Mathematics Program Review

Bridgewater-Raritan Regional School District

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Goals and Purpose

- A description of the current program
- A review of the curriculum, instruction, assessment, resources and professional development
- Summary of survey responses
- Site visits
- Research and best practices
- Recommendations

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The 5-Year Cycle

YEAR 1
Implementation of Curriculum and Materials
Map Curriculum

YEAR 2
Implementation and Updates

YEAR 3
Implementation and Updates

YEAR 4
Program Review

YEAR 4
Curriculum Rewrite

YEAR 5
Implementation of Draft Pilot of Materials

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Year 4 Breakdown

PROGRAM REVIEW (Part 1)

PROGRAM DESCRIPTION (CURRENT) Staffing, Resources… + **Guiding Questions** **Survey Results** + **What Others Do/Model Programs** + **Program Recommendations and Recommendations for Curriculum Revisions**

CURRICULUM REWRITE (Part 2)

Assemble Team of Curriculum Rewriters → **Establish Vision for Curriculum Document and Department** → **Determine Scope & Sequence/Establish Themes/Enduring Understanding/Essential Questions/Unit Assessments/Evidence of Learning** → **Composition of Units**

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Current Program

- **Curriculum**
- **Instruction**
- **Assessment**
- **Resources / Professional Development**

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Current Description K-12 Mathematics

Curriculum and Instruction

- Aligned with NJSLS
- Small Group Instructional Model
- Curricular pathways
- Instructional Time:
  - Kindergarten: 175 minutes weekly
  - Grades 1-4: 375 minutes weekly
  - Grade 5: 301 minutes weekly
  - Grade 6: 215 minutes weekly
  - Grades 7 and 8: 210 minutes weekly
  - Grades 9-12: 200 minutes weekly

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Current Description K-12 Mathematics

Instruction and Assessment

- Average Class Size Range:
  - Grades 1-6: 16-25 students, with the exception of Math 4A with an average class size of 10 students
  - Grades 7-8: 18-26 students
  - Grades 9-12: 15-28
- Grades K-6: Common unit assessments
- Grades 7-12: Common beginning of the year, mid-year cumulative assessment and final exams
- PARCC administered in grades 3 -Algebra 2
- NWEA MAP screenings

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Current Description K-12 Mathematics

Resources

- Grades K-6 Instructional Resources
  - Math In Focus K-6 (CCSS aligned, 2013 edition)
  - ThinkCentral (access to online textbook)
  - TenMarks online software for grades 3-5, and selected RtI/SE students
  - Exemplars
  - NJ State Framework documents
  - NCTM journals and recommended websites

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Current Description K-12 Mathematics

Resources

- Grades 7-12 Instructional Resources
  - Grades 7/6E/7E resources - Pre-Algebra (not CCSS aligned)
  - Grade 8 and Algebra I are the only CCSS aligned texts in grades 7-12
  - Geometry and Algebra II (not CCSS aligned)
  - Students in the grade-level math progression will currently experience a different math program in each of the six years between grade 6 and Algebra II.
  - Algebra I is the only high school textbook that has online access and resources
  - Grade 7-12 textbook copyrights range from 1994 to 2015
  - Technology resources: Desmos, Geogebra, Kahoot, Quizziz, Pear Deck, Albert

