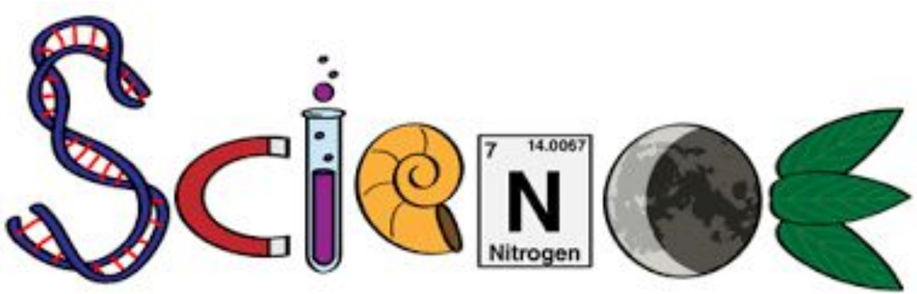

Three Village CSD

Marnie Kula, Science Chairperson WMHS

Christine DiFede, Science Chairperson RCM

Peter Schuchman, Science Chairperson PJG

New York State P-12 Science Learning Standards

MS. Structure and Properties of Matter

Students who demonstrate understanding can:

MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures. [Clarification Statement: Emphasis is on developing models of molecules that vary in complexity. Examples of simple molecules could include ammonia and methanol. Examples of extended structures could include sodium chloride or diamonds. Examples of particulate-level models could include drawings, 3D ball and stick structures, or computer representations showing different substances with different types of atoms.] [Assessment Boundary: Assessment does not include valence electrons and bonding energy, discussing the individual ions composing complex structures, or a complete depiction of all individual atoms in a complex molecule or extended structure.]

MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society. [Clarification Statement: Emphasis is on natural resources that undergo a chemical process to form the synthetic material. Examples of new materials could include new medicine, foods, and alternative fuels.] [Assessment Boundary: Assessment is limited to the qualitative interpretation of evidence provided.]

MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and phase (state) of a substance when thermal energy is added or removed. [Clarification Statement: Emphasis is on qualitative particulate-level models of solids, liquids, and gases to show that adding or removing thermal energy increases or decreases kinetic energy of the particles until a change of phase occurs. Examples of models could include drawings and diagrams. Examples of particles could include ions, molecules, or atoms. Examples of substances could include sodium chloride, water, carbon dioxide, and helium.]

MS-PS1-7. Use evidence to illustrate that density is a property that can be used to identify samples of matter. [Clarification Statement: Emphasis should be on students measuring the masses and volumes of regular and irregular shaped objects, calculating their densities, and identifying the samples of matter.]

MS-PS1-8. Plan and conduct an investigation to demonstrate that mixtures are combinations of substances. [Clarification Statement: Emphasis should be on analyzing the physical changes that occur as mixtures are formed and/or separated. Examples of common mixtures could include salt water, oil and vinegar, and air.] [Assessment boundary: Assessment is limited to separation by evaporation, filtration and magnetism.]

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices

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Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems.
- Develop a model to predict and/or describe phenomena. (MS-PS1-1),(MS-PS1-4)

Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in 6–8 builds on K–5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or design solutions.
- Plan an investigation individually and collaboratively, and in the design: identify independent and dependent variables and controls, what tools are needed to do the gathering, how measurements will be recorded, and how many data are needed to support a claim. (MS-PS1-8)
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Disciplinary Core Ideas

