

THE CHANCELLOR'S MODEL SCHOOL PROJECT (CMSP)

FINAL PROJECT REPORT

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by

Gil Lopez, Director,
Chancellor's Model School Project (CMSP)
Schools of Engineering and Applied Science
at Columbia University
New York, NY 10027

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Executive Summary

What does it take to create and implement a 7th to 8th grade middle school program where the great majority of students achieve at high academic levels regardless of their previous elementary school backgrounds? This was the major question that guided the research and development of a 7-year long project effort entitled the Chancellor's Model School Project (CMSP) from September 1991 to August 1998. The CMSP effort conducted largely in two New York City public schools was aimed at creating and testing a prototype 7th and 8th grade model program that was organized and test-implemented in two distinct project phases: Phase I of the CMSP effort was conducted from 1991 to 1995 as a 7th to 8th grade extension of an existing K-6 elementary school, and Phase II was conducted from 1995 to 1998 as a 7th to 8th grade middle school program that became an integral part of a newly established 7-12th grade high school.

The CMSP research and development effort was undertaken to address the long standing disparity in academic achievement between minority students in urban secondary schools and their majority counterparts in suburban schools. The disparity is further exacerbated by the acute shortage of qualified teachers who teach in urban middle schools and high schools -- especially in the area of mathematics and science. The laws of supply and demand in these two subject areas has limited the quality of mathematics and science being taught in urban middle school and high schools. This is particularly troublesome as the movement for higher academic standards in secondary schools goes forward at state and national levels.

In Phase I, the CMSP demonstrated that with a highly structured curriculum coupled with strong academic support and increased learning time, students participating in the CMSP were able to develop a strong foundation for rigorous high school coursework within the space of 2 years (at the 7th and 8th grades). Mathematics and Reading test score data during Phase I of the project, clearly indicated that significant academic gains were obtained by almost all students -- at both the high and low ends of the spectrum -- regardless of their previous academic performance in the K-6 elementary school experience.

The CMSP effort expanded in Phase II to include a fully operating 7-12 high school model. Achievement gains at the 7th and 8th grade levels in Phase II were tempered by the fact that incoming 7th grade students' academic background at the CMSP High School was significantly lower than students participating in Phase I. Student performance in Phase II was also affected by the broadening of the CMSP effort from a 7-8th grade program to a fully functioning 7-12 high school which as a consequence lessened the focus and structure available to the 7-8th grade students and teachers -- as compared to Phase I. Nevertheless, the CMSP does represent a unique curriculum model for 7th and 8th grade students in urban middle schools. Experience in both Phase I and Phase II of the project allowed the CMSP to be developed and tested along the broad range of parameters and characteristics that embody an operating public school in an urban environment.

Experience in the CMSP Phase I and II effort presents the engaging possibility that almost all students who progress through the 7-8th grade CMSP model can enter the 9th grade strongly prepared to do and succeed in a rigorous high school program of study. In addition, CMSP student achievement in Phase I clearly suggests that strong high school preparation can take place over a 2 year period regardless of the students' prior academic background in grades K-6. If this CMSP student performance can be replicated in different school environments, it would have great implications as to where priorities should be set and resources targeted to insure that students in urban middle schools enter the 9th grade with the necessary foundation to succeed in academically rigorous programs in high school.

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FINAL REPORT

Table of Contents

	<u>Page</u>
<u>Executive Summary</u>	<i>i</i>
1.0 <u>Introduction</u>	1.
1.1 Background and Context of the CMSP Effort	2.
1.2 Goal and Organization of the CMSP Effort	3.
2.0 <u>The CMSP Phase I Effort / 1991-95</u>	4.
2.1 PS 19 Model School Effort	5.
2.2 Demographics of Community School District #1	6.
2.3 <u>Structure of the CMSP Model</u>	6.
2.3.1 A Ground Zero/Mastery Approach	7.
2.3.2 Major Elements of the CMSP	8.
2.4 <u>Model School Implementation and Student Achievement</u>	10.
2.4.1 Student Mathematics and Reading Test Score Data	12.
2.4.2 Regents Course I Mathematics Data / 1992-95	13.
2.4.3 Specialized High School Admissions	14.
3.0 <u>The CMSP Phase II Effort / 1995-98</u>	15.
3.1 Student Preparedness and Achievement at the New Marta Valle School Site	16
3.2 The CMSP Summer Foundations Program	18.
3.3 Shaping the CMSP to Meet the Needs of Lesser Prepared 7th Grade Students	19.
3.4 <u>Student Mathematics and Reading Test Score Data at CMSP/Marta Valle</u>	20.
3.4.1 Regents Course I Mathematics Data / 1997-98	22.
3.5 <u>CMSP Replication in Other Urban School Districts</u>	23.
3.5.1 Student Achievement in Mathematics and Reading	24.
3.5.2 Summer Staff Development and Training	24.
4.0 <u>The First CMSP Graduating Class</u>	25.
4.1 Disbursement of the First Cycle of CMSP Students--1991-1997	26.
4.2 Going to College	26.
5.0 <u>An Idealized CMSP 7th and 8th Grade Curriculum Model</u>	27.
5.1 A Model Curriculum Enhanced by Multi-Media	29.
5.2 Partnerships with Local Colleges	30.
6.0 <u>Conclusion</u>	31.

CHANCELLOR'S MODEL SCHOOL PROJECT (CMSP)

1.0 Project Overview

What does it take to create and implement a 7th to 8th grade middle school program where the great majority of students achieve at high academic levels regardless of their previous elementary school backgrounds? This was the major question that guided the research and development of a 7-year long project effort -- September 1991 to August 1998 -- that is documented in this final project report. The project effort was aimed at creating and testing a prototype 7th and 8th grade model program that was organized and test-implemented in two distinct project phases:

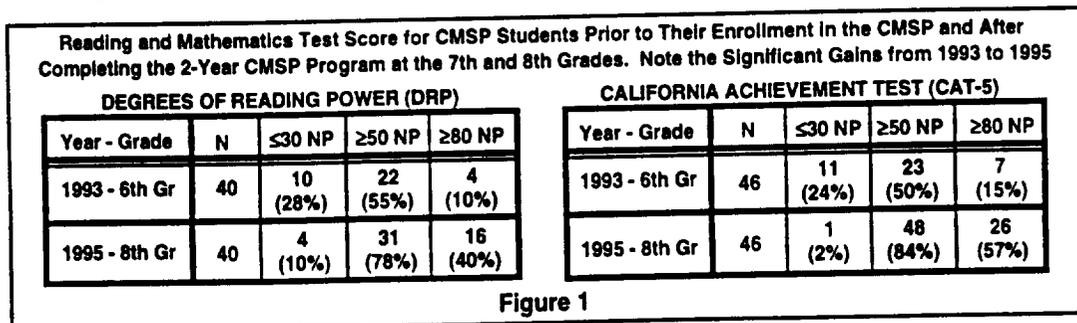
Phase I-- 1/91 to 6/95 as a 7th to 8th grade extension of an existing K-6 elementary school.

Phase II -- 9/95 to 6/98 as a 7th to 8th grade middle school program that became an integral part of a newly created 7-12th grade high school.

The 7-year project effort (hereafter called the Model School or the CMSP - an initialization for Chancellor's Model School Project) was conducted mainly in New York City and was a joint effort of Community School District # 1, the High School Division of the New York City Board of Education (NYC BOE) in consort with the Schools of Engineering at Columbia University and The Cooper Union. NYC BOE school budget allocations to the Model School supported instruction and administration, while grants from NASA, IBM, the Exxon Education Foundation, Con Edison and the Dibner Fund enabled research, development and test-implementation of curriculum projects and academic support systems -- as well as assessment and evaluation of student academic achievement.

The CMSP research and development effort was undertaken to address the long standing disparity in academic achievement between minority students in urban secondary schools and their majority counterparts in suburban schools. The disparity is further exacerbated by the acute shortage of qualified teachers who teach in urban middle schools -- especially in the area of mathematics and science. The laws of supply and demand in these two subject areas has limited the quality of mathematics and science being taught in urban middle school. This is particularly troublesome as the movement for higher academic standards in secondary schools goes forward at state and national levels.

The final report will show that with a highly structured curriculum coupled with strong academic support and increased learning time, students participating in the CMSP were able to develop a strong foundation for rigorous high school coursework within the space of a 2-3 year period. Achievement data during Phase I of the project, clearly indicated that significant academic gains were obtained by almost all 7th and 8th grade students -- at both the high and low ends of the spectrum -- regardless of their previous academic performance in the K-6 elementary school experience. Figure 1 is sample data for the 3rd student cohort enrolled in the CMSP in Phase I.



