

Survey of Mathematics Instructional Practices in California

10th Grade
Teacher Questionnaire

Pilot Test Version

November 1999

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WestEd

935 El Camino Real
Menlo Park, CA 94025

Survey of Mathematics Instructional Practices in California

This questionnaire is part of a research study being conducted for the California Department of Education by WestEd in collaboration with Management Analysis and Planning, Inc. (MAP) and the RAND Corporation. The purpose of the study is to examine the instructional practices used in teaching mathematics in California. Approximately 500 fourth-grade teachers and 300 eighth-grade mathematics teachers have already been surveyed as part of this study. This questionnaire is part of an exploratory research and development effort about mathematics teaching at the tenth-grade level.

About this Questionnaire

This questionnaire contains the following sections:

- I. Current Teaching Situation
- II. Mathematics Instruction in a Particular Class
- III. Recent Developments in Mathematics Education
- IV. Professional Development and Support
- V. Professional Background
- VI. Teacher Demographic Information
- VII. Additional Comments

The time needed to complete the questionnaire is approximately 30 minutes. Of course, we welcome further written comments in any section of the questionnaire. It is important that all individuals receiving this questionnaire participate in the survey so that the results will fairly represent mathematics teachers in the sampled regions. **Please fold the completed questionnaire and return it in the enclosed postage-paid envelope as soon as possible.**

YOUR RESPONSES WILL BE KEPT STRICTLY CONFIDENTIAL. No information identifying individual teachers will be reported under any circumstances. Please remove the name label on the front cover before returning the completed questionnaire.

Thank you for contributing your time and thoughtful responses to this study.

For Further Information

If you have any questions about this questionnaire or about the study in general, please feel free to contact us:

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I. Current Teaching Situation

1. What courses do you currently teach? _____

2. To how many different classes per day do you teach mathematics? _____
3. Do you currently teach any subjects other than mathematics? yes no
If yes, what other subject(s) do you teach? _____

II. Mathematics Instruction in a Particular Class

If you teach more than one mathematics class, please answer the questions in this section for your first mathematics class of the day in which at least half of the students are in 10th grade, and indicate here the class period during which this class meets: _____

4. What is the title of this class? _____
5. Which of the following best describes the duration of this class? (Check one.)
 year-long one-semester other: _____
6. How many days per week and minutes per day does this class meet (for mathematics)?
 - a. Days per week (check one): 1 day 2 days 3 days 4 days 5 days
 - b. Minutes per day: _____ minutes
7. How many total students are enrolled in this class? _____
8. How many 10th grade students are enrolled in this class? _____
9. How would you describe this class in terms of variation in student mathematics ability? (Check one.)
 fairly homogeneous and low in ability
 fairly homogeneous and average in ability
 fairly homogeneous and high in ability
 heterogeneous with a mixture of two or more ability levels
10. In this class, how many students are formally classified as each of the following? (Estimate if necessary.)
 - a. English Learner/LEP? _____
 - b. Special Education? _____
 - c. Gifted and Talented? _____

11. Over a typical week, about what percentage of mathematics class time do you ask students to work or meet...
- a. as a whole class? _____% b. in pairs or groups? _____% c. individually? _____%

12. About how often do **you** do the following as part of mathematics instruction **in this class**? (Circle one number on each line.)

	Never	A few times a year	Once or twice a month	Once or twice a week	Almost daily
a. Introduce/teach topics by explaining the concepts themselves	1	2	3	4	5
b. Introduce/teach topics in the context of everyday situations	1	2	3	4	5
c. Make provisions for students to work at their own pace or level	1	2	3	4	5
d. Check for student understanding at the end of a lesson or class period	1	2	3	4	5
e. Use a computer to present, simulate, or demonstrate concepts and techniques to the class	1	2	3	4	5
f. Assign homework for students to get practice	1	2	3	4	5
g. Assign special challenges/enrichment as homework	1	2	3	4	5
h. Go over homework with the class	1	2	3	4	5
i. Demonstrate how to solve a particular type of problem	1	2	3	4	5
j. Assess student progress to determine the need for additional instructional support	1	2	3	4	5

13. About how often do you ask **students in this class** to do each of the following as part of mathematics instruction, homework, or assessment? (Circle one number on each line.)

