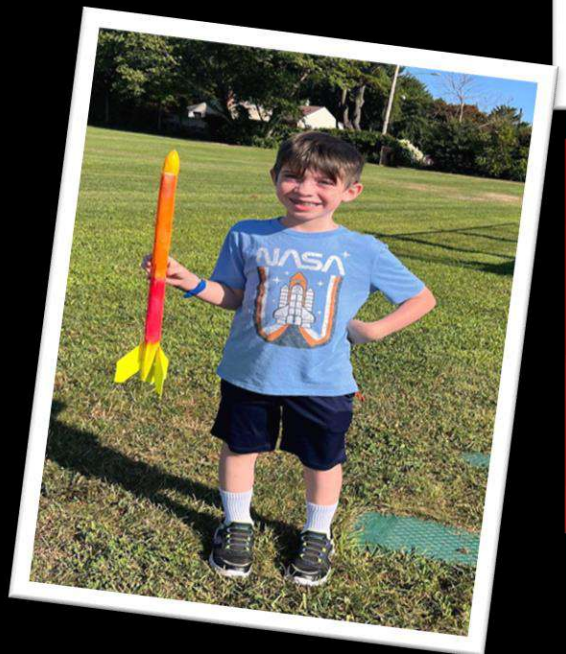
Elementary and Middle School
NYSSLS & STEM UPDATE

PARENT UNIVERSITY – November 1, 2023

NYS ED .gov **NYS Next Generation LEARNING STANDARDS**

Science, Technology & Engineering Education
Northport-East Northport UFSD 2023-2024

WELCOME!
A YEAR OF INSPIRATION and ENGAGEMENT



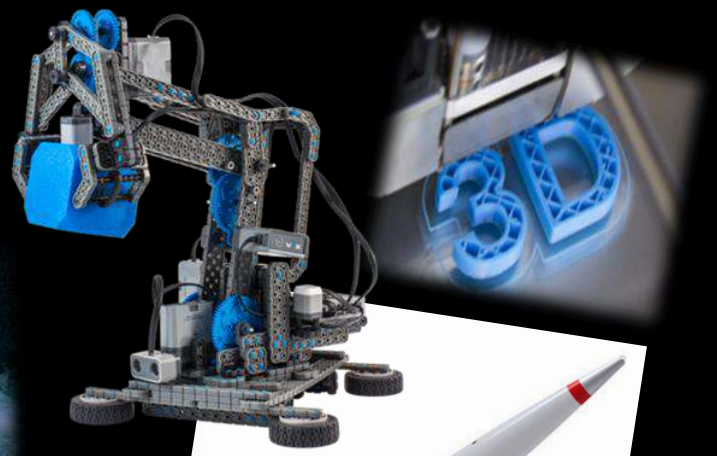
EMPOWERING ALL of our learners to become problem solvers and innovators.

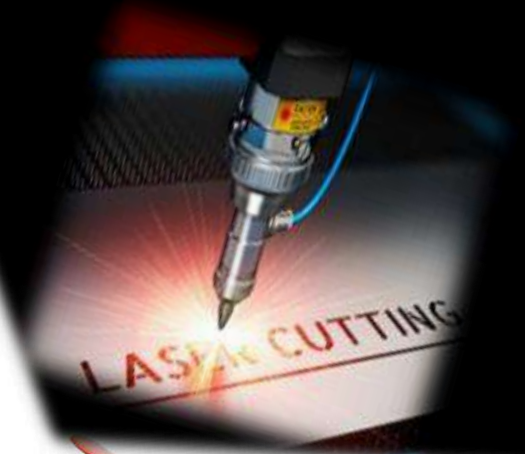
GET SMArT campers discover the artist, musician, entrepreneur and scientist within! **Grade 3-7 students study a musical instrument, find their voices** on stage, **dive into the world of coding, robotics, game design,** and **rocketry.** They work with the latest tech tools and equipment, and learn the **fundamentals of business entrepreneurship**!

Overview:

- Fine & Performing Arts partnership with Science, Technology & Engineering, and Business
- 4 Week Program with Half and Full Day options + a la carte menu
- **July 9 - August 2, 2024 at ENMS**
- 500 Grades 3-7 Campers

STEM SUMMER CAMPS





GET SMArT STEM CAMP VIDEO

Program/ Courses:

VEX GO & IQ Robotics

NEW – AERIAL ROBOTICS WITH DRONES

NEW – THE CHEMISTRY IN STEM

Create in the 3D Design Factory

Roll with Sphero Robotics

Soar with Rocket Science

Woodworking Academy

Codemaker Video Game Design

Overview:

- 12 STEM Camp Program Options
- Two 2-week sessions
- STEM Camps – 2 - 2 hours per day

Participants:

