

CSMP Summary Evaluation Report  
Manhasset School District, 1985-92

Martin Herbert

Evaluation Consultant  
January, 1993

## Table of Contents

History of CSMP in Manhasset .....	1
Administration of the MANS Tests .....	2
Initial Manhasset CSMP - Non-CSMP Comparisons .....	4
Manhasset Changes Over Time .....	7
Manhasset Versus Other CSMP Classes .....	9
Summary .....	12
Appendix A. District Average MANS Scores, 1985-92	
Appendix B. Description of MANS Tests	

## HISTORY OF CSMP IN MANHASSET

The Manhasset, NY, School District began using the CSMP curriculum in first grade in the 1981-82 school year. The following year, 1981-82, all second grade classes used CSMP and in each succeeding year CSMP usage advanced one grade level. By 1986-87 all grades K-6 classes in Manhasset were using CSMP and have continued to do so since then. Table 1, below, shows the schedule of implementation.

Table 1  
CSMP History in Manhasset

Grade	Year						
	81-82	83	84	85	86	87	88-92
1	CSMP	CSMP	CSMP	CSMP	CSMP	CSMP	CSMP
2	Non-CSMP	CSMP	CSMP	CSMP	CSMP	CSMP	CSMP
3	Non-CSMP	Non-CSMP	CSMP	CSMP	CSMP	CSMP	CSMP
4	Non-CSMP	Non-CSMP	Non-CSMP	CSMP	CSMP	CSMP	CSMP
5	Non-CSMP	Non-CSMP	Non-CSMP	Non-CSMP	CSMP	CSMP	CSMP
6	Non-CSMP	Non-CSMP	Non-CSMP	Non-CSMP	Non-CSMP	CSMP	CSMP

## ADMINISTRATION OF THE MANS TESTS

### Description

The MANS Tests are a collection of short tests designed to assess how well students can use mathematical and thinking skills in situations that are new or unfamiliar to them. The tests are in plain English and do not use terminology that is specific to any particular curriculum.

MANS Tests are grouped into seven core categories based on the content and kind of problem solving skills being tested:

- Computation
- Estimation
- Mental Arithmetic
- Number Representations
- Relations and Number Patterns
- Word Problems
- Elucidation of Multiple Answers

In grades 4-6, additional MANS categories are:

- Fourth: Geometry
- Fifth: Geometry, Organization of Data, Probability
- Sixth: Algebra, Organization of Data, Probability

The MANS Tests are described in Appendix B

### Administration

Since 1985, the MANS Tests have been administered in Manhasset schools at various grade levels in various years, according to the wishes of the school district.

The tests have served the following purposes:

- a. Comparison of student performance before and after the introduction of CSMP,
- b. Assessment of change in student performance with increasing district experience with CSMP,
- c. Comparison of Manhasset student performance with that of CSMP students in other districts.

Table 2, below, shows when and at what grade levels the tests were administered.

Table 2  
Administration of MANS Tests, 1985-92

Grade	Year							
	84-85	86	87	88	89	90	91	92
2					X	X	X	X
4				X	X	X	X	X
5 (Non-CSMP)	X	X	X	X	X	X	X	X
6 (Non-CSMP)	X	X (Non-CSMP)	X				X	X

### Computation of Class Scores

In order to increase the number of test items to which the class as a whole is exposed, parallel forms of individual MANS tests are used when appropriate. This is not always possible; for some tests, the directions to be given by the tester must be specific to a particular problem situation, so that all students must then work on the same set of questions. Thus, on some tests, half the students take half the items while the other half take the remaining half of the items. On other tests, all students take the same set of items.

Class scores are calculated as the sum of the average scores on each set of items, regardless of whether the set of items was taken by all students in the class or only half the students. Class scores were computed for Total MANS and for each MANS Category. In addition, class scores were calculated on a special Vocabulary test included with the MANS. This tests served as a measure of ability for the individual student and, when averaged, for the class. It was used as a covariate in much of the analysis that follows.

## INITIAL MANHASSET CSMP - NON-CSMP COMPARISONS

Non-CSMP classes were tested in 1985 in grades 5 and 6 and again in 1986 in grade 6. This section compares their performance with that of subsequent CSMP classes at the same grade level the first year such CSMP classes were tested. The following numbering scheme is used for all grade levels:

Year 0: Non-CSMP curriculum is used. (1985 and 86 results combined for grade 6)

Year 1: The first year of CSMP implementation at that grade level.

Year 2: The next year, etc.

For example, Year 1 was 1984-85 for fourth grade, 1985-86 (5th), and 1986-87 (6th)

### Statistical Analysis

For each MANS Category and for Total MANS, an Analysis of Covariance procedure was carried out to compare the CSMP and Non-CSMP classes. Vocabulary score was used as a covariate, meaning that, effectively, MANS class scores were adjusted to take into account differences in ability as measured by Vocabulary scores.

Results for grades 5 and 6 are shown in Tables 3 and 4, respectively. All significant differences in these tables were in favor of CSMP classes.

Table 3  
Fifth Grade CSMP (Year 1) Versus Non-CSMP

	Raw Score Means		Adjusted Means		Statistical Significance <sup>1</sup>
	CSMP	Non-CSMP	CSMP	Non-CSMP	
Computation	24.9	25.1	24.6	25.3	-
Estimation	17.1	14.5	16.9	14.6	*
Mental Arithmetic	24.7	21.7	24.2	22.1	*
Number Representatns	26.5	23.3	26.0	23.7	**
Relations, Numb Pats	36.4	30.4	35.8	31.0	**
Word Problems	13.6	11.4	13.3	11.7	**
Eluc. Multipl Answers	23.5	21.8	22.5	22.7	-
Geometry	7.1	5.8	7.0	5.8	**
Organization of Data	9.3	7.8	9.2	7.8	**
Probability	9.4	7.4	9.3	7.5	*
Total MANS	193.0	169.6	189.5	173.0	**
Vocabulary	33.5	32.1			
Number of classes	7	6			

<sup>1</sup> F-test with 1 and 11 degrees of freedom

\* = Probability that differences this large between the two groups could have happened by chance is less than .05

\*\* = Probability is less than .01.

Table 4  
Sixth Grade CSMP (Year 1) Versus Non-CSMP

	Raw Score Means		Adjusted Means		Statistical Significance <sup>1</sup>
	CSMP	Non-CSMP	CSMP	Non-CSMP	
Computation	28.2	25.5	28.3	25.4	-
Estimation	25.5	22.9	25.5	22.8	**
Mental Arithmetic	24.5	21.4	24.6	21.3	**
Number Representatns	30.8	27.9	30.8	27.7	**
Relations, Numb Pats	51.0	44.7	51.1	44.5	**
Word Problems	15.4	13.6	15.4	13.5	**
Eluc. Multipl Answers	37.2	30.4	37.3	30.3	**
Algebra	15.7	14.5	15.7	14.3	*
Organization of Data	6.4	5.7	6.4	5.6	*
Probability	6.2	5.6	6.2	5.6	*
Total MANS	241.4	214.7	242.2	213.8	**
Vocabulary	27.5	27.8			
Number of classes	7	13			

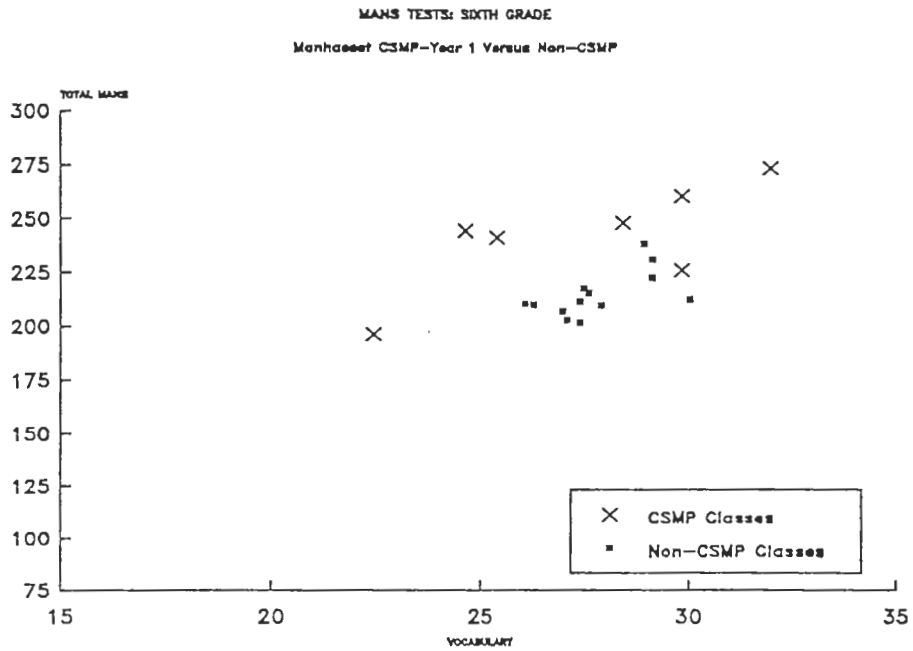
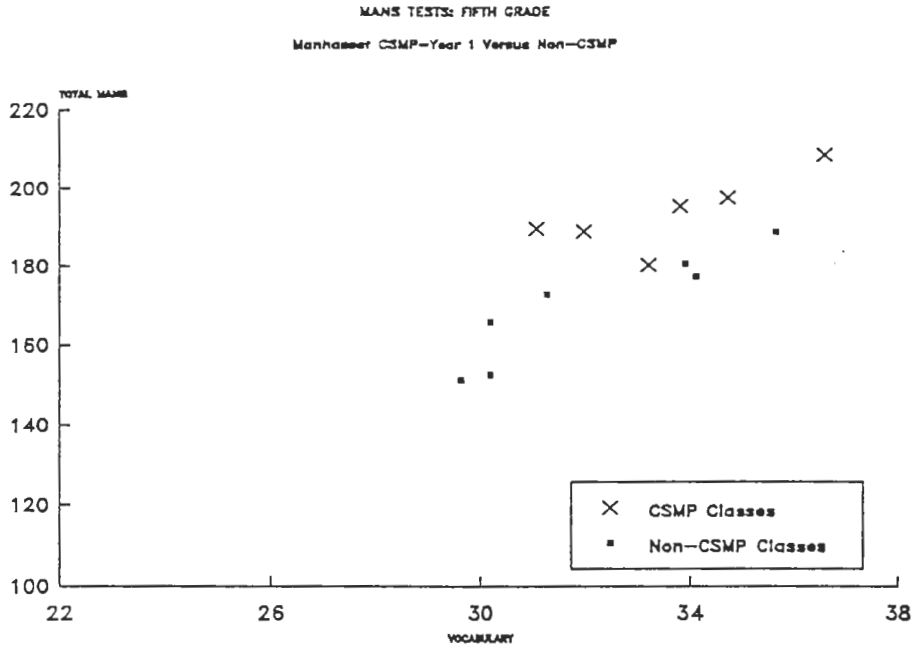
<sup>1</sup> F-test with 1 and 18 degrees of freedom.

CSMP classes had significantly higher Total MANS scores at both grade levels ( $p < .01$ ).

With respect to individual MANS categories, CSMP classes had significantly higher scores on seven of the nine categories in fifth grade and eight of the nine in sixth grade.

## Graphs of Class Scores

The graphs below show Total MANS score for each class. Each class is shown by an entry on the graph, with Total MANS score plotted against Vocabulary score.





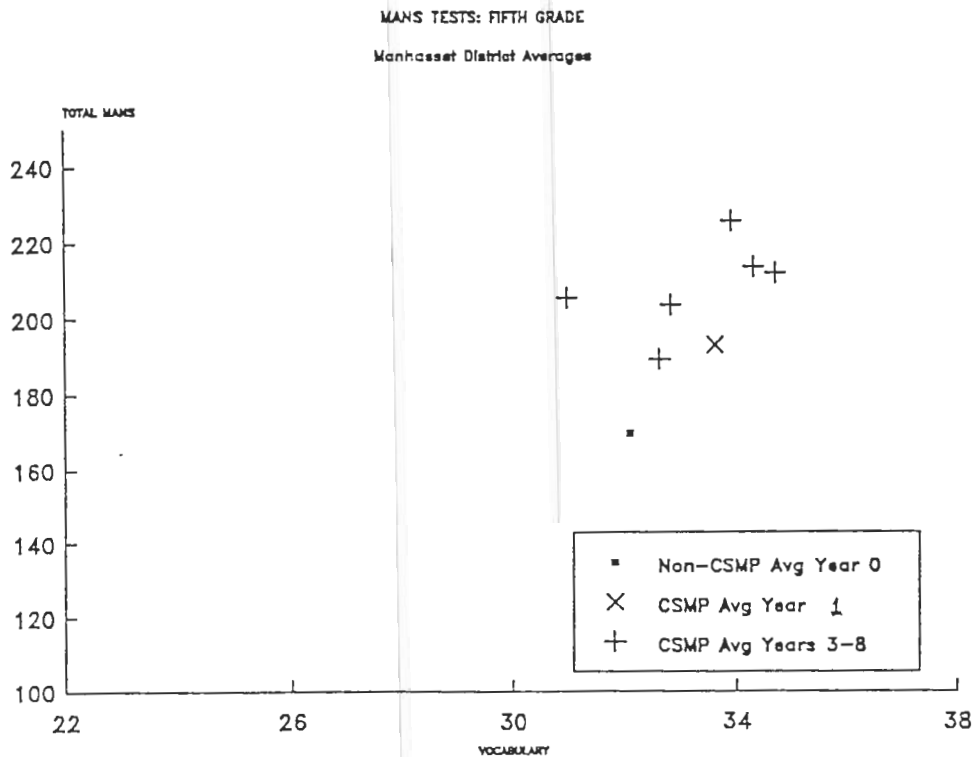
## MANHASSET CHANGES OVER TIME

An important question with respect to any new curriculum is whether, with the passing of time, initial enthusiasm wears off and performance gradually declines. Alternatively, as teachers get more experienced with the curriculum, does performance improve?.