PS1.A: Structure and Properties of Matter
- (NYSED) Substances are made of one type of atom or combinations of different types of atoms. Individual atoms are particles and can combine to form larger particles that range in size from two to thousands of atoms. (MS-PS1-1)
- (NYSED) Each substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it. (MS-PS1-3),(MS-PS1-7) (Note: This Disciplinary Core Idea is also addressed by MS-PS1-2.)
- (NYSED) In a solid, the particles are closely spaced and vibrate in position but do not change their relative locations. In a liquid, the particles are closely spaced but are able to change their relative locations. In a gas, the particles are widely spaced except when they happen to collide and constantly change their relative locations. (MS-PS1-4)
- Solids may be formed from molecules, or they may be extended structures with repeating subunits (e.g., crystals). (MS-PS1-1)
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PS3.A: Definitions of Energy
- (NYSED) The term "heat" as used in everyday language refers both to thermal energy (the motion of particles within a substance) and the transfer of that thermal energy from one object to another. In science, heat is used only for this second meaning; it refers to the energy transferred due to the temperature difference between two objects. (secondary to MS-PS1-4)
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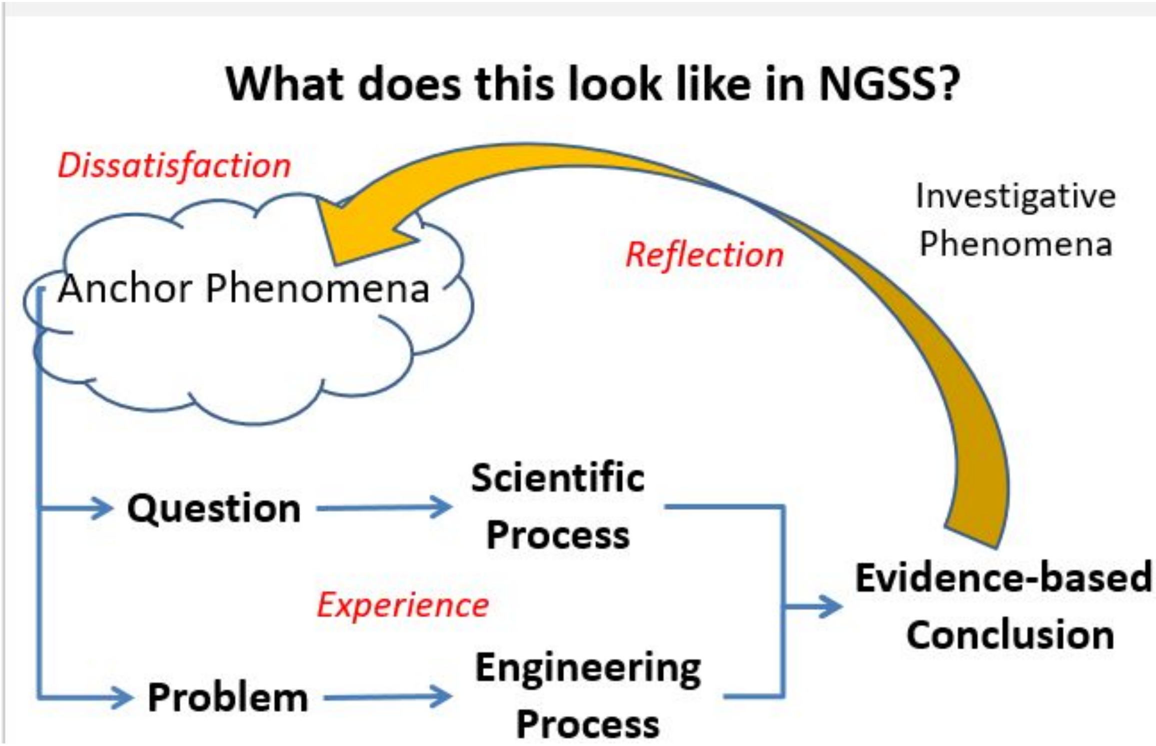
New York State • Science Learning Standards • New York State