- 200 STEM Campers
- ~80% Grades 3-5
- ~20% Grades 6-7

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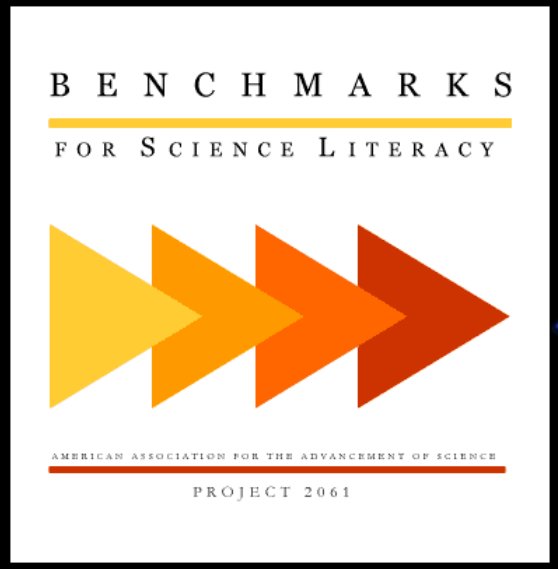
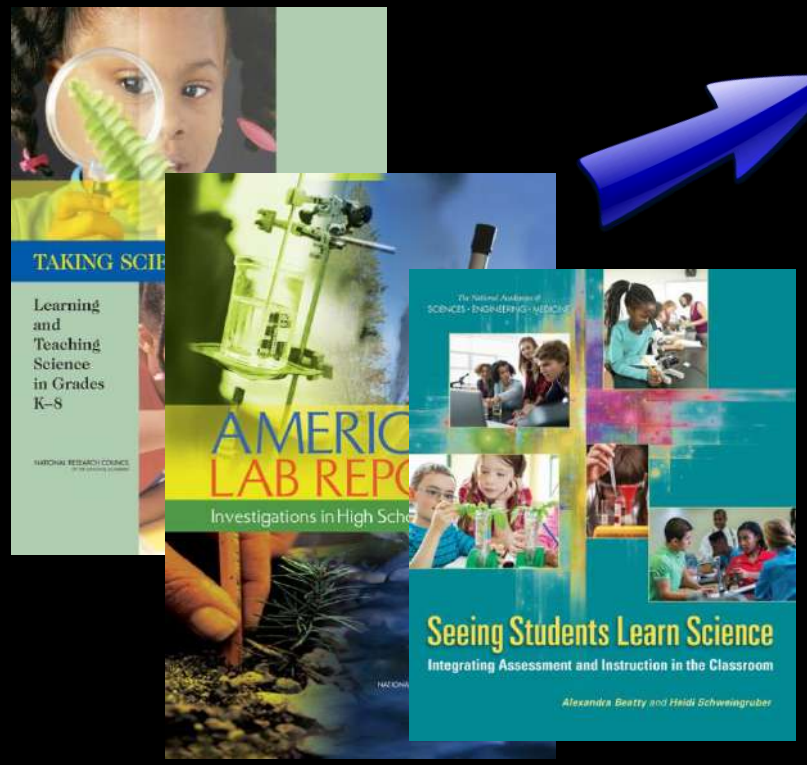
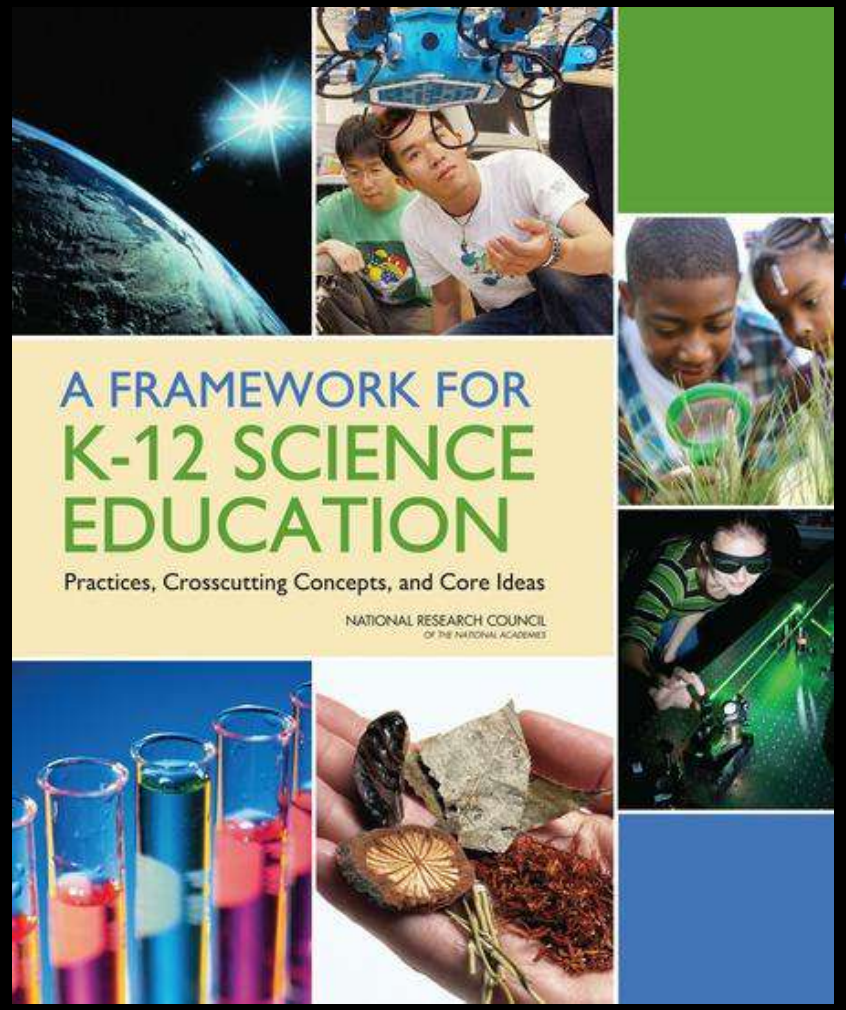






Major advances in the world of science and in our understanding of how students learn science effectively

NEXT GENERATION SCIENCE STANDARDS
For States, By States

New York State • Science Learning Standards •

NYS Science Learning Standards adopted July 1, 2017

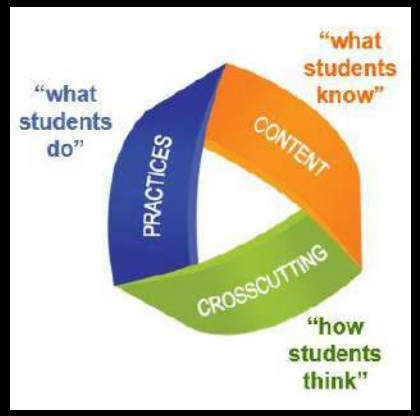
New York State
EDUCATION DEPARTMENT
Knowledge › Skill › Opportunity

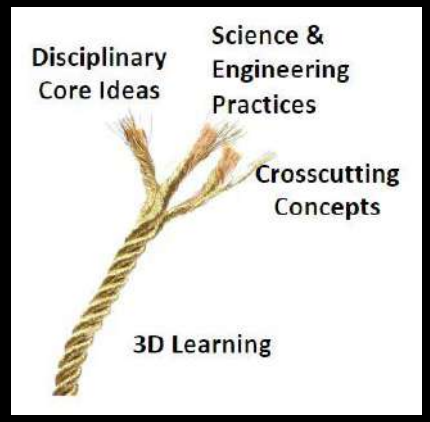
New York State • Science Learning Standards •

