MATHEMATICS (REVISED 9/15/10)

What the Michigan Merit Curriculum Law Says

Sec 1278a(1)(a)(i) At least 4 credits in mathematics that are aligned with subject area content expectations developed by the department and approved by the state board under section 1278b, including completion of at least algebra I, geometry, and algebra II, or an integrated sequence of this course content that consists of 3 credits, and an additional mathematics 22 ESB 981 credit, such as trigonometry, statistics, precalculus, calculus, applied math, accounting, business math, a retake of algebra II, a course in financial literacy as described in section 1165. A pupil may complete algebra II over 2 years with 2 credits awarded or over 1.5 years with 1.5 credits awarded for the purposes of this section and section 1278b. A pupil also may partially or fully fulfill the algebra II requirement by completing a department-approved formal career and technical education program or curriculum that has appropriate embedded mathematics content, such as a program or curriculum in electronics, machining, construction, welding, engineering, or renewable energy. Not later than 30 days after the effective date of the amendatory act that added the immediately preceding sentence, the department shall post on its website and submit to the senate and house standing committees on education guidelines for implementation of the immediately preceding sentence. Each pupil must successfully complete at least 1 mathematics course during his or her final year of high school enrollment. This subparagraph does not require completion of mathematics courses in any particular sequence.

Sec. 1278b(5)(g) (g) Except as otherwise provided in this subdivision, the mathematics credit requirements of section 1278a(1)(a)(i) may be modified as part of a personal curriculum only after the pupil has completed, without necessarily having attained a passing grade in, at least 1-1/2 credits of the mathematics credits required under that section and only if the pupil successfully completes at least 3-1/2 total credits of the mathematics credits required under that section before completing high school. The requirement under section 1278a(1) that a pupil must successfully complete at least 1 mathematics course during his or her final year of high school enrollment is not subject to modification as part of a personal curriculum under this subsection. The algebra II credit required under that section may be modified as part of a personal curriculum under this subsection only if the pupil meets 1 or more of the following:

(i) Has successfully completed the same content as 1 semester of algebra II, as determined by the department.

(ii) Elects to complete the same content as algebra II over 2 years, with a credit awarded for each of those 2 years, and successfully completes that content.

(iii) Enrolls in a formal career and technical education program or curriculum and in that program or curriculum successfully completes the same content as 1 semester of algebra II, as determined by the department.

Background Information

The Mathematics High School Content Expectations (HSCE) are organized in 4 strands, 14 standards, and 157 expectations which students are expected to meet by the end of high school. They represent 3 mathematics credits. The only requirement is that students be proficient in the required Course/Credit Content Expectations to receive 3 of the 4 required mathematics credits.

There is no required course sequence. If a traditional sequence of instruction is selected, the Algebra I, Geometry, and Algebra II Course/Credit requirements define the expectations for those courses. Course/Credit requirement documents for Pre-calculus and Statistics define the expectations for earning additional optional credits in these areas.

An overarching goal of mathematics education is for students to exhibit the "habits of mind" that will result in the Components of Mathematical Proficiency listed in the Successful Post-Secondary Engagement chart on page four of the HSCE document available on the Michigan Department of Education's high school web site at *www.michigan.gov/highschool*. These mathematical proficiencies are developed throughout students' mathematics experiences as they learn and apply the content outlined by the HSCE and the K-8 Grade Level Content Expectations (GLCE).

What Research Says

Studies show students taking four years of challenging math including Algebra I, Geometry, Algebra II, and one additional higher-level course are more likely to succeed in college and the workplace. Eighty-four percent of individuals who currently hold highly paid professional jobs have taken Algebra II or higher as their last high school math course. In Michigan, nearly half of all high school graduates did not take four years of challenging math including Algebra II.

Questions & Answers

1. **Q. Are Algebra I, Geometry, and Algebra II required courses for students who want to earn a diploma?**

   A. No. What is required is that students demonstrate proficiency with the content outlined by the required mathematics HSCE which represent 3 of the 4 required credits. Since credit is based on proficiency with the content not seat time, there are no required courses. The course/credit descriptions developed by MDE divide the required HSCE into the 3 traditional courses. If a course in Michigan is called Algebra I, it must follow the MDE course/credit descriptions, but there is no requirement to teach the content in the traditional sequence. In fact, it might make more sense for some students to learn some of the content through *CTE programs*, on-the-job training or through accelerated programs. The content can also be delivered in an integrated sequence of mathematics courses or integrated with other content such as science or social studies. Regardless of how students learn the content they must demonstrate proficiency with the content on district approved measures of proficiency including testing-out assessments.