THREE VILLAGE SCHOOL DISTRICT

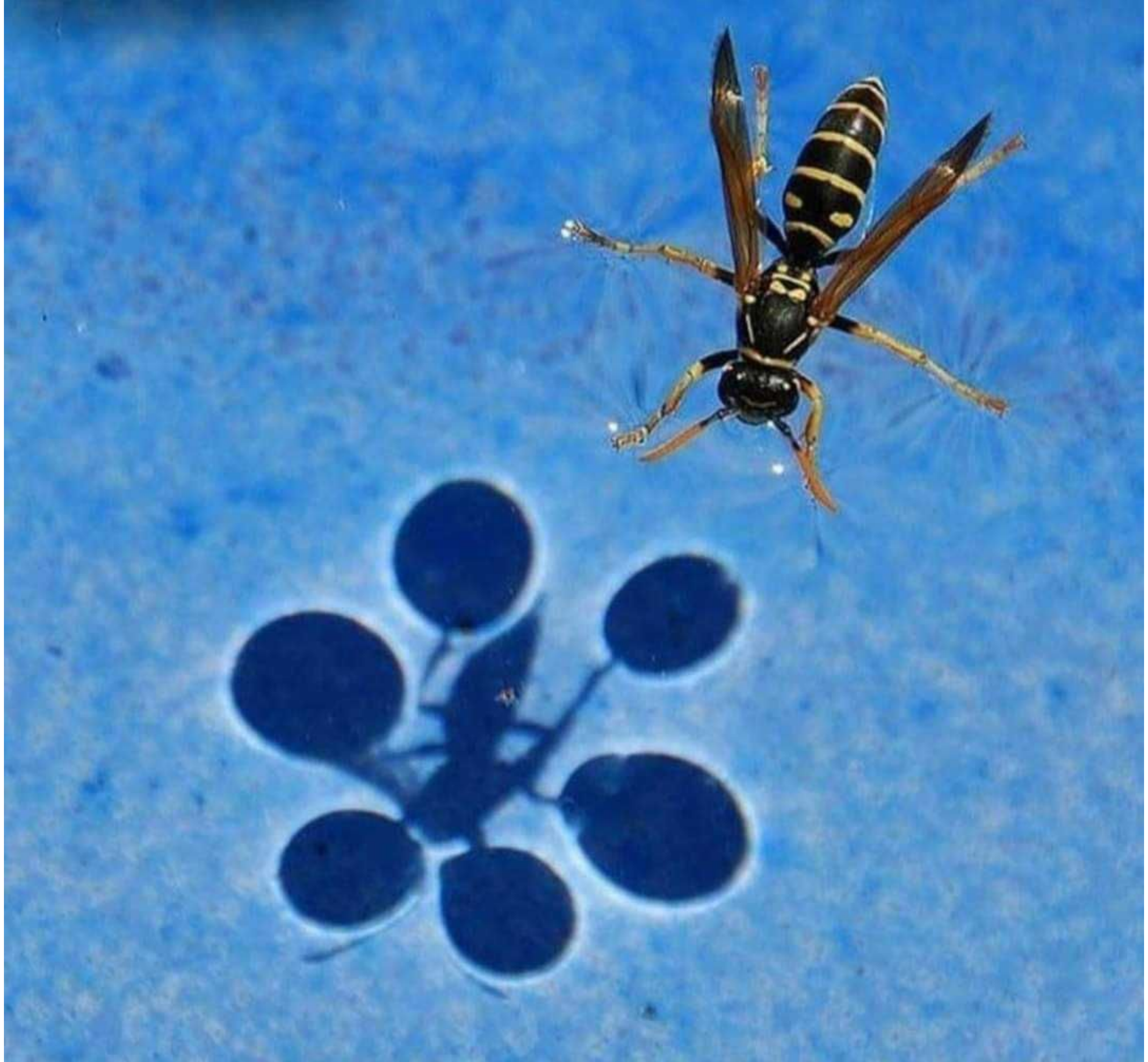
NYSSLS

NEXT GENERATION SCIENCE STANDARDS



Using Phenomenon In Science

- Anchoring Phenomenon
- Investiative Phenomenon
- Everyday Phenomenon




NYSED

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MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and phase (state) of a substance when thermal energy is added or removed. [Clarification Statement: Emphasis is on qualitative particulate-level models of solids, liquids, and gases to show that adding or removing thermal energy increases or decreases kinetic energy of the particles until a change of phase occurs. Examples of models could include drawings and diagrams. Examples of particles could include ions, molecules, or atoms. Examples of substances could include sodium chloride, water, carbon dioxide, and helium.]

