


# Science in Mineola

## Science, Technology, Engineering and Mathematics

Board of Education  
Workshop Meeting  
January 16, 2014

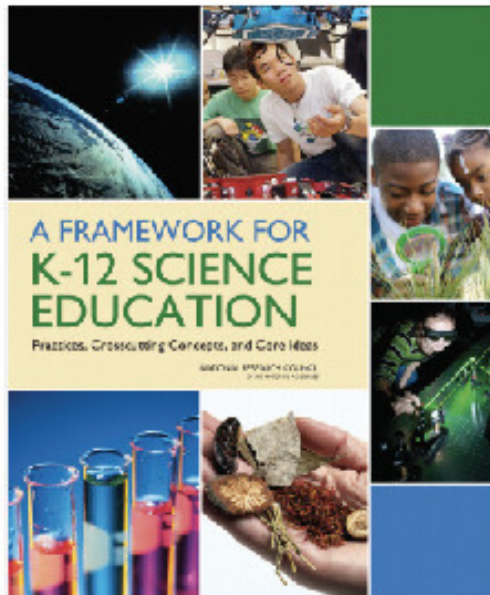


# District Goals

- To get students excited about science.
- To engage students in inquiry and discovery beginning in Pre-Kindergarten.
- To implement a science program that aligns with the Next Generation Science Standards (NGSS).
  - The Knowing Science program is vertically aligned to ensure that knowledge occurs from grade to grade and students have the opportunity to learn more complex material, leading to an overall understanding of science by the end of high school

# *A Framework for K-12 Science Education*

NGSS@NSTA  
STEM STARTS HERE




## Three-Dimensions:

- **Scientific and Engineering Practices**
- **Crosscutting Concepts**
- **Disciplinary Core Ideas**

# Scientific and Engineering Practices

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating and communicating information

# Crosscutting Concepts

1. Patterns
  2. Cause and effect: mechanism and explanation
  3. Scale, proportion and quantity
  4. Systems and system models
  5. Energy and matter: flows, cycles and conservation
  6. Structure and function
  7. Stability and change
- 

# Disciplinary Core Ideas

## Life Science

**LS1: From Molecules to Organisms: Structures and Processes**

**LS2: Ecosystems: Interactions, Energy, and Dynamics**

**LS3: Heredity: Inheritance and Variation of Traits**

**LS4: Biological Evolution: Unity and Diversity**

## Physical Science

**PS1: Matter and Its Interactions**

**PS2: Motion and Stability: Forces and Interactions**

**PS3: Energy**

**PS4: Waves and Their Applications in Technologies for Information Transfer**

## Earth & Space Science

**ESS1: Earth's Place in the Universe**

**ESS2: Earth's Systems**

**ESS3: Earth and Human Activity**

## Engineering & Technology

**ETS1: Engineering Design**

**ETS2: Links Among Engineering, Technology, Science, and Society**

# Grades 5 Lesson Topics

## Grade 5

### Core Idea Lessons

| Physical Sciences   | Engineering & Technology   | Life Sciences  | Earth & Space  |
|---|--|--|--|
| <ul style="list-style-type: none"><li>• Building blocks of matter</li><li>• Properties of matter</li><li>• States of Matter</li><li>• Chemical changes in matter</li><li>• Conservation of matter</li></ul> | <ul style="list-style-type: none"><li>• How different scales work</li><li>• Measuring weights</li><li>• Designing building blocks of matter</li><li>• Design conductivity tester</li><li>• Astronomical observations</li></ul> | <ul style="list-style-type: none"><li>• Ecosystems</li><li>• Matter and energy in organisms</li><li>• Photosynthesis</li><li>• Water, carbon dioxide/oxygen cycles</li><li>• Food webs</li><li>• Energy pyramid</li><li>• Unhealthy ecosystems and human factors</li></ul> | <ul style="list-style-type: none"><li>• Stars and planets</li><li>• Gravity and modeling planets motion</li><li>• Modeling Earth</li><li>• Oceans</li><li>• Interactions: weather and climate</li><li>• Earth's surface processes</li><li>• Human activities</li></ul> |

# Implementation

2011-12 – Meadow Drive piloted Knowing Science in one class in Grades K, 1 and 2

2012-13 – Knowing Science was implemented in K, 1 and 2 in Hampton and Meadow

2013-14 - Knowing Science is implemented in Grade 3, 4, 5 and 6



# Mineola Science Sequence

|                                    | 2013-14  | 2014-15   | 2015-16  |
|------------------------------------|--|---|--|
| Current<br>Pre-K -<br>Grade 6      | Earth, Life<br>Physical, Engineering<br>(NGSS) → | Earth, Life<br>Physical, Engineering<br>(NGSS) →                | Earth, Life<br>Physical, Engineering<br>(NGSS)   |
| Current 7 <sup>th</sup><br>Graders | Life Science →                                   | Physical &<br>Life Science Or Honors<br>Earth Science Regents → | Living Environment<br>or Living Environment<br>Honors  |
| Current 8 <sup>th</sup><br>Graders | Physical &<br>Life Science →                     | Earth Science →   | Living Environment   |
| Grade 8<br>(Honors)                | Earth Science<br>(Regents) →                     | Living<br>Environment<br>Honors →                               | Chemistry or<br><u>Choice of:</u><br>Physics Regents<br>AP Chemistry<br>AP Biology<br>AP Physics<br>AP Environment Science |

# Report Card Progress Indicators

## ➤ Science Practices

- Asks questions and defines problems
- Develops and uses models
- Plans and carries out investigations

## ➤ Scientific Concepts

- Demonstrates an understanding of scientific concepts:

*Physical Science*

*Life Science*

*Earth and Space Science*

*Engineering and Technology*

# Science Program Structure

## ➤ Pre-K – 2

- Science Lessons are taught in the classroom. Lessons are hands-on and are integrated with ELA and Mathematics.

## ➤ Grades 3 & 4

- Science labs are taught once in a six-day cycle by Teresa Dawber, Science Specialist.

*Introduction of concepts, vocabulary, and content reading are done in the classroom.*

## ➤ Grades 5 & 6 **Shared digitally via eBackpack**

- Science labs are taught twice in a six-day cycle by Elena Murphy, Science Specialist.

*Introduction of concepts, vocabulary, and content reading are done in the classroom.*