

**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

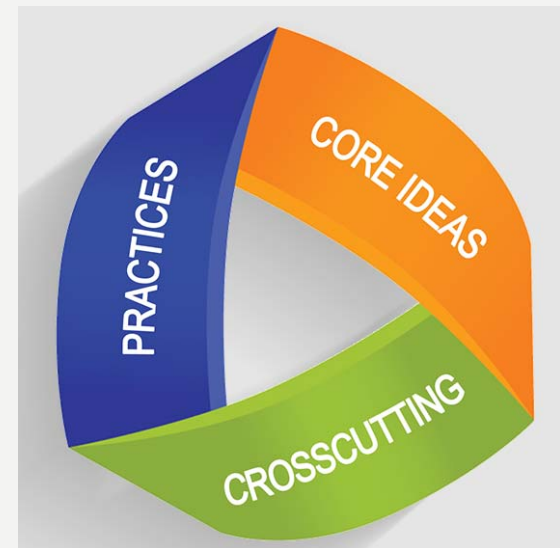
Next Steps at Valley Stream 13:

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

# WHAT'S CHANGED?

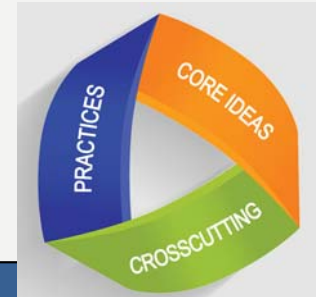
## Three Dimensional Learning:

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



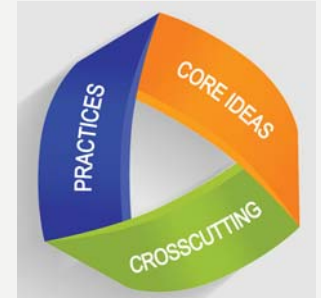
- **Science concepts build across K-12**
- **Focus on a smaller set of Disciplinary Core Ideas (DCI - content)**
- **Science and engineering are integrated into science education (SEP)**
- **New standards coordinate with English language arts and Mathematics standards**

# 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**

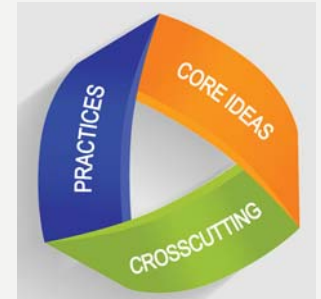
**Cause and Effect**

**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**

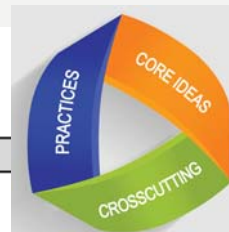
**Planning and Carrying out Investigations**

**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	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Planning and Carrying Out Investigations</b> 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.</p> <ul style="list-style-type: none"> <li>With guidance, plan and conduct an investigation in collaboration with peers. (K-PS1-1)</li> </ul> <p><b>Analyzing and Interpreting Data</b> Analyzing data in K-2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> <ul style="list-style-type: none"> <li>Record information (observations, thoughts, and ideas). (K-PS1-1)</li> <li>Analyze data from tests of an object or tool to determine if it works as intended. (K-PS1-1)</li> </ul> <p style="text-align: center;">-----</p> <p style="text-align: center;"><i>Connections to Nature of Science</i></p> <p><b>Scientific Investigations Use a Variety of Methods</b></p> <ul style="list-style-type: none"> <li>Scientists use different ways to study the world. (K-PS1-1)</li> </ul>	<p><b>PS1.A: Structure and Properties of Matter</b></p> <ul style="list-style-type: none"> <li>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)</li> </ul>	<p><b>Cause and Effect</b></p> <ul style="list-style-type: none"> <li>Simple tests can be designed to gather evidence to support or refute student ideas about causes. (K-PS1-1)</li> </ul> <p><b>Energy and Matter</b></p> <ul style="list-style-type: none"> <li>Students observe objects may break into smaller pieces, be put together into larger pieces, or change shapes. (K-PS1-1)</li> </ul>

*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
- 4<sup>th</sup> 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