With the CMSP effort expanding in Phase II to include a fully operating 7-12 high school model, achievement gains at the 7th and 8th grade levels were tempered by the fact that incoming 7th grade students' academic background was significantly lower than students participating in Phase I. This necessitated major changes in the CMSP curriculum model which at the present time is still undergoing modifications to meet student and teacher needs. Student performance in Phase II was also affected by the broadening of the Model School from a 7-8th grade program to a fully functioning 7-12 high school which as a consequence lessened the focus and structure available to the 7-8th grade students and teachers -- as compared to that experienced in Phase I.

Nevertheless, the CMSP does represent a unique curriculum model for 7th and 8th grade students in urban middle schools. Experience in both Phase I and Phase II of the project allowed the model to be developed and tested along the broad range of parameters that embody an operating public school in an urban environment. The narrative that follows provides a project implementation history as well as a description of an idealized CMSP curriculum model that is based on the project experiences in Phase I and Phase II of the CMSP effort.

1.1 Background and Context of the CMSP Effort.

The design of the CMSP 7th -8th grade model was based in part on experiences in an National Science Foundation (NSF) and private sector funded project where a prealgebra/algebra model program was developed and test-implemented in high schools at diverse school district locations across the nation, including: New York City, Washington, D.C., Fulton County, GA., New Orleans, LA, Beaumont, TX, Los Angeles and Pasadena, CA, Rochester, NY and Kansas City, MO. With the exception of two sites, each of the high schools participating in the NSF project showed an essential doubling of the number of students enrolling and achieving in elementary algebra. The successes in algebra were followed by increased enrollment in upper level mathematics as well as in the physical sciences. Over the course of NSF funding from 1986-1991, over 6,000 students at 15 schools participated in the test-implementation of the prealgebra/algebra model program.

Besides providing a diversity of students to field test the prealgebra/algebra curriculum model, work at the participating school sites showed that: 1) the pool of students with the background to enroll and successfully complete a first course in high school algebra at each of the participating schools was extremely small-- in the range of 5% to 15% of the incoming 9th grade population, and 2) the mathematical weaknesses displayed by incoming 9th grade students appeared to stem from the severe shortage of junior high math and science teachers who were qualified to give students the background and proficiency levels they needed to succeed in a first course in elementary algebra.

The importance of success in a first course in algebra as a springboard to higher levels of mathematics and science learning in urban high schools has been widely recognized -- most notably by the College Board's Equity 2000 Project¹, by Robert Moses's work in his Algebra Project² and by the more than two-decade long work by precollege programs affiliated with the National Association of Precollege Directors (NAPD)³ -- of which the CMSP is a member program.

The 1986-1989 time period also saw the beginnings and development of a prototype Model School project at Park West High School -- one of the NYC schools that was then involved in the prealgebra/algebra program. The Model School concept grew out of the concern that students' high performance in mathematics was not having much effect in their study of English or Social Studies. This was determined as early as 1984 when the idea of a model school was first presented to officials of the NYC Board of Education and to the Engineering Deans at Columbia University and The Cooper Union. Subsequent meetings and proposals to IBM and the Exxon Education Foundation provided grant funds to develop and test the Model School concept at Park West High School located in mid-Manhattan in New York City.

From 1987 to 1989, two groups of 9th grade students (approximately 100 students selected at random each year) participated in the Model School program at Park West High School. Classroom space was set aside for the Model School program and a specialty designed curriculum emphasizing reading, writing and research was developed by participating teachers and project staff. The project was provided with a fully equipped lab of IBM computers which students used daily to develop their writing skills and catalog their English and Social studies assignments. The Model School program had a marked effect on students' academic performance. Their achievement and attendance was far above their 9th grade counterparts at Park West who were enrolled in traditional English and Social Studies programs. The Model School 9th grade students' writing improved so much in one year that they were able to take the 11th Year Writing examination at the end of the school year where they outperformed 11th grade students at Park West High School who took the same test by 2-1 margins.

The Model School experience at Park West High School plus project work with 7th and 8th graders in the prealgebra/algebra program in junior high schools in NYC and Fulton County, GA demonstrated that with little modification, materials and instructional approaches could be used to attain achievements gains at 7-8th grade levels comparable to those attained at the 9-10th grade levels. This was an important project juncture and helped set the stage for the development and testing of a Model School as a newly created 7-8th grade extension to an K-6 elementary school in NYC.

1.2 Goal and Organization of the CMSP Effort

Organizing and developing a Model School presented a significant shift in previous project efforts -- from one of national proportions involving thousands of students and hundreds of teachers to a single school environment that would in its first year involve just 8 project staff (including 4 teachers and 4 full time CMSP staff) and sixty-one 7th grade students. Despite the smaller size of the Model School project, the goals and objectives established required a much more intensive and diverse effort than the larger prealgebra/algebra project venture.

A fundamental goal established at project inception was to research and develop a Model School that could be test-implemented to demonstrate that :

- all students enrolled in a CMSP 7-8th grade program would obtain the necessary academic preparation to enroll and succeed in a precollege (9-12) high school program of study.

This fundamental goal was not unlike the long standing National Minority Engineering Effort⁴ to increase the pool of African American, Hispanic and American Indian high school students who have the prerequisite academic background and interest to gain acceptance to and succeed in college programs of engineering and science. Framed in this context, a major objective of the Model School was to to develop and implement a mathematics curriculum to demonstrate that:

- all students enrolled in the CMSP 7-8th grade program could complete and excel in the study of elementary algebra as measured by achievement in Course I Mathematics⁵

Accomplishing this major objective would insure participating students' enrollment in a full fledged 4-year mathematics and science course sequence in high school and expand their opportunity for advanced high school study and beyond.

The underlying question in the research and development of of the CMSP was:

- could successive groups of randomly selected students attain the above stated goal and objective in the space of two years at the 7th and 8th grade levels?

To be sure, the answer to the underlying question stated above rests with the notion that as nearly as possible, a student population could be randomly selected to enroll in the Model School -- and that this population would be representative of the larger school district population from which it was drawn. If this could be arranged, then project assessment would become much more objective as standardized Reading and mathematics test scores (and other school indicators) could be compiled and analyzed between successive cohorts of students enrolled in the CMSP with those students enrolled in comparative junior high schools in the community school district. And in a larger context, 8th grade CMSP students' performance on the NY State administered Regents Course I Mathematics Examination could be compared with NYC high school students who normally take the same Course I Mathematics Examination at the 9th grade or at higher grade levels.

As a Model School effort with a view towards future project replication in other school settings, the random selection of students became a defining and major program attribute. Given the fundamental goal of demonstrating that all participating students could be academically prepared to enroll and succeed in 9-12 grade precollege program of study, student course scheduling would by design take the form of heterogeneous class grouping at students' initial point of enrollment at the 7th grade. Thereafter, the necessary curriculum structure and resources would be organized and put in place to give all students the opportunity to succeed in their courses of study. In Phase I of the project this was exemplified by three successive groups of CMSP students who successfully completed Course I Mathematics Regents coursework with corresponding high test scores on the Regents examination at the end of the 8th grade.

Analysis of mathematics test score data to be reviewed in the Phase I narrative will show that even those students who entered the Model School at the 7th grade with very low standardized mathematics test scores later did extremely well on the Course I Mathematics Regents examination. This positive project outcome was a result of the highly structured CMSP mathematics program which literally transformed the initial heterogeneous 7th grade class grouping into a high end homogeneous class grouping within the period of two years concluding at the 8th grade.

The CMSP as test-implemented over the course of the Phase I and Phase II project period has demonstrated that significant increases in enrollment and achievement can be attained in heterogeneous class settings. The narrative that follows details the history of the development of the CMSP in Phase I and (1991-1995) and Phase II (1995-1998).

2.0 The CMSP Phase I Effort / 1991-1995

The site for Model School development work during Phase I was an elementary school, Public School 19 located on the Lower East Side of Manhattan in New York City. P.S. 19 is one of several elementary schools and junior high schools in the Lower East Side of Manhattan that make up Community School District (CSD) #1. In organizing the CMSP at P.S. 19, meetings were held in the Spring of 1991 that included the CSD#1 Board and Superintendent, as well as with the Principal, staff and parents of PS 19. The objective of these meetings was to obtain a general consensus from all parties that the Model School represented a unique opportunity to create a new 7th and 8th grade program within the PS 19 elementary school facility. The proposal submitted to the CSD#1 Board would in essence convert PS 19 from a K-6 school to a K-8 school -- with the upper two grades reserved for the Model School initiative. In addition, the students enrolled in the 7th grade Model School program would be drawn exclusively from the 6th grade graduating class at PS 19. The CSD#1 Board's approval of the CMSP proposal took place in late Spring 1991 in time for the teaching and project staff to work over the summer to put a viable classroom and program facility in place. Sufficient classroom space was made available in one corridor of the school to accommodate five classrooms, a computer lab and a staff administrative office.