Surveys

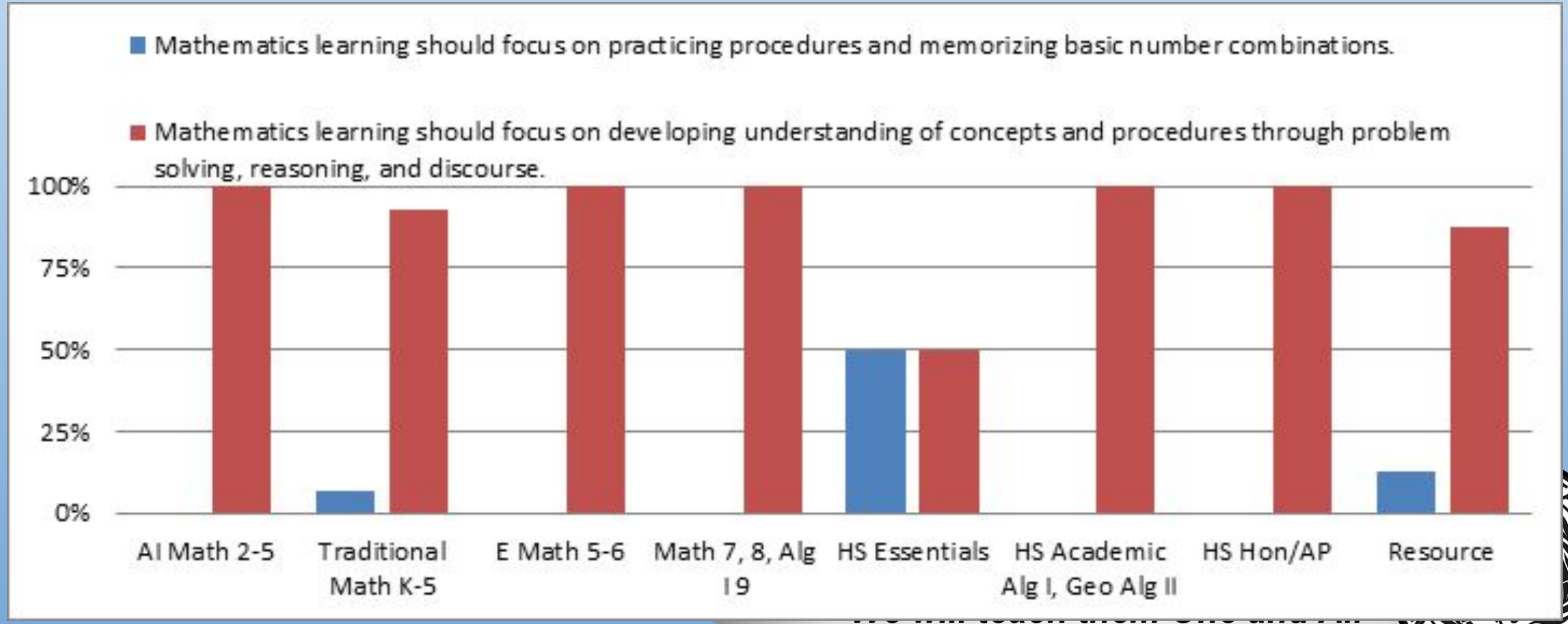
Surveys were developed for three target audiences:

Staff: 277 responses
Students: 5,956 responses (grades 3-12)
Parents: 488 responses