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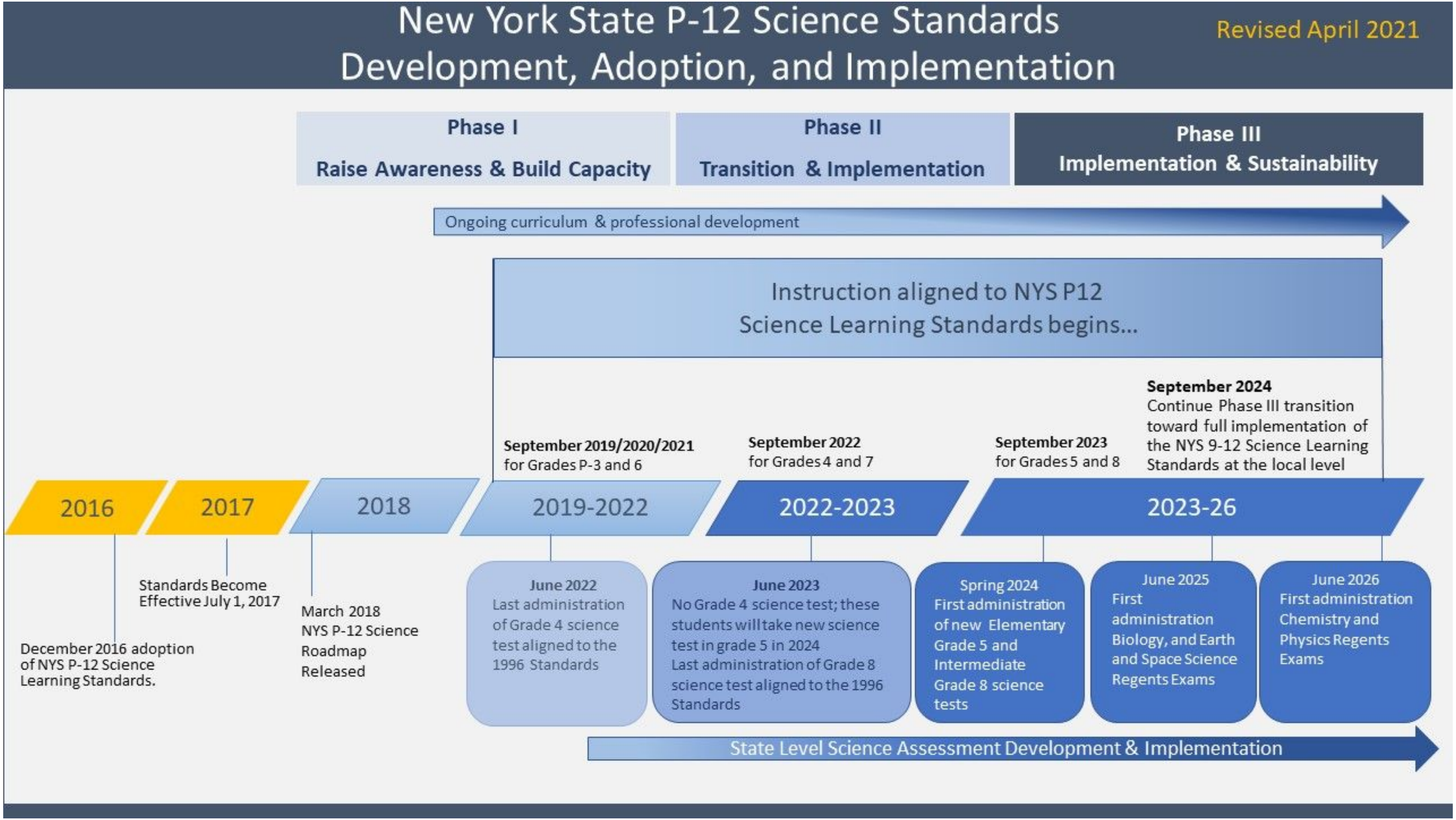
New York State · Science Learning Standards