2. **Q: Can a student earn high school credit for math while in middle school, e.g., Algebra I in 7th grade and Geometry in 8th grade?**

   A: Yes and districts must award credit if the following criteria are met:

   - The middle school class must cover the same content expectations as the high school class.
   - Proficiency must be assessed using the same assessment(s) used at the high school.
   - The level of proficiency expected in order to "pass" must be the same as at the high school.

   Students also have the option of testing out of any credit (see section on Testing Out). There is no limit to the number of state required high school graduation credits a student can earn prior to high school.

3. **Q: Can a program like the Michigan State University C.H.A.M.P. (Cooperative Highly Accelerated Mathematics Program), which allows students to complete the traditional four year high school mathematics program in two years, meet the requirements and count for credit under the Michigan Merit Curriculum?**

   A: Yes, if the district granting credit determines the courses meet the course content expectations and students are able to demonstrate proficiency with these expectations. The Michigan Merit Curriculum outlines the minimum all students should know. It is not intended to limit those students who are capable of going beyond the required HSCE but instead encourages flexibility with addressing the needs of all students, including students capable of acceleration. Students still need to earn a math or math-related credit in their final year of high school. Students also have the option of testing out of any credit (see section on Testing Out)

4. **Q: What courses can be used to fulfill the 4th mathematics credit?**

A: The law provides local districts with the flexibility to determine what counts for the 4th mathematics credit. It does not need to be aligned with the mathematics HSCE because those are covered in the other 3 credits. The credit could be in a basic or an applied math area, such as Business Math, Accounting, Pre-algebra, etc.; or from Career and Technical Education, work study program, or practicum. The course could also be an advanced mathematics course such as Pre-calculus, or college or college-level courses. Non-mathematics courses that apply mathematics can also counts as the 4th mathematics credit such as computer programming or a science or art course.

5. Q. What is the difference between the 4th mathematics credit and the senior year mathematics requirement?

A: In many cases the 4th mathematics credit and the senior year mathematics requirement are one and the same. For instance students who complete the required mathematics HSCE by the end of their junior year will probably complete their 4th credit in their senior year. Similarly, students electing to take Algebra II over 2 years for 2 credits will probably take the second year of Algebra II in their senior year. However, the 4th mathematics credit is not necessarily synonymous with the senior year math credit. For example, students could take a pre-algebra II class as a junior that would count as the 4th credit and then take Algebra II as a senior. An integrated sequence of mathematics could incorporate the required HSCE in each of the 4 years plus enough additional mathematics content to warrant the awarding of 4 credits.

6. Q: Do students electing to take Algebra II for 2 credits have to take it over 2 years or for 1 ½ credits over 1 ½ years?

A: Yes. Students who want to have Algebra II count as 2 credits without a personal curriculum must take it over 2 years. Districts determine how to divide the content over the 2 years but it is suggested that they use the pre/post MME document (*Mathematics: Pre-MME Expectations*) as a guide. Similarly, students who elect to take Algebra II for 1½ credits must take it over 1½ years. Students who take Algebra II over 1 year or take an integrated sequence of courses incorporating Algebra II must still earn a 4th credit of mathematics.

7. Q: If a student has earned the required 4 mathematics credit prior to their senior year is the student still required to take a math or math-related course in the senior year?

A: Yes. The requirement is that a student must successfully complete a mathematics or math-related course in the final year of high school. The MMC law requires one course rather than one credit; this requirement should be interpreted to mean that while a student must take a math or math-related course in his final year of high school enrollment, he/she may earn less than one credit for that course. The total 4.0 credit mathematics requirement (or 3.5 credit requirement for students receiving a PC to modify Algebra II), which includes at most one math-related credit, determines the number of credits a student needs to earn in the final year.

8. Q: Can a district require students to take a math or math-related credit each year he or she is in high school?

A: Yes. A district may establish credit requirements above and beyond the state graduation requirements.

9. Q: If a student earns 4 credits of math by the end of their junior year, and is enrolled in a Physics class during their senior year for science credit, can the Physics course also be counted as a "senior math experience" if he or she does not receive a math credit?

A: That depends. If a student has already satisfied the 3 credit graduation requirements in science, then yes. However, if a student is taking physics as part of the 3 credit requirement, it cannot be counted as both a science and math or math-related credit.

10. Q. Can the mathematics requirements be modified under the personal curriculum option for students without an IEP?

A. A. Yes. A personal curriculum may allow a student to reduce the Algebra II requirement to ½ credit of Algebra II, statistics, or functions and data analysis. If a student requests and receives this personal curriculum modification, the student must complete a total of 3.5 credits of mathematics, including Algebra I, Geometry, and ½ credit of Algebra II, statistics, or functions and data analysis, or their equivalent as well as an additional math or math-related credit. A mathematics or math-related course must also be successfully completed in the final year of high school.