

**NEW YORK STATE SCIENCE LEARNING STANDARDS
& STEM UPDATE**

**OCTOBER 24, 2017
BOARD OF EDUCATION MEETING**

NEW YORK STATE SCIENCE LEARNING STANDARDS (NYSSLS)

Adopted by the Board of Regents in December 2016 with an initial transition beginning July 1, 2017

Currently in Phase I - Raise Awareness and Build Capacity of new NYS P-12 Science Learning Standards

NYS is working on a full implementation timeline which is currently in draft form.

CURRICULUM AND INSTRUCTION & ASSESSMENT

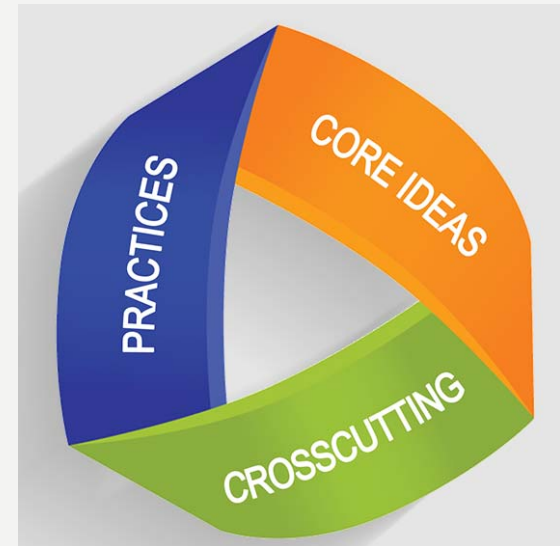
Next Steps at Valley Stream 13:

- Professional development for administrators and teachers
- Review standards aligned core science programs for future adoption
- Review the timeline for transitioning to new assessments; current 4th grade science may move to 5th grade (estimated Spring 2021)

WHAT'S CHANGED?

Three Dimensional Learning:

1. **Disciplinary core ideas (DCI - content)**
2. **Scientific and engineering practices (SEP)**
3. **Cross-cutting concepts (CCC)**



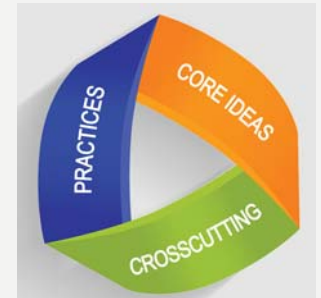
- **Science concepts build across K-12**
- **Focus on a smaller set of Disciplinary Core Ideas (DCI - content)**
- **Science and engineering are integrated into science education (SEP)**
- **New standards coordinate with English language arts and Mathematics standards**

DISCIPLINARY CORE IDEAS - CONTENT



Life Science	Physical Science
<p>LS1: From Molecules to Organisms: Structures and Processes</p> <p>LS2: Ecosystems: Interactions, Energy, and Dynamics</p> <p>LS3: Heredity: Inheritance and Variation of Traits</p> <p>LS4: Biological Evolution: Unity and Diversity</p>	<p>PS1: Matter and Its Interactions</p> <p>PS2: Motion and Stability: Forces and Interactions</p> <p>PS3: Energy</p> <p>PS4: Waves and Their Applications in Technologies for Information Transfer</p>
Earth & Space Science	Engineering & Technology
<p>ESS1: Earth's Place in the Universe</p> <p>ESS2: Earth's Systems</p> <p>ESS3: Earth and Human Activity</p>	<p>ETS1: Engineering Design</p> <p>ETS2: Links Among Engineering, Technology, Science, and Society</p>

CROSSCUTTING CONCEPTS



Crosscutting concepts have application across all domains of science. As such, they are a way of linking the different domains of science.

These are basic scientific concepts independent of specific content.

Patterns

Structure and Function

Scale, Proportion, and Quantity

Cause and Effect

Systems and System Models

Stability and Change

Energy and Matter

SCIENTIFIC AND ENGINEERING PRACTICES



The practices describe behaviors that scientists and engineers engage in as they investigate and build models and theories about the natural world.

These are things that scientists DO.