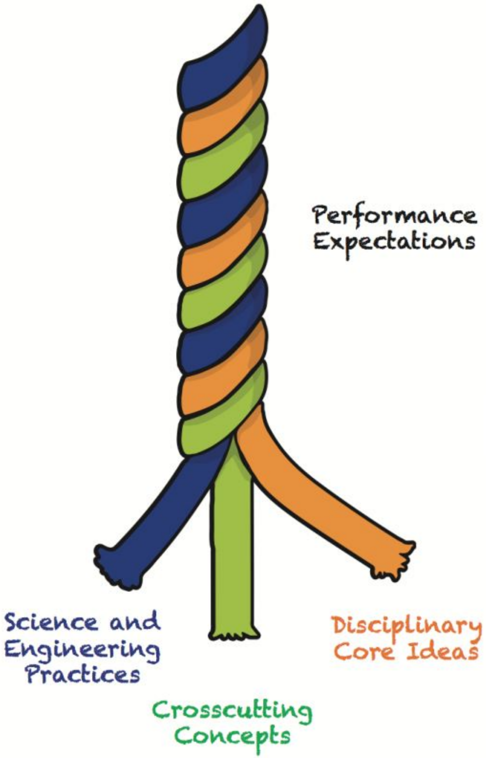
THREE VILLAGE SCHOOL DISTRICT

NYSSLS

NEXT GENERATION SCIENCE STANDARDS

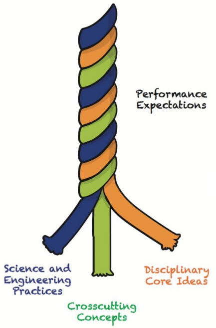

New York State P-12 Science Standards
Development, Adoption, and Implementation
Revised April 2021
Phase I
Raise Awareness & Build Capacity
Phase II
Transition & Implementation
Phase III
Implementation & Sustainability
Ongoing curriculum & professional development
Instruction aligned to NYS P12
Science Learning Standards begins…
September 2019/2020/2021
for Grades P-3 and 6
September 2022
for Grades 4 and 7
September 2023
for Grades 5 and 8
September 2024
Continue Phase III transition toward full implementation of the NYS 9-12 Science Learning Standards at the local level
2016
2017
2018
2019-2022
2022-2023
2023-26
December 2016 adoption of NYS P-12 Science Learning Standards.
Standards Become Effective July 1, 2017
March 2018
NYS P-12 Science Roadmap Released
June 2022
Last administration of Grade 4 science test aligned to the 1996 Standards
June 2023
No Grade 4 science test; these students will take new science test in grade 5 in 2024
Last administration of Grade 8 science test aligned to the 1996 Standards
Spring 2024
First administration of new Elementary Grade 5 and Intermediate Grade 8 science tests
June 2025
First administration Biology, and Earth and Space Science Regents Exams
June 2026
First administration Chemistry and Physics Regents Exams
State Level Science Assessment Development & Implementation

Three-Dimensional Learning



Blending of Three Dimensions

- ☐ Science and engineering practices
- ☐ Crosscutting concepts
- ☐ Disciplinary core ideas



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- (NYSED) Substances are made of one type of atom or combinations of different types of atoms. Individual atoms are particles and can combine to form larger particles that range in size from two to thousands of atoms. (MS-PS1-1)
- (NYSED) Each substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it. (MS-PS1-3),(MS-PS1-7) (Note: This Disciplinary Core Idea is also addressed by MS- PS1-2.)
- (NYSED) In a solid, the particles are closely spaced and vibrate in position but do not change their relative locations. In a liquid, the particles are closely spaced but are able to change their relative locations. In a gas, the particles are widely spaced except when they happen to collide and constantly change their relative locations. (MS-PS1-4)
- Solids may be formed from molecules, or they may be extended structures with repeating subunits (e.g., crystals). (MS-PS1-1)
- (NYSED) The changes of state that occur with variations in temperature and/or pressure can be described and predicted using these models of matter. (MS-PS1-4)
- (NYSED) Mixtures are physical combinations of one or more samples of matter and can be separated by physical means. (MS-PS1-8)

PS1.B: Chemical Reactions

- (NYSED) Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different particles, and these new substances have different properties from those of the reactants. (MS-PS1-3) (Note: This Disciplinary Core Idea is also addressed by MS-PS1-2 and MS-PS1-5.)

PS3.A: Definitions of Energy

- (NYSED) The term "heat" as used in everyday language refers both to thermal energy (the motion of particles within a substance) and the transfer of that thermal energy from one object to another. In science, heat is used only for this second meaning; it refers to the energy transferred due to the temperature difference between two objects. (secondary to MS-PS1-4)
- (NYSED) Temperature is not a form of energy. Temperature is a measurement of the average kinetic energy of the particles in a sample of matter. (secondary to MS-PS1-4)

Crosscutting Concepts

Patterns

- Macroscopic patterns are related to the nature of microscopic and atomic-level structure. (MS-PS1-1),(MS-PS1-7),(MS-PS1-8)
- Graphs, charts, and images can be used to identify patterns in data. (MS-PS1-1),(MS- PS1-4)

Cause and Effect

- Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-PS1-4)

Scale, Proportion, and Quantity

- Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. (MS-PS1-1)

Structure and Function

- Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used. (MS-PS1-3)

Connections to Engineering, Technology, and Applications of Science

Interdependence of Science, Engineering, and Technology

- Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. (MS-PS1-3)

Influence of Science, Engineering and Technology on Society and the Natural World

- The uses of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. Thus technology use varies from region to region and over time. (MS-PS1-3)

Instruction aligned to NYS P12 Science Learning Standards begins...

September 2019/2020/2021
for Grades P-3 and 6

September 2022
for Grades 4 and 7

September 2023
for Grades 5 and 8

September 2024
Continue Phase III transition toward full implementation of the NYS 9-12 Science Learning Standards at the local level

2019-2022

June 2022
Last administration of Grade 4 science test aligned to the 1996 Standards

2022-2023

June 2023
No Grade 4 science test; these students will take new science test in grade 5 in 2024
Last administration of Grade 8 science test aligned to the 1996 Standards

2023-26

Spring 2024
First administration of new Elementary Grade 5 and Intermediate Grade 8 science tests

June 2025
First administration Biology, and Earth and Space Science Regents Exams

June 2026
First administration Chemistry and Physics Regents Exams

State Level Science Assessment Development & Implementation

First and Last Administration of New Regents Examinations

Exam Title	First Administration of New Exam	Last Administration of Current Exam
Algebra I	June 2024	January 2024
Geometry	June 2025	January 2025
Earth & Space Sciences*	June 2025	June 2026
Life Science: Biology*	June 2025	June 2026
Algebra II	June 2026	January 2026
Chemistry*	June 2026	June 2027
Physics*	June 2026	June 2027
English Language Arts	June 2026	January 2026

* For science, the new learning standards are not as strongly aligned to the prior standards. As a result, there will be an overlap period of the old and new exams for four administrations. This will ensure that students can complete the exam that matches the instruction they received.