	Never	A few times a year	Once or twice a month	Once or twice a week	Almost daily
a. Justify their answer or explain their reasoning when giving an answer (oral or written)	1	2	3	4	5
b. Practice computational procedures	1	2	3	4	5
c. Do mathematics in conjunction with other subjects	1	2	3	4	5
d. Memorize mathematics facts, rules, definitions, or formulas	1	2	3	4	5
e. Read or work problems from a textbook	1	2	3	4	5
f. Read or work problems from a published instructional program that is not a textbook	1	2	3	4	5
g. Discuss different ways to solve a particular problem	1	2	3	4	5
h. Generalize from particular problems to other situations	1	2	3	4	5
i. Complete worksheets	1	2	3	4	5
j. Work on non-routine, higher-order problems	1	2	3	4	5
k. Use manipulative materials or models to solve problems or explore concepts	1	2	3	4	5
l. Work problems mentally	1	2	3	4	5

14. About how often do you ask **students in this class** to participate in each of the following **whole-class** activities? (*Circle one number on each line.*)

	Never	A few times a year	Once or twice a month	Once or twice a week	Almost daily
a. Listen to teacher presentation of a new topic or procedure	1	2	3	4	5
b. Engage in class discussion about mathematics concepts or problems	1	2	3	4	5
c. View or participate in mathematics demonstrations or investigations	1	2	3	4	5
d. Watch mathematics-related films, filmstrips, videotapes, or television programs	1	2	3	4	5
e. Read aloud from a mathematics textbook	1	2	3	4	5
f. Go on mathematics-related field trips	1	2	3	4	5
g. Participate in class mathematics contests or games	1	2	3	4	5
h. Other: _____	1	2	3	4	5

15. About how often do you ask **students in this class** to participate in each of the following **group** activities? (*Circle one number on each line.*)

	Never	A few times a year	Once or twice a month	Once or twice a week	Almost daily
a. Work in pairs or small groups on mathematics problems/exercises	1	2	3	4	5
b. Work on group projects that extend for several days	1	2	3	4	5
c. Make group presentations to the rest of the class	1	2	3	4	5
d. Work in pairs or small groups at activity stations	1	2	3	4	5
e. Work in pairs or small groups at computers	1	2	3	4	5
f. Other: _____	1	2	3	4	5

16. About how often do you ask **students in this class** to participate in each of the following **individual** activities during class? (*Circle one number on each line.*)

	Never	A few times a year	Once or twice a month	Once or twice a week	Almost daily
a. Work individually on mathematics problems/exercises	1	2	3	4	5
b. Work on individual projects that take several days	1	2	3	4	5
c. Make individual presentations to the rest of the class	1	2	3	4	5
d. Write in a mathematics journal	1	2	3	4	5
e. Work individually at activity stations	1	2	3	4	5
f. Work individually at computers	1	2	3	4	5
g. Other: _____	1	2	3	4	5

17. About how often do you ask **students in this class** to participate in each of the following **technology-related activities** (in class or in school lab)? (*Circle one number on each line.*)

	No Access	Never	A few times a year	Once or twice a month	Once or twice a week	Almost daily
a. Use calculators to perform basic calculations	0	1	2	3	4	5
b. Use calculators to learn concepts	0	1	2	3	4	5
c. Use computers to run simulations or demonstrations	0	1	2	3	4	5
d. Use computers to practice basic skills	0	1	2	3	4	5
e. Use computers to learn concepts	0	1	2	3	4	5
f. Use computers to collect data	0	1	2	3	4	5
g. Use computers as an analytic tool (e.g., spreadsheets)	0	1	2	3	4	5
h. Use computers to play mathematics games	0	1	2	3	4	5
i. Other: _____	0	1	2	3	4	5

18. About how often do you test **students in this class** using each of the following types of **assessment**? (*Circle one number on each line.*)

	Never	A few times a year	Once or twice a month	Once or twice a week	Almost daily
a. Short-answer tests (e.g., multiple choice, true/false, fill-in-the-blank)	1	2	3	4	5
b. Tests made up of short problems to solve	1	2	3	4	5
c. Tests requiring open-ended responses (e.g., descriptions, justifications of solutions)	1	2	3	4	5
d. Performance tasks for assessment purposes	1	2	3	4	5
e. Other: _____	1	2	3	4	5

19. On average, how often do **you** use each of the following in your mathematics instruction in this class? (*Circle one number on each line.*)

