

QUINCY PUBLIC SCHOOLS

TRANSITION TO THE NEW MA DESE SCIENCE, TECHNOLOGY AND ENGINEERING STANDARDS

School Committee Meeting
September 21, 2016

PRESENTING TONIGHT

Michelle Cunniff

Science Teacher Gr 8 APC, Central Middle School

Taylor Dennehey

Grade 5 Teacher, Montclair Elementary

Madeline Roy

Senior Director of Curriculum

Ed Smith

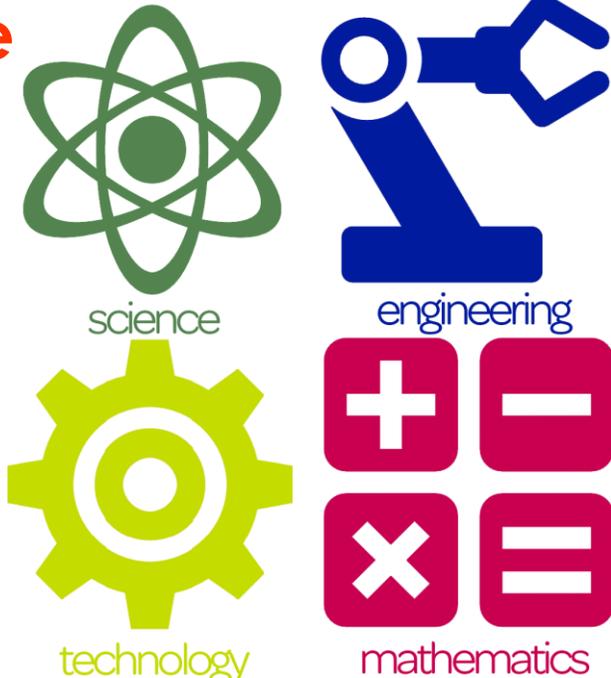
Science Department Chair, Quincy High School

THE STANDARDS

The 2016 STE standards maintain much of the content of our prior STE standards with updates to reflect changes identified by the field and changes in science and engineering over the past 15 years

There is the addition of inquiry and design skills that students need to successfully engage in this discipline

The 2016 STE standards strengthened the existing set of quality standards Massachusetts has relied on since 1996.

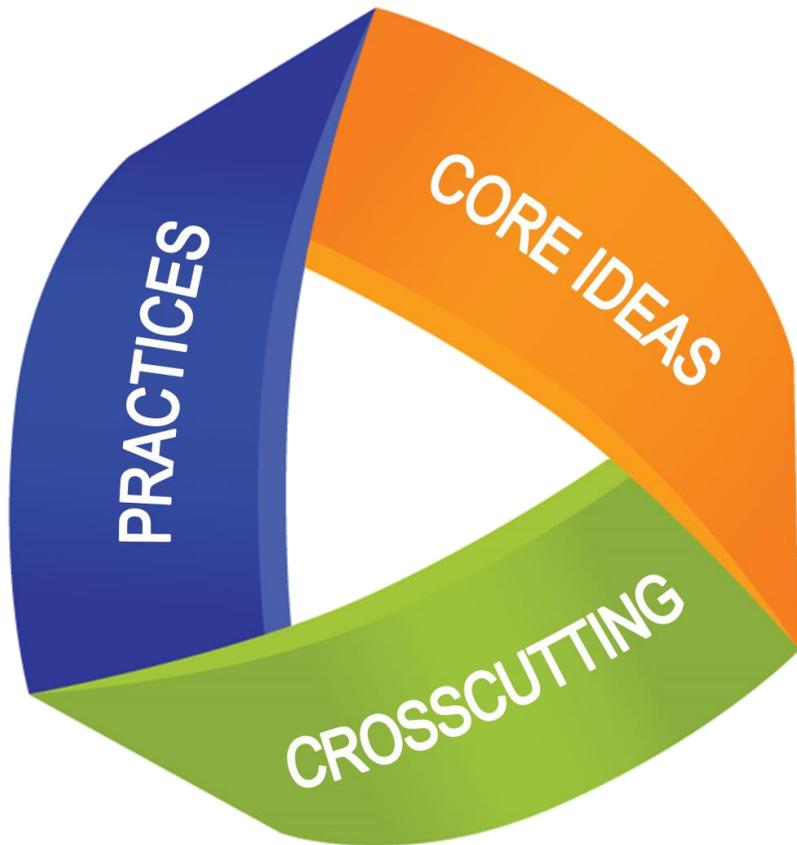


THE NEW STANDARDS

- Focus on conceptual understanding and application of concepts.
- Integrate disciplinary core ideas and practices to reflect the discipline of science.
- Present coherent progressions of core ideas and practices from PreK to High School.
- There are now specific standards for each grade-level PreK-8 
- Application of science in engineering contexts. 

NGSS AND MA STANDARDS:

The Massachusetts STE standards are an adaptation of the Next Generation Science Standards (NGSS).



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

Disciplinary core ideas are meant to focus K–12 science curriculum on the most important aspects of science.