NYSSLS Exam Timeline @ 3V

Intermediate Level Science (grades 6-7-8)

- **May 1, 2024** administration of NYSSLS ILS Assessment
- Computer based exam (chromebook)
- NYS Sample questions
- ILS Investigations (4 completed in grades 6-8 prior to exam)

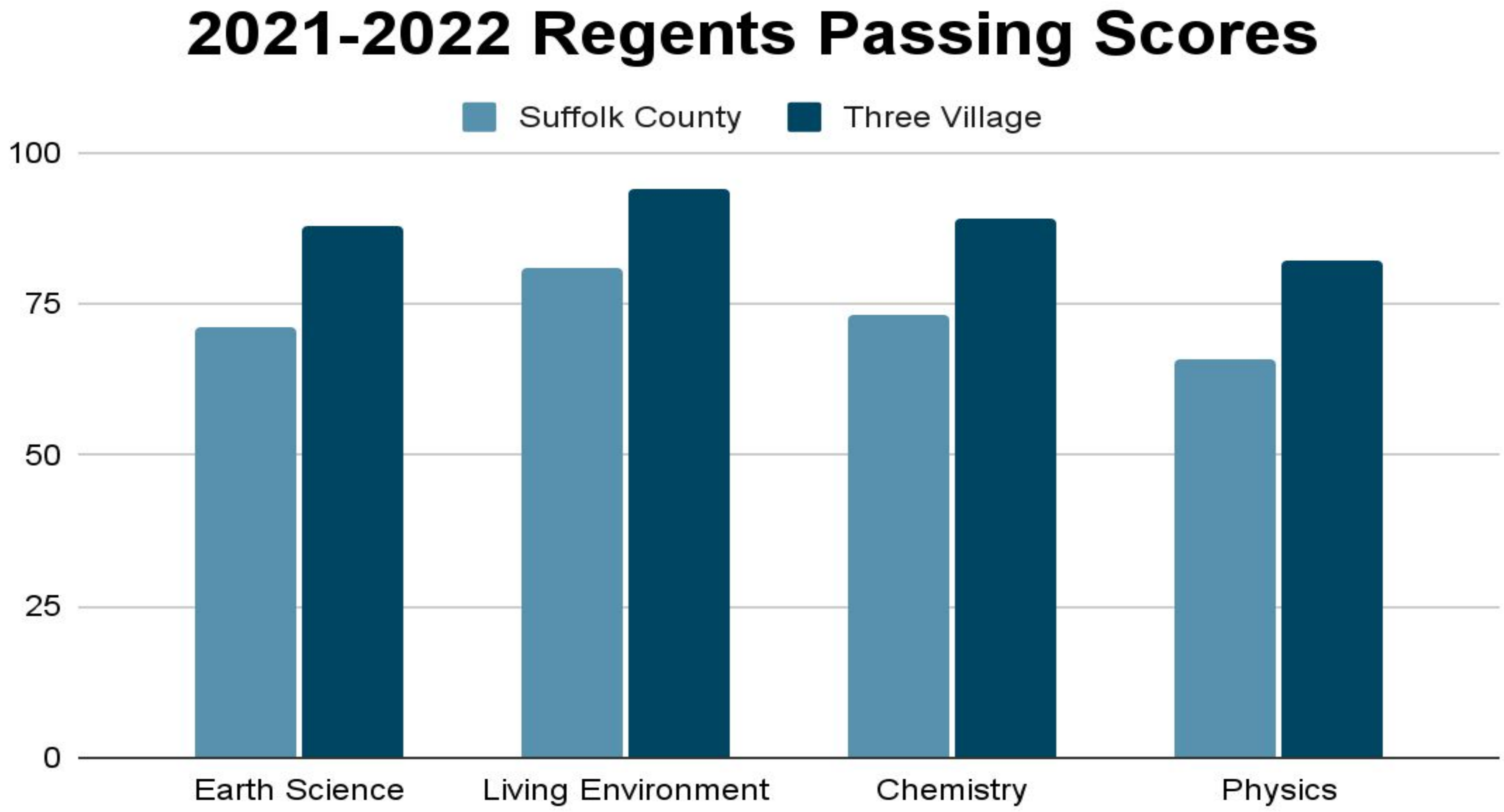
Earth and Space Sciences / Life Science Biology