	Never	A few times a year	Once or twice a month	Once or twice a week	Almost daily
a. Lessons or problems you have created	1	2	3	4	5
b. Teacher's edition or guide (from textbook or other instructional program)	1	2	3	4	5
c. Published supplementary curriculum materials	1	2	3	4	5
d. Suggestions or ideas from other teachers in your school	1	2	3	4	5
e. Suggestions or ideas from a mathematics specialist at the school, district, or county office	1	2	3	4	5
f. Ideas from an in-service, workshop, institute, professional meeting, or conference	1	2	3	4	5
g. Test preparation materials (e.g., commercial materials, items from upcoming or past state or district tests, etc.)	1	2	3	4	5
h. Other: _____	1	2	3	4	5

20. Listed below are a number of possible objectives for mathematics instruction.

- a. **Circle the letters of the five objectives** on which you place the most emphasis **for students in this class**.
- b. **Rank order the five objectives you selected** from 1 to 5 in terms of the emphasis you place on each one (1=greatest emphasis and 5=least emphasis).

<u>Objective</u>	Rank Order
a. Development of conceptual understanding	_____
b. Increased awareness of real-world mathematical applications	_____
c. Mastery of basic computational skills and facts	_____
d. Development of problem solving/inquiry skills	_____
e. Preparation for future mathematics courses	_____
f. Attainment of state or district content standards	_____
g. Preparation for use of mathematics in daily life	_____
h. Increased interest in mathematics	_____
i. Development of mathematical reasoning ability	_____
j. Preparation for standardized tests	_____
k. Use/application of mathematics in other subject areas	_____
l. Other: _____	_____

21. Listed below are a number of topics that might be taught in 10th grade mathematics courses.

- a. **Circle the names of the five topics** on which you anticipate **having spent the most time** by the end of this year. Fill in the "other" spaces if your top five topics are not on the list.
- b. **Check the box to the left of every topic that you DO NOT teach in this class.**

<input type="checkbox"/> 1 absolute value	<input type="checkbox"/> 12 logarithms	<input type="checkbox"/> 23 sequences and series
<input type="checkbox"/> 2 binomial theorem	<input type="checkbox"/> 13 matrices	<input type="checkbox"/> 24 set theory
<input type="checkbox"/> 3 complex numbers	<input type="checkbox"/> 14 negative numbers	<input type="checkbox"/> 25 similar figures
<input type="checkbox"/> 4 congruent figures	<input type="checkbox"/> 15 polyhedra	<input type="checkbox"/> 26 simplification of expressions
<input type="checkbox"/> 5 coordinate geometry	<input type="checkbox"/> 16 polar coordinate system	<input type="checkbox"/> 27 statistics
<input type="checkbox"/> 6 deductive reasoning	<input type="checkbox"/> 17 polynomials	<input type="checkbox"/> 28 systems of equations
<input type="checkbox"/> 7 equations and inequalities	<input type="checkbox"/> 18 probability	<input type="checkbox"/> 29 trigonometric functions
<input type="checkbox"/> 8 exponents and roots	<input type="checkbox"/> 19 proofs	<input type="checkbox"/> 30 trigonometric identities
<input type="checkbox"/> 9 functions	<input type="checkbox"/> 20 quadratic equations	other: _____
<input type="checkbox"/> 10 inductive reasoning	<input type="checkbox"/> 21 quadratic formula	other: _____
<input type="checkbox"/> 11 irrational numbers	<input type="checkbox"/> 22 rational numbers	other: _____

22. a. Which of the following do you use as your **main curriculum resource** in this class? (*Check one.*)
- one or more textbooks
 - one or more published instructional programs that are not textbooks
 - curriculum resources that are neither textbooks nor published instructional programs
 - other: _____
- b. What mathematics textbook, published instructional program, or curriculum resource do you use the most in this class?
- Title _____
- Publisher _____ Copyright Date (if known) _____
23. If you teach more than one mathematics class, is your mathematics teaching in this class representative of your teaching in your other mathematics classes? (*Check one.*)
- Not applicable—this is the only mathematics class I teach.
 - Yes, my teaching in this class is representative of all of my other mathematics classes.
 - No, my teaching in this class is different than in all of my other mathematics classes.
 - My teaching in this class is representative of *some* of my other mathematics classes.
24. Are there any special circumstances or unusual conditions related to the teaching of mathematics to this class (e.g., team teaching)? If so, please specify:
- _____

