

**Cabrillo Unified School District
Cycle Task Force Report-Mathematics**

“Teachers Matter. The greatest school related factor to learning!”
Anonymous

Description of Current Program

K – 5 Math Program: Houghton-Mifflin

All texts must cover the state standards to be considered for adoption. Every page of the Houghton-Mifflin text has a standard enumerated; all standards are covered in our current math program. The Houghton-Mifflin text is structured by strands, and those strands are addressed one-by-one over the course of the book. Each strand is segmented in discreet chapters which limit a student’s opportunity for continuous exposure and the practice necessary for mastery of the concepts and skills in the chapter under study.

The Houghton-Mifflin program employs a procedural, text-based approach to elementary mathematics, focusing on standard algorithms, computations, story problems. Math conceptual reasoning in Houghton-Mifflin is a minimal adjunct. There is little chance for students to practice math vocabulary or collaboration skills due to the heavy emphasis on individual (isolated) effort and work product. Number sense and estimation are not emphasized in the H-M program.

The publishers of the Houghton-Mifflin text instill a de facto assumption of mastery after initial introduction of math procedures. This does not fit with reality. A small amount of review problems are attached to the bottom of each lesson, but it shows up as an infrequent afterthought. The review problems (always simple calculations) are not embedded into the homework assignments, it is up to teacher’s discretion whether they are assigned or not.

The teachers of K-2 students use consumable workbooks in their classrooms and the 3-5 grade teachers use textbooks and reproducible masters for Review, Practice, and Challenge. Teachers at all grade levels are required to plan and copy additional practice sheets to cover basic computational skills.

There is presently no K-5 intervention for low-achieving math students.

Cabrillo Unified is one of three K – 12 school districts in the county. However, we do not share a cohesive math program through the entire school system. All students receive 60 minutes of math instruction per day. High-functioning 5th grade math students may choose to take an end-of-the-year placement test verifying that the students has mastered the 6th grade standards. A 7th grade placement will occur if student successfully passes the placement test.

“From a perspective of attaining mathematical competence, teaching elementary mathematics does not mean bringing students merely to the end of arithmetic or to the beginning of “pre-algebra.” Rather, it means providing them with a groundwork on which to build future mathematics learning.” (Liping Ma)

6 – 8 Current Math Program: McDougal Little Concepts and Skills: Course 1 and 2.

6th and 7th grade

Course 1 addresses 6th grade standards only. It has a skills review which contains some 5th grade standards for review.

Course 2 addresses 7th grade standards only. It has a skills review which contains some 6th grade standards for review. It is a basic pre-algebra course.

Standards addressed for each lesson are delineated at the beginning of each section of the book

Examples show basic algorithms with no conceptual background given. There are no projects or group work incorporated into the curriculum. Often the word problems are confusing.

The text gives a broad overview of all the standards without much depth.

Our students are not tracked in 6th and 7th grade which creates a heterogeneous grouping. The courses are designed to prepare all students for Algebra in 8th grade, however, due to time constraints the material is often not completely covered by CST testing in May.

Currently, all students receive 42 minutes of math instruction per day, compared to 84 minutes of instruction per day for Language Arts. All math classes consist of 32-35 students. There are no support classes during the academic day. Homework Club and Boys’ and Girls’ Club are available after school for students requiring extra help. The “Zero Period” support class addresses Language Arts needs only.

Sheltered 6th – 8th Grade Math Classes

There is one sheltered math class offered for 6th graders which covers 6th grade curriculum. There is one sheltered class of 7th grade curriculum for 7th and 8th grade EL students.

8th grade

A placement test is given at the end of 7th grade year. The results of the Algebra Readiness test, along with students’ work habits and performance, are used to place students in Algebra 1 course or a two –year algebra course named Algebra 1A.

Both courses use the same textbook, Prentice Hall Algebra 1. The Algebra 1 class covers chapters 1-13. Algebra 1A covers chapters 1-7. (Algebra 1A students will continue their study of math in 9th grade at the high school based on teacher-recommendation.)

Algebra 1 standards are addressed in the book. The Prentice-Hall book is not user-friendly—it is difficult to read and the layout is busy. Multiple choice practice is minimal. A cumulative review, covering every three chapters, is provided. Algorithms are taught, but without connecting to past concepts. Frequently, problems sets have “surprise” problems not covered in examples, answers are not given in simplest form, and unorthodox solution methods are spotlighted.

9 – 12 Current Math Program

Glencoe McGraw-Hill textbooks adopted in 2008-2009: Algebra Readiness, Algebra 1, Geometry and Algebra 2. Supplemental materials include Notable workbooks used to take notes during class or for test review. Study guide workbooks that provide examples and extra practice for each math concept. Resources on-line include the textbook, worked out problems and animated tutoring.