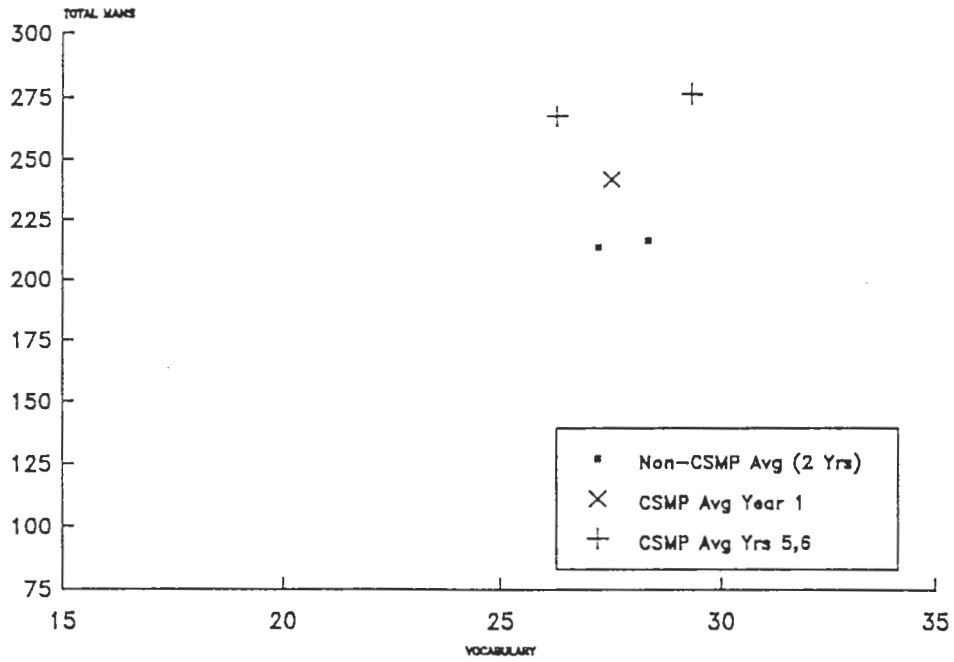
To investigate this question, for both grades the district mean Total MANS score (the mean of all class means) was calculated for each year in which the MANS Tests were administered at that grade level. Appendix A lists these district mean Total MANS scores as well as for each MANS Category.

The graphs below, one per grade level, compare district means for three types of classes:

- Non-CSMP - two entries (1985, 1986) for sixth grade, one entry (1985) for fifth
- CSMP Year 1 - one entry
- CSMP Years 2 and higher - two entries for sixth grade, six for fifth grade  
(It should be noted that these two sixth grade entries are based on results from the one Manhasset schools that was tested.)



MANS TESTS: SIXTH GRADE  
Manhasset District Averages

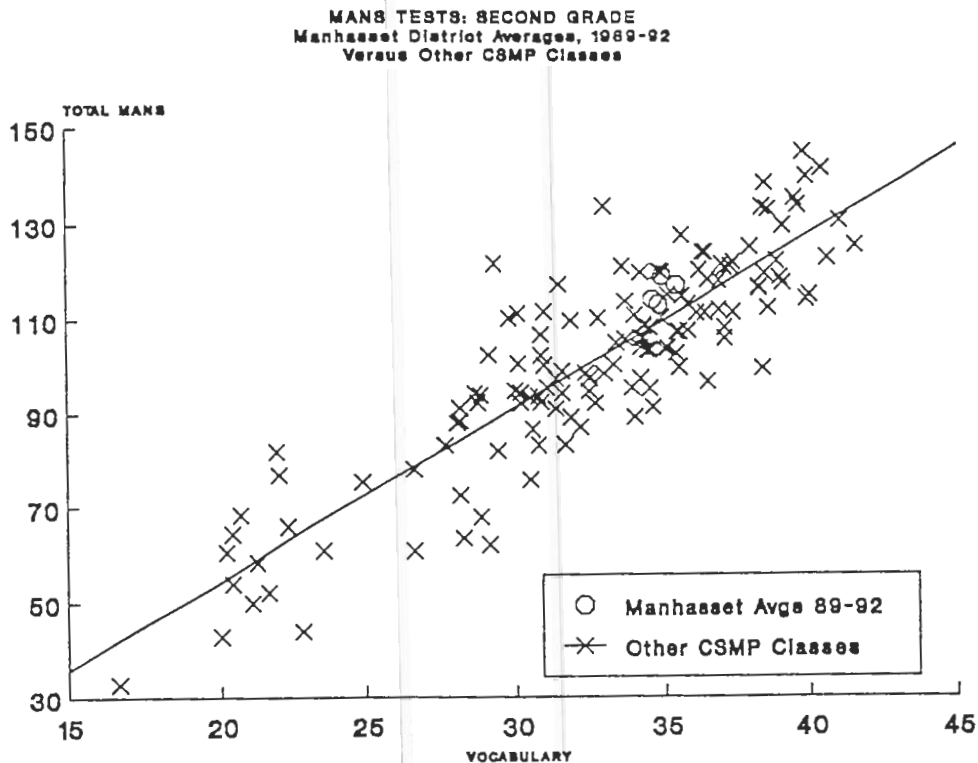


The graphs show clearly and consistently that MANS scores improve when CSMP is implemented, improve again with further experience, and then remain at those high levels over time.

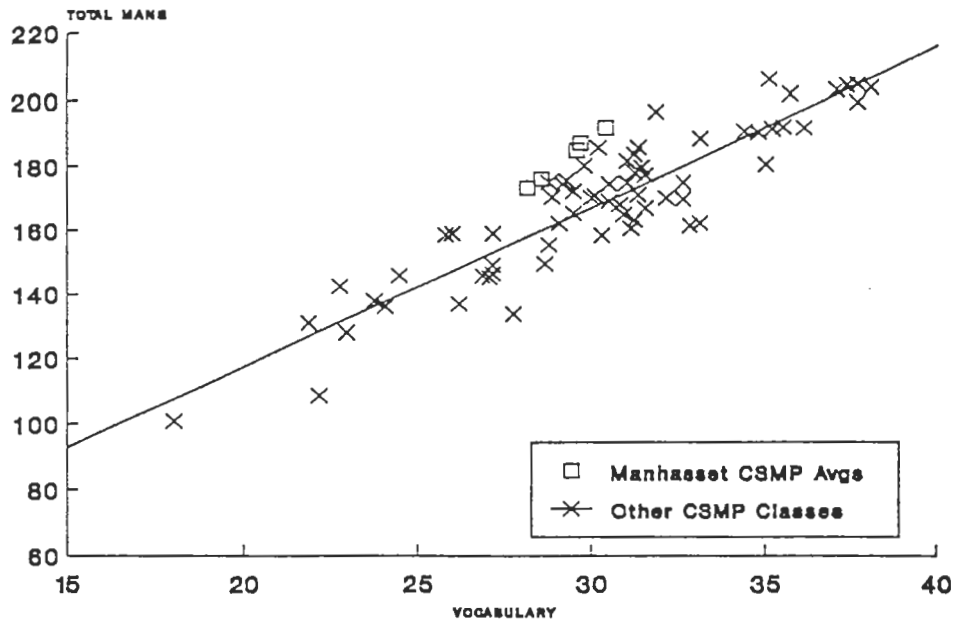
## MANHASSET VERSUS OTHER CSMP CLASSES

The last section of MANS Test analysis compares graphically the performance of Manhasset students with that of CSMP students in other grades. Manhasset district averages (same as previous) are shown superimposed on a representative set of class means from other districts using CSMP. Note that the Manhasset entries on the graph are district means while the other entries are for (Non-Manhasset) class means.

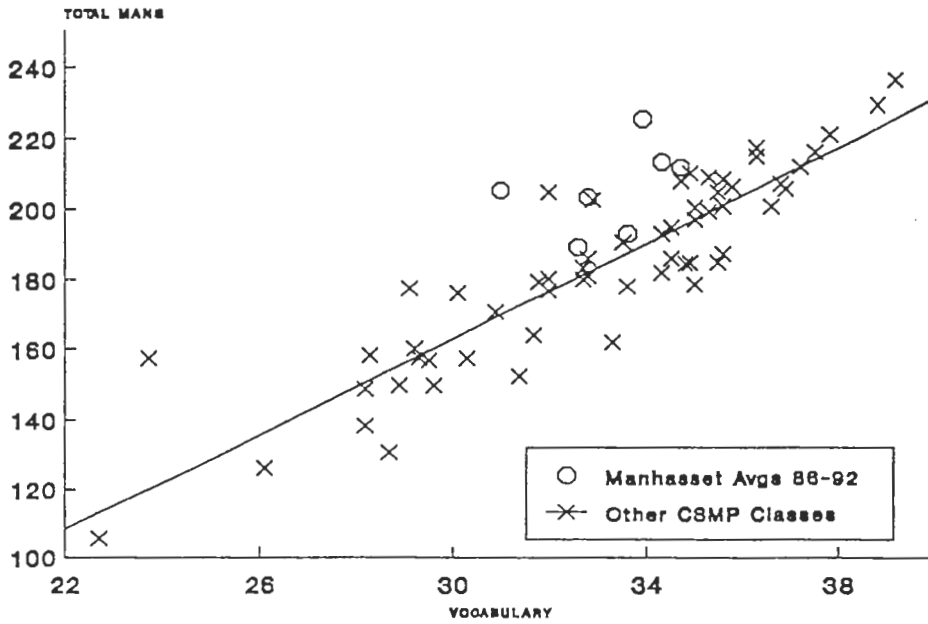
Each graph contains a regression line, which represents the best predictor of Total MANS score based on Vocabulary score. The line was calculated using the Non-Manhasset class scores and represents a norm of sorts; scores above the line are higher than typically achieved by CSMP classes of the same ability level.



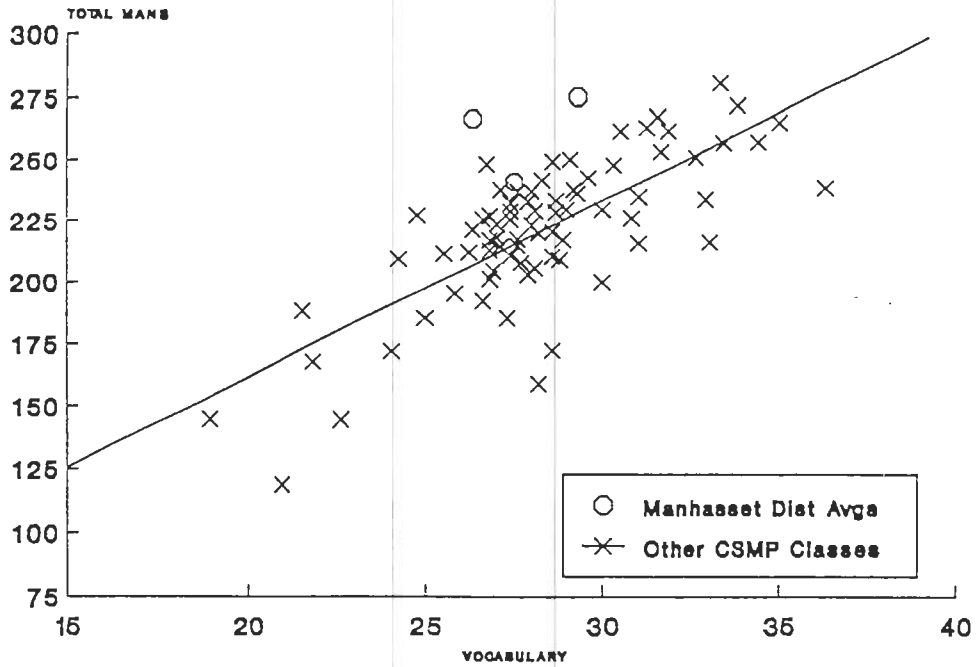
**MANS TESTS: FOURTH GRADE**  
 Manhasset District Averages, 1988-92  
 Versus Other CSMP Classes



**MANS TESTS: FIFTH GRADE**  
 Manhasset District Averages, 1988-92  
 Versus Other CSMP Classes



**MANS TESTS: SIXTH GRADE**  
**Manhasset District Avgs 1987,91,92**  
**Versus Other CSMP Classes**



It can be seen that all Manhasset entries are above the regression line. (Again it should be noted that the two very high 6th grade entries are based on results from only one of the two Manhasset schools.)