III. Recent Developments in Mathematics Education

25. Please indicate how familiar you are with each of the documents listed below. (We have included the publication dates after each document.) (*Circle one number for each document.*)

<u>Document</u>	Have NOT heard of this	Have heard of or skimmed this, but it has not influenced my teaching	Have read much or all of this, but it has not influenced my teaching	Has influenced my teaching
a. NCTM Curriculum and Evaluation Standards (1989)	1	2	3	4
b. NCTM Standards 2000 (1998 discussion draft)	1	2	3	4
c. California Mathematics Framework (1985)	1	2	3	4
d. California Mathematics Framework (1992)	1	2	3	4
e. California Mathematics Framework (1998)	1	2	3	4
f. California Mathematics Program Advisory (1996)	1	2	3	4
g. California Mathematics Content Standards adopted by the State Board (1998)	1	2	3	4
h. Your local district mathematics content standards/curriculum guidelines	1	2	3	4

26. Indicate your opinion about each statement below. (Circle one number on each line.)

	Disagree strongly	Disagree somewhat	Agree somewhat	Agree strongly	Don't know
a. Our district mathematics standards are aligned with the 1998 California Mathematics Content Standards.	1	2	3	4	9
b. Our district mathematics standards are aligned with the NCTM standards.	1	2	3	4	9
c. The principal of this school is well-informed about our district mathematics standards.	1	2	3	4	9
d. The principal of this school is well-informed about the 1998 California Mathematics Content Standards.	1	2	3	4	9
e. There is a school-wide effort to implement our district mathematics standards.	1	2	3	4	9
f. There is a school-wide effort to improve student mathematics achievement on the SAT-9.	1	2	3	4	9
g. Our district has provided workshops/professional development based on our district mathematics standards.	1	2	3	4	9
h. Our district has provided workshops/professional development based on the 1992 California Mathematics Framework.	1	2	3	4	9
i. Our district has provided or has plans to provide workshops/professional development based on the 1998 California Mathematics Content Standards.	1	2	3	4	9
j. Curriculum and instructional materials aligned with district mathematics standards are readily available for use in my teaching.	1	2	3	4	9
k. The NCTM standards have influenced my teaching for the better.	1	2	3	4	9
l. The 1992 California Mathematics Framework has influenced my teaching for the better.	1	2	3	4	9
m. The 1998 California Mathematics Content Standards are likely to influence my teaching for the better.	1	2	3	4	9

IV. Professional Development and Support

27. **Since January 1998**, *approximately* how many hours have you spent in **mathematics professional development**, and how many of these hours were required by your district? Include attendance at workshops, extension courses, professional meetings or conferences, and any other relevant experiences.

- Estimated number of **total** math professional development hours: _____ hours
- Estimated number of these hours **required by district**: _____ hours

28. **Since January 1998**, approximately how much time have you spent in professional development activities related to **each topic** listed below? For activities that covered more than one of the topics, split the time evenly among the topics covered. (Circle one number on each line.)

	None	Less than 4 hours	4-8 hours	1-3 days	More than 3 days
a. Mathematics content	1	2	3	4	5
b. Mathematics instructional techniques or strategies (e.g., cooperative learning, manipulatives, etc.)	1	2	3	4	5
c. Use of particular mathematics curricula or curriculum materials (e.g., a particular textbook)	1	2	3	4	5
d. Use of technology in mathematics instruction (e.g., calculators or computers)	1	2	3	4	5
e. Mathematics standards (state and/or district) or framework	1	2	3	4	5
f. Mathematics assessment/testing	1	2	3	4	5
g. Other topics related to mathematics or to the teaching of mathematics (please specify): _____	1	2	3	4	5

29. **Over the past five years**, which of the following have you participated in? (Check all that apply.)