Disciplinary core

- Physical
- Life
- Earth and Space
- Engineering and Technology:

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

OVERVIEW OF THE TRANSITION

Spring 2009

MA started a revision of state's science standards

July 2011

National Research Council released the *Framework for K-12 Science Education*, which led to the development of the Next Generation Science Standards (NGSS)

April 2013

Public comment period led to an agreement to adapt the proposed NGSS standards which...

Dec 2013

Led to the drafting and public release of a revised set of standards for MA

January 2016

The Massachusetts Board of Education voted to adopt the new STE Framework

QPS BEGINS THE TRANSITION

2014-2015

**Elementary Report Card Team Aligns to
New STE Standards**

MS STE Team created a transition plan

Summer 2015

Grade 5/6 Summer Alignment and Mapping

School Year

**Inventory of equipment and resources
Partial Implementation**

Summer 2016

**Middle School Summer Alignment and
Unit Development**

Fall 2016

Full implementation of new standards

3 IMPORTANT GOALS FOR ALL STUDENTS

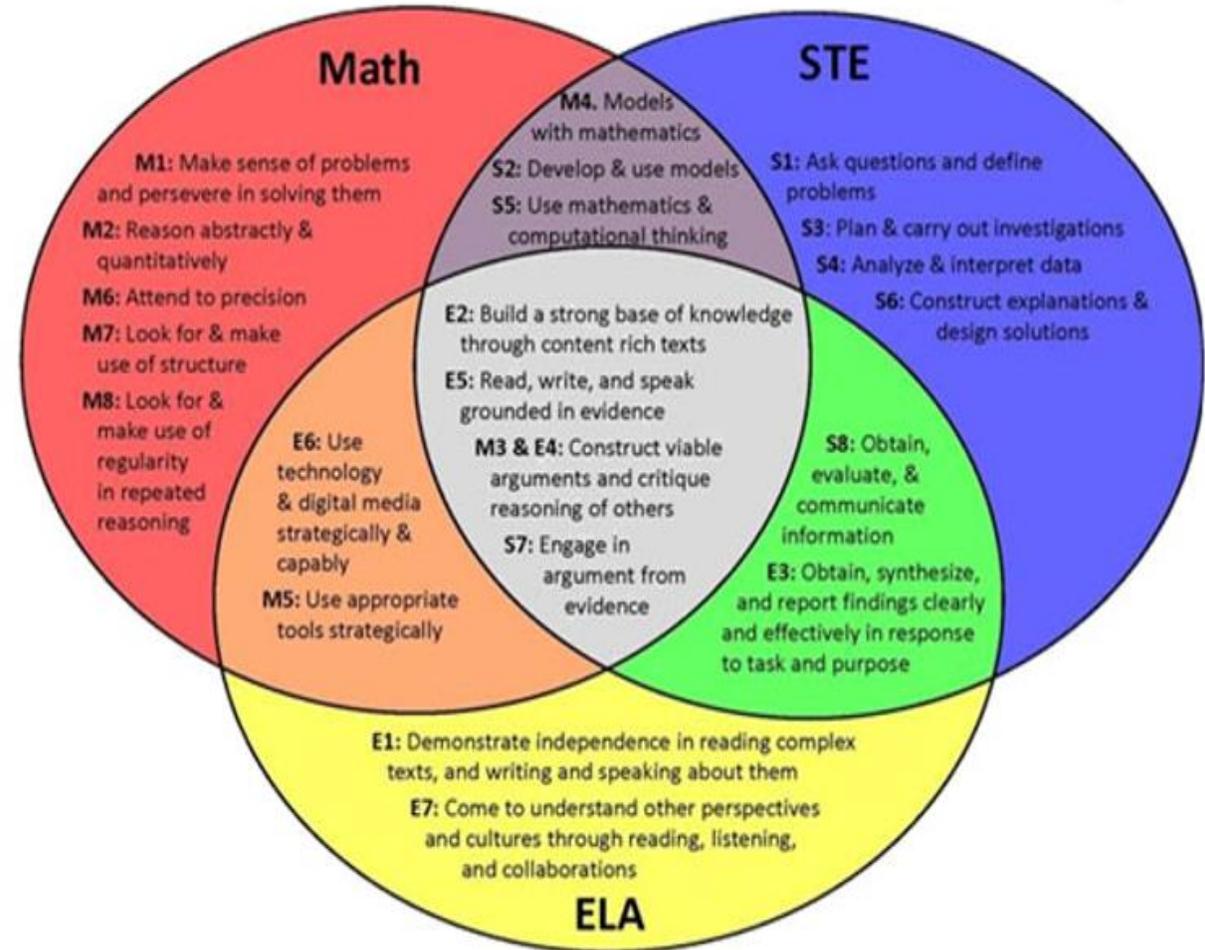
CIVIC PARTICIPATION,
COLLEGE PREPARATION
CAREER READINESS

The goal of STE education is to develop scientifically and technologically literate citizens who can solve complex, multidisciplinary problems and apply analytical reasoning and innovative thinking to real-world applications needed for civic participation, college preparation, and career readiness.

