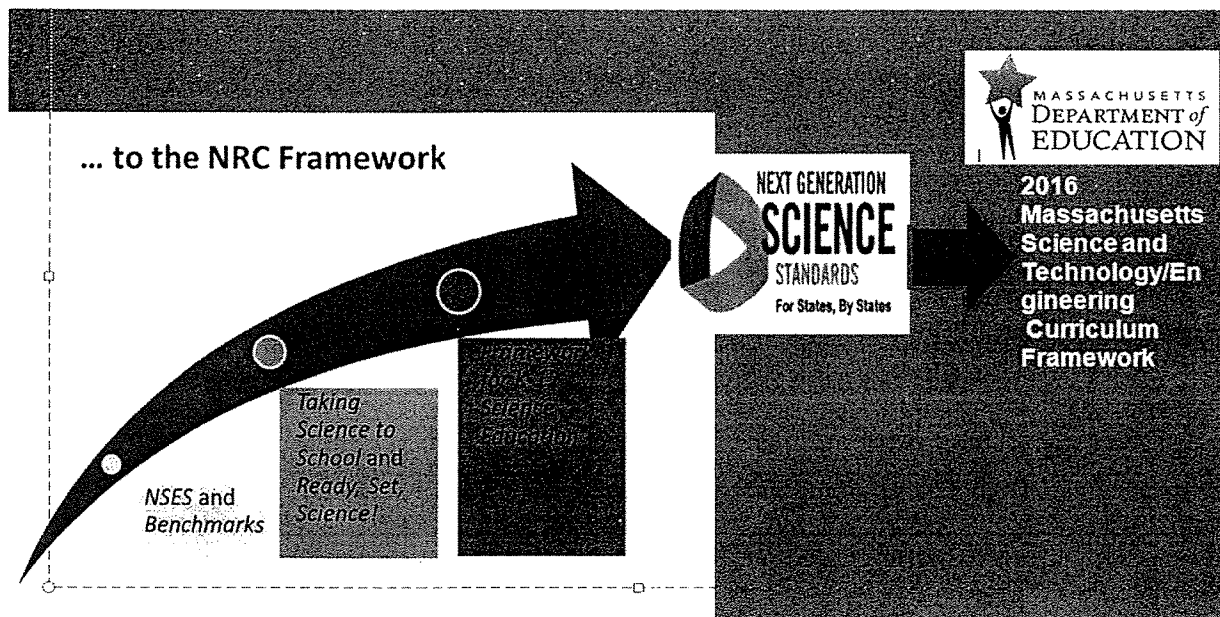


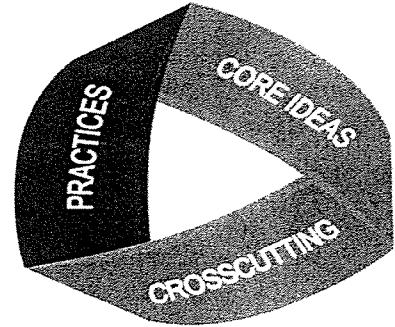
Science in Belmont Public Schools

May 10, 2016

A Little History...



The Standards



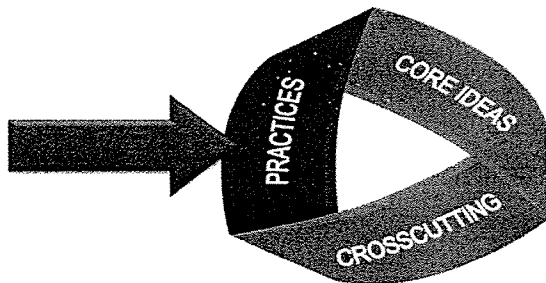
- Each “standard” is actually a **Performance Expectation**.

They combine:

- Science and Engineering Practices
- Crosscutting Concepts
- Disciplinary Core Ideas

into a single statement of **what is to be assessed**.

Science and Engineering Practices



The 8 Scientific and Engineering Practices are integrated with Concepts

- The practices represent good teaching and learning of science and engineering.
- Practices were well-established in the NRC Framework early in the process.