- Continue with current core through June 2025
- Formally instruct NYSSLS 2025-2026
- NYSSLS Regents administered June 2026
- Permits more exams, more time on curriculum, more resources published

NYSSLS Exam Timeline @ 3V

Chemistry / Physics

- Continue with current core through June 2026
- Formally instruct NYSSLS 2026-2027
- NYSSLS Regents administered June 2027
- Permits more exams, more time on curriculum, more resources published


2021-2022 Regents Passing Scores
Suffolk County
Three Village
100
75
50
25
0
Earth Science
Living Environment
Chemistry
Physics

Reasons why Three Village Science has success:

- Open communication
- Shared decision-making with all stakeholders
- Motivated teachers and ambitious students
- High expectations
- Professional Learning Communities (PLCs)
- Extra help during lunch periods, before and after school
- Early identification of struggling students
- Academic Intervention Services (AIS)
- Collaboration

JHS Science

Current Course Sequence

6th Grade	7th Grade	8th Grade	9th Grade	10th Grade (WMHS)
ILS Science (3V-ILS Spiral)	Science 7 (3V-ILS Spiral)	Science 8 (3V-ILS Spiral)	Earth Science 9R (ES Regents)	Living Environment 10R
	Science 7H (3V-ILS Spiral)	Earth Science 8H (ES Regents)	Biology 9H (LE Regents)	Chemistry H
			Living Environment 9R (LE Regents)	Chemistry R

JHS Science

Elective Course Offerings

7th Grade
Science Research I

8th Grade
Science Research I
Farm to School
Natural Disasters

9th Grade
Science Research II

JHS Science Clubs

Competitive:

Science Olympiad

Science Bowl

Non-Competitive:

Ecology Club

Greenhouse Club

Typical Sophomore Science Program

LIVING ENVIRONMENT or CHEMISTRY

Elective Options:
Animal Science, Microbiology, The Biology of Being Human: Molecular / Systems Approach, Long Island Ecology

Enrichment Programs:
Academic Challenges Team ("The Bowlers")
Robotics - HOSA Science Olympiad
Environmental Club Greenhouse Club
Ethical Care of Animals Club
InSTAR pre-college research program

Courses of Study - *WARD MELVILLE HIGH SCHOOL*

NY STATE / CORE	AP / COLLEGE LEVEL	LOCAL ELECTIVES
LIVING ENVIRONMENT^ CHEMISTRY R CHEMISTRY H PHYSICS R PHYSICS H "The Cycle" ~60% of graduating seniors have taken Physics ^graduation requirement	PHYSICS 1 PHYSICS 2* PHYSICS C* BIOLOGY* CHEMISTRY* ENVIRONMENTAL SCI. (APES) *second-year course HUMAN ANATOMY (Adelphi) HUMAN PHYSIOLOGY (Adelphi) FORENSICS H (Syracuse)	ANIMAL SCIENCE APPLIED SCIENCE ASTRONOMY Biology of Being Human -SYSTEMS / -MOLECULAR CONSUMER CHEMISTRY ENVIRO. CHEMISTRY CURRENT ISSUES FORENSICS LONG ISLAND ECOLOGY MICROBIOLOGY

InSTAR®

Independent Science Technology And Research

3 year program; by application only

InSTAR-I: Sophomores	Full year – alternating single period
InSTAR-II: Juniors	Full year – single period every day
InSTAR-III: Seniors	Fall – single; Spring – after school

2½ vs. **4**

Science Achievements

Student Competitions - Sophomores & Juniors

LONG ISLAND SCIENCE CONGRESS

NSTA TOSHIBA ExploraVision

2018 NATIONAL WINNERS
1st Place

Regeneron Science Talent Search (STS)

TOP STORIES

Regeneron winner

Ward Melville senior earns $150G award for placing 3rd

BY JOE TYRRELL

Amber Luo, a senior at Ward Melville High School in East Setauket, placed third in the Regeneron Science Talent Search on Tuesday night, earning a $150,000 prize, contest organizers said.

Luo, 18, of Stony Brook, was the top finisher of the seven finalists from Long Island in the nation's oldest and most prestigious science competition. They were among the 40 seniors who had been competing for prize money since Thursday in Washington, D.C.

Another Long Island finalist, Hailee Youn, 17, of Roslyn High School, was named the Seaborg Award winner and given the opportunity to speak on behalf of the Regeneron Class of 2022.