*Shifting **from teaching students to remember** what scientists know to **engaging students in the ways that scientists work and think** by investigating real-world phenomena through the science and engineering practices **apprentices students into the scientific community** while helping them build **in-depth understandings** of the explanations underlying **core scientific ideas while using these ideas to explain the world around them.***

SCIENCE EDUCATION WILL INVOLVE LESS:	SCIENCE EDUCATION WILL INVOLVE MORE:
Rote memorization of facts and terminology	**Developing explanations and designing solutions supported by evidence-based arguments and reasoning**
Learning of ideas disconnected from questions about phenomena	Systems thinking and **modeling to explain phenomena** and to give a context for the ideas to be learned
Teachers providing information to the whole class	Students **conducting investigations, solving problems, and engaging in discussions** with teachers' guidance
Teachers posing questions with only one correct answer	Students discussing open-ended questions that focus on the strength of the **evidence used to generate claims**
Students reading textbooks and answering questions at the end of the chapter	Students reading multiple sources, including science-related journal articles and web-based resources; students **developing summaries of information**
Pre-planned outcome for "cookbook" labs or hands-on activities	Multiple investigations driven by students' questions with a range of possible outcomes that collectively lead to a **deep understanding of established core scientific ideas**
Worksheets	Student **writing of journals, reports, posters, and media presentations that explain and argue**
Oversimplification of activities for students who are perceived to be less able to do science	Provision of supports so that **all students can engage in sophisticated science and engineering practices**

What is Three-Dimensional Learning?





Shifts the focus of the science classroom to active learning environments where students use **scientific and engineering practices**, **disciplinary core ideas**, and **crosscutting concepts** to make sense of phenomena and/or design solutions to problems.

Engage & Explore BEFORE Explain

Activity BEFORE Content

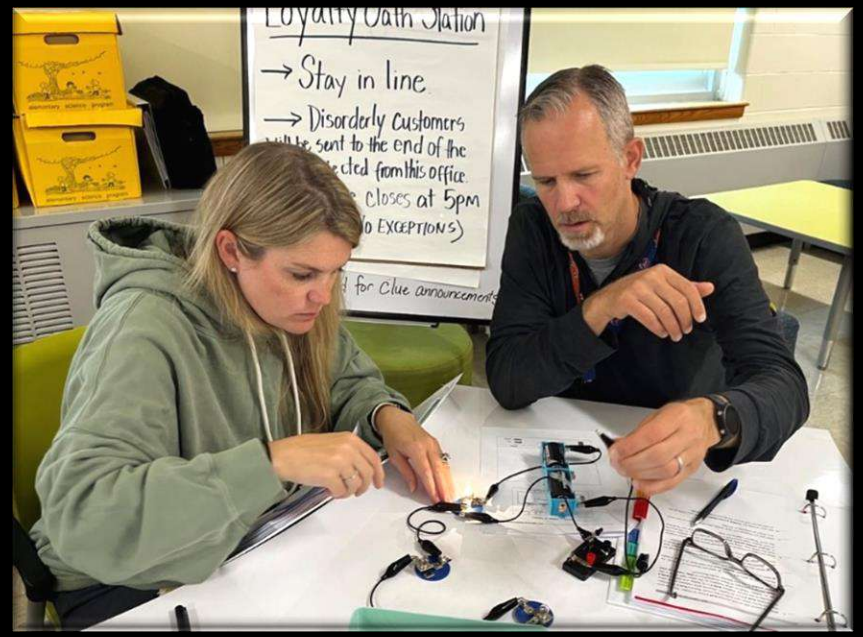
Students question, investigate, conduct, research, experience & apply knowledge, extend & deepen understanding, reflect and communicate to

DRIVE THE LEARNING PROCESS.

NYSSLS Unified Curriculum & Program Development

- Lead Teachers working in collaboration with Secondary Content Specialists
- Lead Teachers & Coordinators Turnkey Units across each grade level

3D NYSSLS Alignment District-Wide



Elementary Science & STEM Curriculum

	Trimester 1	Trimester 2	Trimester 3
K	Weather & Climate Matter & Its Interactions	Forces & Interactions	Interdependent Relationships in Ecosystems
1	Space Systems: Patterns & Cycles	Waves: Light & Sound	Structure, Function, and Information Processing
2	Structure & Properties of Matter	Earth's Systems: Processes that Shape the Earth	Interdependent Relationships in Ecosystems
3	Forces & Interactions	Weather & Climate	Interdependent Relationships in Ecosystems Inheritance and Variation of Traits: Life Cycles
4	Earth's Systems: Processes that Shape the Earth	Structure, Function, and Information Processing	Energy Waves & Information
*5	Structure & Properties of Matter	Matter & Energy in Organisms and Ecosystems	Earth's Systems and Space Systems

*quarterly units in 2023-24

K-5	STEM Challenges are integrated into every trimester unit Defining and Delimiting Engineering Problems Developing Possible Solutions Optimizing the Design Solution

Middle School Integrated Science & STEM Curriculum

	Life Sciences	Physical Sciences	Earth & Space Sciences
6		Forces & Interactions Energy	Weather and Climate Earth's Systems Space Systems
7	Matter and Energy in Organisms and Ecosystems Interdependent Relationships in Ecosystems	Structure & Properties of Matter Chemical Reactions	
8	Structure, Function, and Information Processing Growth, Development, and Reproduction of Organisms	Waves & Electromagnetic Radiation	History of Earth Human Impacts
6-8	Defining and Delimiting Engineering Problems Developing Possible Solutions Optimizing the Design Solution		

Performance Expectations Build Across Years

Learning Builds Across the Years

9-12

HS-PS1-1. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.

6-8

MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

3-5

5-PS1-3. Make observations and measurements to identify materials based on their properties.