2.1 P.S 19 Model School Organization

The CMSP initiative at PS 19 at the very outset established a non-selective admissions policy for the school as well as a program schedule that would group students heterogeneously in class. This was made clear to parents of graduating 6th graders at PS 19 in several meetings held during the Spring of 1991. The response was very positive from parents, stemming in part by their reservation about sending their children to the local junior high school. The notion of keeping their children in the PS 19 school to enroll in a new 7th grade program where students would not be ability grouped, and have access to support structures to insure student success for all students was very appealing to the parents. As a result, almost all of the students who graduated from PS 19 at the 6th grade and who remained in CSD #1-- 61 students in all -- became the first entering 7th grade population of the Model School when it formally opened in the Fall of 1991.

Over the next 3 years of the Phase I CMSP activity (1991-1994), the 7th grade entering school population was drawn exclusively from PS 19's 6th grade graduating class. The unique 6-7th grade enrollment procedure effectively produced a fairly random student population because of the non-selective admissions policy of the school. See 6th grade test scores in Figure 1. It also insured that the Model School would have a fairly stable 7th grade entering population without the need for recruiting outside of the PS 19 school. In each of the three successive 2 year cycles of students participating in the Model School from 1991 - 1995, the 7-8th grade student population held steady at approximately 120 students.

The basic message to the parents of students enrolled in the Model School was that resources and support structures would be in place to insure student success for all -- regardless of students' previous academic experience and background. This included extensive use of resources obtained from The Cooper Union, a nearby college where college students visited the school to serve as Teaching Assistants (TAs). The TAs role in the school cannot be understated as they provided teachers and students with that extra hand in learning -- which in many ways gave the program a personal touch by enabling students to be reached who otherwise would be missed in traditional classroom settings. The Cooper Union also provided an environment that was highly stimulating as students in their frequent visits there gained a vivid sense of what college life was about.

In addition to The Cooper Union, IBM and Con Edison played instrumental roles in providing the school with grant funds and with industry sites that students could visit to see how technology works to create commercial products, energy and services. IBM in particular, provided the Model School with two fully equipped computer lab networks -- as well as bolstering the CMSP core staff with three full-time engineers who served the school successively in 15 month assignments during the period 1991-1996 as part of IBM's Faculty Loan program. This technical assistance and business experience provided by the IBM Faculty Loan personnel was of great value in the development and implementation of the Model School at PS 19.

2.2 Demographics of Community School District #1

Community School District #1 (CSD#1) located on the Lower East Side, has a long and rich history which is almost synonymous with the great migration of people to the U.S. in the early part of the century. Over the years, the movement of people of different ethnic groups through the district has left a distinct flavor of cultural diversity. People of Hispanic origin now dominate the CSD#1 student population as indicated in Table 1 which shows the student characteristics for the school year 1991/92 and math test scores for April 1993. The socioeconomic data shows that CSD #1 students are typical of students who reside in low income urban neighborhoods where many of the students' families receive government assistance.

CSD#1 STUDENT CHARACTERISTICS -1991/92

Pupil Enrollment (1)			Socio-Economic Data (2)			Math Test Scores -- 4/93		
	Number	%		Number	%		Nat % (NP)	Rank
Hispanic	5,056	72	Students Eligible for Free Lunch	6,203	83	CSD #1	39.7	22
African American	1,122	16	Students with Low SES	3,859	52	CSD #2	68.7	3
Asian American	461	7				CSD #3	45.9	16
White	357	5				CSD #4	38.4	25
Native American	27	nil				CSD #5	34.1	28
Total	7,023					CSD #6	45.7	17

(1) Does not include Pre-K

(2) Includes Pre-K

Table I

Source: NYC Board of Education

The great majority of students enrolled in CSD #1 schools in the 1991/92 school year were Hispanic (72%) made up mostly of youngsters whose parents were from Puerto Rico and the Dominican Republic. About 25% of the Hispanic group came from families whose origins were in Central and South America. African American students were the next largest population group in CSD #1 accounting for 16% of pupil enrollment. The Asian American population was unusually small (only 7%) given the proximity of CSD #1 to Chinatown on the Lower East Side. The small white population (5%) reflects the general diminishing trend in urban areas in the last two decades.

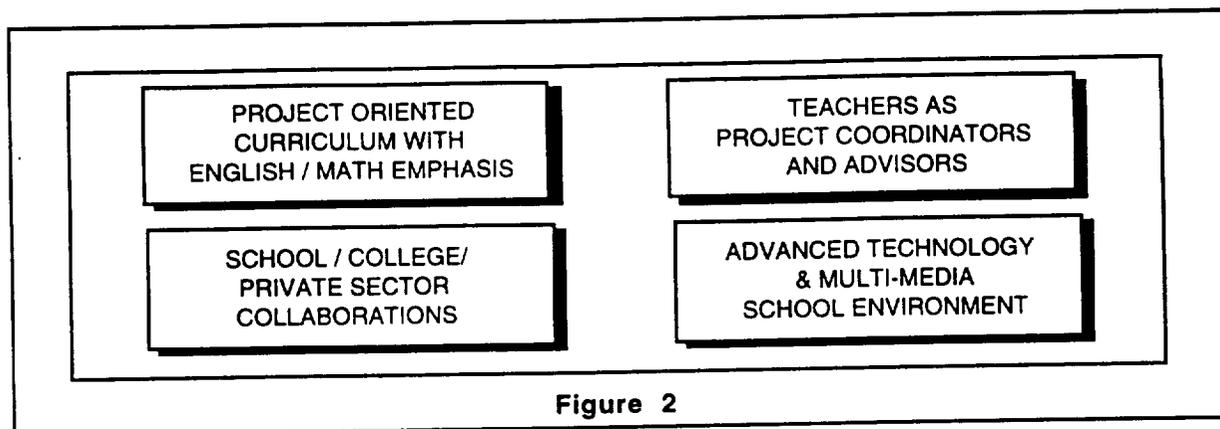
Table I also lists math test score comparisons of the six community school districts whose boundaries lie in the borough of Manhattan in New York City. Note the wide difference between CSD#1 and CSD #2 on the California Achievement Test (CAT) 5 that was administered to all New York City public school students in grades 2-8 in April 1993. Out of the 32 NYC community school districts, CSD#1 was ranked 22 as compared to a rank of 3 for CSD #2. As indicated, CSD #4 located in East Harlem and CSD #5 located in Harlem proper had similar test score levels as CSD #1, with each ranked in the bottom third in CAT-5 achievement levels among NYC's 32 community school districts. It should be noted that many of CSD#2 schools are located in Manhattan's wealthier neighborhoods where family income is much higher than that in the other school districts listed in Table I.

Table I shows a pupil enrollment of 7,023 for the 1991/92 school year. The significance of this enrollment figure is that CSD #1 had in that year, a building capacity that could accommodate over 13,000 students! This under enrollment (less than 60%) and limited use of building facilities has plagued CSD #1 for years. In the 1982/83 school year, student enrollment stood at 10,500 with a building capacity of 18,000 students. Since then enrollment has decreased by 30% (even though the school age population in the district has remained relatively constant) and building capacity has been reduced through high school interventions and by space appropriated for administrative services and special programs (not officially connected to CSD #1). What is important to note here is the notion of the highly probable link between low achievement and underutilized space for students in CSD #1. In nearby CSD #2, where achievement levels are high, space utilization for students is much higher than in CSD #1. CSD #4 and #5 are in the same circumstance as CSD #1 with space utilization rates hovering around 60%. These low space utilization figures are ironic because in most community schools districts in New York City at the time, the problem was one of school overcrowding.

2.3 Structure of the CMSP Model

The four cornerstones of the Model School are shown in Figure 2. Central to the Model School's organization is a project driven curriculum that has an emphasis on English and mathematics. All other subjects are fashioned to complement the learning of English and

Mathematics, either as distinct applications for English and mathematics concepts or as parts of comprehensive projects that cut across all disciplines. The emphasis on mathematics and English addressed the two major academic obstacles for students who enter high school in urban centers.