Houghton Mifflin textbooks adopted in 2008-2009: Honors Geometry.

Houghton Mifflin College Division textbooks adopted in 2008-2009: Pre-calculus with Limits: A Graphing Approach and Calculus of a Single Variable (7th edition). A classroom set of Fast Track to a 5: Preparing for the AP Calculus Examination and a student purchased workbook is used to help prepare AP Calculus students for the exam in May.

WH Freeman textbooks adopted in 2008-2009: The Practice of Statistics:TI 83/84/89 Graphing Calculator Enhanced. Supplemental material provided is the Amsco’s AP Statistics Preparing for the Advanced Placement Examination.

Our math classes are comprised of students from every grade level and classes are capped at 35. An algebra class will have 9-12th graders, and resource students all in the same class.

The State standards are addressed for every math class taught. Each lesson aligns to the standard being addressed.

Currently we require three years of math. We are aligned with the minimum UC/CSU requirements. The sequence is as follows: Algebra Readiness, Algebra, Geometry or honors Geometry, Algebra 2, Pre-calculus or AP Statistics, and finally AP Calculus or AP Statistics.

We currently have started a tutoring program after school on Tuesday and Thursdays.

Our current program compares to other school districts as follows. We do not offer as many courses as the other school districts. We’re looking to add more math levels and a variety of courses to support our students’ needs.

Quantitative Data on Effectiveness of Program K-12

Standardized tests and common assessments show no clear trend about student learning. Most grade levels appear to be remaining constant. 4th grade has made some improvement while 8th grade has declined. The high school scores are quite variable, most notably in Algebra 2.

Cruncher data is consulted to modify instruction and provide information to parents. Staff has received some instruction on how to access and read data. Under time constraints, limited knowledge and questionable value, we are not utilizing Cruncher.

Advanced or proficient ratings on the California Standards Test have not demonstrated an increase with the current math program/text. (See chart below)

PERCENT PROFICIENT AND ABOVE ON MATH CST

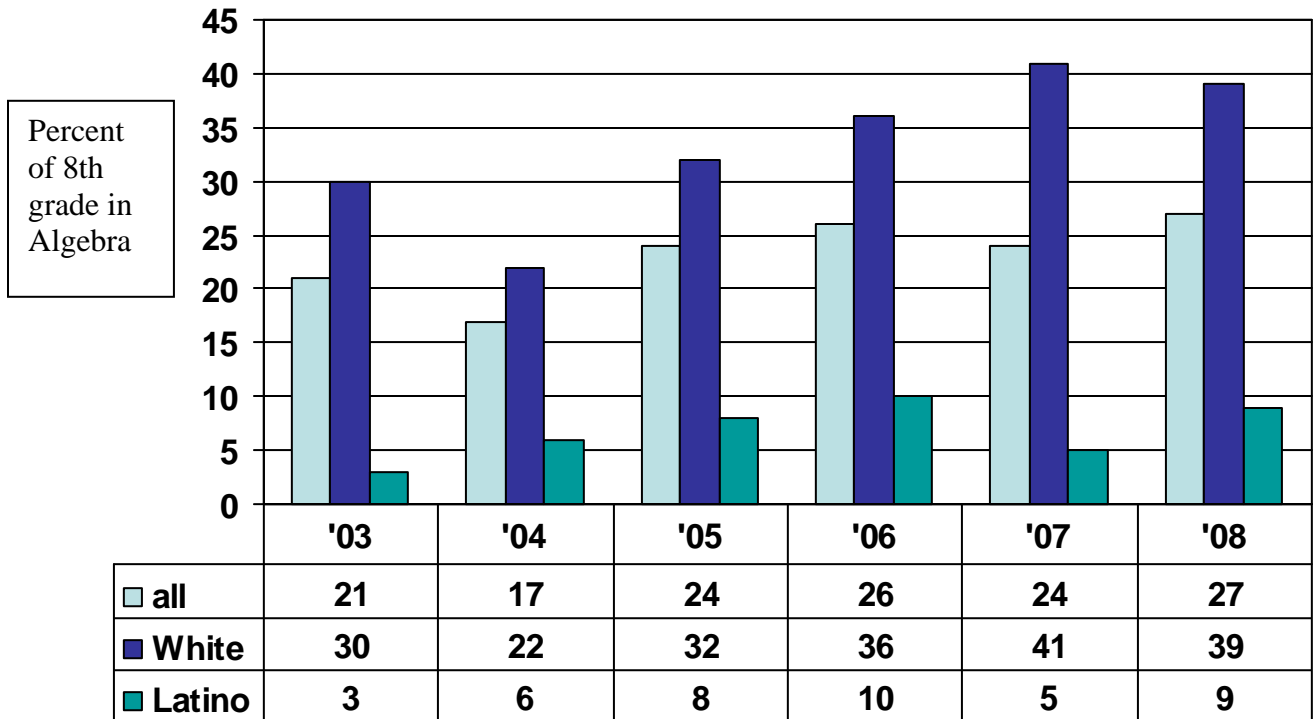
	2nd	3rd	4th	5th	6th	7th	8th	Gen Math	Alg 1	Geom	Alg 2	Sum Math
'04-'05	54	63	58	51	48	42	61	11	25	34	51	70
'05-'06	67	63	52	63	44	52	58	7	40	33	55	87
'06-'07	58	64	61	52	53	47	55	5	38	29	62	74
'07-'08	55	62	65	57	46	53	52	9	31	31	30	75