K-2

2-PS1-2. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose

LEARN Science & STEM by DOING Science & STEM

Students Engage & Explore

Investigative Phenomenon

to develop problem-solving, critical-thinking, perseverance and communication skills

THE WONDER OF SCIENCE

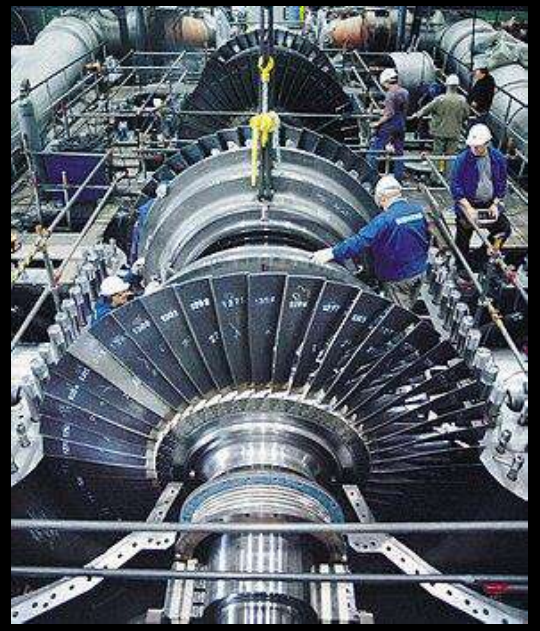
Investigative Phenomenon

I promise… this will be phenomenal!

https://www.youtube.com/watch?v=Vvi3G_ZrcIo

Models provide scientists with tools for thinking, **to visualize and make sense of phenomena**.

(Krajcick, 2012)



A Cycle of Modeling Practices

Let's visualize and make sense of a phenomenon and test ideas

1. **Construct Model**

Students create an initial (or consensus) model to explain phenomena

2. **Test Model**

Students collect data (evidence) to support their ideas by conducting multiple experiments

3. **Evaluate Model**

Students clarify ideas and refine their model using new evidence

4. **Use Model**

Explain phenomena, make predictions, formulate questions, design & conduct investigations, communicate & justify ideas

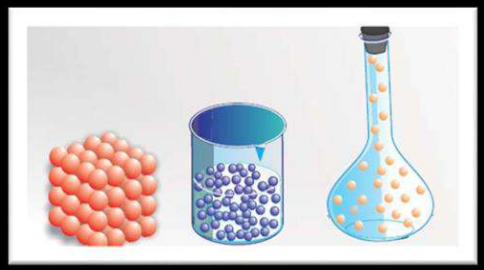
NYSED NYSSLS Assessment Schedule 1st Administration

2023-24 School Year
NYSSLS Based CBT Exam

Spring 2024	NYSSLS Grade 5	Elementary Level Science Test
	NYSSLS Grade 8	Intermediate Level Science Test
June 2025		Regents Exam in Earth & Space Sciences
		Regents Exam in Biology
June 2026		Regents Exam in Chemistry
		Regents Exam in Physics

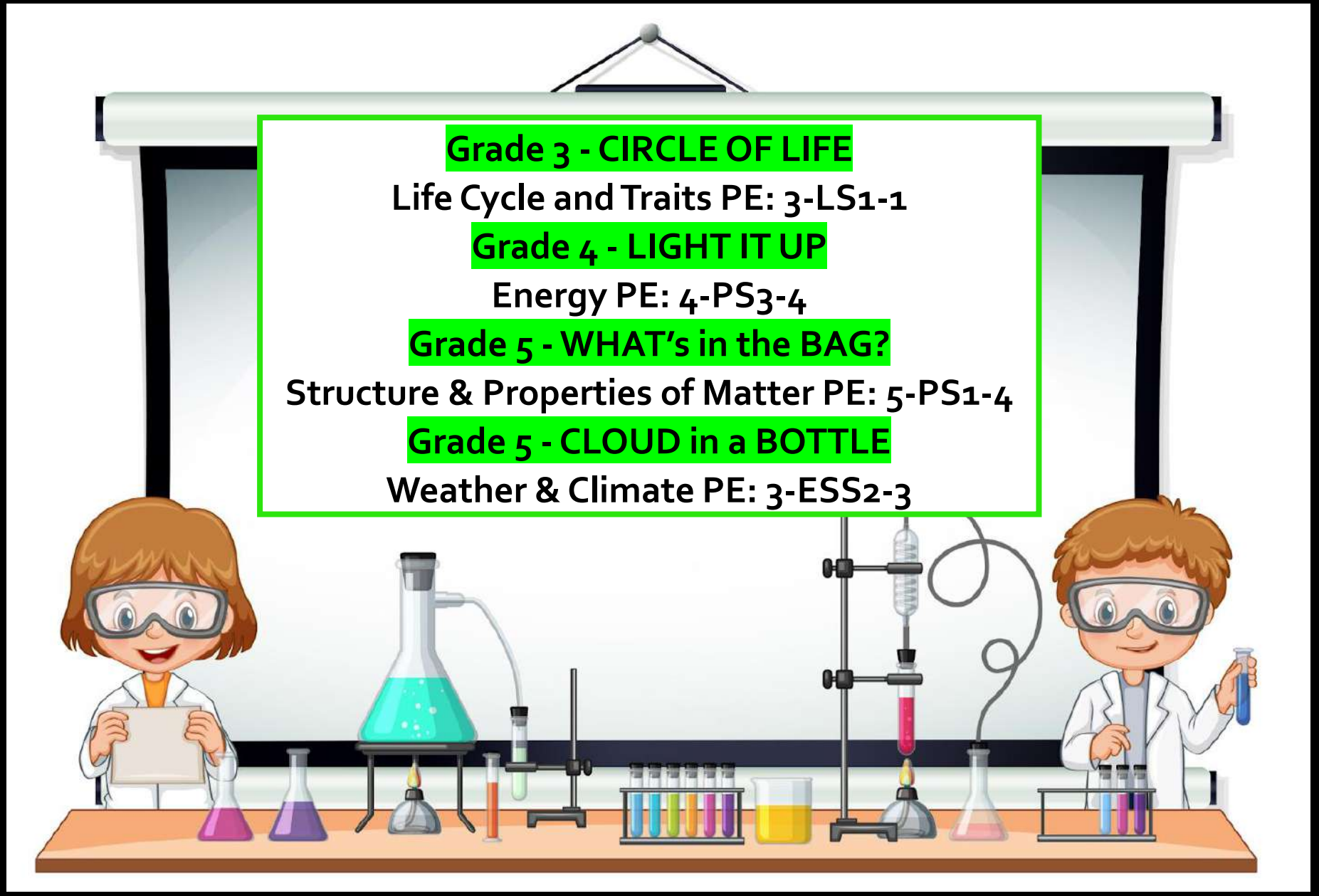
Grades K-5 and 6-8 are NYSSLS-aligned preparing students for May 2024 NYSSLS-based Grade 5 and 8 State Science Exams.