Scientific Inquiry

Engineering Design

Ask a question

Define a problem

Obtain, evaluate and communicate technical information

Obtain, evaluate and communicate technical information

Plan investigations

Plan designs and tests

Develop and use models

Develop and use models

Design and conduct tests of experiments or models

Design and conduct tests of prototypes or models

Analyze and interpret data

Analyze and interpret data

Use mathematics and computational thinking

Use mathematics and computational thinking

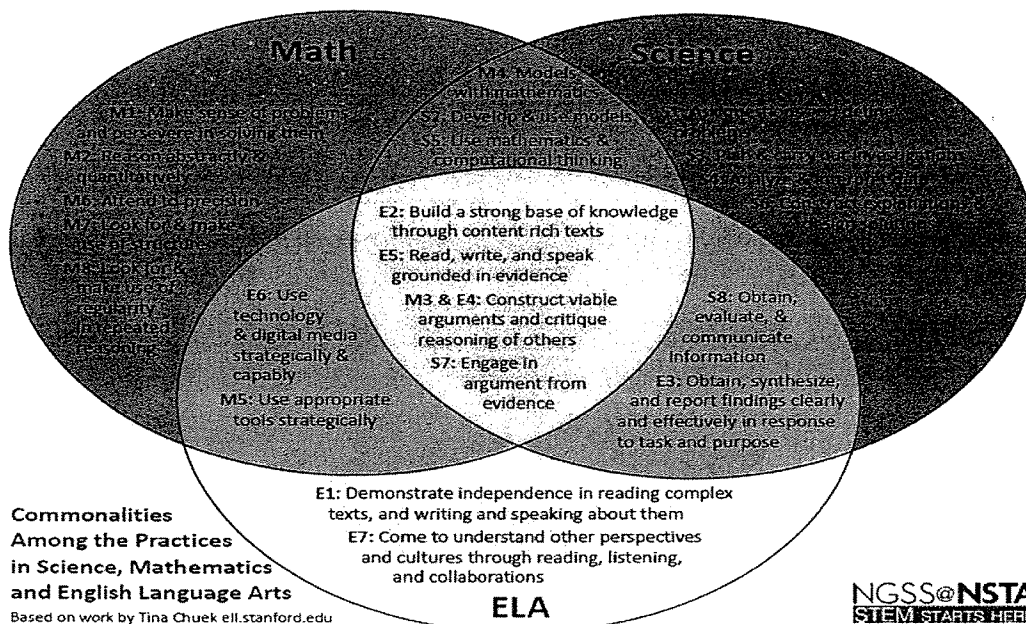
Construct explanations using evidence

Design solutions using evidence

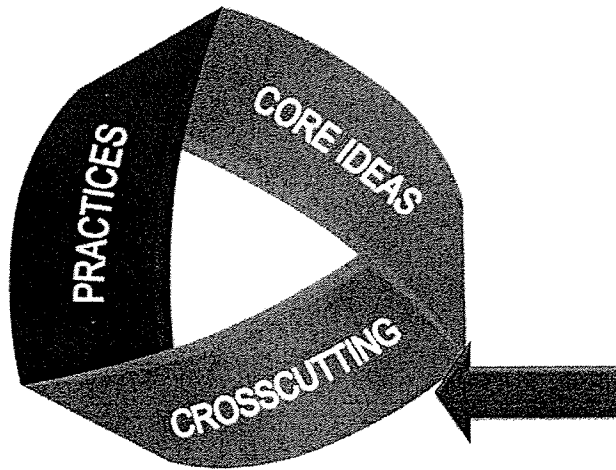
Engage in argument using evidence

Engage in argument using evidence

ELA, Math, and Science Practices



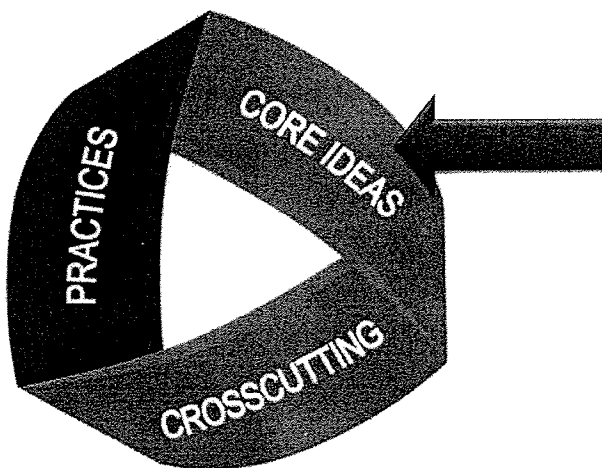
Crosscutting Concepts



Crosscutting concepts help shape the way in which we study the phenomenon.

Examples: Cause and effect, movement of matter and/or energy

Disciplinary Core Ideas



Students use Core Ideas in science performances to make sense of phenomena.

Core Ideas

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These Core Ideas:

-progress in complexity over the grade levels.

-build across time and between science disciplines to create a coherent storyline.

LS1.C How do organisms obtain and use the matter and energy they need to live and grow?



Molecular model of biochemical reactions for matter and energy in food.

Chemical reactions model for matter and energy in food, drawing on particle model of matter and energy transfer model.

Simple food model: food consumed or produced is made of matter and provides energy for organisms.

General needs model: Organisms get what they need to survive from the environment.

Science Steering Committee Work this Year

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Vision statement DRAFT:

Science, engineering and technology education in the Belmont Public Schools nurtures students' curiosity and appreciation for the natural and designed world around them. To develop deep conceptual understanding, students ask questions, design investigations, gather evidence, evaluate data, create models and communicate findings in multiple modes. Students apply their knowledge, skills and practices to productively engage in our complex world.

Elementary Grades

Teachers have:

- Reviewed the standards. Shifts and changes were noted.
- Created a common understanding of science/engineering practices.
- Identified planning templates to ensure the science and engineering practices are embedded within lessons as effectively as possible.
- Identified resources to work from.
- Identified unit to focus on for next year.

Elementary Grades Moving Forward

- Focus on one unit per a year per a grade level
- Start with the units that most closely align to these new standards so we can focus on the scientific and engineering practices
- Create/purchase lessons and curriculum to fill the gaps
- K-4 Teachers will participate in summer curriculum work this June
- Utilize PD opportunities through EDCO and other nonprofit organizations around the state.
- Use curriculum meeting time to create a progression of science/engineering practices k-4

Middle School

- The teachers have reviewed the new standards and we have worked to map out which standards will be in which grade
- The Science and Engineering Practices have been examined, and we are finding places to emphasize them
- This summer Grades 5 and 6 will be writing their curriculum for new units
- Next summer, Grades 7 and 8 will do the same

High School

- The new standards have been examined and feedback was given to the state this fall.
- Shifts and changes have been noted.
- The teachers have started mapping where the Science and Engineering Practices are currently occurring, and where to emphasize them more.
- We are looking for opportunities in the current curriculum for student-centered, inquiry-based activities, as we start the process of alignment
- Next year we will dive more deeply in Biology and Chemistry

Resources

<http://www.doe.mass.edu/STEM/review.html>

<http://www.nextgenscience.org/>