- | | | |
|--|---|---|
| <input type="checkbox"/> California Math Project | <input type="checkbox"/> MathMatters | <input type="checkbox"/> Woodrow Wilson Workshops |
| <input type="checkbox"/> Urban Systemic Initiative | <input type="checkbox"/> Math Renaissance | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Local Systemic Initiative | <input type="checkbox"/> MRK12 | <input type="checkbox"/> none |

30. Indicate your opinion about each statement below. (Circle one number on each line.)

	Disagree strongly	Disagree somewhat	Agree somewhat	Agree strongly	Don't know
a. Teachers in this school support one another in trying innovations in teaching mathematics.	1	2	3	4	9
b. The school administration promotes innovations in mathematics education.	1	2	3	4	9
c. My way of teaching mathematics is supported by school administrators.	1	2	3	4	9
d. My way of teaching mathematics is supported by district personnel, including district mathematics specialists (if any).	1	2	3	4	9
e. My way of teaching mathematics is supported by the parents of my students.	1	2	3	4	9
f. I feel that I belong to a professional community of mathematics educators at a regional, state, or national level.	1	2	3	4	9
g. I have some control over my mathematics teaching (e.g., selecting content, selecting materials, setting the pace, etc.).	1	2	3	4	9

31. About how often does each of the following occur at your school? (Circle one number on each line.)

	Never	A few times a year	Once or twice a month	Once or twice a week	Almost daily
a. Teachers share ideas about mathematics instruction.	1	2	3	4	5
b. Teachers observe one another teaching mathematics.	1	2	3	4	5
c. Teachers work together to develop mathematics curriculum.	1	2	3	4	5
d. Teachers work together to coordinate the mathematics content of different courses (e.g., across grade levels or across subject areas).	1	2	3	4	5
e. A specialist in mathematics education (e.g., mentor teacher or district mathematics coordinator) works with teachers in this school.	1	2	3	4	5

V. Professional Background

32. Which of the following high school and college courses have you completed? Include both semester and quarter courses. (Check all that apply.)

High School Mathematics

- Algebra I
- Algebra II
- Geometry
- Trigonometry or Precalculus
- Calculus
- Other: _____

College Mathematics

- Calculus (# of smstrs: _____)
- Linear algebra
- Modern algebra
- Discrete mathematics
- Real analysis
- History of mathematics
- College geometry
- Computers in mathematics
- Probability and statistics
- Other: _____

Mathematics Education

- Student teaching (mathematics)
- Mathematics teaching methods
- Instructional use of computers
- Other: _____

33. Describe the subject area of your degree(s). (Check one in each column.)

Bachelor's Degree

- none
- mathematics
- mathematics education
- education
- humanities
- social sciences
- sciences
- other: _____

Master's Degree

- none
- mathematics
- mathematics education
- education
- humanities
- social sciences
- sciences
- other: _____

Doctoral Degree

- none
- mathematics
- mathematics education
- education
- humanities
- social sciences
- sciences
- other: _____

34. Describe your teaching credential(s).

a. Which of the following teaching credential(s) do you have? (Check all that apply.)

- | | |
|---|--|
| <input type="checkbox"/> multiple subject teaching credential | <input type="checkbox"/> single subject credential in mathematics |
| <input type="checkbox"/> general or standard elementary credential | <input type="checkbox"/> single subject credential <i>not</i> in mathematics |
| <input type="checkbox"/> emergency multiple subject teaching permit | <input type="checkbox"/> standard secondary credential in mathematics |
| <input type="checkbox"/> emergency teaching permit in mathematics | <input type="checkbox"/> standard secondary credential <i>not</i> in mathematics |
| <input type="checkbox"/> internship credential (multiple subject) | <input type="checkbox"/> general secondary credential |
| <input type="checkbox"/> internship credential in mathematics | <input type="checkbox"/> other: _____ |
| <input type="checkbox"/> credential waiver | |

b. Do you have a supplementary authorization in mathematics? yes no

35. Including this year, how many years have you taught full-time in a regular teaching position...

a. total? _____ b. in this district? _____ c. in this school? _____

VI. Teacher Demographic Information

36. Are you: male female

37. Are you: African American (not of Hispanic origin) Hispanic
 American Indian or Alaskan Native White (not of Hispanic origin)
 Asian or Pacific Islander Other: _____

VII. Additional Comments (Optional)

38. What one or two things do you believe contribute the most to your effectiveness as a mathematics teacher?

39. What are the biggest obstacles to your mathematics teaching?

40. If there are specific state, district, or school policies that have **helped** your mathematics teaching, please describe.

41. If there are specific state, district, or school policies that have **hindered** your mathematics teaching, please describe.

42. Do you have additional comments about any topic addressed by this questionnaire or any topic you think should have been included in this questionnaire?

Thank you for participating in this survey!