NYSSLS Grade 5 & 8 ASSESSMENTS



- **Scientific phenomena** are authentic, relevant & engaging
- **Stimuli** in the form of graphs, data tables, text, models, graphics & animations & other evidence
- In **question clusters**, students will apply information to develop explanations, models, or design solutions
- **Exam will not focus on recall, rather students will apply what they know toward sense-making**

NYSSLS Grade 3-5 Science Investigations



Grade 3 - CIRCLE OF LIFE

Life Cycle and Traits PE: 3-LS1-1

Grade 4 - LIGHT IT UP

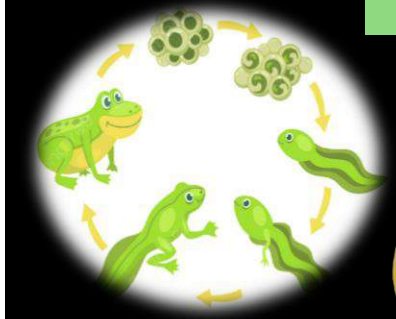
Energy PE: 4-PS3-4

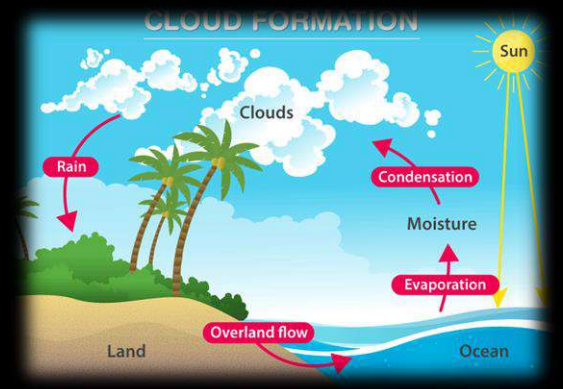
Grade 5 - WHAT's in the BAG?

Structure & Properties of Matter PE: 5-PS1-4

Grade 5 - CLOUD in a BOTTLE

Weather & Climate PE: 3-ESS2-3





LEARN Science & STEM by DOING Science & STEM

SCIENCE in ACTION

NYSSLS Grade 6-8 Science Investigations

Grade 6 – Cool It!

Energy PE: MS-PS3-4

Grade 6 – How's the Weather Up There?

Weather and Climate PE: MS-ESS2-5

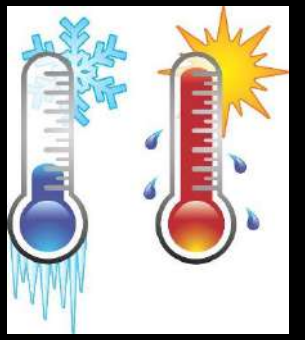
Grade 7 – All Mixed Up

Structure and Properties of Matter PE: MS-PS1-8

Grade 7 – It's Alive

Structure, Function & Info Processing PE: MS-LS1-1

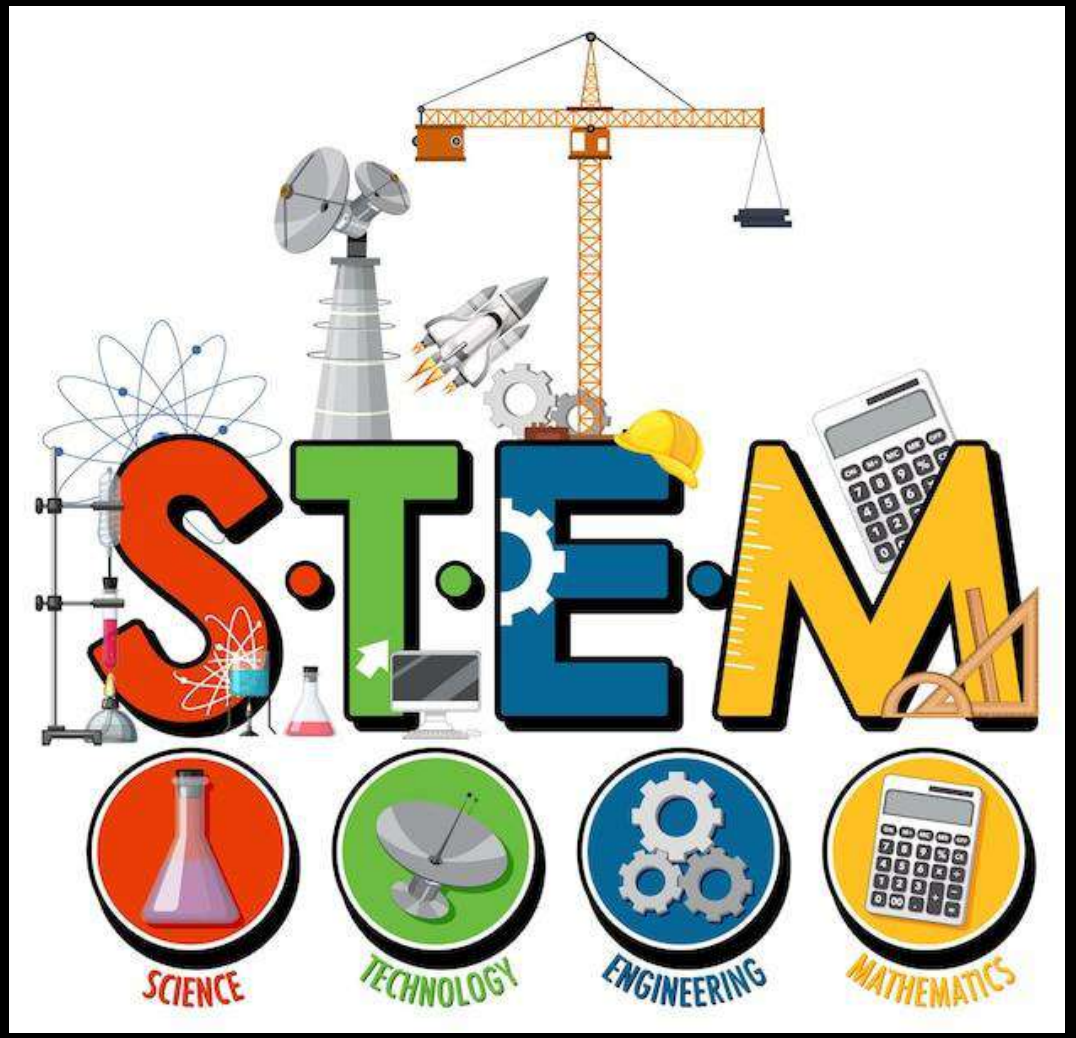
Grade 8 - All four investigations in 2023-24