## SUMMARY

The Manhasset Central School District began using the CSMP curriculum at the earliest grades in 1980-81. Over a six year period the full grades K-6 curriculum became implemented district-wide and continues to be so. In 1985 the MANS Tests were administered to all classes in grades 5 and 6; these classes were using the previous (Non-CSMP) curriculum. Sixth grade Non-CSMP classes were also tested in 1986. During the next six years the tests were administered to CSMP classes at various grade levels according to district needs. The main results of the MANS testing are as follows:

1. CSMP classes, grades 5 and 6, in their first year of implementation of the curriculum had significantly higher Total MANS scores than the previous Non-CSMP classes at the corresponding grade levels. Their scores on the various individual MANS categories were also higher and the difference was significant on 15 of the 18 categories (nine at each grade).
2. CSMP grades 5-6 MANS scores increased still more beyond those of the initial implementation as teachers became more familiar with the CSMP curriculum. They have continued at these high levels in the intervening years.
3. Manhasset average MANS scores are above the level achieved by most CSMP classes of comparable ability in other school districts.







CSMP Summary Evaluation Report  
Guilderland Central School District, 1982-92

Martin Herbert

Evaluation Consultant  
January, 1993

## Table of Contents

History of CSMP in Guilderland.....	1
Administration of the MANS Tests.....	2
Initial Guilderland CSMP - Non-CSMP Comparisons.....	4
Guilderland Changes Over Time.....	8
Guilderland Versus Other CSMP Classes .....	10
Teacher Reactions to CSMP.....	13
Summary.....	18
Appendix A. District Average MANS Scores, 1982-92	
Appendix B. Description of MANS Tests	

## HISTORY OF CSMP IN GUILDERLAND

The Guilderland, NY, Central School District began using the CSMP curriculum in first grade in the 1978-79 school year. Approximately half the first grade classes used CSMP and the remainder used the regular district mathematics curriculum.

The following year, 1980-81, all first grade classes used CSMP and half the second grade classes. From year-to-year, CSMP usage advanced one grade level; by 1984-85 all grades K-6 classes in Guilderland were using CSMP and have continued to do so since then. Table 1, below, shows the schedule of implementation.

Table 1  
CSMP History in Guilderland

Grade	Year						
	78-79	80	81	82	83	84	85-92
1	half-CSMP	CSMP	CSMP	CSMP	CSMP	CSMP	CSMP
2	Non-CSMP	half CSMP	CSMP	CSMP	CSMP	CSMP	CSMP
3	Non-CSMP	Non-CSMP	half-CSMP	CSMP	CSMP	CSMP	CSMP
4	Non-CSMP	Non-CSMP	Non-CSMP	half-CSMP	CSMP	CSMP	CSMP
5	Non-CSMP	Non-CSMP	Non-CSMP	Non-CSMP	half-CSMP	CSMP	CSMP
6	Non-CSMP	Non-CSMP	Non-CSMP	Non-CSMP	Non-CSMP	half-CSMP	CSMP

## ADMINISTRATION OF THE MANS TESTS

### Description

The MANS Tests are a collection of short tests designed to assess how well students can use mathematical and thinking skills in situations that are new or unfamiliar to them. The tests are in plain English and do not use terminology that is specific to any particular curriculum.

MANS Tests are grouped into seven core categories based on the content and kind of problem solving skills being tested:

- Computation
- Estimation
- Mental Arithmetic
- Number Representations
- Relations and Number Patterns
- Word Problems
- Elucidation of Multiple Answers

In grades 4-6, additional MANS categories are:

- Fourth: Geometry
- Fifth: Geometry, Organization of Data, Probability
- Sixth: Algebra, Organization of Data, Probability

The MANS Tests are described in Appendix B

### Administration

Since 1982, the MANS Tests have been administered in Guilderland schools at various grade levels in various years, according to the wishes of the school district.

The tests have served the following purposes:

- a. Comparison of student performance before and after the introduction of CSMP,
- b. Assessment of change in student performance with increasing district experience with CSMP,
- c. Comparison of Guilderland student performance with that of CSMP students in other districts.

Table 2, below, shows when and at what grade levels the tests were administered. ("X" means all classes were CSMP and were tested.)

Table 2  
Administration of MANS Tests, 1982-92

Grade	Year										
	81-82	83	84	85	86	87	88	89	90	91	92
2							X	X	X	X	X
4	Both		X	X	X	X	X			X	X
5	Non-CSMP		X			X	X	X	X	X	X
6	Non-CSMP			X		X		X	X		

### Computation of Class Scores

In order to increase the number of test items to which the class as a whole is exposed, parallel forms of individual MANS tests are used when appropriate. This is not always possible; for some tests, the directions to be given by the tester must be specific to a particular problem situation, so that all students must then work on the same set of questions. Thus, on some tests, half the students take half the items while the other half take the remaining half of the items. On other tests, all students take the same set of items.

Class scores are calculated as the sum of the average scores on each set of items, regardless of whether the set of items was taken by all students in the class or only half the students. Class scores were computed for Total MANS and for each MANS Category. In addition, class scores were calculated on a special Vocabulary test included with the MANS. This tests served as a measure of ability for the individual student and, when averaged, for the class. It was used as a covariate in much of the analysis that follows.

## INITIAL GUILDERLAND CSMP - NON-CSMP COMPARISONS

Non-CSMP classes were tested in 1982 in grades 4-6. This section compares their performance with that of subsequent CSMP classes at the same grade level the first year such CSMP classes were tested. The following numbering scheme is used for all grade levels:

Year 0: CSMP is implemented in half the classes

Year 1: The next year, in which CSMP is used for the first time district-wide

Year 2: The next year, etc.

For example, Year 1 was 1982-83 for fourth grade, 1983-84 for fifth grade, and 1984-85 for sixth grade.

### Statistical Analysis

For each MANS Category and for Total MANS, an Analysis of Covariance procedure was carried out to compare the CSMP and Non-CSMP classes. Vocabulary score was used as a covariate, meaning that, effectively, MANS class scores were adjusted to take into account differences in ability as measured by Vocabulary scores.

Results for grades 4-6 are shown in Tables 3-5, respectively. All significant differences in these tables were in favor of CSMP classes.

Table 3  
Fourth Grade CSMP (Year 0) Versus Non-CSMP

	Raw Score Means		Adjusted Means		Statistical Significance <sup>1</sup>
	CSMP	Non-CSMP	CSMP	Non-CSMP	
Computation	21.6	22.3	21.6	22.3	-
Estimation	28.4	25.5	28.3	25.6	*
Mental Arithmetic	21.4	16.9	21.3	17.0	**
Number Representatns	18.3	16.9	18.2	17.0	-
Relations, Numb Pats	33.4	22.5	33.3	22.7	**
Word Problems	13.3	11.9	13.3	11.9	-
Multiple Answers	18.2	17.2	18.6	17.3	-
Geometry	4.0	3.8	3.9	3.9	-
Total MANS	158.7	137.2	158.1	137.6	*
Vocabulary	28.6	28.4			
Number of classes	5	7			

<sup>1</sup> F-test with 1 and 10 degrees of freedom

\* = Probability that differences this large between the two groups could have happened by chance is less than .05

\*\* = Probability is less than .01.

Table 4  
Fifth Grade CSMP (Year 1) Versus Non-CSMP

	Raw Score Means		Adjusted Means		Statistical Significance <sup>1</sup>
	CSMP	Non-CSMP	CSMP	Non-CSMP	
Computation	23.1	24.4	25.7	22.6	*
Estimation	16.7	14.8	16.5	15.3	*
Mental Arithmetic	25.4	19.9	25.1	20.7	**
Number Representatns	24.0	21.3	24.1	21.7	-
Relations, Numb Pats	35.1	28.1	34.5	29.7	**
Word Problems	13.3	10.4	13.1	11.0	**
Multiple Answers	24.8	22.4	24.2	24.0	-
Geometry	6.7	5.8	6.6	6.0	-
Organization of Data	8.3	7.9	8.2	8.0	-
Probability	9.1	7.9	9.1	8.0	-
Total MANS	187.2	163.1	184.5	169.8	*
Vocabulary	34.0	31.9			
Number of classes	10	4			

<sup>1</sup> F-test with 1 and 12 degrees of freedom.

Table 5  
Sixth Grade CSMP (Year 1) Versus Non-CSMP

	Raw Score Means		Adjusted Means		Statistical Significance <sup>1</sup>
	CSMP	Non-CSMP	CSMP	Non-CSMP	
Computation	26.2	24.7	26.2	24.8	*
Estimation	22.4	19.7	22.3	20.1	-
Mental Arithmetic	21.8	18.1	21.7	18.4	**
Number Representatns	27.6	24.1	27.5	24.4	**
Relations, Numb Pats	46.6	36.8	46.4	37.4	**
Word Problems	13.5	11.9	13.4	12.2	-
Multiple Answers	33.3	27.5	33.1	28.0	**
Algebra	13.5	13.6	13.8	13.5	-
Organization of Data	5.9	5.5	5.4	5.9	-
Probability	5.8	5.2	5.8	5.4	-
Total MANS	217.0	186.1	216.0	188.9	**
Vocabulary	27.4	26.6			
Number of classes	11	4			

<sup>1</sup> F-test with 1 and 13 degrees of freedom.

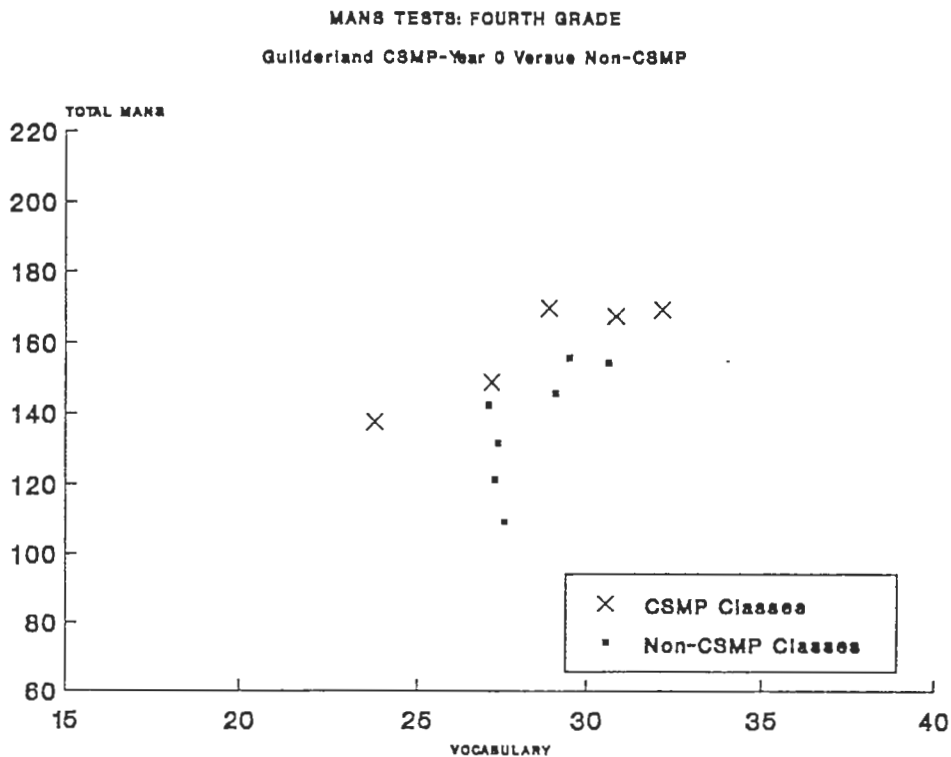
CSMP classes had significantly higher Total MANS scores at all three grade levels.

With respect to individual MANS categories, CSMP classes had higher scores on every category at every grade level except Computation in fourth grade. The differences were statistically significant:

- at all grade levels for Mental Arithmetic and Relations and Number Patterns
- at one or two grade levels in the other five core categories (Computation, Estimation, Number Representations, Word Problems, Multiple Answers)
- at none of the grade levels in the additional MANS categories (Algebra, Geometry, Organization of Data, Probability)

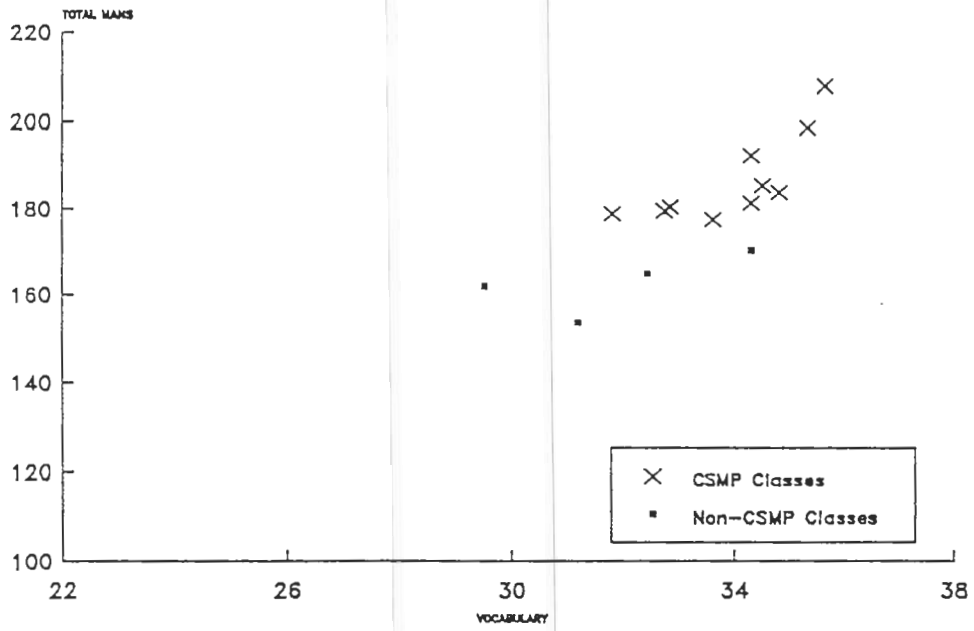
### Graphs of Class Scores

The graphs which follow show Total MANS score for each class, one graph for each grade level. Each class is shown by an entry on the graph, with Total MANS score plotted against Vocabulary score.