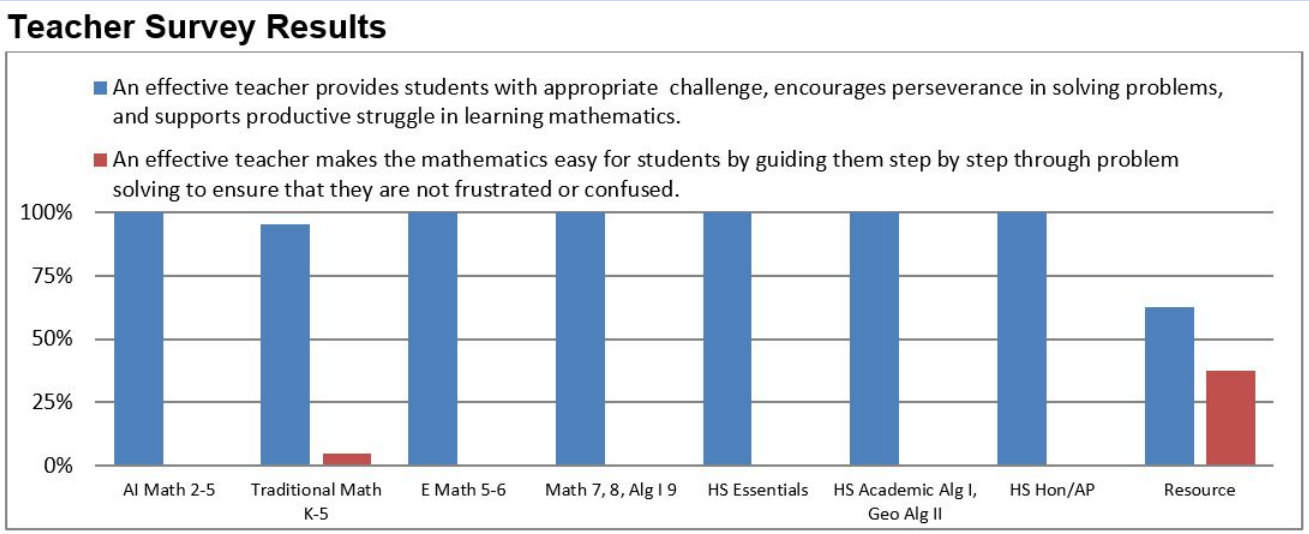
Survey topics: Mathematical beliefs, curriculum, instruction, instructional resources, assessment, and professional development.

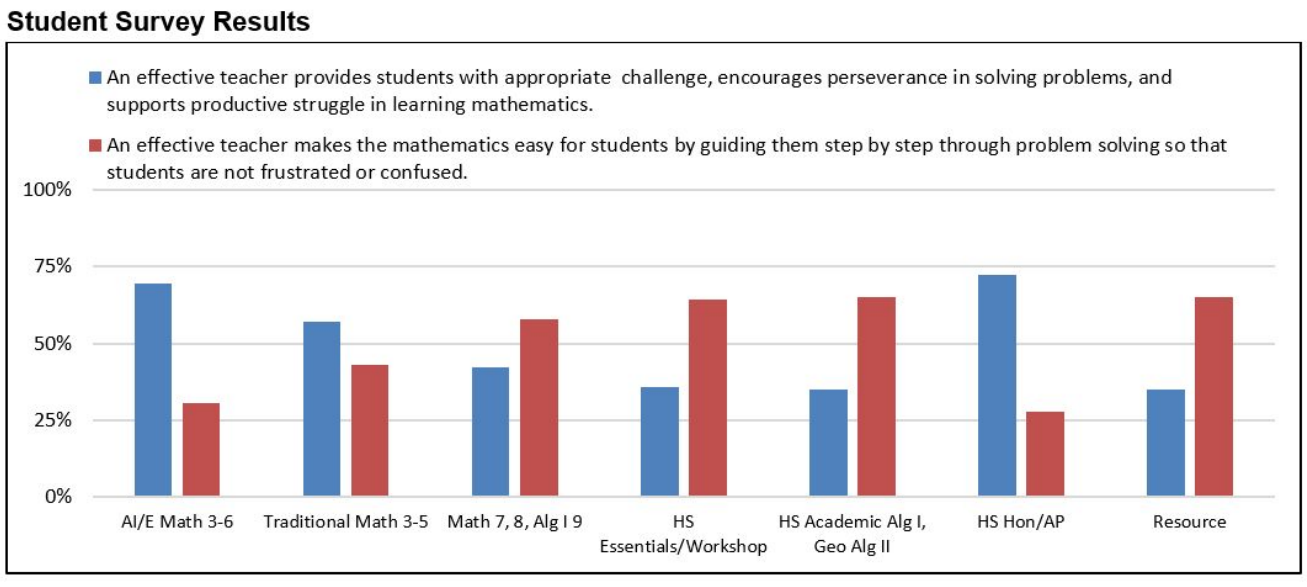
Teacher Survey Results

Select the statement with which you most strongly agree:



Teacher and Student Responses





Select the statement with which you most strongly agree:

- An effective teacher provides students with appropriate challenge, encourages perseverance in solving problems, and supports productive struggle in learning mathematics.
- An effective teacher makes the mathematics easy for students by guiding them step by step through problem solving to ensure that they are not frustrated or confused.

