$500.00	Universal Studios Hollywood California
Local transportation	\$200.00	\$400.00	Rental Car,
Souvenirs	\$75.00	\$112.50	Souvenirs & other expenses

# Grade 8 STEAM





# Grade 6 STEAM Explorations

## STEAM Explorations - Grade 6

### Design and Modeling

Students discover how designers and engineers transform ideas into reality through hands-on problem-solving. Students design ankle-foot orthoses for individuals with cerebral palsy, build and test paper air skimmers, and develop technical sketching and measurement skills. The course introduces 3D modeling in Tinkercad, where students design and print pencil toppers and create birdhouses that meet specific criteria. The course culminates with students solving an authentic problem.



# Grade 7 STEAM Explorations

## STEAM Explorations - Grade 7

### Flight and Space

Students explore the science and engineering that make air and space travel possible. Students investigate aerodynamics and apply their understanding by designing and building aircraft prototypes. The course then explores the challenges of launch, orbit, landing, and maintaining healthy living environments for astronauts. Students apply the engineering design process to design, build, and test their own prototypes.



## STEAM Explorations - Grade 8

### Automation and Robotics

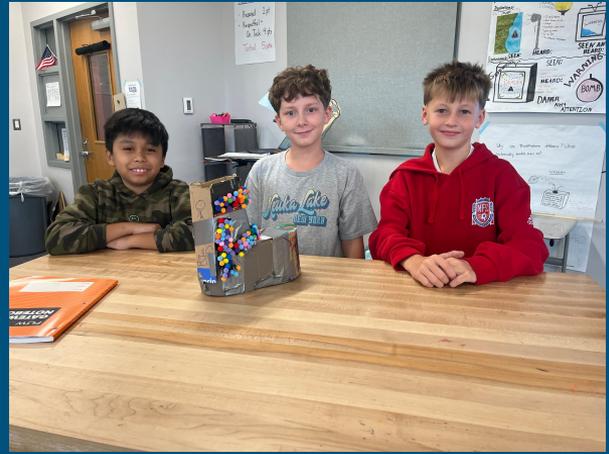
Students explore robotics and automation by designing, building, and programming mechanical systems. Students investigate how gear trains and mechanisms transfer movement, then design automated devices for clients such as interactive pet toys, warning signs, or high-speed dragsters. Students incorporate sensors as input devices, learning how automated systems respond to user interaction. The course concludes with students designing, building, and programming their own robots.

# Grade 8 STEAM Explorations

# Grade 6 STEAM Explorations

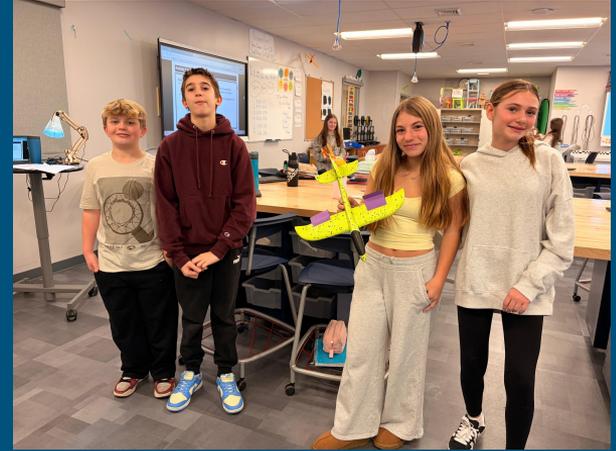


## Design and Modeling



# Grade 7 STEAM Explorations

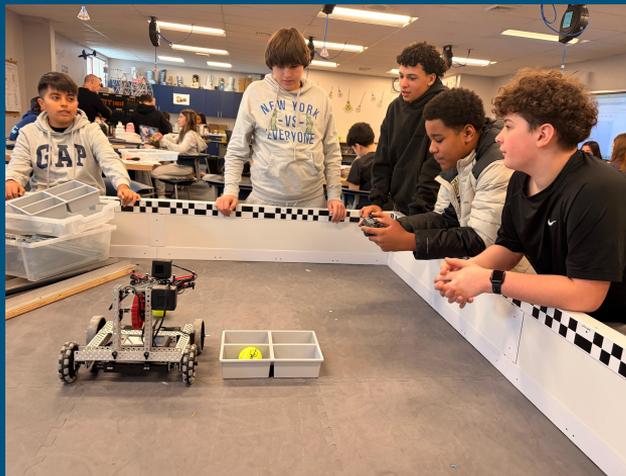
## Flight and Space

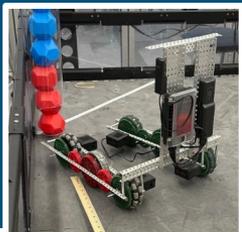


# Grade 8 STEAM Explorations



## Automation and Robotics





# New Fairfield High School

## Career & Technical Education Courses & Opportunities



### Career & Technical Education (CTE) - Robotics

Students develop a solid foundation in robotics and participate in hands-on learning activities. They concentrate on problem solving using robotic maneuvering projects that also venture into basic electronic circuitry, sensors, and computer controlled systems. Students design and engineer solutions to various problems while using tools, and design software. Career options in robotics are explored.

### Career & Technical Education (CTE) - Video and Broadcasting

This course is designed to take students through the video production process. They collaboratively and independently create films for the class while learning about solving problems in scripting, storyboarding, editing and sound. Students work in the NFHS state-of-the-art studio to create broadcasts. Careers in the film and broadcasting industries are explored, and student work is shared with the school community.

### Career & Technical Education (CTE) - Animation

The animation course develops advanced digital media literacy, storytelling, and animation, while exploring how animation knowledge can be applied to careers in science, technology and digital media. Students learn about the history of animation, animation principles, and different animation techniques. Students complete multiple hands-on projects using software and traditional animation methods.



# New Fairfield High School

## Career & Technical Education Courses & Opportunities

### And more ...

- AP Computer Science
- Architectural Design
- Commercial Art & Design
- Digital Design
- Engineering & Design
- Foundations of Engineering
- Introduction to Programming
- Music Technology
- Woodworking Technology



### NFHS Robotics Team



# Engaging for the Future: Forward thinking

- Digital literacy skills / AI competencies
- Industry-recognized credentials
- **Additional opportunities for design-thinking, innovation, prototyping, communicating, collaborating and cross-disciplinary problem solving**