As stated above, the Model School has no special admission criteria. Students entering the 7th grade are grouped heterogeneously in class and all students are held to high academic standards. Grades of A, B and I (incomplete) are the only grades that students can attain. A grade of I (incomplete) signifies the need for additional attention and tutorial support which is an every day occurrence -- after-school and on Saturdays. The after-school and Saturday tutorial sessions at the Model School are very structured and active sessions. Since inception in 1991, the Model School has been open every Saturday and during the summer with teachers and college students available to assist students in need. In essence, the CMSP evolved into 6 day a week, all year round school.

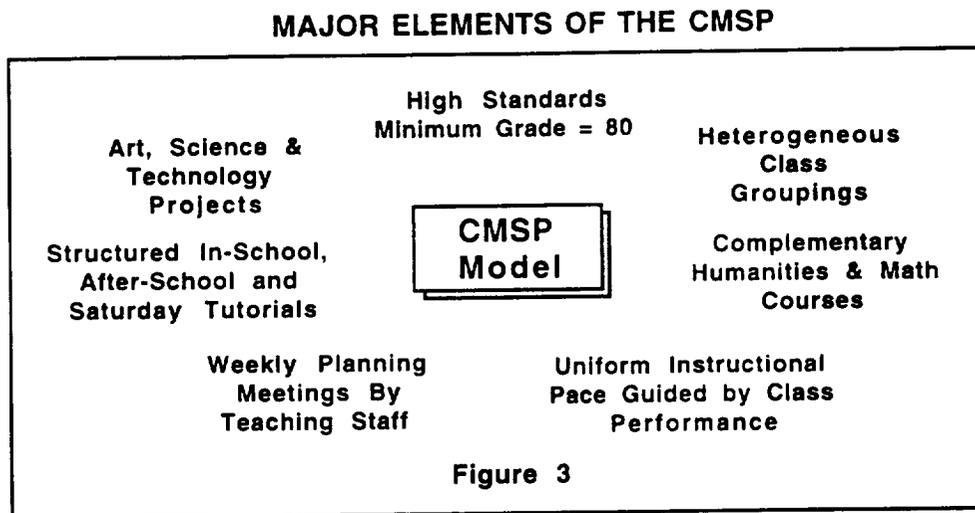
2.3.1 A Ground/Zero Mastery Approach

Central to the CMSP curriculum structure is a ground zero/ mastery approach which allows all students to refresh and build a strong foundation in mathematics and in English during the 7th grade. English readings and mathematics study begins at ground zero and the tempo and level of study is gradually increased throughout the term so that all students are given the opportunity to attain a level of mastery in their Humanities and mathematics coursework. On-going assessment, tutoring and frequent discussions with students and parents insure that every student in need receives the necessary attention and support. This approach was used effectively in the NSF funded prealgebra/algebra project described previously. The experiences in the Model School in Phase I strongly suggest that it is just as effective in the study of English and the Humanities.

The key to the effectiveness of the ground zero/mastery approach used in the Model School has been a structured curriculum package which gives teachers a wide range of instructional options in working with students. The curriculum provides the structure and a scheduled plan that allows participating teachers to guide students at a uniform instructional pace consistent with their mastery of coursework. The prealgebra/algebra curriculum development efforts over the years contributed greatly to the development of Humanities materials for the Model School. One of the great distinctions of the CMSP effort at P.S. 19 is that it is curriculum driven. Accordingly, implementation of the CMSP with teachers new to the program is guided by a curriculum package that teachers can immediately use with students. This inevitably reduces the misinterpretation of the programs' goals and objectives. The ground zero/mastery approach, the high standards, the structured tutorials, the continual assessments are all possible because CMSP curriculum and supporting materials are available to the Model School teachers and supporting staff.

2.3.2 Major Elements of the CMSP

Figure 3 indicates the major elements that encompass the CMSP and which allows the ground zero/mastery approach to be implemented. All of the CMSP elements are interconnected and while one or a combination of the indicated elements may contribute to increased student achievement, it is the interaction of all of the elements that contribute to the significant student academic gains in the CMSP that have been previously noted in Figure 1.



High Standards Minimum Grade = 80 or B

The minimum passing grade in the CMSP is 80. Students scoring less than 80 on a unit test, quiz or teacher assessment are scheduled to attend structured tutorial sessions during and after school and/or Saturdays until such time that achievement at the 80 grade level is attained. Student report cards note only grades of 80 or above. Students who at the end of a marking period are performing at a level below 80 are given an NI (Needs Improvement) notation indicating that students need more individualized attention and learning time through the structured tutorials. Grade notations below 80, i.e., C, D or F are not used at the 7th and 8th grade levels.

Heterogeneous Class Groupings

It is important in the CMSP to keep all classes balanced in the terms of academic preparation and student maturity. This allows each of the incoming 7th grade classes (as well as the 8th grade) to follow and maintain a uniform pace of instruction that precludes any one class from outperforming another. The incoming 7th grade classes are first formed heterogeneously using 6th grade Reading and math test scores that are fed into a random sampling data base to produce 2-4 classes that are academically similar. The same process of class scheduling is used in the 8th grade except that students' academic performance in the 7th grade and their 7th grade Reading and math test scores are utilized as parameters for class placement.

Complementary Humanities & Math Courses

The CMSP's high standard of achievement (≥ 80) requires that students have the increased learning time and academic support to attain the high standard. The curriculum emphasis on Reading and mathematics in the 7th and 8th grades is supported by a complementary two-course format for both mathematics and Humanities coursework. Through this two-course format, the time during the

regular school day that students have to learn a given math topic or reading unit is essentially doubled. The 2-course curriculum arrangement enables teachers to utilize a given topic in one course to complement and reinforce the same topic in the other.

Uniform Instructional Pace Guided by Class Performance

Maintaining the success that students experience in the ground zero start at the beginning of the term is fostered by a pace of instruction that is driven by the academic performance of each of the participating classes. The measure of class performance is an almost continuous process by virtue of frequent quizzes and tests enabling teachers to adjust the pace of instruction to insure student mastery of a given unit of study. The uniform pace of instruction is facilitated by the structured curriculum followed by the participant teachers.

Weekly Planning Meetings By Teaching Staff

The uniform CMSP instructional program at the 7th and 8th grades is taught by a team of teachers who formally meet weekly to discuss how students have progressed during the week and what sort of schedule adjustments should be made -- and what topics should be emphasized. This discussion and planning by the teaching team is probably one of the more important elements of the CMSP Model, because it focuses on how the students are doing and what can be done to have them do better. It is during these weekly meetings where overall and individual class performances are determined and a consensus of opinion is reached on how instruction should proceed in the coming week. The uniform CMSP curriculum enables constructive discussions to take place with the objective of making the instructional program more effective and the curriculum more responsive to class and student needs. Teacher discussions are also directed at students who are in need of greater individual attention and support to attain the high standard.

Structured In-School, After-School and Saturday Tutorials

Increased learning time for students is further obtained by a very structured tutorial program that is directly tied to individual students' performances on unit tests and teacher assessments -- using 80 as the standard reference point. Students who score below 80 are scheduled for structured sessions that take place during the school day, after school and on Saturday mornings. During the tutorial sessions students get the individualized attention they need and also have the opportunity to retake unit tests when teachers feel they are ready and prepared to attain the 80 standard. Through this structured tutorial process, students can make enormous leaps in their retest grade. A grade of 60 jumping to a 90 after a concentrated string of tutorial sessions is quite a common occurrence and contributes greatly to maintaining students' academic confidence. The tutorials are very effective because of the weekly teacher meetings which pinpoint students' difficulties and because scaled tutorial materials are available for teachers and students that are tied directly to the school day instructional program.