STEM Education Update

Northport-East Northport UFSD

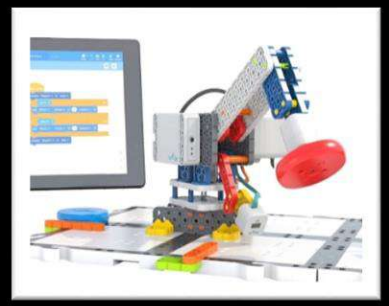
2023-2024

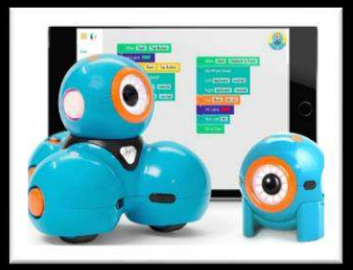


STEM & MAKERspace

3rd YEAR in GRADES K-5 in 2023-2024

Enrichment For All!

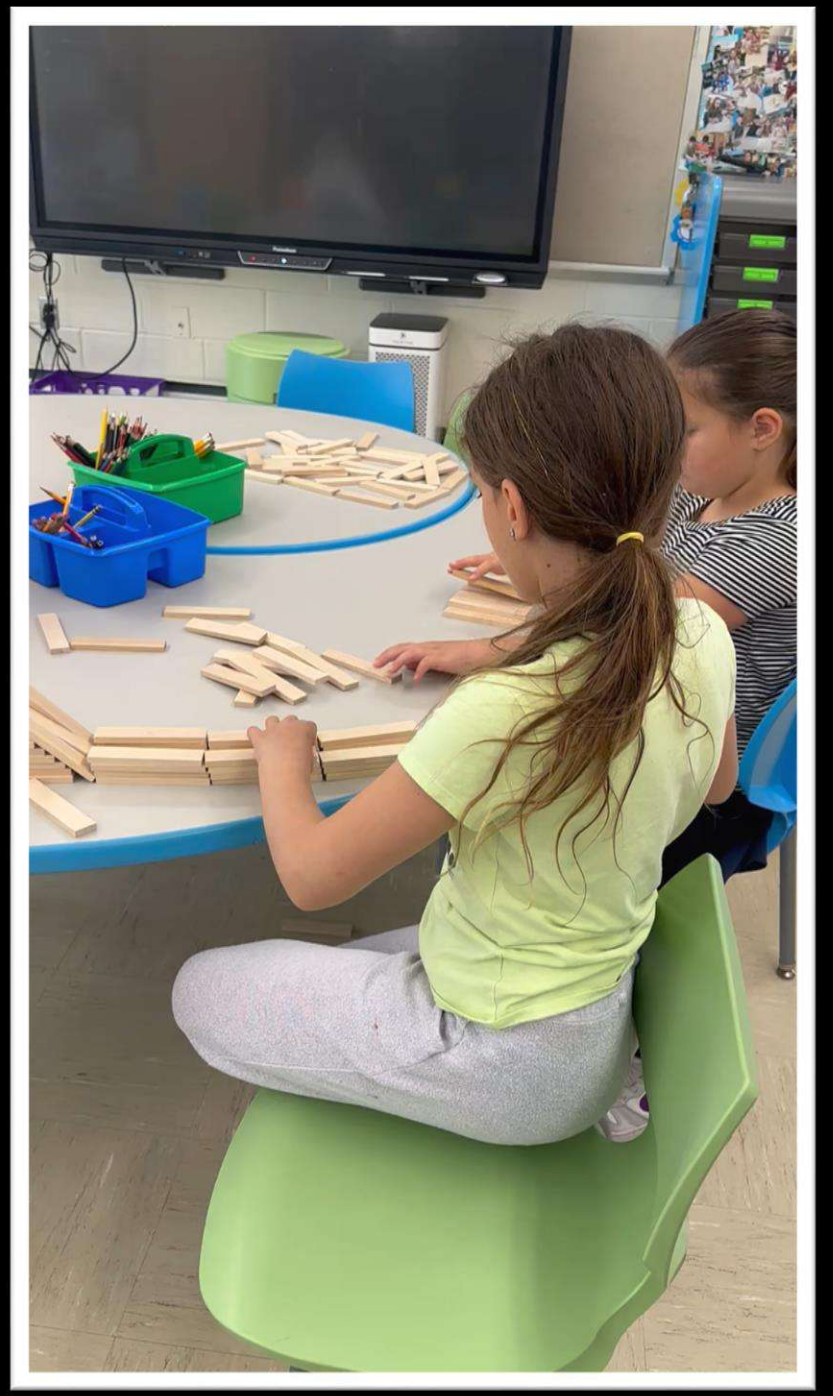




Ignites students' **curiosity** & **wonder** about their world. Motivates students to think **creatively** and **empowers** them to problem **solve** as they conduct **research**.

