

The New 8th Grade Algebra Requirement: This is NOT Your Mother's Algebra

Presented by the Members of MCTM's Algebra Task Force

Time for a quiz. Please answer *True* or *False* to the following statements:

T or F? 1. Your textbook determines the algebra concepts and skills that you should cover at a particular grade level.

T or F? 2. Algebra content has been shifted down and now starts in the middle grades.

T or F? 3. Under current MN law, students must satisfactorily complete an Algebra I credit by the end of eighth grade, and, if you teach a traditional Algebra I course in 8th grade, you will meet the requirements in the law.

T or F? 4. We know much more now about teaching Algebra successfully than we did twenty years ago.

Did you answer as follows? 1. *False* 2. *True* 3. *False* 4. *True*

Whether you did or not, the information below will help explain these answers.

What determines the algebra content at your grade level?

The federal "No Child Left Behind" (NCLB) legislation mandates that each state develop a system of setting standards and aligning assessments to those standards in math, reading, and science. Those standards and assessments are intended to shift the focus from what is TAUGHT to what is LEARNED. In a standards-based system, the state standards determine the goals of algebra instruction by delineating what concepts and skills students should learn and what students should be able to do with their new understandings. The standards become our 'play book', while the textbook remains a tool, but not the only tool, in developing and implementing curriculum. Standards-based instruction and assessment become the critical elements in maximizing student learning.

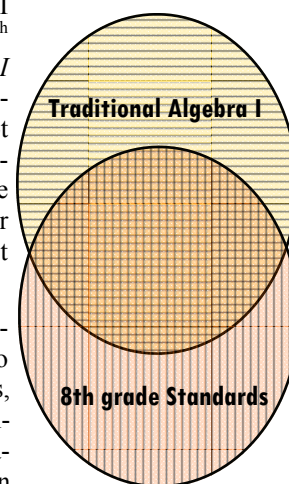
When does the learning of algebra begin?

In the 2007 MN state standards, algebraic thinking has been mapped from Kindergarten to High School (11th grade), so the learning of algebra starts *way before* middle school. If elementary teachers do not begin to help develop students' algebraic thinking using the standards as a guide, success at the middle school level will be very difficult. Similarly, if middle school teachers don't help students develop a strong understanding of algebra concepts related to linear functions, it will be very difficult for high school teachers to expand students' learning of advanced algebra concepts. Every teacher has to do his/her part to give students the opportunities to learn the appropriate grade-level content in algebra and improve our assessment techniques in order to identify students who aren't making progress. Truly, Minnesota students will not be successful in algebra unless we work as a team across K-12.

What does the law say? What does it mean?

The state legislation does mandate that students satisfactorily complete an Algebra I credit by the end of 8th grade, but this 8th grade algebra course must be defined by the 8th grade standards. *The 8th grade standards do not cover the same traditional Algebra I course content that your mother (or father) studied.* If we address the 8th grade standards by teaching a traditional Algebra I course, we will teach a great deal of content not assessed on the 8th grade MCA, and also have to make time to teach the topics of geometry and measurement, number and operation, data analysis and probability which are included on the 8th grade MCA. While these additional standards are related to linear functions, they will demand a more in-depth approach than is currently provided in most traditional Algebra I texts.

Parents and administrators may not understand the implications of the 2007 state standards on the scope and nature of this 8th grade algebra course. It is our responsibility to educate them on this. We will be teaching our 8th grade students the algebra of lines, including slope, equations, systems of equations, inequalities, and parallel and perpendicular lines. We will need students to be able to identify linear functions from situations, tables, graphs, and equations, and describe how these representations connect. In order to understand linear relationships and prepare for high school mathematics, we will want students to differentiate linear from non-linear functions. There are other topics in a traditional Algebra I course that we will not teach for mastery until the next course in high school, including quadratic, exponential, and polynomial functions, and more intensive work with inequalities and symbolic manipulation.



Do we know more now than we did twenty years ago?

Yes, which is one reason why the 8th grade standards do not describe your mother's traditional Algebra I course.

- We learned that our students never mastered everything in that traditional Algebra I course, and we ended up repeating much of it in Algebra 2.
- We learned how important it is to help students make connections within mathematics and between mathematics and the real world in order to enhance their understanding and appreciation of algebra. The 8th grade standards provide a coherent content focus on the algebra of lines.
- We know more about students' errors around the concepts of equality, ratio and proportion, and pattern that get in the way of their understanding algebra.
- We know more about how the brain works, and the implications for effective classroom instruction and the need to differentiate instruction.
- We know that we have to do things differently, because "if we do what we've always done, we'll get what we've always gotten" and that won't be good enough for most of our middle school students.

Algebra is still a difficult subject to learn **well** and a difficult subject to teach **well**. Supporting the learning of algebra by 8th grade students will provide us all with a common challenge, and an opportunity to share our observations, insights, and successes with each other in the months and years ahead.

Looking into the crystal ball...

The new state standards lay out a positive vision for a coherent approach to curriculum, instruction and assessment to support ALL students in mathematics. The emphasis on learning algebra in 8th grade will provide the foundation for more and better mathematics for our students in high school and beyond. These refocused standards will also demand more thoughtful district decisions about curriculum adoption and alignment in mathematics and more creative and thoughtful ways to provide professional development for teachers. MCTM has established an Algebra Task Force to identify some of these challenges in supporting 8th grade students in algebra. The members of this Task Force are working to clarify the issues involved in the new standards and identify resources for both teachers and administrators. If you have questions (or answers!), we'd like to hear from you. Contact us at AlgebraTaskForce@gmail.com