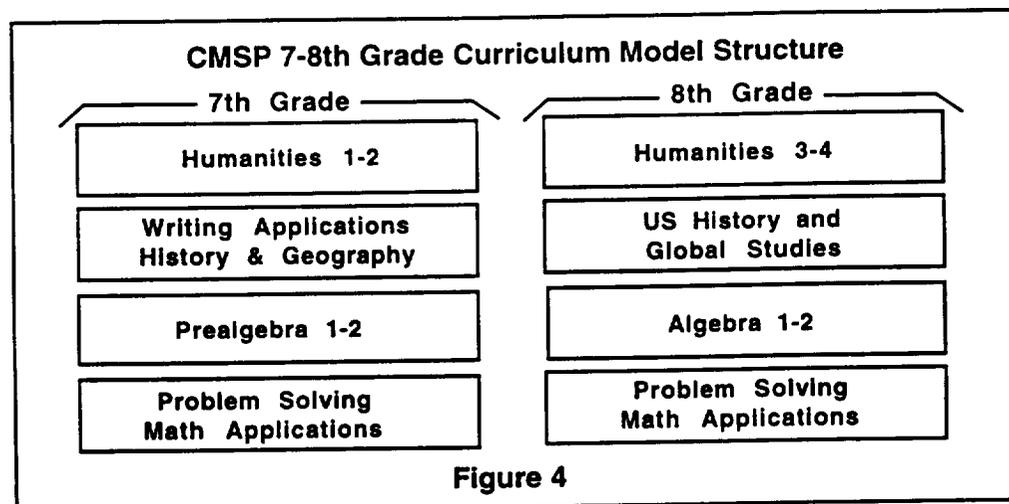
Art, Science / Technology Projects

Making connections between topics that students are engaged in for a given unit of study can also contribute to increased learning time as well as deeper topic understanding. Art, science/technology are elements of the CMSP curriculum that provide students with opportunities for hands-on and lab experiences. Students' art experiences in the 7th and 8th grades take two forms, 1) structured design art where students gain a sense of parallel, triangular, circular constructions and color symmetry, and 2) free-form art depictions of events, characters and places drawn from their fiction and non-fiction readings in Humanities classes.

In the 8th grade, a wide range of digital instruments are used by students to facilitate making scientific measurements including analog and digital scales, multimeters, timers, PH meters and blood pressure meters. In addition, the project units are enhanced by graphical depictions and animations provided by software, videos and slides.

2.4 Model School Implementation and Student Achievement

In Phase I, the CMSP at PS 19 was implemented in three successive 2-year cycles of approximately 60 students in each cycle -- for a total of 180 students. Each of these successive cycles of students were presented with a structured program containing all of the basic elements of the CMSP Model -- as noted in Figure 3. The school day was divided into four 75 minute periods that offered complementary coursework in the Humanities and mathematics as shown in Figure 4.



The first cycle of 7th grade students were enrolled at PS 19 in the Fall of 1991. Prior to their Fall enrollment, these 1st cycle CMSP students attended a 2-week summer orientation program to give them a sense of what the 7th grade program would be like. The summer orientation also provided the CMSP staff with the opportunity to assess the students proficiency in reading, writing and mathematics in preparation for starting a Fall program where a minimum grade of B was expected for all. Students who were identified as needing additional academic assistance were scheduled for tutorial support for 3 additional weeks. This focused tutorial support was carried over into the Fall term and continued until the students showed they could keep up with mastery of course materials.

The summer orientation and the regular academic year program were essentially the same for all three groups of students that were enrolled in the Model School at PS 19 from 1991-1995. With each successive cycle, the curriculum was revised based on the feedback from teachers and the course performance of students. As noted in Figure 4, the emphasis of the CMSP curriculum during the school year was on the Humanities and mathematics with all students receiving the structure, academic support and learning time to master coursework that was presented to them.

The Humanities and mathematics program were designed to give all students an opportunity to refresh and review their reading and mathematics skills to the point of mastery for all. At the same time, new topics of study were introduced to allow students to delve into new issues that reflect their natural curiosity and their growing awareness as adolescents. In mathematics, the approach was signified by problem solving applications and the goal of successfully completing the study of high school algebra by the end of the 8th grade. In English, reading was made more interesting and germane by group discussions, daily writings (by hand and on computer) and a host of related activities and modes of study that directed students to do research and learn more on their own.

At the beginning of each school year during Phase I, books of fiction were selected for high interest to adolescents. Book selection was also based on story lines that could provide a springboard for excursions into history, art, geography, health, technology, and to a variety of topics that could both enhance and extend the basic reading. The book sequence and level of reading was gradually scaled to insure a thorough understanding by all. Students who excelled were given opportunities to assist other students and also to engage in higher level reading of their own choice. In mathematics, the curriculum structure was the same with a gradual increase in rigor to insure mastery by all.

Developing Talent in the Arts Development of the Model School at P.S. 19 was also bolstered by an extensive program in music and the arts, as well as excursions in Karate -- all of which allowed students to gain a better sense of accomplishment through participation. On three occasions (in June 1992, June 1993 and June 1995), the school year ended on a very high note with 7th grade students performing in an original musical play entitled "We Are the World". What was unique about the play was that it gave students the opportunity to learn about the geography, culture and dance traditions of seven countries located in the five major continents of the world. All students were required to perform in the play which included singing, reciting, creating art works depicting the culture of the seven countries, designing and sewing dance costumes, and finally learning and performing in a folk or ceremonial dance for each of the seven countries selected.

Parental Support The comprehensive program that each of the three groups of students experienced at the Model School in Phase I gave every indication that program and curriculum development efforts were on track. The students were content as well as their parents. In each of the years of the Phase I project period, parents attended at least eight meetings where they could be brought up to date on the progress of their children and the status of Model School development. The traditional open school days and nights that occur once each term in NYC public schools was instead used as a formal Students Assessment Report period where student/teacher/parent conferences were scheduled for a given time and day. The conferences were very meaningful to parents and students because they were based on a formal report assignment which asked students to assess their own performance in Humanities and mathematics coursework and in other school activities. These formal student assessment sessions were very well attended by parents and proved to be a highlight for a given term because the student report served to prompt a sharp focus and interaction between student, parent and teachers

Overall, parents were very supportive of the CMSP effort and their childrens' enrollment at PS 19. This was reflected in very high attendance -- hovering around 92% for all three groups and minimal behavior problems both in and out of school. Over the four year period, there were no drop outs because of academic or behavior reasons. The few students who did leave the school, left because of new home locations outside of New York City.

Laying the Foundation for Student Achievement During Phase I, the CMSP was basically demonstrating that students could make significant academic gains at the middle school level regardless of their previous K-6 experience. In essence, students were given an opportunity to show they could succeed because they received the appropriate curriculum structure, academic support and learning time. The CMSP's highly structured curriculum and it's emphasis on reading and mathematics, enabled almost all students to obtain the strong foundation needed to succeed in high school Regents coursework -- especially in elementary algebra which all students completed at the end of the 8th grade. Contributing heavily to students' success in Phase I was a team of experienced math and English teachers who early in the first project cycle established the basic curriculum foundation and teaching strategies upon which future project cycles would build upon.

2.4.1 Student Mathematics and Reading Test Score Data / 1991-1995

A compilation of CMSP achievement data for students participating in the project at P.S. 19 is shown in Figure 5. The data is arranged over a 4 year period beginning with the first cohort of CMSP students who were administered standardized Reading and Mathematics tests in May 1992. CMSP students achievement on these annual Reading and Mathematics tests are compared with other 7th and 8th grade students in Junior High Schools in Community School District #1 for the test years 1992, 1993 and 1994. Each year presented shows CMSP students outscoreing comparable 7th and 8th grade students by very wide margins.

These data comparisons are objective and meaningful because of the essentially random and representative nature of CMSP participating students academic background. By design -- and since project inception -- there have been no selection criteria for students enrolled in the CMSP. All students in the 6th graduating classes at PS 19 were admitted automatically into the 7th grade CMSP program. And upon entering the 7th grade, students were placed in classes which were heterogeneously grouped -- and thereafter regrouped periodically to maintain classes that resemble one another in terms of academic achievement and student maturity. The heterogeneous class groupings throughout the life of the project have provided an objective base for assessing the progress of the CMSP both within the participant CMSP school sites and with comparable student populations in Community School District #1. The comparative data in Figure 5 clearly shows the CMSP's progress in demonstrating that all participant students can achieve at high levels when given the appropriate structure, support and time.