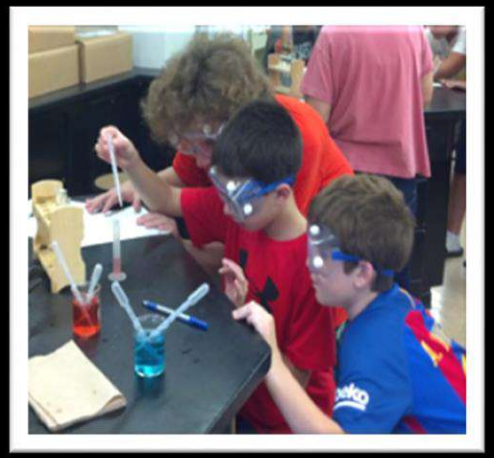
Explore ∞ Tinker ∞ Build ∞ Inspire
Learn & Create ∞ Communicate

Engineering Design & Modeling
Robotics & Automation
Computer Science & Coding



2024 Northport-East Northport Elementary Science & Engineering Fair

Brookhaven National Laboratory



Class Projects during T1 or T2

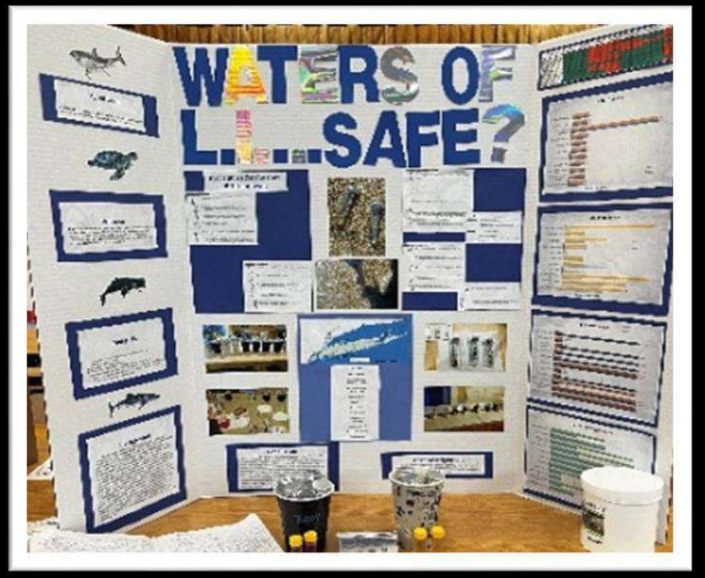
Fair Launch – January 29, 2024

Local NEN Fairs – March 2024

NEN Expo – April 30, 2024

BNL Fair – June tbd, 2024

Science & Engineering EXPO



Annual Fall & Spring K-6 STEM Fairs

Elementary K-6 STEM Spooktacular!

Thursday, October 26, 2023

NHS Commons 6:30-8:30PM

Elementary K-6 STEM Fair

Saturday, April 13, 2024

NHS Commons 4:00-7:00PM





STEM Fair Video 2023

Grade 4 Plant Science & Native Ecology Field Experience

4th grade learners work with AP Environmental Science students at the NHS Greenhouse and Native Garden Trail.

Our young botanists study the soil and growing environment of LI native plants and mix soil to germinate their own perennial false sunflowers (heliopsis helianthides).

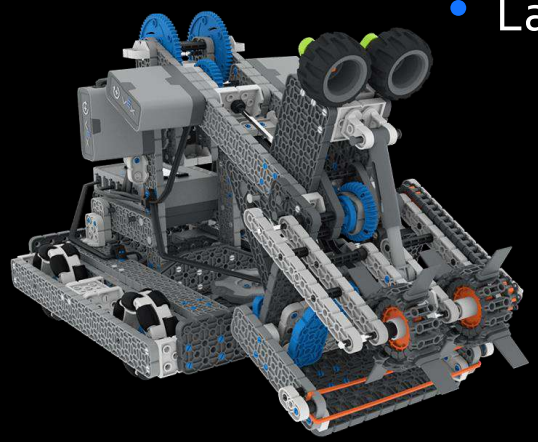
FIRST LEGO LEAGUE ROBOTICS

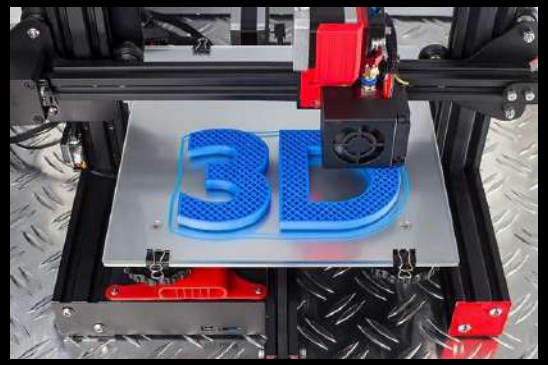
COMING SOON TO 3rd and 4th Grade in 2023-24!

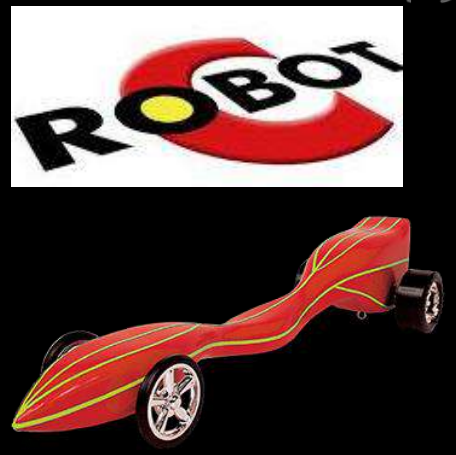
The MASTERPIECE Robotics season will take students on an adventure to use their creativity to design and construct a motorized performance stage!

