



# Contra Costa Christian Schools

PREPARING THE NEXT GENERATION

## MIDDLE & HIGH SCHOOL MATHEMATICS



### What is College Preparatory Mathematics (CPM)?

CPM Education Program, a California nonprofit 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.

### What do CCCS teachers love about CPM?

- Student engagement is high.
- The curriculum is problem-based and actually more difficult than the math courses previously taught. As an example, 7th-grade students use various strategies to solve systems of equations, such as getting rid of fractions, concepts typically in an 8th-grade course.
- CPM requires close reading and attention to almost all of the 8 good mathematical practices each day.
- Learning sticks in students' minds through application, not rote steps and rules.
- The course work is challenging, and the homework is more review-based.
- The practice in the homework is varied, specific, and not boring.

## PARENT RESOURCES

**Additional support for students and parents is provided at the CPM Homework Help site and in the Parent Guide:** <http://homework.cpm.org>

The Homework Help website provides a variety of complete solutions, hints, and answers. Some problems refer back to other similar problems. The website is designed to assist students to be able to do the problems but not necessarily do the problems for them.

The Parent Guide provides an alternative explanation of key ideas along with additional practice problems. The Parent Guide resources are arranged by chapter and strand. The Parent Guide is also accessible for free below.

#### Core Connections

- |                                   |                                    |                                    |
|-----------------------------------|------------------------------------|------------------------------------|
| <a href="#">CC1: Parent Guide</a> | <a href="#">CCA: Parent Guide</a>  | <a href="#">INT1: Parent Guide</a> |
| <a href="#">CC2: Parent Guide</a> | <a href="#">CCG: Parent Guide</a>  | <a href="#">INT2: Parent Guide</a> |
| <a href="#">CC3: Parent Guide</a> | <a href="#">CCA2: Parent Guide</a> | <a href="#">INT3: Parent Guide</a> |

CPM also offers weekly [Parent Tips](#), each tip corresponding with the timeline of students' progression through the curriculum.

### Other Area Schools using CPM Curriculum

Bellarmino College Preparatory  
[Why Bellarmino Prep uses CPM](#)

Piedmont Unified School District  
[Information on PUSD's implementation](#)

Oakland School for the Arts  
[Description of OSA math classes](#)

### Research Reports

[CPM Pedagogy](#)  
[Mixed Practice](#)

WHAT CPM IS...	WHAT CPM IS NOT...
<p><b>Student-centered:</b></p> <ul style="list-style-type: none"> <li>• The curriculum emphasizes discovery and collaboration within student small groups.</li> <li>• Working together on non-routine and team-worthy problems, students develop multiple strategies toward a solution and must recognize connections between concepts, justify their reasoning, communicate their thinking, and generalize patterns.</li> <li>• While it can sometimes frustrate students who just want to be told what to do, all students benefit from the process.</li> </ul>	<p><b>NOT a student free-for-all:</b></p> <ul style="list-style-type: none"> <li>• While providing structured space for student discovery, the teacher continually facilitates the groups by asking questions and giving clarifying instructions.</li> <li>• The teacher holds whole-class discussions, targeted lectures, and direct instruction when appropriate to the students' needs in each lesson. In this way, the curriculum is flexible to the teacher's discretion.</li> <li>• Students receive ongoing instruction on effective group work and are regularly evaluated on their contributions to the process.</li> </ul>
<p><b>Standards- and research-based:</b></p> <ul style="list-style-type: none"> <li>• Though CPM piloted before the adoption of the Common Core State Standards, the two are clearly aligned, both in philosophical approach and practical application.</li> <li>• CPM follows the recommendations of the National Council of Teachers of Mathematics for math education.</li> <li>• CPM offers ongoing professional development in best practices because the curriculum is informed by current learning theory and research. Teachers participate in experiential workshops, attend conferences, and receive feedback from observations by CPM mentors and coaches.</li> </ul>	<p><b>NOT fuzzy math:</b></p> <ul style="list-style-type: none"> <li>• While students explore multiple strategies to solve problems, the teacher has a core idea or lesson objective, to which he or she is always guiding the students.</li> <li>• The course balances procedural fluency, deep conceptual understanding, strategic competence, and adaptive reasoning .</li> <li>• At the close of each lesson, the teacher ensures that the students understand those big ideas.</li> </ul>
<p><b>Spiraled:</b></p> <ul style="list-style-type: none"> <li>• Math skills build on each other, but conceptual understanding occurs at progressively deepening levels.</li> <li>• CPM regularly revisits previous material since mastery happens over time and not in rote steps.</li> </ul>	<p><b>NOT linear:</b></p> <ul style="list-style-type: none"> <li>• Math skills build upon each other, but students rarely learn linearly.</li> <li>• Lessons allow for individual attention and differentiation so that struggling students can focus on the core concepts and high-achieving students can tackle more challenging layers.</li> </ul>
<p><b>Professional preparedness:</b></p> <ul style="list-style-type: none"> <li>• According to the National Association of Colleges and Employers' Job Outlook 2018, the top 4 attributes desired on an applicant's resume are the ability to: <ol style="list-style-type: none"> <li>1. Work in a team</li> <li>2. Make decisions and solve problems</li> <li>3. Plan, organize, and prioritize work</li> <li>4. Communicate verbally with people inside and outside an organization</li> </ol> </li> </ul>	<p><b>NOT irrelevant:</b></p> <ul style="list-style-type: none"> <li>• More than just an emphasis on them, CPM weaves all of these 21st-century skills and attributes into the very framework of its program.</li> <li>• Students develop these soft skills in addition to the hard skills of math</li> </ul>