WHO DOES IT AFFECT?

Students experience and navigate the world as an integrated whole.

Language, literacy, mathematics, science, technology, and engineering are seamlessly interwoven in our everyday lives.



WHAT DOES THE TRANSITION LOOK LIKE FOR TEACHERS AND STUDENTS

High School

- 2016 STE standards broken into content areas:
 - Earth and Space Science, Biology, Chemistry, Physics, and Technology/Engineering
- Courses in the 2016 STE standards have all been reduced in scope to encourage greater depth.
- 9th and 10th grade courses will continue alignment with the 2001/2006 standards in order to cover all topics on the MCAS.
- All other high school courses will transition to the 2016 STE standards immediately and implement an inquiry based approach with modeling throughout the curriculum

WHAT DOES THE TRANSITION LOOK LIKE FOR TEACHERS AND STUDENTS

Middle School

- The 2016 STE standards are broken into 4 domains: life science, physical science, earth science, and technology and engineering. Each grade is given specific standards as well as skill sets and practices to implement.
- Grade 6 – 8 teachers initiated the new standards while still in its “adopted” form, beginning with the grade 6 transition in 2014. At the end of the 2017 school year, all grades will have implemented the new standards.

WHAT DOES THE TRANSITION LOOK LIKE FOR TEACHERS AND STUDENTS

Middle School

- For the 2016 – 2017 school year grade 6 – 8 students will use Interactive Science Notebooks in the classroom.
- ISN enhance student's literacy skills, accountability, and scientific inquiry.
- The ISN units are taken directly from the STE Standards and addresses many Common Core Standards.

WHAT DOES THE TRANSITION LOOK LIKE FOR TEACHERS

Elementary

- Studied the new standards in all grade levels including the guiding principles and disciplinary core ideas
- Collaborated and documented shared resources used to teach standards
- Created an updated curriculum map for grades 3-5 that would support the progression of the standards beginning in earlier grades
- Collaborated with a team of 6th grade teachers and discussed use of interactive notebooks

WHAT DOES THE TRANSITION LOOK LIKE FOR STUDENTS

Elementary

- These new standards help to provide our students with a deeper conceptual understanding
- We are able to shift our focus from the “what” to the “why?” and “how?”
- These standards provide a great opportunity for students to formulate their own questions and to construct their own understanding of the world around them.

***Grade 5 Students
working together
on an engineering
activity***



WHEN DOES THE WORK TAKE PLACE

System Wide PD

Department Meetings

Vertical Team Meetings

Site-based Content Team Meetings

Summer Work Groups

HOW DO TEACHERS COLLABORATE?

Middle and High School

- Teachers collaborate by department, professional development, vertical teams, and by AP Pathways team meetings.
- Discussions include use of interactive science notebooks, pacing guides, sharing of best practices, and curriculum mapping.
- Teachers share and new online resources and demonstrate the use of new tools/equipment

HOW DO TEACHERS COLLABORATE?

Elementary

- Teachers collaborate on site within their grade-level teams or vertical team meetings
- Across the system, science focused teachers meet for professional development and curriculum alignment
- Teachers share and new online resources and demonstrate the use of new tools/equipment

ADVANCED SCIENCE PATHWAY TEAM

TEAM MEMBERS

Michelle Cunniff, Julie Krieger, Madeline Roy, Rob Shaw, Ed Smith, Kendra Trainor, Lou Venturelli

GOALS for ADVANCED SCIENCE PATHWAY

- Provide a pathway preparing city-wide middle school students for high school advanced placement courses
- Encourage independent learning and stimulate natural curiosity in science
- Foster high academic achievement, organization, problem solving and critical thinking skills
- Creation of suggested activities and suggested differentiations for advanced learners

ADVANCED SCIENCE PATHWAY (WHAT'S NEXT)

This will lead to:

- **More 9th grade students enrolled in Advanced and now Honors Biology at both high schools**
- **Give advanced students more flexibility in the 11th and 12th grade schedule allowing enrollment a STE elective and/or AP courses.**
- **Creation of grade 6 and 7 guides with differentiations**

BU GLACIER PROGRAM

- **The GLACIER Program partners BU graduate students with middle school science teachers. The purpose is to enhance science curriculum and provide science expertise in the classroom.**
- **Graduate students spend 2 full days a week in the classroom from September to May co-teaching. In addition they work with the teacher to identify and create topics and units in the curriculum related to global climate change specifically addressing the Quincy community.**

NEXT STEPS

22

High School - Department Meetings

Review standards by science content area, address any changes, i.e.

- [HS-ESS3-4 and HS-ESS3-6 from NGSS is not included.]
- [HS-PS1-8 is now found in introductory physics.]

Middle School – System PD October 11th

- Moving Forward with Coherence and Clarity
- Summer Work
- Plan to Realign DDMs and Interactive Notebook Check in

Elementary - System PD November 22nd

- Alignment and Pacing Review
- Sharing of Best Practice and Resources



THANK YOU

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