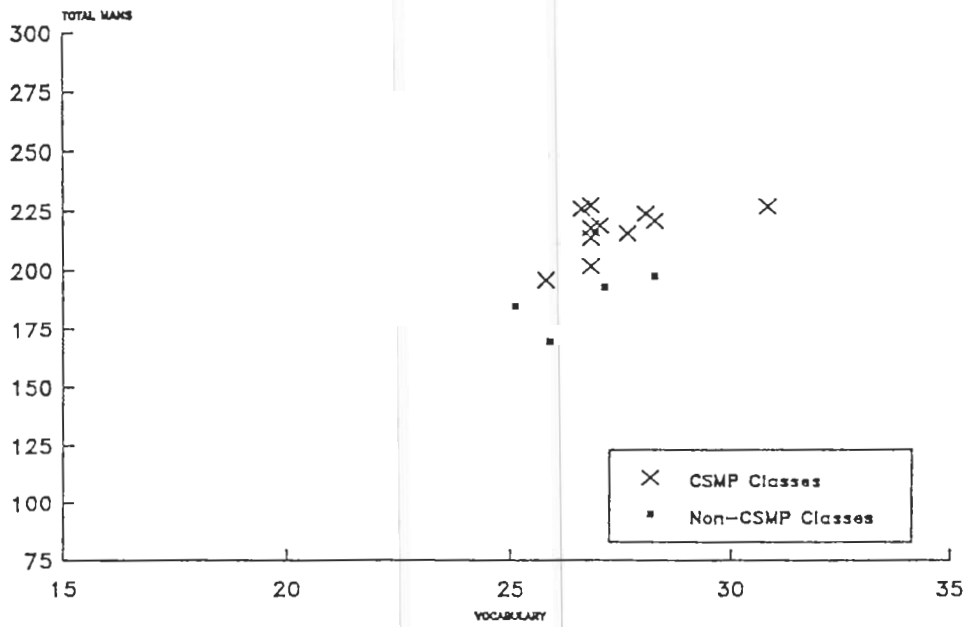




MANS TESTS: FIFTH GRADE  
 Guilderland CSMP-Year 1 Versus Non-CSMP



MANS TESTS: SIXTH GRADE  
 Guilderland CSMP-Year 1 Versus Non-CSMP



## GUILDERLAND CHANGES OVER TIME

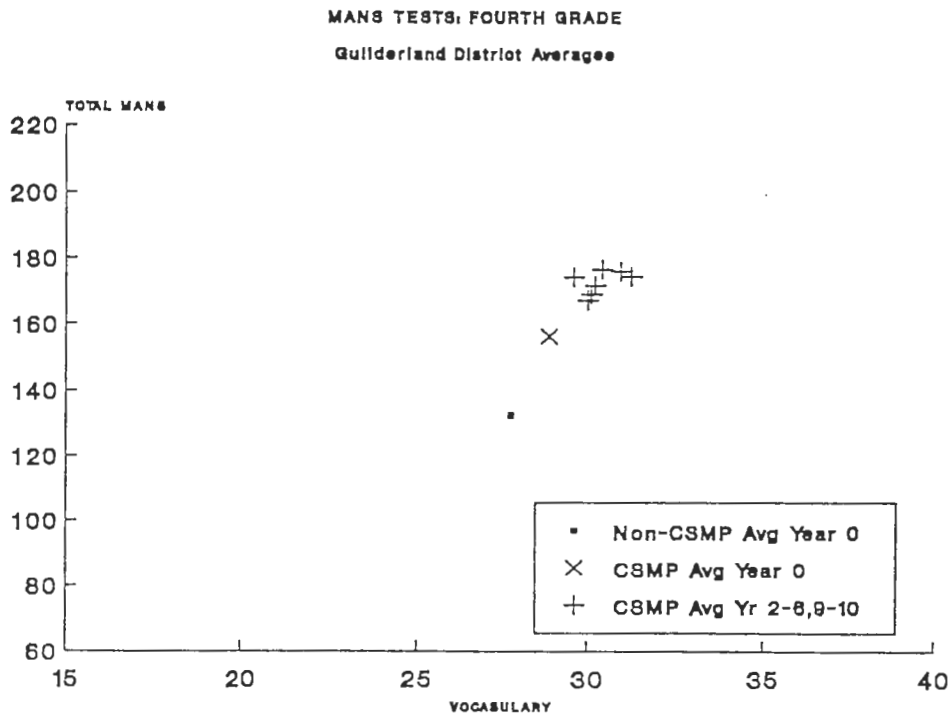
An important question with respect to any new curriculum is whether, with the passing of time, initial enthusiasm wears off and performance gradually declines. Alternatively, as teachers get more experienced with the curriculum, does performance improve?.

To investigate this question, at each grade the district mean Total MANS score (the mean of all class means) was calculated for each year in which the MANS Tests were administered at that grade level. Appendix A lists these district mean Total MANS scores as well as for each MANS Category.

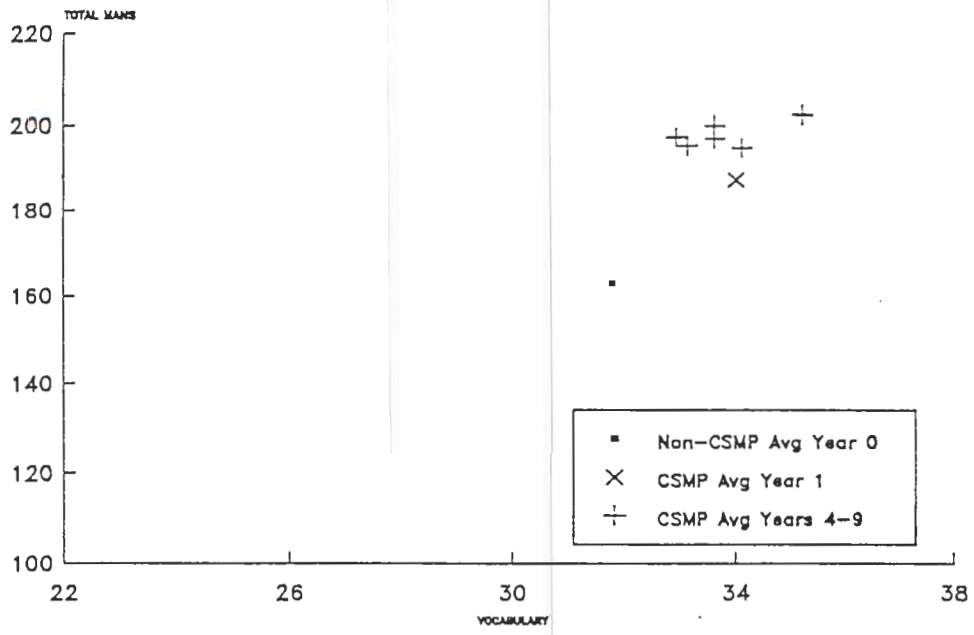
The graphs below, one per grade level, compare district means for three types of classes:

- Non-CSMP (1982) - one entry
- CSMP Year 0 or Year 1 (used in previous analysis) - one entry
- CSMP Years 2 and higher (4-7 entries depending on grade level)

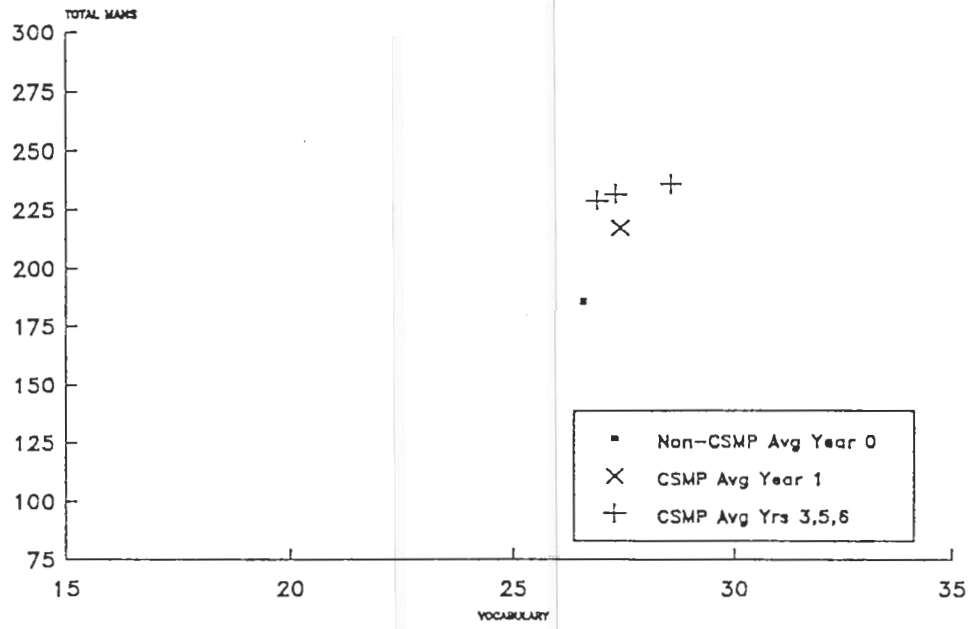
The graphs are remarkably consistent from grade-to-grade. They show clearly that MANS scores improve when CSMP is implemented, improve again with further experience, and then remain at those high levels over time. Thus the program has been maintained at a high level over a significant period of time in spite of the inevitable staff turnover. For example, for the period 1984-1992, the turnover rate for 4th and 5th grade teachers was approximately 50%; clearly the district has been able to train these teachers and integrate them smoothly into the CSMP program.



MANS TESTS: FIFTH GRADE  
Guilderland District Averages



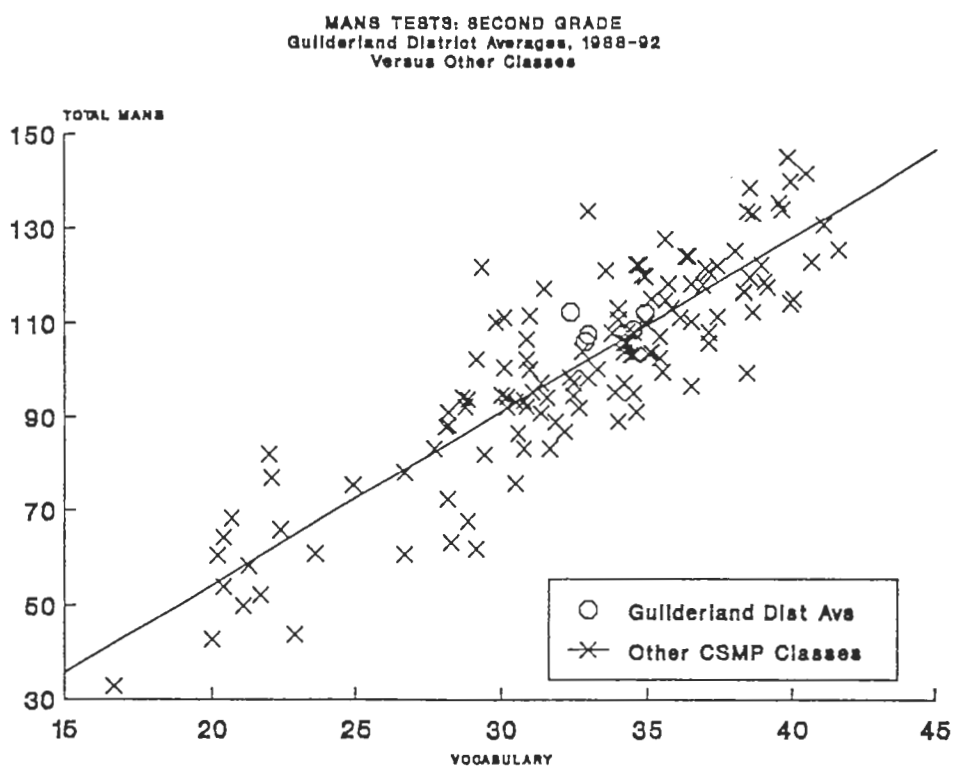
MANS TESTS: SIXTH GRADE  
Guilderland District Averages



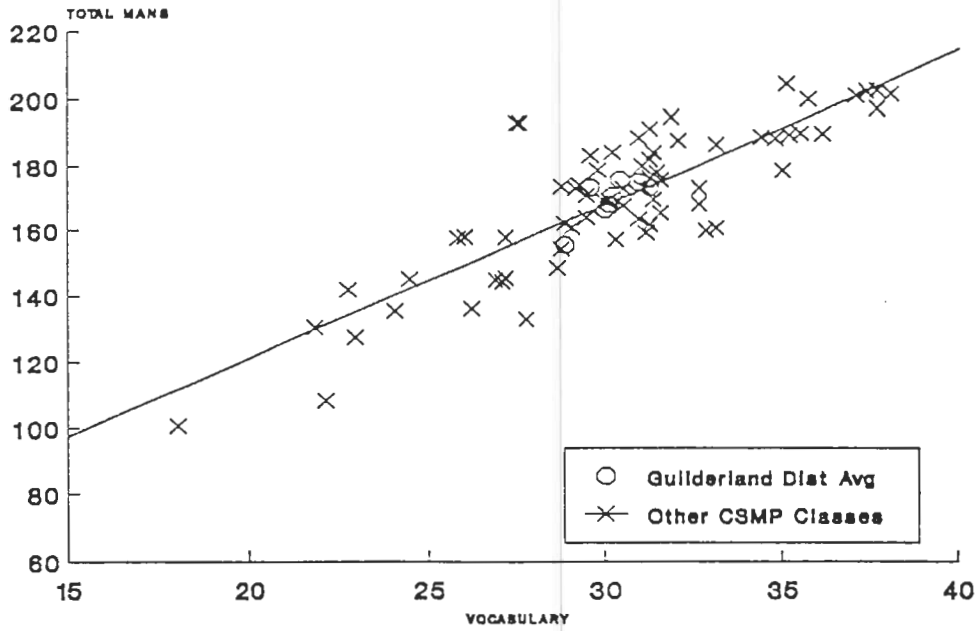
## GUILDERLAND VERSUS OTHER CSMP CLASSES

The last section of MANS Test analysis compares graphically the performance of Guilderland students with that of CSMP students in other grades. Guilderland district averages are shown (as in the previous graphs) superimposed on a representative set of class means from other districts using CSMP. Note that the Guilderland entries on the graph are district means while the other entries are for (Non-Guilderland) class means.

