

# **Putnam Valley Middle School**

## **Implementing NYSSLs**

### **Grades 5 - 8**

**Our goal is to foster a love for science while investigating the world around us and to inspire students to think like scientists!**

# A move from Earth Science to Science 8

## Implementing the NYSSLS

**Earth Science** - Regents Credit

Physical Sciences

**Science 8** - NYS Science Learning Standards

Physical Sciences

Life Sciences

Earth and Space Sciences

Engineering Design

\*This builds a balanced foundation for all of our sciences

\*This will spiral in grades 6 - 8

# Science and Engineering Practices

## Next Generation Science Standards



1

### Ask Questions and Define Problems

You should ask questions about what you read, about phenomena you observe, and about the conclusions you can draw from models and scientific investigations. For engineering, you should ask questions to help you define a problem to be solved.

### Develop and Use Models

Models help us bring into focus features of science that are challenging to observe. You should recognize their assumptions and limitations, and evaluate and refine them by comparing their predictions with the real world. When new evidence is uncovered, models are refined.

2

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### Plan and Carry Out Investigations

Investigations are undertaken to describe a phenomenon, or to test a theory or model for how the world works. Engineering investigations might seek to determine how to fix or improve the functioning of a technological system or compare results to see which solution best solves a problem. You should always try predict outcomes and plan an investigation that will generate data to provide evidence.



### Analyze and Interpret Data

Data must be presented in a form that can reveal patterns and relationships, and that allows results to be communicated to others. Raw data has little meaning on its own, and a major practice of science is to organize and interpret data through tabulating, graphing, and statistical analysis.

4

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### Use Mathematical and Computational Thinking

Math brings the fields of science and engineering together by enabling engineers to apply the mathematical form of scientific theories and enabling scientists to use powerful information technologies designed by engineers. Both engineers and scientists accomplish investigations with the use of math, and use it to analyze and build complex models.

### Construct Explanations and Design Solutions

The goal of science is to construct explanations for the causes of phenomena. You are expected to construct your own, as well as apply standard explanations you learn about from teachers or items you read. The goal of engineering is to solve problems, and designing solutions is a systematic process involving generating, testing, and improving solutions.

6

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### Engage in Argument from Evidence

Argument is necessary for advancing and defending a new idea or an explanation of a phenomenon. You should argue for the explanations you construct, defend your interpretations of the associated data, and advocate for the designs you propose.



### Obtain, Evaluate, and Communicate Information

You must learn to read and produce texts specific to the science you are studying. Being able to read, interpret, and produce scientific and technical texts is fundamental to the practices of science and engineering. Also, being a critical consumer of information about science and engineering requires the ability to recognize well-constructed ideas, ID sources of error, distinguish observations from inferences, and claims from evidence.

8

For more information about NGSS, please visit:

[www.nextgenscience.org](http://www.nextgenscience.org)

# Next Generation Science Standards

## Disciplinary Core Ideas



Physical Sciences



Life Sciences



Earth and Space Sciences



Engineering Design

## Science and Engineering Practices



Asking questions (for science) and defining problems (for engineering)



Developing and using models



Planning and carrying out investigations



Analyzing and interpreting data



Using mathematics and computational thinking



Constructing explanations (for science) and designing solutions (for engineering)



Engaging in argument from evidence



Obtaining, evaluating, and communicating information

## Crosscutting Concepts



Patterns



Cause and effect



Scale, proportion, and quantity



Systems and system models



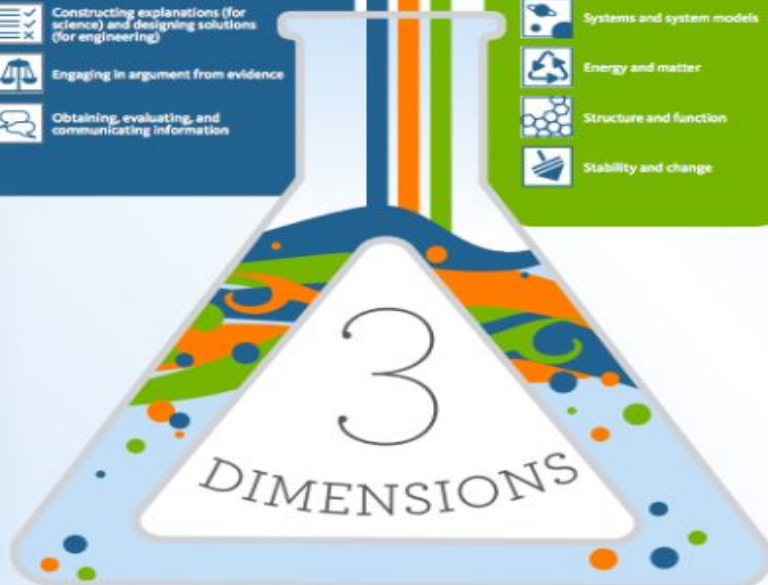
Energy and matter



Structure and function



Stability and change



# Why?

1. The NYSSLS curriculum (New York State's Science Learning Standards) is designed to provide students with the foundational knowledge and skills they will need to be successful on the current and more importantly future regents exams in science.
2. This model will support heterogeneous groupings of students across all 8th grade science classes.
3. The recommendation is being made only after working with both MS and HS teachers and administrators on how to best support students throughout our science program.
4. This change will have NO impact on a student's ability to pursue the highest levels of our science curriculum or to pursue an IB diploma or certificate.
5. We anticipate that many schools across New York State have made or are considering making a similar move away from regents level middle school science courses. (Briarcliff, Harrison, Somers)

# A shift to the standards . . .

At the high school level, the current regents exams will integrate the NYSSLS in the near future. This helps to build the foundation for our students and prepare them for that shift.

This shift addresses the how and why as opposed to just the facts.

Students are encouraged to think critically and to investigate like a scientist.

Aligned with IB philosophy (Inquirers, Knowledgeable, Reflective, Thinkers)

# Multiple Science Pathways

**Science 8** - NYSSLS - Physical Sciences, Life Sciences, Earth and Space Sciences, and Engineering Design.\*This will spiral in grades 6 - 8

**9th - Living Environment**

**10th - Chemistry and/or Earth Science**

**11th - Chemistry and/or AP Physics and/or Physics Honors and/or Earth Science and/or Electives**

**12th - IB Chemistry, IB Bio, IB Environmental Systems and/or Chemistry and/or AP Physics and/or Physics Honors and/or Earth Science and/or Electives**

**All of this information is found in the [PVHS Course Catalog](#). (pg. 38)**

# Graduation Requirements (Science)

## Regents Diploma

- **Science 3 Credits**

**(1 Science Regents Examination Passed) • Living Environment • Chemistry  
• Earth Science • Physics**

## Advanced Regents Diploma

- **Science 3 Credits**

**(2 Science Regents Examinations Passed) (1 must be Living Environment) •  
Living Environment • Chemistry • Earth Science • Physics**

**All of this information is found in the [PVHS Course Catalog](#). (pg. 4)**

Brian Greene

Theoretical Physicist, Columbia University





A Case for Implementing NYSSLS at  
PVMS for ALL Students by Maria  
Bradfield