We have not recognized an increase in our English Learners enrolling in honors or Advanced Placement courses. However, there are an increasing number of English Learners enrolling in Algebra 2 due to the recent 3 year math graduation requirement. (See chart below)

NUMBER OF ENGLISH LANGUAGE LEARNERS ENROLLED

	04-05	05-06	06-07	07-08	08-09
AP Calculus	0	0	0	0	0
AP Statistics	0	0	0	0	0
Pre-Calculus	0	0	0	1	0
Algebra II	5	4	3	10	19
Honors Geom.	na	na	na	na	3

Additionally, the number of Latino students enrolling in 8th grade Algebra has remained constant. (See chart below)



Qualitative Data on Effectiveness of Program K-12

Strengths:

- Covers standards
- 9-12th grade textbook/tutoring on-line
- Supplemental Review and Practice worksheets
- Ease of delivery

Needs:

- Enhance teacher knowledge through professional development and collegiality
- Increase rigor
- Promote student discourse through collaboration
- Address issues of disparities between demographic populations
- Use of calculators
- Enhance student communication and increase comprehension through math games
- Connect procedures to conceptual understanding and attitudes
- Technology support: computer lab, Smartboards, LCD projectors, computers, interactive assessment tools (Quizzdom), Interwrite Pad, benchmark analysis tools, etc.
- Manipulative materials: centimeter cubes, algebra tiles, small white boards, etc.

- Valuable Formative assessments along with the time and training to use them effectively
- Increase math instructional time in the middle school
- Adopt materials that present clearly and are balanced for conceptual and procedural skills

Quality control measures for the current K-12 program:

Steps taken to make certain that agreed upon standards are addressed in all grade levels/sections of a course.

- Pacing calendars
- Teacher collaboration
- District wide articulation
- Faculty/department meetings

Common Assessments.

- Triennial benchmark assessments (K-5)
- CST (2-11)
- Common textbook assessments
- Common Final Exams (9-12)

Steps taken to calibrate grading practices.

- Currently not adequately addressed. (see proposed revisions)

Program Revisions/Recommendations for K-12 program:

“Teachers’ mathematical knowledge and training is a key factor in elementary mathematics achievement.” –Liping Ma

- Professional development
 - Training in subject matter knowledge (conceptual, procedural, and attitudes)—it is necessary to emphasize and make explicit connections among concepts and procedures that students are learning, to present a “unified body of knowledge.” (Ma, 1199, p.122)
 - Training with manipulative materials and group strategies
 - Training in alternative methods of assessment
 - Creation of new pacing guides and assessment tools
 - Grading calibration
 - Deepening of teaching culture by teachers interacting collegially among themselves (articulation)
 - Establish involvement in Cal PASS
- Algebra 1 classes capped at 28 students
- Instructional minutes 55-60 minutes daily
- Re-evaluate the Sheltered Math program at Cunha
- CAHSEE prep course offered during summer or early-bird
- Subject Area Specialization for Elementary teachers

- Team teaching
- Teacher exchange between classrooms (students do not move)
- Reassess benchmark (formative) testing: consider alternatives to bring real value to our data collecting
- Institute quality control measures to create accountability for student progress

Maintain the district wide math committee during the 2009-2010 school year to ensure the success of a seamless K-12 program implementation. This committee would be tasked with:

- Creating a timeline for program training and implementation
- Researching and recommending quality control measures
- Reviewing and revising the special education math program
- Reviewing and revising the summer school program

Instructional material recommendations

- Balanced conceptual and procedural math program
- Smartboards in every classroom
- LCD projectors and Interwrite Pads in every classroom
- Functioning teacher computer in every class
- Individual white boards--slates (class sets/teacher)
- Algebra tiles and other hands-on manipulative materials

“Good Instruction Makes a Difference” Good teaching can make a significant difference in student achievement, equal to one effect size (a standard deviation), which is also equivalent to the affect that demographic classifications can have on achievement.

Paraphrase Dr. Heather Hill, University of Michigan