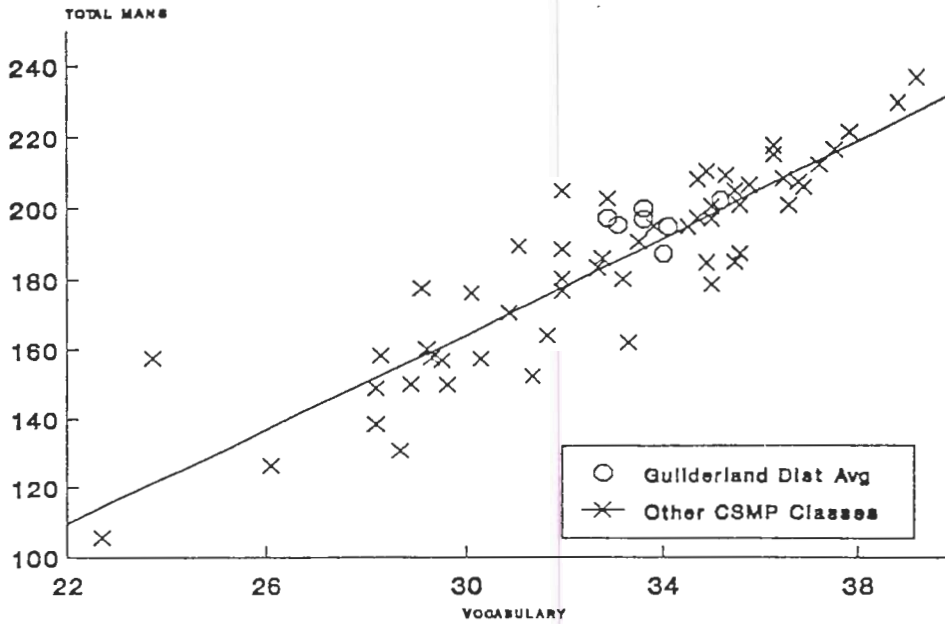
Each graph contains a regression line, which represents the best predictor of Total MANS score based on Vocabulary score. The line was calculated using the Non-Guilderland class scores and represents a norm of sorts; scores above the line are higher than typically achieved by CSMP classes of the same ability level.



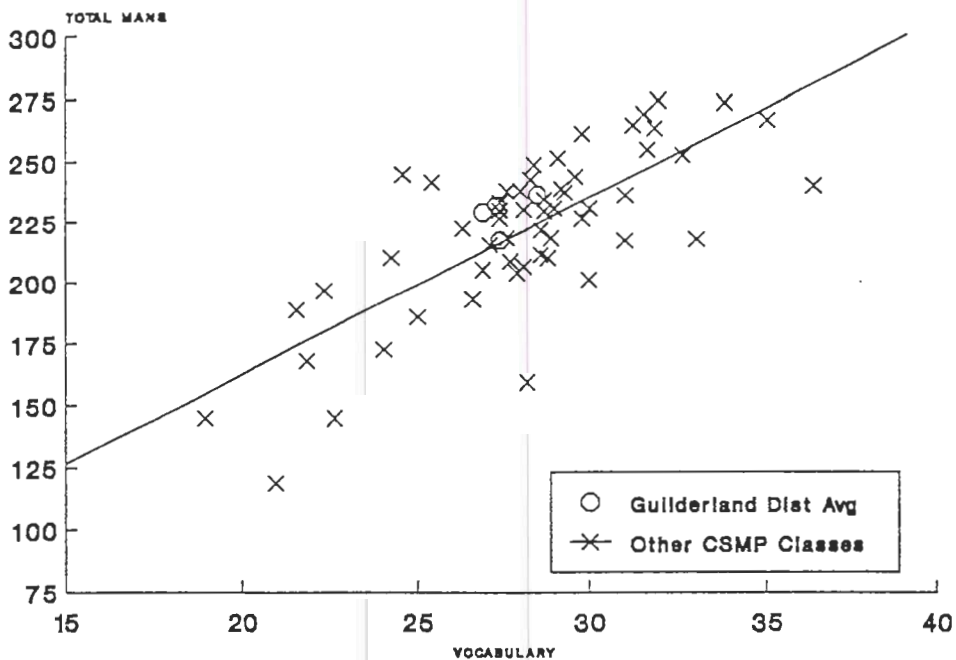
**MANS TESTS, FOURTH GRADE**  
 Guilderland Dist. Averages, 82-88, 91-92  
 Versus Other CSMP Classes



**MANS TESTS, FIFTH GRADE**  
 Guilderland Dist. Averages 1984, 87-92  
 Versus Other CSMP Classes



MANS TESTS: SIXTH GRADE  
 Guilderland Dist Averages, 1986,87,90,91  
 Versus Other CSMP Classes



It can be seen that, in grades 2 and 6, all Guilderland entries are above the regression line. In grade 4 and 5, all but one are above the line (the exception in each case represents the initial CSMP implementation).

## TEACHER REACTIONS TO CSMP

In the spring of 1988, a questionnaire was completed by all 2nd, 4th and 5th grade teachers (38 teachers in all). The questionnaire was similar to one administered in previous years to CSMP teachers at various sites. Thus responses could be interpreted both in an absolute sense and also in comparison to these previous responses.

Unless otherwise noted, responses will be summarized across grade levels. Where the responses differed substantially between grades, data will be provided separately for each grade.

### A. Teacher Experience and Training for CSMP

#### A1. Teaching experience

About 3/4 of the teachers had at least 10 years of teaching experience; only 5 of the 38 teachers had less than six years of experience.

#### A2. Experience at present grade level with CSMP

About 2/3 of the teachers had taught CSMP at their present grade level for at least four years. The remaining teachers were equally divided among one, two or three years - 10 - 15% each.

#### A3. Academic background

About 2/3 of the teachers had attained at least a Master's Degree. Most had an undergraduate background in Elementary Education with one or two mathematics courses.

#### A4. Attendance at math-related activities

The percentages of teachers indicating that they had attended the following activities within the last two or three years is shown below:

- 70% - Observed classroom demonstrations of math methods/curricula
- 64% - Attended local informal math group meetings
- 32% - Participated in local math committees or curriculum projects
- 16% - Attended regional math conferences

In summary, the teaching staff appears to well qualified and experienced with CSMP and participates fairly actively in a range of inservice activities. Their usage of CSMP has probably reached a mature level of implementation.

## B. Implementation of CSMP

### B1. Composition of classes by ability grouping

Almost all teachers said classes were not ability grouped.

### B2. Assignment of homework

About 85% said homework was regularly assigned.

### B3. Use of hand calculators

All teachers said hand calculators were used in their classrooms.

### B4. Assignment of teacher aides

Half the second grade teachers had an aide regularly assigned to their classroom; about a quarter of the 4th and 5th grade teachers had an aide.

### B5. Length of time for math class

Average number of minutes per day reported for math class was 48 for 2nd grade, 50 for 4th grade and 61 for 5th grade. This was marginally higher than 2nd and 5th grade teachers in other districts have reported.

The distribution of activities during math time differed somewhat by grade:

	2nd/4th	5th
Developing a lesson	52%	70%
Supervising while students work on their own	23%	17%
Leading the class in reviewing completed assignments	8%	5%
Working with a student or small group of students	15%	7%

### B6. Supplementation

About 10% of math time was spent in supplementing the CSMP curriculum (slightly higher in 2nd grade). About half the teachers indicated that supplementing was usually for a few minutes at a time, about a quarter of the teachers said it was for a full math period at a time and about 8% said it was for several consecutive math periods. This amount of supplementing is considerably less than is usually reported by CSMP teachers; between 15 and 20% of math time spent supplementing is most often reported.

Most of the supplementing fell into one of two categories. At 4th and 5th grades it was usually for computational skills - basic facts and algorithms. At 2nd grade it was also for topics omitted from the CSMP curriculum, such as money and telling time.



Most teachers indicated that the amount of supplementing this past year was about the same as last year, but about a quarter of the teachers said they spent more time supplementing (higher in 4th grade).

#### B7. Teacher preparation time

Teacher preparation time for math was roughly equal to the preparation time for other subjects taught this past year; about 60% said it was the same, 25% said it was less, and 15% said it was more.

Teacher preparation was also comparable to the time spent with other math programs these teachers had taught; about 30% said it was the same, 25% said it was less, and about 40% said it was more than with other math programs. At 4th and 5th grades 60% of teachers said they spent more time preparing for CSMP.

#### B8. Teacher training

Only one teacher reported not receiving pre- or inservice CSMP training and all but 3 of the remaining 37 teachers reported that the training they received for CSMP was sufficient.

Teachers were asked for suggestions to improve training. Most teachers did not make specific suggestions or merely commented that they were satisfied with the way the training went. A number of second grade teachers (and one or two 4th and 5th grade teachers) suggested that training sessions be more targeted to specific grade levels and to specific topics at these grade levels.

Teachers were asked how many times they met with the CSMP Coordinator during the past year. Most responses were either zero or 1-2 times. At 4th and 5th grades most teachers said that this number of meetings was about right. 10% of 4th grade teachers and 35% of the 5th grade teachers said it was not often enough but responses to the adequacy of meetings was unrelated to how often meetings were held. At second grade however, almost half the teachers indicated that they did not meet often enough with the coordinator and almost all of these teachers said they had not met with the coordinator during the past year.

Teachers were asked how frequently they met with other CSMP teachers in their building and whether or not it was often enough. About a third of the teachers said they did not meet or met rarely or informally. Almost all of these teachers said this was not enough. The other teachers said they met as needed or on some regular basis and these teachers usually set this was often enough.

## C. Teacher Evaluations of CSMP

### C1. CSMP compared to previous math program

Teachers were asked to rate CSMP, compared to the math program they had previously used, on a number of criteria. Ratings were from 1 to 5 where "1" = much lower, "2" = lower, "3" = about the same, "4" = higher, and "5" = much higher. The average rating for each issue is shown below by grade level and overall. Also shown are the average ratings from teachers in other districts.

The items are grouped: the first group (items 1-5) received very high ratings (an average of over 4.0 or between "higher" and "much higher"); the middle group (item 6) received slightly above average ratings; and the last group (items 7-8) received slightly below average ratings.

		2nd Grade	4th Grade	5th Grade	Over- all
1 Overall quality	Guild.	4.4	4.2	4.3	4.3
	Other	4.5	4.0	3.7	4.1
2 Student interest and involvement	Guild.	4.6	4.0	4.6	4.4
	Other	4.2	4.0	3.9	4.0
3 Student ability to do logical reasoning	Guild.	4.6	4.3	4.3	4.4
	Other	4.3	4.3	4.4	4.3
4 Appropriateness for high ability students	Guild.	4.6	4.3	4.6	4.5
	Other	NA	4.4	4.6	4.5
5 Student achievement - math concepts	Guild.	4.3	4.3	4.5	4.4
	Other	NA	3.7	3.8	3.8
6 Student ability to do word problems	Guild.	3.2	3.1	3.5	3.3
	Other	3.4	3.4	3.3	3.4
7 Student achievement - computation skills	Guild.	2.9	2.8	3.0	2.9
	Other	2.8	2.5	2.5	2.6
8 Appropriateness for low ability students	Guild.	3.2	2.5	2.1	2.6
	Other	NA	2.7	2.7	2.7

Overall, CSMP was rated very highly by Guilderland teachers. Their ratings were fairly similar to ratings given by other teachers previously surveyed, except for higher Guilderland ratings for "Student interest and involvement" (1) and for "Student achievement of math concepts" (5).

## C2. Best aspects of CSMP

Teachers were asked, in an open-ended question to name the best aspects of CSMP. The most common responses, and the percentage of teachers giving each response, are shown below. Percentages are based on the number of teachers responding to this question (34).

- 43% Interesting, high involvement, motivates, exciting, etc.
- 38% Thinking skills, problem solving (higher for 5th grade teachers)
- 32% Variety of topics, schedule, spiral approach
- 34% Concepts, student understanding, different strategies
- 16% Challenging for students
- 25% (2nd grade teachers only): a. Hands on approach
- 25% (2nd grade teachers only): b. Appropriate for all students

## C3. Worst aspects of CSMP

Teachers were also asked to name the worst aspects of CSMP. Common responses are shown below.

