

# An Introduction to CPM

*[NOTE: Bellarmine uses the College Preparatory Math (CPM) Program curriculum and methodology for our math courses at the Algebra 1, Geometry, and Algebra 2 levels. This document provides a brief introduction to the program and its philosophies. For more information about why we adopted the program and why we believe a problem-based curriculum like CPM helps Bellarmine students achieve college and career readiness, please read the document, “**Why We Teach a Problem-Based Math Curriculum at Bellarmine: From “Hitting the Wall” to College and Career Readiness,**” which is posted on the Bellarmine Math Department web site.]*

**CPM Educational Program**, a California non-profit corporation, has provided problem-based instructional materials and professional development for teachers since its inception in 1989. “College Preparatory Mathematics (CPM)” was originally an Eisenhower-funded grant program. CPM teaching strategies focus on how students best learn and retain mathematics. Teaching strategies rely on the recommendations of the National Council of Teachers of Mathematics, and are based solidly on the methodological research in teaching mathematics. The research-based principles that guide the course are:

- Students should engage in problem-based lessons structured around a core idea.
- Guided by a knowledgeable teacher, students should interact in groups to foster mathematical discourse.
- Practice with concepts and procedures should be spaced over time; that is, mastery comes over time.

Although CPM predates the CCSS Standards for Mathematical Practice by about 20 years, very similar practices have always been a core and integral part of CPM curriculum materials. Because of CPM’s broad experience and long history with these practices, the CCSS Mathematical Practices are deeply and seamlessly interwoven into the fabric of the daily lessons. The course balances procedural fluency (algorithms and basic skills), deep conceptual understanding, strategic competence (problem solving), and adaptive reasoning (application and extension).

On a daily basis, students using CPM Core Connections employ problem solving strategies, question, investigate, analyze critically, gather and construct evidence, and communicate rigorous arguments to justify their thinking. With the CPM instructional materials, students can tackle mathematical ideas set in everyday contexts to help them make sense of otherwise abstract principles. Students are taught how to gather and organize information about problems, break problems into smaller parts, and look for patterns that lead to solutions. Students often learn in collaboration with others, sharing information, expertise, and ideas.

Consistent with the requests we frequently hear from leaders of business and industry, CPM routinely has students solve non-routine problems. That is, students develop their skills of synthesis and analysis so that they can confidently make connections between varied mathematical concepts and deal with

problems they have never seen before. Students will build problem-solving strategies that apply to most academic disciplines, the workplace, and daily life.

While students are solving complex mathematical problems, they are communicating their thinking and understanding, both formally and informally, whether they are writing or speaking out loud. Communication helps to clarify students' thinking, prepares them for sharing their ideas in professional settings, and formal or informal feedback that allows for revision. Communication lets teachers and peers assess students' thinking and depth of understanding. In turn, all students get the chance to improve the quality of their work.

CPM Core Connections courses are the products of classroom teachers who created lessons that work with the diverse student population of California. The teaching strategies outlined in the CPM instructional materials were initially informed by theory and scholarly research into how children learn and how teaching should occur in the ideal classroom. Care was taken to pilot and field test the lessons during the development of the first edition with thousands of students to assure the effectiveness of the lessons. But ultimately the development was informed in practice by the 4000 teachers and over 4 million students that use CPM, the specific suggestions over the last 20 years from hundreds of teachers, and even comments and suggestions by students and parents.

More than two-dozen studies have examined the results of both high- and low-performing students on statewide standardized tests, and on the SAT, and ACT. All of these studies, as well as detailed investigations of individual schools, show that CPM students learn the basic mathematical skills and procedures that appear on standardized tests at least as well as students who use other programs. Most of the studies show that they do better. Studies that measure the other elements of a complete curriculum—conceptual understanding, problem solving ability, the mathematical practices—show that they do considerably better in these areas. These studies are available at [www.cpm.org/learn.html](http://www.cpm.org/learn.html), along with the research base of the CPM program.