

# Transition to High School

**P**lanning for the transition to high school should be part of any successful implementation plan. As soon as the district has made the decision to adopt CMP in middle school, teachers and administrators at the high school level must take time to get to know the CMP curriculum and what students can be expected to do, long before CMP students start arriving in 9th grade. Likewise, parents and guardians of middle school students, especially those going into 8th grade, should be included in the information loop about this transition.

Presently a trend throughout the country is to make the study of algebra a goal for all eighth grade students. If successful, these students may go on to take calculus, or other advanced mathematics classes, in their senior year of high school. Certainly, it is a worthy goal for all students to become more proficient in algebra and to include more algebra in the curriculum prior to high school. Indeed, the Connected Mathematics Project was funded by the National Science Foundation and designed by its authors with this as one of its goals.

One strategy, tried by some schools, is to move the traditional Algebra 1 course to 8th grade. However, experience has shown that many eighth grade students fail a traditional Algebra 1 course, and must repeat it in high school. A more promising strategy, recommended by the NCTM *Principles and Standards 2000*, is the development of algebraic ideas over a longer period of time, well before the first year of high school, to better prepare students to deal with abstraction and symbols. This philosophy is consistent with the way that algebra is taught in other countries. The NCTM *Principles and Standards* guided the development of the algebra strand in the Connected Mathematics Project.

## Algebra Goals in CM

---

Algebra is developed in all three grades of *Connected Mathematics*. By the end of Grade 8, CMP students have studied an impressive array of algebraic ideas and skills. Most students should be able to meet the following goals.

### Patterns of Change—Functions

- Identify and use variables to describe relationships between quantitative variables in order to solve problems or make decisions.
- Recognize and distinguish among patterns of change associated with linear, inverse, exponential, and quadratic functions.

### Representation

- Construct tables, graphs, symbolic expressions, and verbal descriptions and use them to describe and predict patterns of change in variables.
- Move easily among tables, graphs, symbolic expressions, and verbal descriptions.
- Describe the advantages and disadvantages of each representation and use these descriptions to make choices when solving problems.
- Use linear and inverse equations and inequalities as mathematical models of situations involving variables.

### Symbolic Reasoning

- Connect equations to problem situations.
- Connect solving equations in one variable to finding specific values of functions.
- Solve linear equations and inequalities and simple quadratic equations using symbolic methods.
- Find equivalent forms of many kinds of equations, including factoring simple quadratic equations.
- Use the distributive and commutative properties to write equivalent expressions and equations.
- Solve systems of linear equations.

## High School Math Courses for CMP Students

---

If the high school offers a standards-based mathematics curriculum, then the approach will be compatible with CMP. High school and middle school teachers need to communicate with each other about what CMP students can do coming out of Grade 8 in order to make sure that there is no unintended duplication or unexpected gap. It may well be the case that students who have been successful in CMP in 8th grade can skip the first year of the high school program. Obviously this decision can only be made based on knowledge of both programs, and the best guides are the teachers involved.

If the high school in the district is still offering a traditional Algebra 1, Geometry, Algebra 2 sequence, then, based on what courses are available at 9th grade, and on how successful a particular student has been in 8th grade CMP, there are several options for the district to consider. Two options are outlined below. In neither of these options is it necessary for a student who has been successful in the algebra units in CMP to spend a valuable year of high school in a traditional Algebra 1 class.

Students who have been successful in the CMP algebra units will have met and mastered many of the ideas and skills that are part of a traditional Algebra 1. But, they also will have done very much more than this in their study of algebra in CMP. Their experience will have been a coherent

functions approach to important mathematical relationships, especially linear, exponential, inverse proportion, and quadratic,—including solving linear, exponential, and quadratic equations, and inverse and direct proportions. Therefore, CMP algebra units are an excellent preparation for a traditional functions-based approach in Algebra 2. Because of this extensive and thorough study of algebraic ideas in CMP, many students entering a high school with a traditional curriculum in place may successfully proceed to Algebra 2.

If, on examining what is expected of students coming out of 8th grade CMP, teachers in a high school offering the traditional curriculum see skills which they believe are integral to Algebra 1 and which CMP students have not met, then they may create a short “patch” which can be added to the 8th grade CMP units. However, Algebra 2 textbooks typically include a lot of review of Algebra 1, and, therefore, would review and supplement what students know from CMP.

In summary, many students who complete all 8 algebra units of CMP2 and meet other district criteria may successfully proceed to a traditional Geometry and/or Algebra 2 course. Whatever options are offered to students entering 9th grade after a successful CMP experience in 8th grade, they should be based on teacher input, knowledge of the CMP curriculum and the high school curriculum, data about student achievement—particularly on algebraic topics—and input from all the professionals involved.