- 46% Basic facts, more drill, poor for computation skills, algorithms
- 10% - 15% for each of the following:
  - a. Poor for low ability students
  - b. Too much material, yearly schedule is too crowded
  - c. Some lessons are too long
  - d. Missing curriculum topics - time, money, roman numerals
  - e. Some lessons seem irrelevant, pointless, don't mesh

## C4. Overall evaluation of CSMP

In the final open ended question, teachers were asked to give their overall evaluation of CSMP. Of the 37 teachers responding to this item:

- 70% gave only positive comments - "excellent", "super", "wonderful", "enjoy it", "very good", "good", "fun to teach", "strong program", "outstanding", "much better than planned textbook", etc.
- 16% gave positive comments but added some caveat, for example, "I like it very much but add much to it for ease of understanding", "Very good except for computation."
- 14% gave equally positive and negative comments or a neutral rating for example, "OK, not great."

## SUMMARY

### Major Results of MANS Testing

The Guilderland Central School District began using the CSMP curriculum at the earliest grades in 1978-79. Over a six year period the full grades K-6 curriculum became implemented district-wide and continues to be so. In 1982 the MANS Tests were administered to approximately half of the classes in grades 4-6; these classes were using the previous (Non-CSMP) curriculum. During the next 10 years the tests were administered to CSMP classes at various grade levels according to district needs. The main results of the MANS testing are as follows:

1. CSMP classes, grades 4-6, in the early stages of implementation of the curriculum had significantly higher Total MANS scores than the previous Non-CSMP classes at the corresponding grade levels. Their scores on the individual MANS categories were almost universally higher, significantly so at all grade levels in Mental Arithmetic and Number Patterns and Relationships, and at one or two grade levels in the other core MANS categories.
2. CSMP grades 4-6 MANS scores increased still more beyond those of the initial implementation as teachers became more familiar with the CSMP curriculum. They have continued at these high levels in the intervening years.
3. Guilderland average MANS scores are at or above the level achieved by most CSMP classes of comparable ability in other school districts.

### Teacher Reactions to CSMP

In the spring of 1988, a questionnaire was completed by all 2nd, 4th and 5th grade teachers (38 teachers in all). The questionnaire was similar to one administered in previous years to CSMP teachers at various sites.

Teachers were asked to rate CSMP, compared to the math program they had previously used, on a number of criteria. Overall, CSMP was rated very highly by Guilderland teachers, particularly (at least 4.3 on a 5-point scale) on overall quality, student interest and involvement, student ability to do logical reasoning, appropriateness for high ability students, and student achievement of math concepts.

In an open ended question, teachers were asked to give their overall evaluation of CSMP. Of the 37 teachers responding to this item:

70% gave only positive comments - "excellent", "super", "wonderful", "enjoy it", "very good", "good", "fun to teach", "strong program", "outstanding."

16% gave positive comments but added some caveat, for example, "I like it very much but add much to it for ease of understanding", "Very good except for computation."

14% gave equally positive and negative comments (or neutral) for example, "OK, not great."





CSMP Evaluation Report  
Guilderland Central School District, 1992-94

Martin Herbert  
Evaluation Consultant

December, 1994

## Table of Contents

Summary . . . . .	1
Setting . . . . .	2
Computation of Class Means . . . . .	3
Statistical Analysis of MANS Scores . . . . .	4
Graphs of MANS Class Scores . . . . .	8
Appendix: Summary Description of MANS Tests	



## Summary

In the spring of 1994, the MANS Tests were administered to all students in grade 2 and 4 - 6 in the Guilderland Central School District. Results were compared with those obtained in previous administrations of the test in 1990 or 1992 (depending on grade level).

At all grade levels, the 1994 classes had slightly higher scores on almost all MANS categories and the differences were significant at the .05 level in five of these comparisons. The 1994 classes had higher scores on Total MANS, although the differences were significant only in the .05 - .20 range.

In addition, graphical data showed clearly that the MANS scores for the 1994 Guilderland classes compared favorably with scores from CSMF classes.

Thus, after several years of CSMF usage, Guilderland Schools have been able to maintain and even improve their excellent performance on the MANS Tests.

CSMP has been used for a number of years in the Guilderland Central School District, New York, as the mathematics curriculum for all students in grades K - 6. During that time a considerable amount of evaluation data has been collected. The most recent report of this data was prepared in 1992.

In the spring of 1994 the MANS Tests (Mathematics Applied to Novel Situations) were administered to all students grades 2 - 4 and in grade 6.

The MANS Tests are a collection of short tests designed to assess how well students can use mathematical and thinking skills in situations that are new or unfamiliar to them. The tests are in plain English and do not use terminology that is specific to any particular curriculum. The tests are described in the Appendix.)

This report systematically compares MANS scores from 1994 with scores from 1992. (In sixth grade, the tests were not administered in 1992 and so results from 1990 were used.) In addition, graphical data is presented at each grade level comparing Guilderland scores with those obtained from a representative sample of CSMP classes from other districts.

The report therefore provides a kind of status check for Guilderland Schools. On the one hand, the program is clearly well entrenched in the district and one would not expect any large changes in MANS scores in 1994. On the other hand, one could hypothesize that the program may have lost its freshness which, when combined with inevitable teacher turnover during its years of use, might cause interest to slacken and scores to decline.

### Computation of Class Scores

In order to increase the number of test items to which the class as a whole is exposed, parallel forms of individual MANS tests are used when appropriate. This is not always possible; for some tests, the directions to be given by the tester must be specific to a particular problem situation, so that all students must work on the same set of questions. Thus, on some tests, half the students take half the items while the other half take the remaining half of the items. On other tests, all students take the same set of items.

Class test scores are calculated as the sum of the average scores on each set of items, regardless of whether the set of items was taken by all students in the class or only half the students.

Class scores used in this report were computed for each of the following:

a. The Vocabulary test administered as part of the MANS.

Scores on this test served as a measure of ability for the individual student and, when averaged, for the class.

b. Each MANS Category.

MANS Tests are grouped into seven core categories based on the content and kind of problem solving skills being tested as shown below. (For grades 4 - 6, there were additional categories as shown below) Class test scores for tests within each category were totaled to produce a class score in each of these MANS categories

Computation  
Estimation  
Mental Arithmetic  
Number Representations  
Relations and Number Patterns  
Word Problems  
Elucidation of Multiple Answers  
Geometry (4th and 5th grades)  
Probability (5th and 6th grade)  
Organization of Data (5th and 6th grade)  
Algebra (6th grade)

c. Total MANS score.

The total score is the sum of the various MANS Categories

Statistical Analysis of MANS Comparisons

For each MANS Category and for Total MANS, an Analysis of Covariance procedure was carried out to compare the 1994 Guilderland classes with the 1992 classes (1990 for sixth grade)

Vocabulary score was used as a covariate, meaning that, effectively, MANS class scores were adjusted to take into account differences in ability as measured by Vocabulary scores. The covariate adjustments were very small since the Vocabulary scores of the two groups were almost identical.

The results are shown in the Tables 1 - 4 below. In each table, in addition to the raw and adjusted means, p-values are shown. The p-value is from the F-tests with 1 and 26 - 34 degrees of freedom (depending on grade level). It is the probability that differences as large as occurred between the two groups could have happened by chance. Only p-values below .20 are shown.

Second Grade Analysis of Covariance of Class Scores

MANS Category	1992	1994	Raw Score Means	Adjusted Means	p-value
Computation	14.0	14.5	14.0	14.5	
Estimation	10.0	10.1	10.0	10.1	
Mental Arithmetic	20.6	21.4	20.6	21.4	
Number Representatns	18.1	18.5	18.1	18.2	18.4
Relations, Numb Pats	29.2	29.8	29.2	29.2	29.8
Word Problems	6.0	6.3	6.0	6.0	6.3
Multiple Answers	9.6	11.1	9.6	9.6	11.1
Total MANS	107.6	111.7	107.6	107.8	111.5

Mean Vocabulary scores: 1992 = 33.0  
1994 = 33.4

Number of classes: 1992 = 17  
1994 = 19

Table 2

Fourth Grade Analysis of Covariance of Class Scores

MANS Category	1992	1994	1992	1994	p-value
	Raw Score Means		Adjusted Means		
Computation	23.7	24.1	23.8	24.1	
Estimation	30.6	31.1	30.7	31.0	
Mental Arithmetic	24.7	25.5	24.9	25.6	
Number Representatns	19.4	19.7	19.5	19.6	
Relations, Numb Pats	38.1	39.4	38.3	39.3	.13
Word Problems	14.7	15.3	14.8	15.2	
Multiple Answers	18.4	20.3	18.5	20.2	.01
Geometry	4.4	4.5	4.4	4.5	
Total MANS	174.1	180.0	174.8	179.2	.13

Mean Vocabulary scores: 1992 = 29.6  
1994 = 30.0

Number of classes: 1992 = 16  
1994 = 18

Fifth Grade Analysis of Covariance of Class Scores

Table 3

MAN'S Category	1992		1994		p-value
	Raw Score Means	Adjusted Means	Raw Score Means	Adjusted Means	
Computation	25.7	25.6	25.8	25.8	
Estimation	17.2	17.1	16.8	16.8	
Mental Arithmetic	26.0	26.0	26.3	26.4	
Number Representatns	26.5	26.4	27.0	27.2	.13
Relations, Numb Pats	37.1	37.0	37.9	38.0	.08
Word Problems	14.3	14.3	14.6	14.6	
Multiple Answers	27.7	27.7	30.3	30.4	.01
Geometry	7.6	7.5	7.6	7.7	
Organization of Data	8.4	8.3	8.4	8.5	
Probability	9.4	9.3	9.4	9.4	
Total MAN'S	199.9	199.2	204.1	204.8	.08

Mean Vocabulary scores: 1992 = 33.6  
1994 = 33.2

Number of classes: 1992 = 16  
1994 = 16

Sixth Grade Analysis of Covariance of Class Scores

Table 4

MANS Category	Raw Score Means		Adjusted Means		p-value
	1990	1994	1990	1994	
Computation	27.0	28.4	27.0	28.3	.03
Estimation	24.1	24.4	24.2	24.4	
Mental Arithmetic	22.7	23.6	22.7	23.6	
Number Representatns	29.4	30.6	29.4	30.6	.06
Relations, Numb Pats	49.3	51.4	49.4	51.3	.04
Word Problems	14.3	14.9	14.3	14.9	
Multiple Answers	38.3	39.4	38.3	39.3	.14
Algebra	13.8	14.9	13.9	14.9	.06
Organization of Data	6.2	6.2	6.2	6.2	
Probability	6.1	6.1	6.1	6.1	
Total MANS	231.6	240.0	231.9	239.8	.08
Mean Vocabulary scores: 1990 = 27.3 1994 = 27.5					
Number of classes: 1990 = 12 1994 = 16					

The data from these four tables show clearly that 1994 classes had systematically higher scores. The difference was significant at the .05 level in five places:

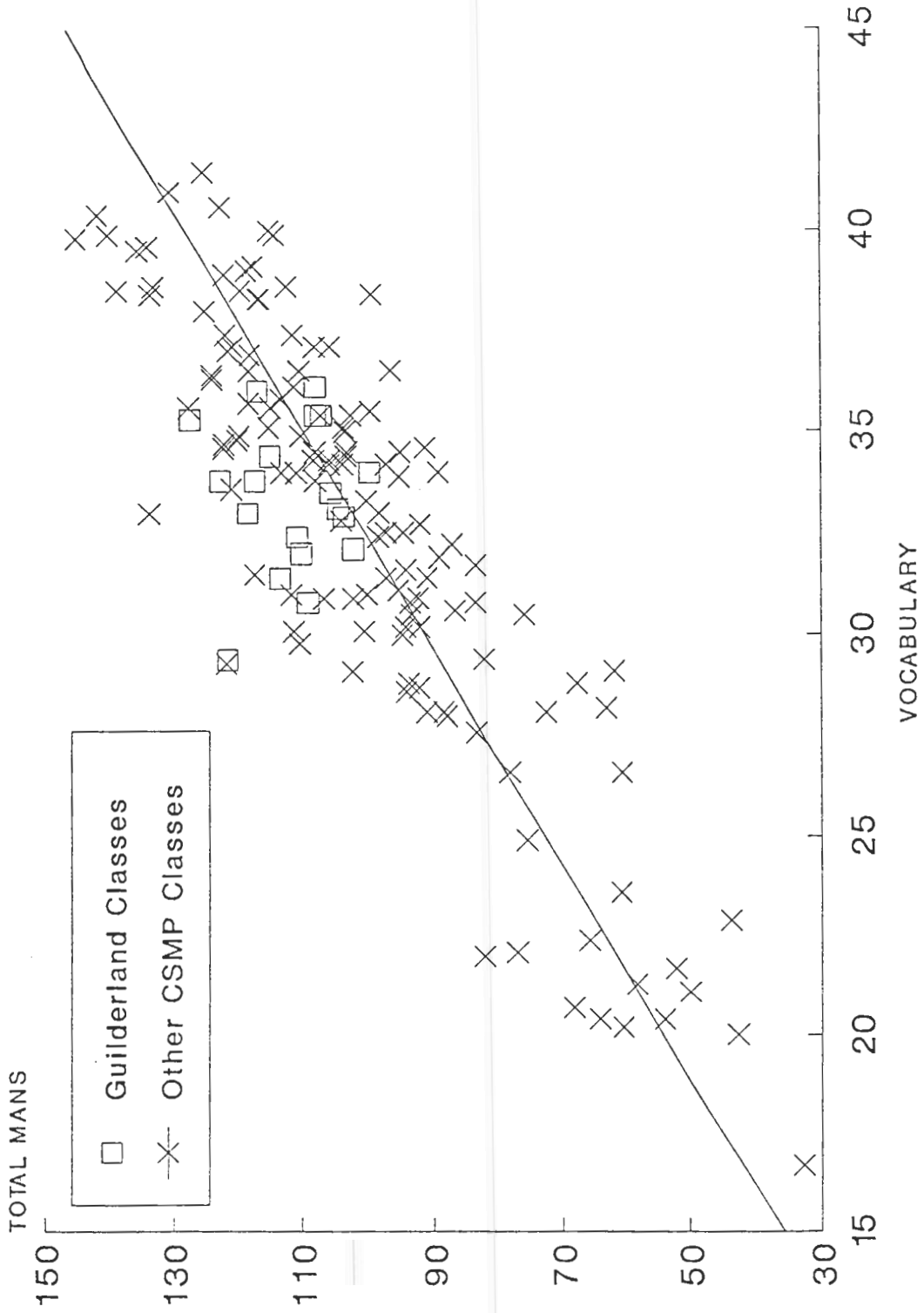
- Multiple Answers (grades 2,4 and 5)
- Computation (grade 6)
- Number Patterns and Relationships (grade 6)

The 1994 group had higher scores at each grade level in Total Mans scores. The differences never reached statistical significance, although the p-value was always less than .20.