Asking Questions

Analyzing Data

Developing and Using Models

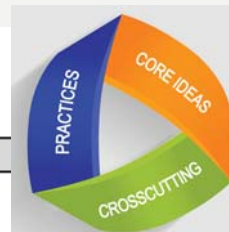
Planning and Carrying out Investigations

Using Mathematics

Obtaining, Evaluating, and Communicating Information

Engaging in Argument from Evidence

New York State P-12 Science Learning Standards



K. Matter and Its Interactions

Students who demonstrate understanding can:

- K-PS1-1. Plan and conduct an investigation to test the claim that different kinds of matter exist as either solid or liquid, depending on temperature.** [Clarification Statement: Emphasis should be on solids and liquids at a given temperature and that a solid may be a liquid at higher temperature and a liquid may be a solid at a lower temperature.] [Assessment Boundary: Only a qualitative description of temperature, such as hot, warm, and cool, is expected]

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

Planning and Carrying Out Investigations

Planning and carrying out investigations to answer questions or test solutions to problems in K-2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.

- With guidance, plan and conduct an investigation in collaboration with peers. (K-PS1-1)

Analyzing and Interpreting Data

Analyzing data in K-2 builds on prior experiences and progresses to collecting, recording, and sharing observations.

- Record information (observations, thoughts, and ideas). (K-PS1-1)
- Analyze data from tests of an object or tool to determine if it works as intended. (K-PS1-1)

Connections to Nature of Science

Scientific Investigations Use a Variety of Methods

- Scientists use different ways to study the world. (K-PS1-1)

Disciplinary Core Ideas

PS1.A: Structure and Properties of Matter

- Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. (K-PS1-1)

Crosscutting Concepts

Cause and Effect

- Simple tests can be designed to gather evidence to support or refute student ideas about causes. (K-PS1-1)

Energy and Matter

- Students observe objects may break into smaller pieces, be put together into larger pieces, or change shapes. (K-PS1-1)

Connections to other DCIs in kindergarten: **K.ETS1.A** (K-PS2-2); **K.ETS1.B** (K-PS2-2)

Articulation of DCIs across grade-levels: **2.ETS1.B** (K-PS2-2); **3.PS2.A** (K-PS2-1),(K-PS2-2); **3.PS2.B** (K-PS2-1); **4.PS3.A** (K-PS2-1); **4.ETS1.A** (K-PS2-2)

Common Core State Standards Connections:

ELA/Literacy –

RI.K.1 With prompting and support, ask and answer questions about key details in a text. (K-PS1-1)

W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-PS1-1)

SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-PS1-1)

Mathematics –

MP.2 Reason abstractly and quantitatively. (K-PS1-1)

K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-PS1-1)

K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. (K-PS1-1)

RESOURCES

[Statewide Strategic Plan for Science](#)

[Introduction to New York State P-12 Science Learning Standards](#)

[New York State P-12 Science Learning Standards](#)

STEM AT VALLEY STREAM 13

- STEM projects at each grade level
- 4th Grade – All classrooms have STEM enrichment push-in

Fourth Grade – Engineering a Mountain Rescue, Magic Spinning Pen

Fifth Grade – Engineer a Moon Landing, Earthquake

Sixth Grade - Engineer Like an Ancient Greek, DNA Build, Battle Like the Ancient Rome

STEM Projects K-3

	Kindergarten	First Grade	Second Grade	Third Grade
Physical Science	Kites K-PS-2-1. Motion and Stability Create Umbrella to keep out light K-PS3-2 Energy; Forces and interaction Earth and Activity	Rainbow Fish 1-PS4-3 Waves and Applications in Technology Telephone Cups 1-PS4-1 Waves and Applications in Technology	Assemble and Disassemble Matter 2-PS1-3 Matter and Its Interactions	Moving on Wheels 3-PS2-1 Motion and stability
Life Sciences	Recycling- Make Bird Feeder K-ESS3-3. K-LS1-1 Human activity Molecule to organisms	Butterfly Lifecycle Wheels 1-LS3-1 Molecules and Organisms; Hereditary	Create a Plant/Animal 2-LS2-2 Biological Evolution	Hopping Frogs 3-PS2-1 3-LS4-2 Forces and Interaction Inheritance and Variation of Traits
Earth and Space	What's in Wind K-PS1-1 Weather and Climate	Groundhog Shadow 1-PS4-2-3 1-ESS1-2 Earth's place in the Universe	Use items to redirect the flow of water 2-ESS2-1 Earth System; Matter and Its Interactions	Study annual rainfall percentages, temperatures, flooding worldwide 3-ESS2-1