Distribution of 7th & 8th Grade Reading* and Math Test Scores at the CMSP and at Junior High Schools in Community School District #1 -- 1992, 1993, 1994 and 1995

1992 DEGREES OF READING POWER (DRP)					1992 METROPOLITAN ACHIEVEMENT TEST (MAT)				
Schools	N	≤30 NP	≥50 NP	≥80 NP	Schools	N	≤30 NP	≥50 NP	≥80 NP
7gr CMSP at P.S. 19	54	6 (11%)	40 (74%)	26 (48%)	7gr CMSP at P.S. 19	58	0 (0%)	56 (97%)	44 (76%)
7th Gr in CSD#1 JHSs	772	347 (45%)	242 (31%)	61 (8%)	7-8th Gr in CSD#1 JHSs	854	279 (31%)	382 (45%)	143 (17%)

1993 DEGREES OF READING POWER (DRP)					1993 CALIFORNIA ACHIEVEMENT TEST (CAT-5)				
Schools	N	≤30 NP	≥50 NP	≥80 NP	Schools	N	≤30 NP	≥50 NP	≥80 NP
CMSP 7-8 Gr at P.S. 19	106	10 (9%)	77 (73%)	38 (36%)	CMSP 7-8 Gr at P.S. 19	113	9 (8%)	89 (79%)	57 (50%)
7-8th Gr in CSD#1 JHSs	1,500	621 (41%)	510 (34%)	124 (8%)	7-8th Gr in CSD#1 JHSs	1,454	667 (46%)	436 (30%)	131 (9%)

1994 DEGREES OF READING POWER (DRP)					1994 CALIFORNIA ACHIEVEMENT TEST (CAT-5)				
Schools	N	<30 NP	≥50 NP	≥80 NP	Schools	N	≤30 NP	≥50 NP	≥80 NP
CMSP 7,8, 9 gr at P.S. 19	135	14 (10%)	106 (79%)	57 (42%)	CMSP 7-8 Gr at P.S. 19	106	10 (9%)	74 (70%)	43 (41%)
7-9th Gr in CSD#1 JHSs	2,049	1,037 (42%)	714 (35%)	217 (11%)	7-8th Gr in CSD#1 JHSs	1,412	667 (46%)	410 (29%)	96 (7%)

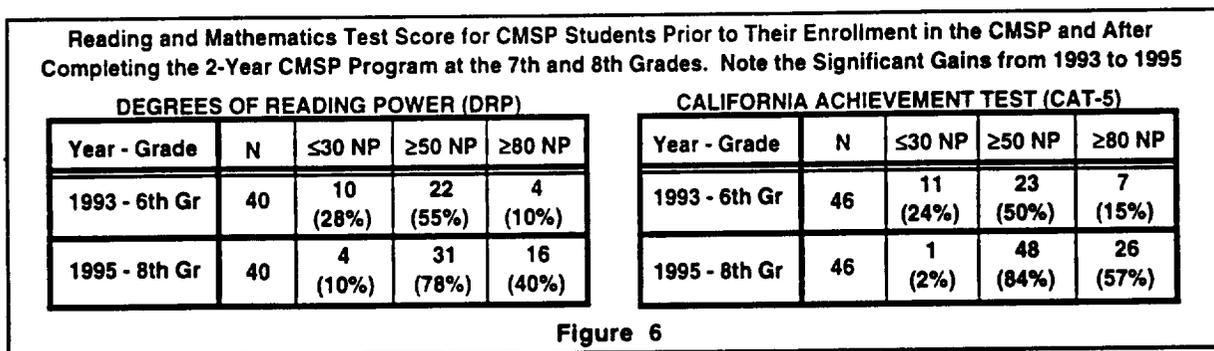
1995 DEGREES OF READING POWER (DRP)					1995 CALIFORNIA ACHIEVEMENT TEST (CAT-5)				
Schools	N	<30 NP	≥50 NP	≥80 NP	Schools	N	≤30 NP	≥50 NP	≥80 NP
CMSP 8 gr at P.S. 19	48	7 (15%)	35 (70%)	18 (38%)	CMSP 8 Gr at P.S. 19	49	1 (2%)	41 (84%)	28 (57%)
CSD #1 Junior High School Data Not Available									

Source: New York City Board of Education
NP = National Percentile

* 9th Grade students included in DRP results for 1994.

Figure 5

The wide and essentially random distribution of students' test scores in Reading and Mathematics is illustrated in Figure 6. This data shows the same cohort of students who took the Reading and Mathematics tests as 6th graders prior to their enrollment in the CMSP 7th grade program in 1993 and then again in 1995 after having completed two years of CMSP 7th and 8th grade coursework. The data indicate test scores on Standardized Reading and Mathematics tests that were administered to students city-wide in May for both years -- 1993 and 1995. Note the distribution of test scores at the 6th grade in 1993. 55% of the students were reading at and above grade level (≥ 50 NP) and 50% of the students were achieving in mathematics at and above grade level school (≥ 50 NP). Of equal importance are the number and percentage of students at the 6th grade whose test scores are equal to and below the 30th NP and the number and percentages of students who scored at and above the 80th NP. By comparing 1993 and 1995 data at these three data points (≤ 30 NP, ≥ 50 NP and ≥ 80 NP), a good sense can be obtained of the significant test score gains made by CMSP students during their 2-year 7th and 8th grade enrollment in the CMSP in Phase I.



As shown in Figure 6, CMSP students test score gains are significant at all three data points in both Reading and Mathematics tests. Test scores ≥ 50 NP in Reading jumped 23 percentage points (55% to 78%) over the 2-year period while in Mathematics there was a 34 percentage point increase from 50% to 84%. The movement in test scores ≤ 30 NP and ≥ 80 NP were even more impressive. The number of students who scored at ≤ 30 NP was reduced from 10 to 4 in Reading and from 11 to 1 in Mathematics. At the higher end there were significant increases in the students who scored ≥ 80 NP -- rising from 4 to 16 in Reading and from 7 to 26 in Mathematics.

What the data in Figure 6 indicates in broad terms is that an essentially heterogeneous grouping of students in 1993 was transformed into relatively homogeneous group two years later in 1995. This has been a consistent occurrence with each of the three cohorts of students who were enrolled in the CMSP at PS 19 during the period 1991 to 1995. While the small numbers of CMSP students may limit data generalizations to a larger student population, the very significant test score gains made by CMSP strongly suggest that the CMSP curriculum and instructional program had a major influence on student learning and achievement.

2.4.2 Regents Mathematics Data / 1992-1995

Figure 7 is data which shows CMSP students' excellent performance on the New York State Regents Course I Mathematics Examination. This Regents examination is normally taken by students in New York State high schools at the 9th grade at the completion of a year long Regents mathematics course whose major emphasis is algebra.

**CMSP 8th Grade Students' Performance On The
New York State Regents Course I Mathematics (Algebra) Examination
June 1993, June 1994 And June 1995**

N	<35(%)	<55 (%)	<65 (%)	≥65 (%)	≥70 (%)	≥80 (%)	≥90 (%)
JUNE 1993							
57	1 (2%)	2 (4%)	5 (9%)	52 (91%)	49 (86%)	47 (82%)	33 (58%)
JUNE 1994*							
49	1 (2%)	6 (12%)	7 (14%)	42 (86%)	35 (71%)	23 (47%)	13 (27%)
JUNE 1995							
49	1 (2%)	2 (4%)	5 (10%)	45 (90%)	43 (86%)	41 (84%)	29 (59%)

* Includes 15 Students Who Retook Test in August 1994

Figure 7

The strong mathematics foundation that CMSP students develop in the 7th grade has allowed them to complete the Regents course in the 8th grade and also take and pass the Regents Course I Mathematics Examination at very high levels. Note the number and percentage of students who scored 90 and above. In each of the years shown, CMSP students have achieved at levels well above students in New York City high schools who take the examination at the 9th grade or higher. In fact in 1995, CMSP students' 90% pass rate on the Regents Course I Mathematics Examination was second only to Stuyvesant High School (the most competitive high school in New York City) out of a listing of 27 high schools in the borough of Manhattan!

Passing the Regents Course I Mathematics Examination at the 8th or 9th grade is essential if students are to complete the sequences of precollege mathematics and science courses in high school so necessary for college enrollment in science and engineering. By succeeding in this first course in algebra at the 8th grade, CMSP students are placed in a position to take and complete a 4 year high school mathematics program (including the Calculus -- which was taken by CMSP 12th graders in the 1996/97 school year) before high school graduation. Success in 3 years of Regents mathematics also insured student enrollment and achievement in essential Regents science courses, including Biology, Chemistry and Physics.

2.4.3 Specialized High School Admissions Each year, thousands of 8th grade students in New York City take competitive examinations to gain entrance to three renowned Specialized High Schools: Stuyvesant, Bronx Science and Brooklyn Technical -- and also to F. H. LaGuardia where auditions in music and art are required for admission. The rate at which CMSP students qualified for admission to the three specialized high schools was well above that of other junior high school in CSD#1 -- 30% vs 10%. Figure 8 shows the number of CMSP students admitted to the specialized high schools with approximately 30 CMSP students taking the examination each year. This is yet another indication that the ground zero/mastery approach used in the Model School helped all students -- those who are most prepared as well as those who are less prepared as they enter the 7th grade.

