

PIEDMONT UNIFIED SCHOOL DISTRICT
Implementation of Common Core Mathematics
Answers to Frequently Asked Questions
February 2015

What follows are answers to frequently asked questions about the *proposed* math courses and math pathways that, if approved by the Board of Education, will be introduced during the 2015/16 school year.

The District’s Math Task Force, consisting of students, parents, math teachers, and administrators, has recommended the math courses and math pathways described below. These recommendations include:

- pathways to Calculus AB and BC for qualified students;
- multiple “compression” options for students who are ready for more challenge;
- opportunities to take summer school classes that provide additional entry points to the compression tracks; and
- support classes for learners who need additional time to master concepts.

The recommended courses and pathways were originally formulated by the PMS, PHS, and MHS math educators and represent what the teachers consider to be the most practical, feasible, coherent way to “compress” and “expand” the math units. The Math Task Force vetted these pathways and recommended these to the Board of Education for adoption. These recommendations provide *more* opportunity for students seeking to accelerate than are currently in place.

Overview of Recommended Pathways

Current 5th grade students

2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
5 th Grade	6 th Grade	7 th Grade	8 th Grade	9 th Grade	10 th Grade	11 th Grade	12 th Grade
	CC-6 Support	CC-7/CC-8 Support		IM-1/IM-2 Support			
CC – 5th	CC-6	CC-7	CC-8	IM-1	IM-2	IM-3	Math Analysis or Statistics
					IM-2B/IM-3	Math Analysis or Statistics	AP Calculus AB or Statistics
				IM-1/IM-2A (3:2)	IM-2B/IM-3 (3:2)	Math Analysis Honors	AP Calculus BC
						Math Analysis or Statistics	AP Calculus AB or Statistics
		CC-7/CC-8A (3:2)	CC-8B/IM-1 (3:2)	IM-2	IM-3	Math Analysis Honors	AP Calculus BC
						Math Analysis or Statistics	AP Calculus AB or Statistics
				IM-2B/IM-3	Math Analysis or Statistics	AP Calculus AB or Statistics	AP Calculus BC
					Math Analysis Honors	AP Calculus BC	Elective

 In addition to the compression options indicated by the black arrows in the diagrams above, students who want more opportunity to accelerate have the option to accelerate from IM-1 to the compressed IM-2B/IM-3 course. This added option is indicated by the dashed-orange arrows in the diagrams above. To take advantage of this extra option, the student can take Integrated Math 2-A (IM-2A) either as a summer course (a semester’s worth of material covered over a 6-week summer program hosted by PUSD) or as a self-study program. In either case, the student will be required to demonstrate mastery of the IM-2A material by means of an assessment before enrolling in IM-2B/IM-3.

Current 6th grade students

Grade in 2014/15	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
		CC-7/CC-8 Support		I-1/IM-2 Support			
6	CC-6	CC-7	CC-8	IM-1 IM-1/IM-2A (3:2)	IM-2 IM-2B/IM-3 (3:2)	IM-3	Math Analysis or Statistics
		CC-7/CC-8A (3:2)	CC-8B/IM-1 (3:2)	IM-2	IM-3	Math Analysis or Statistics	AP Calculus AB or Statistics
						Math Analysis Honors	AP Calculus BC
						Math Analysis or Statistics	AP Calculus AB
				IM-2B/IM-3	Math Analysis or Statistics	Math Analysis Honors	AP Calculus BC
					Math Analysis Honors	AP Calculus AB or Statistics	AP Calculus BC
						AP Calculus BC	Elective

Current 7th grade students in CC-7 Math

Grade in 2014/15	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
		CC-7/CC-8 Support		IM-1/IM-2 Support		
7	CC-7	CC-8	IM-1 IM-1/IM-2A (3:2)	IM-2 IM-2B/IM-3 (3:2)	IM-3	Math Analysis or Statistics
						Math Analysis Honors
						AP Calculus AB or Statistics
						AP Calculus BC

Current 7th grade students in CC-8 Math (29 students)

Grade in 2014/15	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
			IM-1/IM-2 Support			
7	CC-8 (29 - 7 th graders)	IM-1	IM-2	IM-3	Math Analysis or Statistics	AP Calculus AB or Statistics
					Math Analysis Honors	AP Calculus BC
			IM-2B/IM-3	Math Analysis or Statistics	AP Calculus AB or Statistics	AP Calculus BC
				Math Analysis Honors	AP Calculus BC	Elective
		IM-1/IM-2A (3:2) location TBD	IM-2B/IM-3 (3:2)	Math Analysis	AP Calculus AB	AP Calculus BC
				Math Analysis Honors	AP Calculus BC	Elective

Current 8th grade students in CC-8 Math

Grade in 2014/15	2014/15	2015/16	2016/17	2017/18	2018/19
			IM-1/2 Support		
8	CC-8	IM-1 IM-1/IM-2A (3:2)	IM-2 IM-2B/IM-3 (3:2)	IM-3	Math Analysis or Statistics
					Math Analysis Honors
					AP Calculus AB
					AP Calculus BC

Compression at PMS & PHS/MHS

Under the proposed pathways, students who require additional challenge could compress starting in either **7th grade** ...