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Survey Highlights

- Students report being aware of the instructional goals for their math classes
- Over 90% of students state math was important in life
- 80% of students stated they can apply their knowledge to new situations
- Almost all parents believe it is important for students to develop problem-solving skills

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Survey Highlights

- 84% of students agree they are appropriately challenged in their math class (parents reported 78% agreement)
- 94% of teachers would be interested in visiting their colleagues as a form of professional development
- 55% of teachers reported they did not have adequate time to collaborate with their colleagues

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Survey Highlights

- Time spent on homework reported by students and parents aligned closely to teacher expectations with 85% students reporting less than 30 minutes
- 70% of parents believed summer work had value
- Students report use of manipulatives is prevalent in grades 3-6 but the use is diminished at 7-12

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Site Visits

The following school districts were visited:

School District	County	DFG	# Students
*Montgomery	Somerset	J	4,800
*West Windsor- Plainsboro	Mercer	J	10,000
*Hillsborough	Somerset	I	7,500
Somerset Hills	Somerset	I	1,965
Freehold	Monmouth	G-H	10,790

*The committee visited classrooms in the districts labeled with an asterisk.

The following items were areas of interest at each of the districts visited:

- Instructional Time
- Acceleration Programs
- Leveling of Courses
- Program Resources

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Recommendations are based on:

- **Assessment of our current program**
- **Research of best practices**
- **Site visits**
- **Survey results**
- **Evaluation of NJSLS**
- **Collaborative discussions of Math Program Review Committee**

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Program Recommendations

- Recommendation
- Rationale
- Implementation Plan
- Curriculum and PD
- Resources/Staffing/Costs

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Program Recommendations

- **Provide additional opportunities and resources for students to engage in productive struggle and build procedural fluency from conceptual understanding by engaging students in tasks that promote reasoning and problem solving.**

Program Recommendations

- **Improve equity and access to high level mathematics and high quality instruction by phasing out high school essentials and workshop courses.**

Program Recommendations

- **Improve equity and access to high level mathematics and high quality instruction by allowing all students opportunities to enroll in honors and AP mathematics courses in high school.**

Program Recommendations

- **Split AP Calculus BC into two courses, one for students coming from AP Calculus AB and for students coming from Honors Precalculus.**

- **Replace Math Analysis A with College Algebra/Trigonometry A course.**

Program Recommendations

- **Eliminate Math 4A, universally screening all students for 5E mathematics.**

Program Recommendations

- **Provide more consistent daily instructional time in grades 5-12.**

- **Provide consistent structured time for teachers to collaborate during the school day.**

Program Recommendations

- **Revise all current math curricula to include more best teaching practices and new state curricular requirements.**
  - Integrate technology standards
  - Identify evidence of interdisciplinary connections
  - Align all current common assessments to NJSLS

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Program Recommendations

- **Create and implement more performance tasks in K-12 mathematics classrooms.**

- **Create and implement quarterly common assessments in all math classes in grades 7-12.**

Program Recommendations

- **Implement consistent textbook resources and program across grades 6-8 and algebra I, geometry and algebra II.**

- **Update resources and textbooks in precalculus, calculus and statistics courses.**

Program Recommendations for Computer Science

- **Offer a comprehensive four-year computer science program**
  - **Add CS1: Programming for One and ALL with no prerequisites necessary (semester course)**
  - **Add Advanced Topics in Computer Science course following AP Computer Science A (linked to Rutgers University)**