<p>September 1993 N = 12 4 @ Stuyvesant 1 @ Bx Science 6 @ B'klyn Tech 1 @ LaGuardia</p>	<p>September 1994 N = 12 2 @ Stuyvesant 2 @ Bx Science 8 @ B'klyn Tech</p>	<p>September 1995 N = 10 1 @ Stuyvesant 8 @ B'klyn Tech 1 @ LaGuardia</p>
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Figure 8

Source: NYC Board of Education

3.0 The CMSP Phase II Effort / 1995-1998

A major milestone in the development of the CMSP was reached in June 1994 when the CMSP was officially established as a public high school with the designation Comprehensive Model School Project (CMSP) High School. This NYC Board of Education approval carried with it an operational budget and an administrative structure that allowed the appointment of an Interim Acting Principal and support staff. The establishment of the CMSP as an official public school was driven primarily by the continuous and consistently high achievement of CMSP students over the 4-year Phase I project period.

In the 1994/95 school year, CMSP project development and coordination was hampered by the separation of two distinct groups of CMSP students. One group of 120 students was located at PS 19 (where the program originated in 1991) and another group of 100 students was located in a shared school building adjacent to PS 20 -- from which students were drawn. The students from PS 20 were a new addition to the CMSP and provided a unique project opportunity to replicate the CMSP instructional program with a different student population. Coordinating the CMSP at two locations proved to be a challenge primarily because of the duplication of effort in program administration and in staff development. The latter required extensive involvement by experienced CMSP teachers working with first year teachers recruited for the project at both CMSP sites. By December of 1994 it was clear that combining the two CMSP sites at one location would facilitate project development and greatly ease day to day school administration.

As early as January 1995, presentations were made to parents and to the Community School District #1 Superintendent to move students from PS 19 to a larger school building adjacent to PS 20. All agreed that the move from PS 19 to the larger school building was in the best interest of the students, staff and for the long term CMSP development as a 7-12 grade Model High School. The new building location formerly occupied by the Marta Valle Junior High School which was phased out a year earlier because of poor school performance and very low student enrollment had been committed to the CMSP by CSD #1 Board resolution. Again, providing the CMSP with this relatively new (it was built in 1978) and large building (able to accommodate over 800 students on 3 floors) was based on the success of the CMSP at PS 19. With the extreme shortages of classroom space that beset the New York City Board of Education, it was indeed fortunate for the CMSP to be afforded such ideal school facilities. Although, the building was designed as a junior high school, the building had more than adequate and appropriate space to accommodate the development and growth of a full sized and technologically advanced model high school.

Moving the accumulations of a 4-year CMSP project experience at PS 19 to the Marta Valle school site took place over the summer of 1995. Fortunately, the talents and energy of college students and CMSP 10th grade students were available to organize classrooms and materials, move equipment and supplies and set up computer labs (three in all) -- all in time for school opening in September 1995. In addition, the students played a major role in making the school look presentable including: displaying artwork in the hallways, decorating bulletin boards and classrooms as well as tending to planters in the school's inner courtyard. Completing the move to the Marta Valle school site prior to the arrival of CMSP teachers and students in September was a major project accomplishment in the summer of 1996. It not only provided a ready-to-start environment for teachers and students to begin schooling --with almost no distractions -- it also signaled the formal beginnings of a new and larger phase of the project.

During Phase II, two principals were appointed successively to lead the CMSP at the Marta Valle school site. Barry Hauptman served as Interim Acting Principal from 1994 to 1996 and he was followed by Marilyn Addis who was officially appointed as Principal in 1996 -- a position she continues to occupy. Mr. Hauptman and Ms. Addis were assisted by Gil Lopez, CMSP Director, Joan Diller, Coordinator of the 7-8th grade CMSP Middle School and Joe Germano, math specialist for the 7-12 CMSP math program. During 1995/96, teachers teams were scheduled for specific grade levels so they could focus on a single course curriculum and invest their advisement time in students of common age. While the arrangement was not totally organized along grade levels (some of the teachers were scheduled to teach across grade levels), its implementation clearly resulted in more focused instruction, more effective team planning and greater personal attention to individual students.

The CMSP effort at the Marta Valle School site was organized and developed in two distinct components 1) a middle school for Grades 7-8, and 2) a high school for Grades 9-12. Because the 9-12th grade program turned out to be a continuing new experience -- as each grade level was established -- considerable amount of project time was expended in developing and staffing a Regents program of study.

3.1 Student Preparedness and Achievement at the New Marta Valle School Site

The 7th grade class entering the CMSP in September 1995 was by far the least academically prepared than all of the entering classes in the previous 4 years. This is shown clearly by the standardized test score data in Figure 9. Of most importance in examining the data are the number and percentage of students who scored below the 20 NP. Test scores at these low levels tend to be fairly accurate assessments of students' reading and math levels of skills and comprehension.

COMPARISON OF 6TH GRADE DEGREES OF READING POWER (DRP) AND CALIFORNIA ACHIEVEMENT TEST (CAT) - 5 TEST SCORES FOR STUDENTS ENTERING THE 7TH GRADE AT THE MODEL SCHOOL / 1993, 1994 AND 1995													
Degrees of Reading Power (DRP) Test						California Achievement Test (CAT-5)							
Year	N	0-19	20-39	40-59	60-79	80-99	Year	N	0-19	20-39	40-59	60-79	80-99
1993	45	7 (16%)	9 (20%)	7 (16%)	16 (36%)	6 (13%)	1993	47	7 (15%)	8 (17%)	14 (30%)	11 (23%)	7 (15%)
1994	93	32 (34%)	16 (17%)	18 (19%)	13 (14%)	14 (15%)	1994	101	9 (9%)	19 (19%)	25 (25%)	29 (29%)	19 (19%)
1995	106	51 (48%)	16 (15%)	21 (20%)	8 (8%)	10 (9%)	1995	122	30 (25%)	37 (30%)	24 (20%)	13 (11%)	18 (15%)

Figure 9

The pool of students who tested below the 20 NP in reading was close to half (48%) of the incoming 7th grade students population as shown in Figure 9. This was up from 34% from the previous year (1994) and a much larger percentage than the 16% of 7th grade students who entered the CMSP program at PS 19 in 1993. The low reading scores of students who entered the CMSP in September 1995 came equally from students drawn from PS 19 and PS 20. The major difference between the schools was the greater proportion of students from PS 20 who were of Limited English Proficiency (LEP). This was true in the previous year when an English as a Second Language (ESL) program was established in the Model School for LEP students. The intensive review and mastery approach of the Model School proved beneficial in the ESL program and in the course of the first three weeks of the Fall 1995 term over one-third of the enrolled ESL students were mainstreamed into the regular CMSP classes. In this regular classroom setting, the former ESL students greatly increased their English conversational ability, however comparable advancement in reading and writing were not forthcoming and improvement would require more focused curriculum and academic support.

The incoming 7th grade students in the Fall of 1995 not only tested low in reading they also performed poorly in mathematics -- with over 25% scoring below the 20 NP as compared to 9% of the 7th grade students in 1994 and 15% in 1993. The low reading and math scores and subsequent work with students in the first few months of the 1995 school year clearly showed that this fifth cycle of CMSP 7th grade students were in need of greater academic structure and support services than previous four cycles of CMSP students. The low level of student academic preparation had an immediate impact on the pace of instruction and in the quality of student homework during the first weeks of school. For a significant portion of the 7th grade students (approximately 30%) the Model School Humanities and Mathematics curriculum was proving to be more challenging than anticipated. This prompted a vigorous effort to modify the Model School curriculum and provide more support services to those students who were having the most academic difficulty. Changes were made in the reading materials as well as identifying and providing individualized support for specific students who were basically non readers. How these students were able to progress through K-6 schooling without special notice is testament to the difficulties of assessment and in providing necessary corrective actions in a timely manner.

Certainly it was apparent that the CMSP needed to quickly adapt to this new and lesser prepared 7th grade student population by both modifying the curriculum and providing more personalized support resources. The latter was in part aided by the participation of college students from The Cooper Union college located nearby the Model School. While these changes took care of the situation over the short term it did not offer the longer term solution enabling the CMSP to assess incoming 7th grade students prior to their arrival in the Fall term.

Based on work with 7th grade students over the course of the 1995/96 school year, students' performance in CMSP Mathematics and Humanities coursework while adequate was well below that of CMSP students participating in Phase I at PS 19. Several changes were made throughout the year including reforming classes to maintain heterogeneity, creating and providing much more basic supportive materials for after-school and Saturday tutorials, arranging small group tutorials for non-readers, helping students get started with homework and adjusting the pace of instruction to insure class mastery for the majority of students. These changes and additional support did have a somewhat positive effect on the majority of students-- however, still more support was needed for students at the lower end. For these students, an intensive 4-week summer program was planned to enable them to master the necessary 7th grade coursework in preparation for the 8th grade.