Luo was honored for her development of a software called RiboBayes, a computational tool used to reveal how ribosomes move along a cell's mRNA transcript to produce proteins, according to contest officials. Her work, she said, can enable researchers to gain a better view of underlying health conditions in a range of diseases, such as Alzheimer's.

Luo told Newsday earlier that she is "fascinated" with the intersection of math and biology. Her project represented the "first dive into the world of computational biology." She conducted her research at Drexel University's School of Biomedical Engineering in Philadelphia.

Top 10 finalists revealed

The top 10 finishers were announced at a gala around 9:30 p.m. Tuesday. The students were chosen from among 1,804 applications received from 603 high schools across 46 states, D.C., Puerto Rico and eight countries. Finalists were selected from among 300 semifinalists chosen earlier this year. Each finalist automatically received $25,000.

Regeneron selections are based on research skills, academics, innovation and promise as scientists. Long Island students' projects covered a variety of topics, including studies on the Island's salt marsh ecosystem, eye cancer, voting habits and COVID-19-induced stress.

Luo hasn't selected her college yet, but said she would like to become a research professor and continue pursuing her interests in math and science. She heads the math team and Science Olympiad at her high school, and founded an educational STEM nonprofit called Illumina Learning that provides free online courses in biology, research and computing from accomplished high school scientists to aspiring young students.

Luo: 'Dancing is an outlet'

For fun, Luo said she owns an Instagram dance cover account, where she posts videos of herself covering various K-pop dances, ranging from hip-hop boy-band songs to cute girl-group bubblegum pop.

"Dancing is an outlet of creativity for me, and it's so relaxing to coordinate outfits, learn dances, and do my makeup after a long day of research," she told Newsday earlier.

First place in the competition went to Christine Ye, of Sammamish, Washington, who won $250,000 for her project, which analyzed the gravitational waves emitted from collisions between neutron stars (collapsed super-dense stars) and black holes.

Roslyn student also honored

The finalists chose Youn, of Roslyn, as the student who most exemplifies their class and the extraordinary attributes of nuclear chemist Glenn T. Seaborg, who won the Nobel Prize for Chemistry in 1951 and served on the Society's Board of Trustees for 30 years. No additional money came with the honor.

Youn's project examined the psychology behind voting habits.

Long Island's other finalists were: Ethan Chiu and Rohan Ghotra, both of Syosset High School; Roberto Lopez of Brentwood High School, and Christopher Labit and Desiree Rigaud, both of John F. Kennedy High School in the Bellmore-Merrick Central High School District.

Amber Luo of Ward Melville High School in East Setauket placed third in the Regeneron Science Talent Search.

Hailee Youn of Roslyn High School was named the Glenn T. Seaborg award winner, as the student who most exemplifies their class.

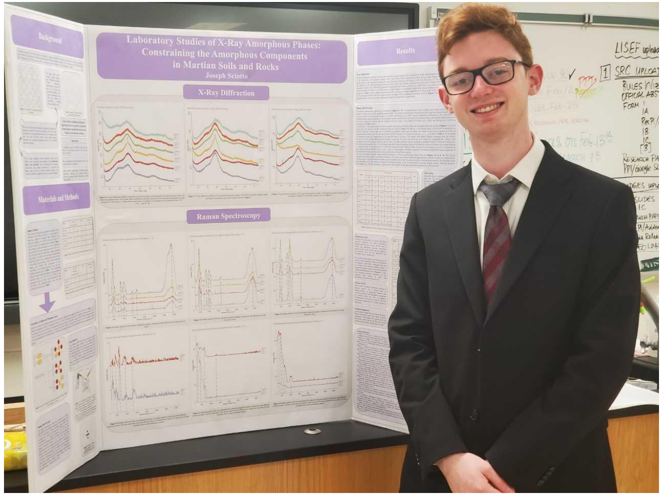
PRESENTATION COMPETITIONS…Taking the show on the road

In-person competitions…

Long Island Science & Engineering Fair (LISEF)
New York State Science & Engineering Fair (NYSSEF)

REGENERON
ISEF
A PROGRAM OF
SOCIETY FOR SCIENCE

Junior Science & Humanities Symposium



Science Clubs

Academic Challenges
“The Bowlers”

NAQT
National Academic Quiz Tournaments, LLC

NSB
NATIONAL SCIENCE BOWL®
a competition like no other . . .

Science Olympiad

Science Goals

- Adopt NYSSLS in Regents courses
- Adjust ILS curriculum based on new Assessment & ILS Investigations
- Reinstate robustness of InSTAR program
- Create Science Centers at the secondary buildings
- Increase Academic Intervention Services
- Examine Secondary Science courses with Strategic Planning goals