ARHS Math Curriculum Review
Presentation 2

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Amherst-Pelham Regional High School
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Agenda

1. K – 12 Math Objectives
2. Traditional or Integrated
3. Curriculum review process
4. Course Sequence
Meeting Objectives

1. Update on Curriculum review process
2. Address questions from 12/11 parent/guardian meeting
3. Gather feedback about course sequence and names
Math (K-12)

Provide a rigorous, meaningful, coordinated, standards-based and engaging mathematics curriculum for all students. Have as many students as possible prepared to take and succeed in advanced HS math and science courses.

What might this look like?

• Strengthen K-12 math program and devote resources to maximizing the number of students succeeding in advanced math courses including Calculus.
• Develop a strong school and district culture about the importance of developing strong math skills and succeeding in all math courses.
Model for Supporting High Math Achievement

- Extended **window of opportunity** for movement between courses.
- **Aligned** and interrelated courses
- **Intervention** aligned with core program
Courses in higher level mathematics: Precalculus, Calculus*, Advanced Statistics, Discrete Mathematics, Advanced Quantitative Reasoning, or courses designed for career technical programs of study.

**Traditional Pathway**
- High School Algebra I
- Geometry
- Algebra II

Typical in U.S.

**Integrated Pathway**
- Mathematics I
- Mathematics II
- Mathematics III

Typical outside of U.S.
Course Sequence

Traditional

Calculus AB/BC or Stats

Pre-Calculus or Trig

Algebra 2 CP/H

Geometry CP/H

Algebra 8, 8+

Integrated

Calculus AB/BC or Stats

Math 4 CP/H

Math 3 CP/H

Math 2 CP/H

Algebra 8, 8+
Common Questions (12/8)

• How are the ARHS teachers involved in this process?
• What criteria are the ARHS math department using during this review process?
• Will Honors courses still exist?
• How will students get to Calculus at ARHS?
• How is the projected course sequence inclusive to the needs of all students?
Review Process

• Determined curricula to review
  – Contacted districts

• Established curriculum review criteria
  – Rigor
  – Standards for Math Practice
  – Differentiation

• Norming department practice around the Standards for Math practice

• Learned about each Curriculum – at least 1 day

• Visited area schools

• Contact STEM Professors and College Admissions departments
Curricula under review

– Center for Mathematics Education Project
– College Preparatory Math
– Core-Plus Math
– Interactive Mathematics Program
Rigor

- Conceptual Understanding
- Procedural Fluency
- Application

“K–8 Publishers’ Criteria for the Common Core State Standards for Mathematics”

http://www.corestandards.org/assets/Math_Publishers_Criteria_K-8_Summer%202012_FINAL.pdf
Standards for Math Practice

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Reasoning and explaining.
Modeling and using tools.
Seeing structure and generalizing.
Overarching habits of mind of a productive mathematical thinker.
Differentiation

• Multiple means of...
  – Representation (What?)
  – Action and Expression (How?)
  – Engagement (Why?)
Potential Course Sequences
Common Concerns

• College readiness
• Calculus readiness
• MCAS/PARCC readiness
• Student engagement
• An inquiry based classroom
  – Unbalanced group work
  – Balance Individual and group work
  – Vague content coverage
  – Procedural fluency
• 21st Century Skills
21st Century Skills

- Creativity and Innovation
- Critical Thinking and Problem Solving
- Communication and Collaboration
- Flexibility and Adaptability
- Initiative and Self-Direction
- Social and Cross-Cultural Skills
- Productivity and Accountability
- Leadership and Responsibility
Mechanical Engineering

Learned at MIT

Used pervasively

Did not learn
Learned elsewhere
Learned on the job
Graduate school
MIT undergrad

Mechanical Engineering Core
Professional Skills
How & Why

Next Steps in Review Process

• Review comments gathered tonight
• Next information night
  – January 14th, 6:30 – 7:45, ARHS Library
Thank You
Practical book + DVD classroom examples

“The authors have done nothing less than provide a bold framework for designing a 21st century approach to education, an approach aimed at preparing all of our children to successfully meet the challenges of this brave, new world.”

Paul Reville, Secretary of Education, Commonwealth of Massachusetts; former director of the Education Policy and Management Program, Harvard Graduate School of Education

“It’s about time that we have such an accessible and wise book about the 21st century skills that so many companies, policymakers, and educators are talking about”

Roy Pea, Professor, Education and the Learning Sciences, Stanford University

http://www.21stcenturyskillsbook.com