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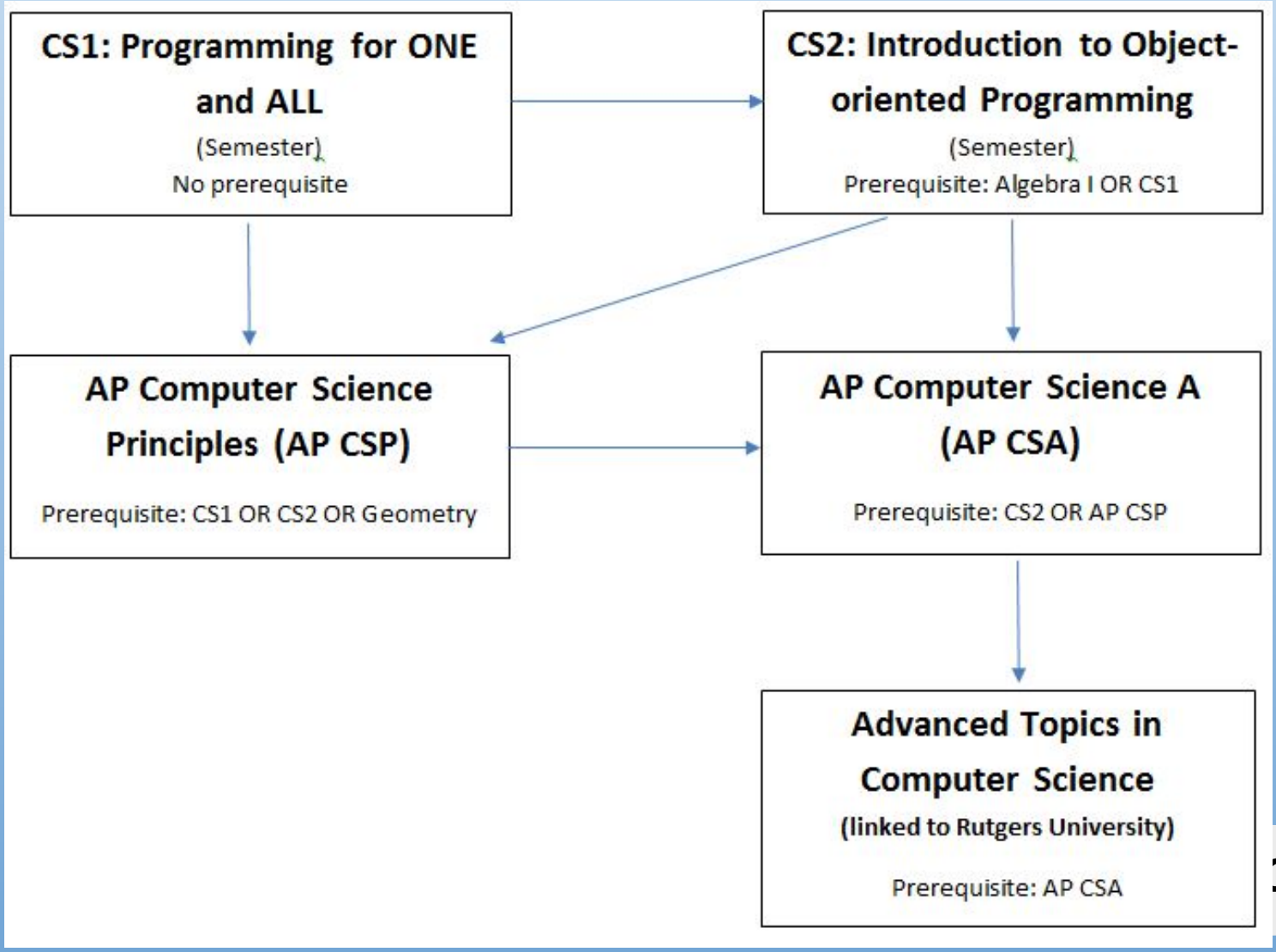
Recommended Computer Science Program



One and All

THANK YOU

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