2015/16	2016/17	2017/18
6 th Grade	7 th Grade	8 th Grade
CC-6	CC-7	CC-8
	CC-7/CC-8A (3:2)	CC-8B/IM-1 (3:2)

7th grade students choosing this compression would complete:

- CC-7 Math
 - CC-8 Math
 - Integrated Math I
- at the completion of 8th grade, three courses over two years.

Or in **9th grade** ...

2017/18	2018/19	2019/20
8 th Grade	9 th Grade	10 th Grade
CC-8	IM-1	IM-2
	IM-1/IM-2A (3:2)	IM-2B/IM-3 (3:2)

9th grade students choosing this compression would complete:

- Integrated Math I
 - Integrated Math II
 - Integrated Math III
- at the completion of 10th grade, three courses over two years

Compression at **either** point would enable a student to complete Math Analysis in her junior year and take either AP Calculus AB or Statistics during senior year.

2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
6 th Grade	7 th Grade	8 th Grade	9 th Grade	10 th Grade	11 th Grade	12 th Grade
CC-6	CC-7	CC-8	IM-1	IM-2	IM-3	Math Analysis or Statistics
	CC-7/CC-8A (3:2)	CC-8B/IM-1 (3:2)	IM-1/IM-2A (3:2)	IM-2B/IM-3 (3:2)	Math Analysis or Statistics	AP Calculus AB or Statistics
			IM-2	IM-3	Math Analysis or Statistics	AP Calculus AB or Statistics

Whether a student compressed in 7th or 9th grade, she could compress a second time by taking Math Analysis Honors (a compression of Math Analysis and Calculus A) in 11th grade, which would enable her to take either AP Calculus BC or Statistics during senior year.

2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
6 th Grade	7 th Grade	8 th Grade	9 th Grade	10 th Grade	11 th Grade	12 th Grade
CC-6	CC-7	CC-8	IM-1	IM-2	IM-3	Math Analysis or Statistics
	CC-7/CC-8A (3:2)	CC-8B/IM-1 (3:2)	IM-1/IM-2A (3:2)	IM-2B/IM-3 (3:2)	Math Analysis or Statistics	AP Calculus AB or Statistics
			IM-2	IM-3	Math Analysis Honors	AP Calculus BC
					Math Analysis or Statistics	AP Calculus AB or Statistics
					Math Analysis Honors	AP Calculus BC

Increased Opportunities for Advancement with PUSD Summer Bridge Course

 In addition to the compression options indicated by the black arrows in the diagrams above, students who want more opportunity to accelerate have the option to accelerate from IM-1 to the compressed IM-2B/IM-3 course. This added option is indicated by the dashed-orange arrows in the diagrams above. To take advantage of this extra option, the student can take Integrated Math 2-A (IM-2A) either as a summer course (a semester's worth of material covered over a 6-week summer program hosted by PUSD) or as a self-study program. In either case, the student will be required to demonstrate mastery of the IM-2A material by means of an assessment before enrolling in IM-2B/IM-3.

Giving 8th graders completing CC8B/IM1 the option to take the IM-2A summer course or self study program before 9th grade would provide those students who compressed in middle school the opportunity to continue on a compression track as they enter high school, and take *sequential* AB and BC Calculus. This also allows a truly gifted math student to enroll in Math Analysis Honors as a sophomore, AP Calculus BC as a junior, and then have an opportunity to take an additional elective during senior year.

2017/18	2018/19	2019/20	2020/21	2021/22
8 th Grade	9 th Grade	10 th Grade	11 th Grade	12 th Grade
CC-8B/IM-1 (3:2)	IM-2	IM-3	Math Analysis or Statistics	AP Calculus AB or Statistics
		Math Analysis or Statistics	Math Analysis Honors AP Calculus AB or Statistics	AP Calculus BC
	IM-2B/IM-3		AP Calculus BC	AP Calculus BC
		Math Analysis Honors	AP Calculus BC	Elective

Giving 9th graders completing IM-1 the option to take IM-2A over the summer before 10th grade would provide an additional compression entry point for those who want additional challenge in math.

2018/19	2019/20	2020/21	2021/22
9 th Grade	10 th Grade	11 th Grade	12 th Grade
IM-1	IM-2	IM-3	Math Analysis or Statistics
	IM-2B/IM-3	Math Analysis or Statistics	AP Calculus AB or Statistics
		Math Analysis Honors	AP Calculus BC

Proposed Course Development Schedule

Adoption of the recommended pathways would require the implementation of 11 new courses over the next three years, although three of the courses would be “support” courses with no stand-alone curriculum, and we would phase out Algebra I, Geometry, and Algebra II. In addition, PUSD would implement one summer school course or self-study program.