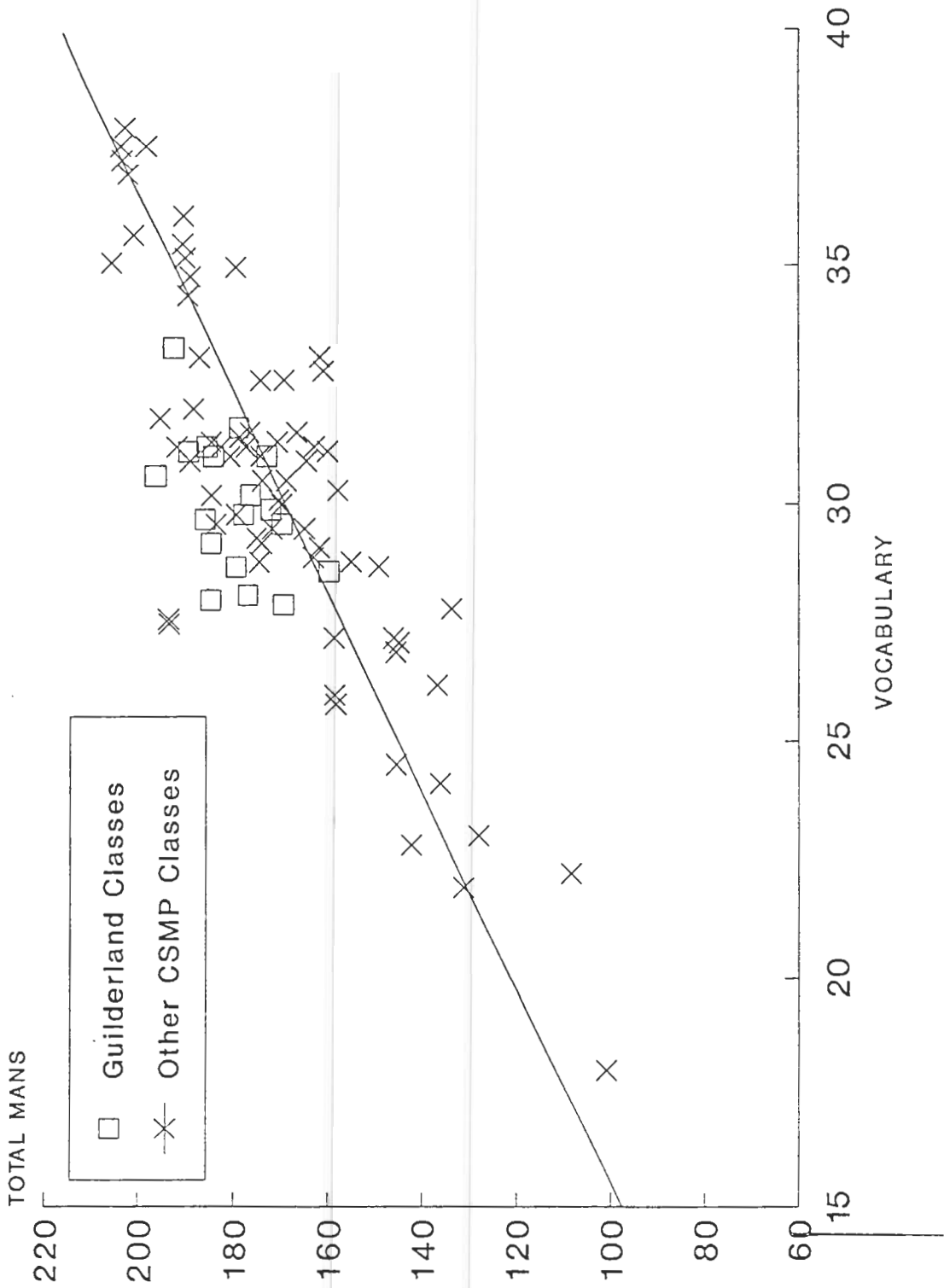


MANS TESTS: SECOND GRADE  
GUILDERLAND CLASSES, 1994



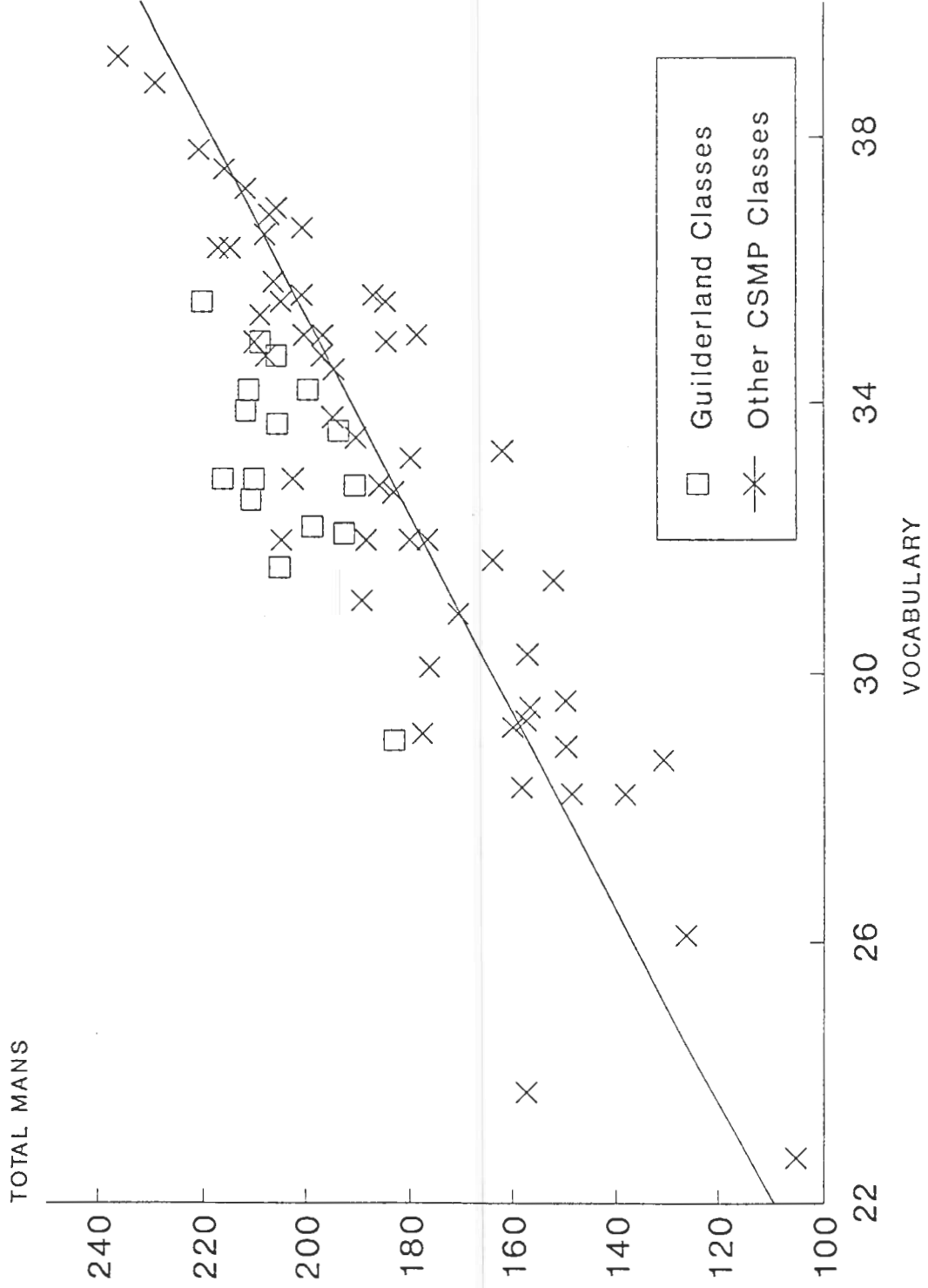
# MANS TESTS: FOURTH GRADE

GUILDERLAND CLASSES, 1994



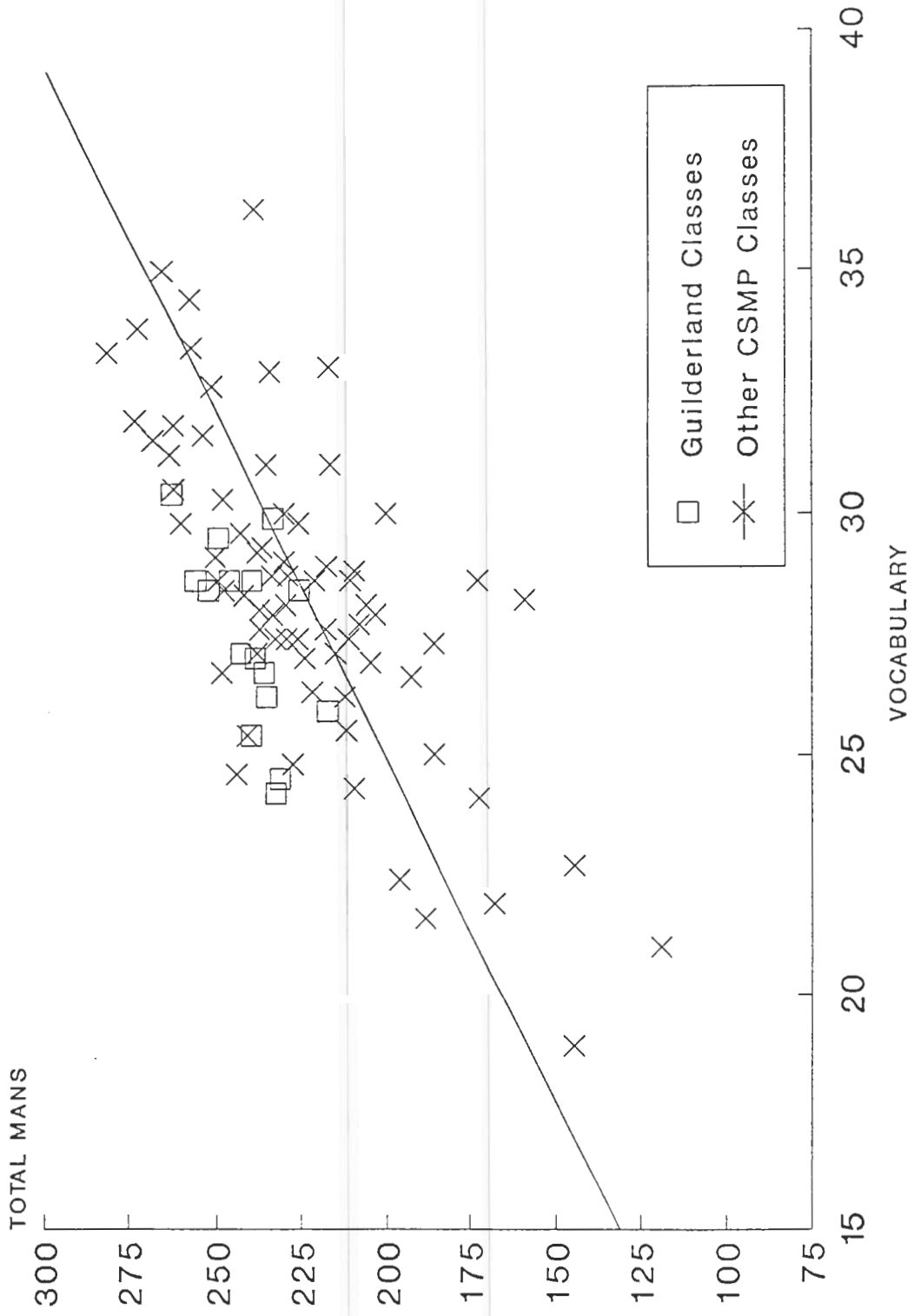
# MANS TESTS: FIFTH GRADE

## GUILDERLAND CLASSES, 1994



# MANS TESTS: SIXTH GRADE

Guilderland Classes 1994







CSMP Evaluation Report  
Hillsborough Township School District, 1992-94

Martin Herbert  
Evaluation Consultant  
December, 1994

Table of Contents

Summary . . . . .	1
Setting . . . . .	2
Computation of Class Means . . . . .	3
Fourth Grade Results: Statistical Analysis . . . . .	4
Graphs of Class Means . . . . .	5
Second Grade Results: Statistical Analysis . . . . .	8
Graphs of Class Means . . . . .	9
Appendix A. Description of 2nd Grade MANS Tests	
Appendix B. Description of 4th Grade MANS Tests	



## Summary

During the 1990-91 school year, the CSMF curriculum was used in 13 of the 18 second grade classes in the Hillsborough Township, New Jersey, Public Schools. The remaining schools used the regular (previous) district mathematics curriculum. The following year, schools in which CSMF had been used continue to use it third grade; schools in which the Non-CSMF curriculum had been used continue with that curriculum in 1992.