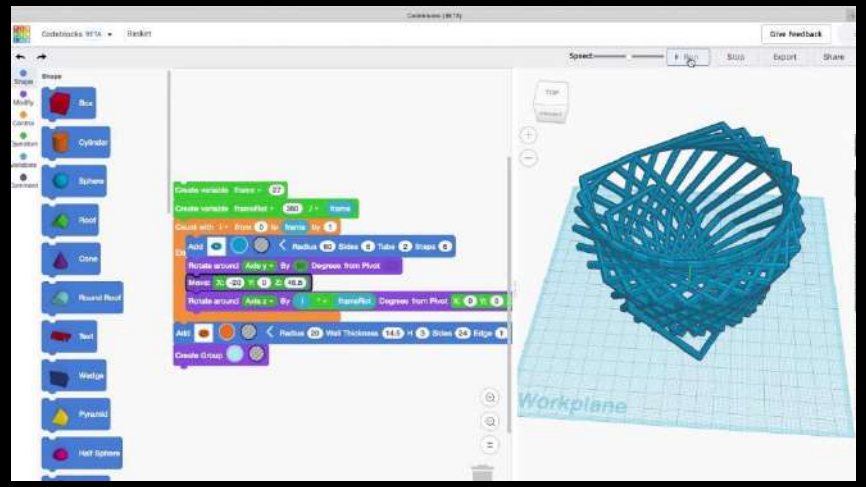
Middle School Technology & Engineering Education

- **Engineering Design & Modeling**
  - TinkerCAD and Chief Architect
  - CO_2 Racecars, Maglev, Flight, & Trebuchet
- **Robotics & Automation**
  - VEX IQ & RobotC Programming & Coding
  - Virtual Robotic Worlds
- **Computer Science – Coding & Programming**
  - Scratch, CodeMonkey, GameMaker, & Python
- **Computer Integrated Manufacturing**
  - CNC Routing
  - 3D Printing
  - Laser Cutting/Engraving



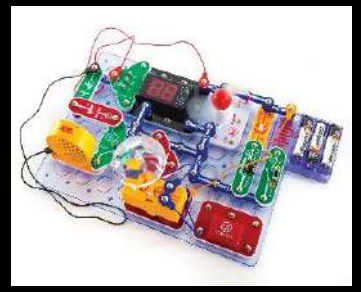


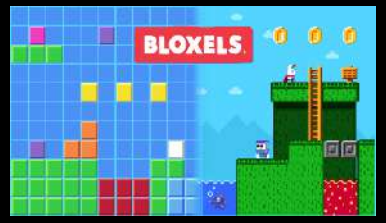




Middle School MAKERspace

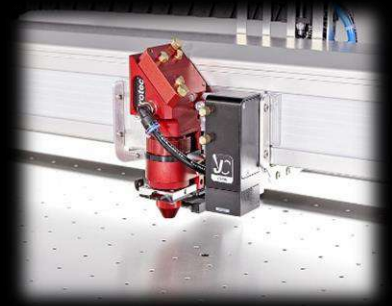
Makerspace ignites students' curiosity & wonder.
It invites students to think creatively and empowers them to problem solve as they construct, engineer & tinker.





Explore ∞ Robotics Coding Circuitry
Create ∞ CNCs 3D Printers Lasers
Tinker ∞ Manufacturing Engineering
Innovate & Design ∞ Inspire

Check out lunch period schedule to attend Makerspace in 2023-2024!



Middle School Robotics , Science Research, Science Olympiads, STEM & Computer Science Extracurricular Clubs

SCIENCE OLYMPIAD™

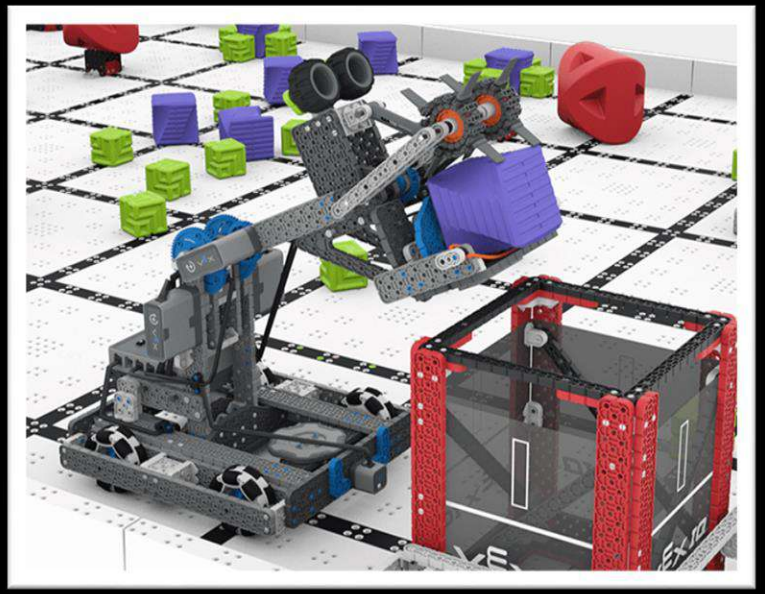
Exploring the World of Science

BROADCOM FOUNDATION

MASTERS

– a program of –

SOCIETY FOR SCIENCE



SCIENCE | TECHNOLOGY | ENGINEERING | MATHEMATICS

NORTHPORT - EAST NORTHPORT U.F.S.D.

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Middle School Technology & Engineering Education
Scope & Sequence

	Program	Module 1	Module 2	Module 3	Module 4
6	**10 weeks**	Safety & Measurement	*Maglev Engineering Design Challenge	*Gyroscope Engineering Design & Construction	Computer Science +Coding/Programming
7	**10 weeks**	*Structure & Function Bridge or Tower Design Challenge	Computer Science +Coding/Programming	*Flight or Vehicle Engineering Design Challenge	
8	**20 weeks**	*Catapult/Trebuchet Engineering Design Challenge	**#Robotics & Automation**	*CO2 Racecar Engineering Design Challenge	**Green Architecture & Sustainable Design

VEX IQ Robotics platforms including RobotC coding & programming
* Design & modeling component using TinkerCAD, Fusion, and others
** Software platforms include Chief Architect, REVIT, and others
+ Software platforms include Scratch, Code Monkey, Tynker, Gamemaker and others
Computer integrated manufacturing and prototyping are imbedded into all modules