- 15/16:
 - o 4 new courses at PMS
 - CC-6 Support
 - CC-7/CC-8 Support
 - CC-7/CC-8A
 - IM-1 (taught by PHS or MHS teacher – 1 year only)
 - o 3 new courses at PHS
 - IM-1/IM-2 Support
 - IM-1
 - IM-1/IM-2A

- Summer 2016
 - o Starting in the summer of 2016, PHS would offer a summer school course or self-study program covering the content of IM-2A. This option would be open to any student who completed IM-1 and is interested in joining the IM-2B/IM-3 compression class the following year.

- 16/17:
 - o 1 new courses at PMS
 - CC-8B/IM-1
 - o 2 new courses at PHS
 - IM-2
 - IM-2B/IM-3

- 17/18:
 - o 0 new courses at PMS
 - o 2 new courses at PHS
 - IM-3
 - Math Analysis Honors

The course development plan outlined above is ambitious but feasible.

Key Issues

- *Common Core Philosophy vs. College Admissions Practices*

Throughout the pathway planning process, the MTF struggled with the tension between two competing concerns. On the one hand, Common Core emphasizes depth of knowledge and mastery of new math practice standards. The Common Core authors and other math experts caution against a rush to high school calculus at the expense of foundational math concepts. (See Cheryl Holzmeyer, Ph.D.'s [report](#) to PUSD for more information about the rush to high school Calculus.)

On the other hand, the UCs and other college admissions offices still look for AP Calculus on high school transcripts. The MTF consensus is that: until college admissions criteria change, PUSD must continue to offer a pathway to high school Calculus; when these admissions criteria change, the pathways should be revisited.

A related concern is whether PUSD should offer a path to *sequential* Calculus AB and BC (this splits one year of college Calculus into two years, with some overlap of content). With the implementation of Common Core math, and the addition of the new CC-8 course, most schools offer either AB or BC but not both. The MTF consensus is that, until college admissions criteria change, PUSD should continue to offer a pathway to *sequential* AB and BC Calculus, and this pathway may include a summer bridge.

- *6th Grade Compression*

In recognition of the elementary students who are strong in math and looking for more challenge, the MTF considered the pros and cons of offering compression starting in 6th grade. Based on input from the PMS math teachers about the social and emotional transitions that occur in 6th grade, and the adjustments to multiple classes, multiple teachers, increased workload, and block scheduling, as well as the need for middle school math teachers to assess the students' abilities, work habits, and readiness for compression, the MTF concluded that it would be premature to offer compression before 7th grade.

Key Challenges

- Volume of Content and Practice Standards to Cover

PUSD teachers and students have never before “compressed” math courses. Although some students skipped 6th grade math, or took Algebra II or Math Analysis over the summer, compression is entirely new. Given the volume of material to be covered in compressed courses, students will have more homework, and more “classwork” as homework.

As one of the math teachers wrote to the MTF members:

“Our concern is that by taking compressed secondary math courses (CC6 - Math Analysis), students might not have the opportunity to develop a more thorough understanding of the mathematics involved in those courses. More importantly, they might not have the time needed to engage in mathematical application and problem solving tasks. We fear that over time, compressed courses could start to gloss over or skip content and dedicate less and less time to application and problem solving.”

- Determining Readiness for Compression

PUSD will have to develop clear criteria for selecting students for compression pathways. This may include multiple measures, such as CC-6 test scores and assessments, as well as teacher recommendations and requirements that students maintain certain grades or scores to remain in the compression track. MTF parents as well as teachers emphasized the importance of having meaningful selection criteria to promote student success, and working with families around course selection so that expectations are clear.

As one math teacher wrote to the MTF members:

“I know we have a handful of kids who do develop a genuine and deep understanding of the mathematics they study in a fairly short time span. But the overwhelming majority of those kids currently on advanced/accelerated pathways do not.”

- Planning for Students in Transition

There is a group of 7th graders currently in CC8 (this is the last cohort of students who skipped 6th grade math). Under the proposed pathways, these students would have a choice of taking

either IM-1 or the compressed IM-1/IM-2A next year. We will reach out to those families to determine their preference and plan accordingly. Depending on the numbers of students who take the compressed option, it may be necessary for these students to take this course at the high school.

- Trading an Elective Class for Math Support

Support classes that complement CC6, CC7, CC8, IM1, and IM2 and that are taught by a credentialed math teacher would provide the most effective support for learners who need additional time to master concepts. This would mean that students needing support will give up an elective during the time period when they are enrolled in the support class.

- Preparation of Teachers

Some parents have asked how teachers who specialize in one course (for example, geometry), will make the transition to teaching integrated courses. As PUSD has done this year at PMS, there will be professional development and collaboration time devoted to preparing teachers for these challenges.

- Evaluation and Revision

MTF members asked that PUSD develop standards and methods to evaluate the new courses and pathways, and revisit course and pathway decisions as needed.