In the spring of 1991 the second grade MANS Test were administered to all second grade classes and comparisons made between CSMF and Non-CSMF classes. In the spring of 1992 the third grade MANS tests were administered to all third grade classes and, again, comparisons made between CSMF and Non-CSMF classes.

Statistical comparisons of MANS Test results between CSMF and Non-CSMF classes were carried out at each grade level using an Analysis of Covariance procedure, with Vocabulary score used as covariate.

At both grades, CSMF classes had significantly higher scores ( $p < .01$ ) on Total MANS. They also had significantly higher scores ( $p < .05$ ) on six of the seven MANS Categories in second grade and five of the seven in third grade.

In addition, second grade MANS Tests were re-administered in 1992 to all second grade classes. Schools which had used the Non-CSMF curriculum in 1991 used the CSMF curriculum in 1992 and the MANS scores of this subgroup rose dramatically with the introduction of CSMF. In the remaining schools, who were using CSMF again, scores rose very slightly, indicating some improvement with increased teacher experience with CSMF.

Fourth Grade

By the 1992-93 school year, all fourth grade classes in the Hillsborough Township School District, New Jersey, were using the CSMF curriculum. There were two distinct groups of classes: twenty classes were continuing CSMF from previous years while the other five classes were using CSMF for the first time (i.e., had been using the district's former math curriculum in grades K - 3).

In the spring of 1993 the MANS Tests (Mathematics Applied to Novel Situations) were administered to all students in fourth grades. The tests are a collection of short tests designed to assess how well students can use mathematical and thinking skills in situations that are new or unfamiliar to them. The tests are in plain English and do not use terminology that is specific to any particular curriculum. The fourth grade MANS Tests are described in Appendix B)

This report provides a statistical comparison of the performance of those two groups of CSMF fourth graders. It also provides a graphical comparison of Hillsborough CSMF fourth grade classes with fourth grade classes from other districts.

Second Grade

The CSMF curriculum was introduced gradually in Hillsborough schools. By 1990-91 13 second grade classes used CSMF and by 1991-92 all second grade classes were using CSMF. This usage has continued through 94.

In the spring of 1994 the MANS Tests were administered to all second grade classes. The purpose was to assess the performance of second graders as the second grader teachers accumulated more experience with the curriculum and it came to have less of a novelty effect.

## Computation of Class Scores

In order to increase the number of test items to which the class as a whole is exposed, parallel forms of individual MANS tests are used when appropriate. This is not always possible; for some tests, the directions to be given by the tester must be specific to a particular problem situation, so that all students must then work on the same set of questions. Thus, on some tests, half the students take half the items while the other half take the remaining half of the items. On other tests, all students take the same set of items.

Class test scores are calculated as the sum of the average scores on each set of items, regardless of whether the set of items was taken by all students in the class or only half the students.

Class scores used in this report were computed for each of the following:

a. The Vocabulary test administered as part of the MANS.

Scores on this test served as a measure of ability for the individual student and, when averaged, for the class.

b. Each MANS Category.

MANS Tests are grouped into seven categories based on the content and kind of problem solving skills being tested as shown below. (For fourth grade only there is one additional category, Geometry.) Class test scores for tests within each category were totaled to produce a class score in each of these MANS categories

Computation  
Estimation  
Mental Arithmetic  
Number Representations  
Relations and Number Patterns  
Word Problems  
Elucidation of Multiple Answers

c. Total MANS score.

The total score is the sum of the various MANS Categories

Statistical Analysis of Fourth Grade MANS Comparisons

For each MANS Category and for Total MANS, an Analysis of Covariance procedure was carried out to compare the "veteran" CSMF classes (composed of students who had studied CSMF since kindergarten) and "new" classes (whose students were studying CSMF for the first time).

Vocabulary score was used as a covariate, meaning that, effectively, MANS class scores were adjusted to take into account differences in ability as measured by Vocabulary scores.

The results are shown in the table below.

MANS Category	Raw Score Means		Adjusted Means	
	VETERAN	NEW	VETERAN	NEW
Computation	25.7	25.2	25.4	26.4
Estimation	30.8	28.2	30.4	30.2
Mental Arithmetic	25.0	19.5	24.2	22.7
Number Representatns	19.9	18.4	19.5	20.3
Relations, Numb Pats	36.8	29.7	35.6	34.2
Word Problems	15.3	13.1	14.9	15.0
Multiple Answers	21.6	18.8	21.5	19.2
Geometry	4.5	3.9	4.5	4.1
Total MANS	179.7	156.7	175.8	172.1
Mean Vocabulary scores:	VETERAN = 29.6	NEW = 25.5		
Number of classes:	VETERAN = 20	NEW = 5		

The Veteran-CSMP group had higher MANS scores than the New-to-CSMP group. However, most of the difference could be accounted for statistically by their higher scores on the Vocabulary test. The remaining differences (represented under "Adjusted Means") were not statistically significant. In only one of the MANS Categories did the difference approach significance: Multiple Answers where the difference in favor of the Veteran group was significant at the .07 level (using an F-test with 1 and 23 degrees of freedom).

The next two pages show graphs of class scores. Each class is shown by an entry on the graph, with Total MANS score plotted against Vocabulary score.

The first graph shows only the 25 Hillsborough fourth grade classes. Veteran classes are distinguished from New-to-C SMP classes. The differences in Vocabulary levels is apparent; the thirteen highest scoring classes were from the Veteran group.

Also notable is the fact that scores do show any consistency at the lower vocabulary score level. The line on the graph is the regression line (for Veteran-C SMP classes) showing the prediction of MANS scores based on the vocabulary score of a class. Note the class with the lowest vocabulary score (left-most on the graph); the MANS score for this class was about 50 points above the predicted score.

The second graph shows the average Total MANS scores for the two groups of Hillsborough classes (i.e., the average across the 20 C SMP classes and across the five Non-C SMP classes). Also shown is a representative sample of other fourth grade C SMP and Non-C SMP classes. For this graph, the regression line shown is based on Non-C SMP classes.

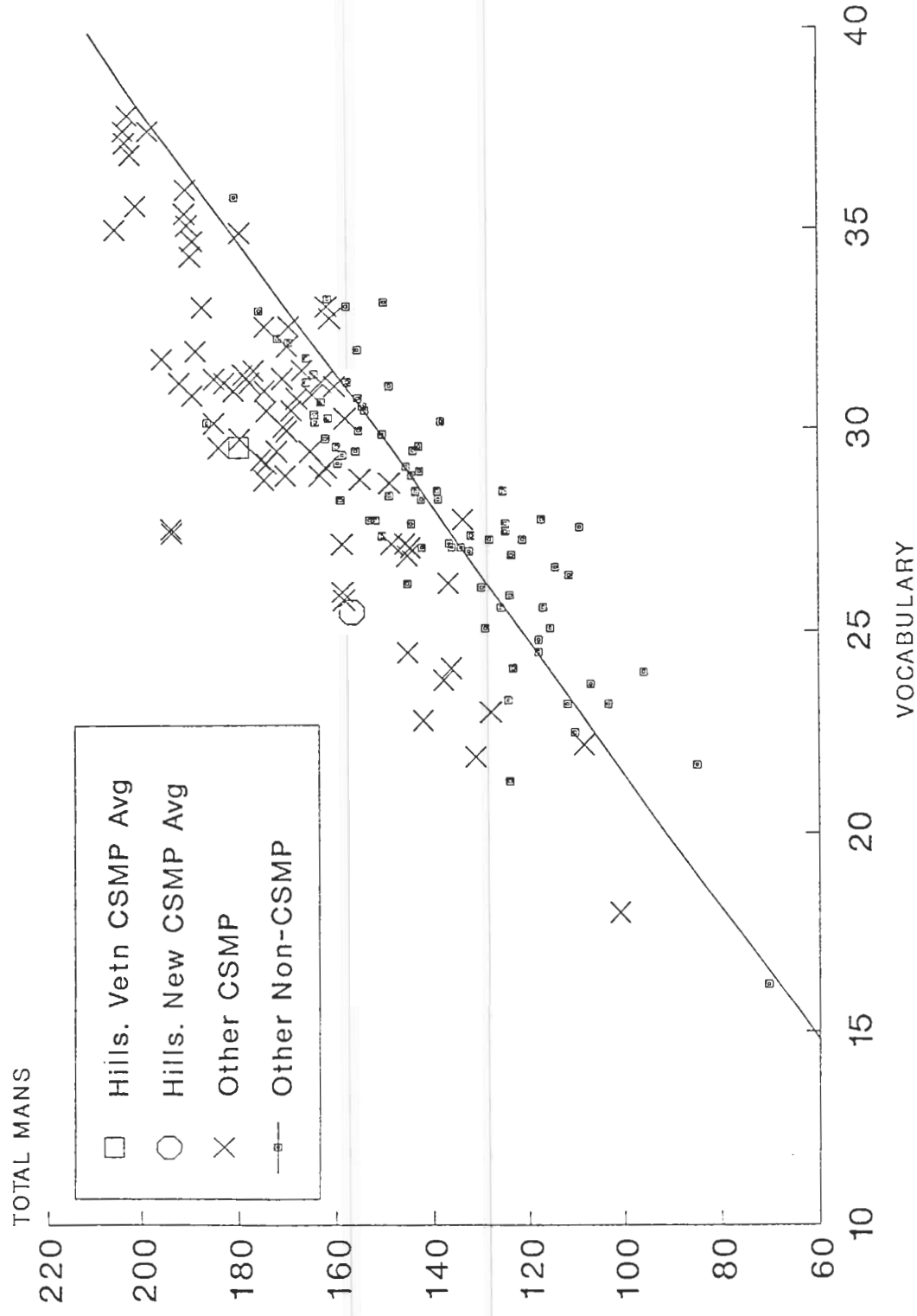
The graph shows that both Hillsborough groups had high scores relative to non-Hillsborough classes. Most surprising is how far above the regression line the New-to-C SMP Hillsborough classes scored; in fact, their score is above most non-Hillsborough C SMP classes.

The overall fourth grade results show that fourth graders in Hillsborough were well able to move directly into the C SMP curriculum. These results differed from those obtained in several previous C SMP evaluation studies, where it was found that such classes lagged somewhat behind their veteran counterparts. Apparently the Hillsborough District has been very successful in implementing the curriculum.



# MANS TESTS: FOURTH GRADE

## HILLSBOROUGH VERSUS OTHER CLASSES





Statistical Analysis of Second Grade MANs Comparisons

An Analysis of Covariance procedure similar to the fourth grade analysis was carried out to compare the MANs scores of Hillsborough second grade CSMF classes in 1994 with those of similar classes in 1992. The covariate adjustments were small since the Vocabulary scores of the two groups were very similar. The results are shown in the table below.

MANs Category	Raw Score Means		Adjusted Means		p-value*
	1992	1994	1992	1994	
Computation	15.5	15.3	15.6	15.3	-
Estimation	10.9	11.3	11.0	11.3	-
Mental Arithmetic	22.2	22.7	22.4	22.6	-
Number Representatns	19.4	19.2	19.5	19.1	-
Relations, Numb Pats	31.9	32.8	32.2	32.7	-
Word Problems	6.4	6.6	6.5	6.6	-
Multiple Answers	11.0	12.2	11.1	12.1	.02
Total MANs	117.3	120.2	118.3	119.6	-

Mean Vocabulary scores:  
 1992 = 33.9  
 1994 = 34.4

Number of classes:  
 CSMF = 26  
 Non-CSMF = 15

\* The p-value, from the resulting F-test with 1 and 39 degrees of freedom, is the probability that differences this large between the two groups could have happened by chance. Only p-values below .20 are shown.

The 1994 group had significantly higher scores on one MANs category, Multiple Answers. The 1994 group's Total Mans score was very slightly higher than the 1992 group, but this difference was entirely accounted for by the Multiple Answers category.



Graph of Second Grade Class Means

The next page shows the average Total MANS scores for second grade Hillsborough CSMP classes in 1992, 1993 and 1994. Also shown is a representative sample of other second grade CSMP and Non-CSMP classes.

The graph again shows that the two Hillsborough groups had similar scores to one another and were in the high range of CSMP second grade classes in general.

**MANS TESTS: SECOND GRADE**  
 HILLSBOROUGH 1992-4 versus other classes