Spring 1996 test results for the California Achievement Test (CAT)-5 were compiled by Community School District #1 comparing the percentage of 7-8th grade students scoring at or above the 50th National Percentile (NP). The data shown in Figure 10 indicates once again the better performance of CMSP students than their counterparts in CSD#1.

PERCENTAGES OF 7-8TH GRADE STUDENTS SCORING AT OR ABOVE THE 50NP ON THE CALIFORNIA ACHIEVEMENT TEST (CAT) - 5 TEST SCORES AT JUNIOR HIGH SCHOOLS IN COMMUNITY SCHOOL DISTRICT #1			
School	7th Grade	8th Grade	7-8th Grades
JHS 60	8%	31%	23%
East Side Comm JHS	16%	29%	22%
JHS 22	19%	38%	29%
JHS 56	36%	51%	43%
CMSP	39%	70%	54%

Source: NYC Board of Education

Figure 10

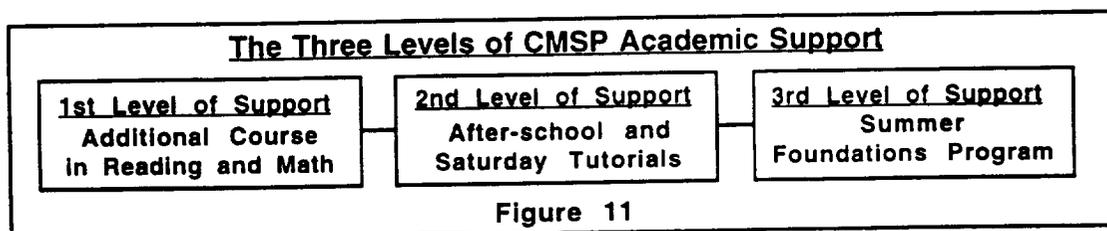
The data also underscores the very low 7th grade test score performance (<20NP) of students in other CSD#1 junior high schools (with the exception of JHS 56 which draws on a highly select student population from nearby PS 110). While CMSP students' 7th grade test score percentage was higher than all of the schools listed, it was lower than the usual ≥ 70 NP that has been attained in previous years. The lower NP for CMSP students was partly due to students' weaker incoming preparation and also partly to the gradual maturation of recently appointed mathematics teachers who needed time to adjust to the CMSP 7th grade math curriculum and instructional approaches. These new teachers were given considerable support by experienced CMSP math teachers as well as by Joe Germano, the CMSP math specialist who has been responsible for both the coordination of the 7-8th grade math program and also for generating most of the supporting CMSP mathematics materials.

The experiences in the 1995/96 project year were very useful in assessing what revisions were needed in the CMSP curriculum and instructional program. In addition, the very low reading levels of incoming 7th grade students (48% at <20 NP) prompted the idea of an intensive summer program for students in need prior to their enrollment in the Model School in the Fall term. Historically, the CMSP used 2-weeks in the summer to orient all new students who enroll in the CMSP as 7th graders. The orientation allowed all students to meet CMSP teachers and get a feel for the curriculum, the computer technology and how the school operates to insure mastery of course materials. The orientation, also proved useful in identifying students who needed additional preparation for the Fall term 7th grade classes. These students so identified would spend additional time in the summer program gaining the foundation for 7th grade CMSP Mathematics and Humanities coursework. Given the past levels of student preparation as they entered the 7th grade CMSP program, this summer orientation appeared to suffice -- at least until the latest group of 7th grade students who entered the Model School in the Fall of 1995.

3.2 The CMSP Summer Foundations Program

There was general consensus among CMSP staff that what was needed as a long term solution to the problem of incoming ill prepared students was more time for learning. And this additional time would best be obtained during the summer prior to students Fall term enrollment in regular classes. Given the constraints of staffing and budgeting, a 4-week Summer Foundations Program (as it was named) was designed for students who were identified as needing additional attention and preparation. The basic idea for the Summer Foundations Program was to have students study and master topics they would encounter in the first month of the Fall term. The Summer Foundations Program curriculum was enhanced to include materials that allowed individual and group tutorials of not more than 5 students. In essence, the Summer Foundations Program curriculum development effort focused on providing teachers and students with a 3rd level of support which would give students more individualized attention both in terms of assessment and in instruction. This three leveled system of academic support is illustrated in Figure 11 and has become the basis of future CMSP curriculum development efforts.

By adding this third level of curriculum support, the CMSP should be able to more effectively reach students who enter the school with very low academic proficiency levels -- which has been the school's experience in the Phase II project period.



The 4-week Summer Foundations Program represents a major change in the CMSP for which materials need to be developed and tested. As organized and staffed, the summer program appears to be affordable and its implementation should help remedy the problem of students who are ill prepared to succeed in the basic and introductory CMSP mathematics and Humanities coursework.

The curriculum developed for the Summer Foundations Program is matched to what students will be studying in the first month of the Fall term. For example, intensive work will be done on building students' strength in Problem Solving in Whole Numbers which is the beginning mathematics unit for 7th graders in the September. Using the same approach, students will be reading books which are comparable to the books they will be reading in September. The big difference will be that students will be enrolled in classes with no more than 12 students and college students will be available to provide students with individual attention. The goal over the long term is to have all students participating in the Summer Foundations Program reach a level of preparation for the first units of CMSP Humanities and Mathematics coursework that will allow them to succeed and gain academic confidence. The students will be closely monitored during the first weeks of the Fall term and given all the tutorial assistance they need to master Humanities and mathematics coursework. During the summer, students will also work on art and technology project, use computers, take trips to museums and use the school's recreational facilities.

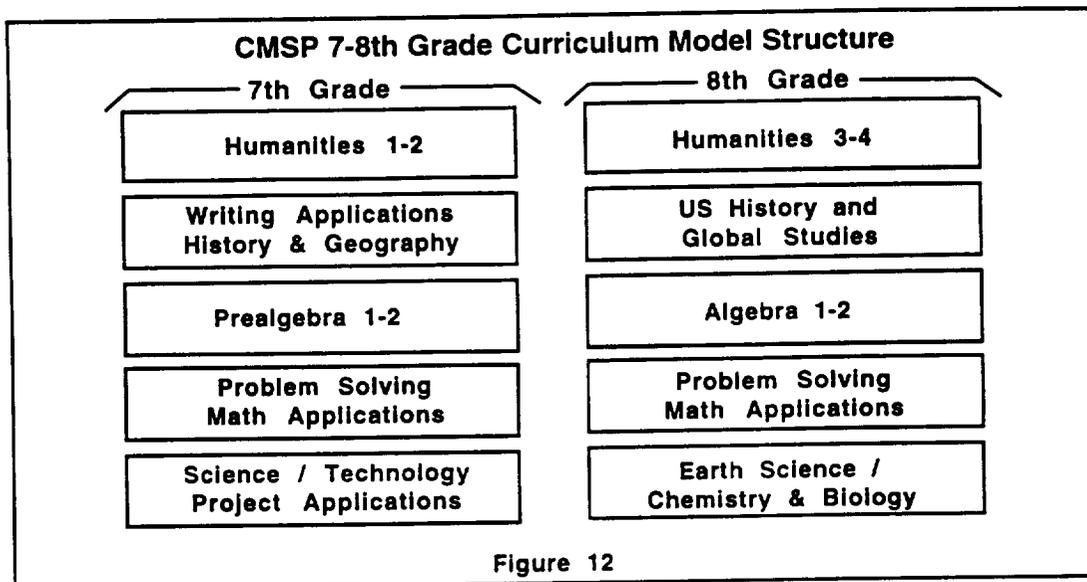
Close assessment of students who participated in the Summer Foundations Program throughout the school year enabled revision of the program before it was implemented again with a new group of students in June of 1997. The June 1997 program also was modified to allow for at least two visitations to the Model School location by all 6th grade students from PS 19 and PS 20. In this way, the June 1997 program became an orientation program for all 6th grade students which allowed them to meet with teachers and interact with current 7th grade students -- who served as their hosts. The two-day visitation also gave 6th grade students an opportunity to see and become familiar with the many qualities of the school they would soon experience in the Fall term.

3.3 Shaping the CMSP To Meet Needs of Lesser Prepared 7th Grade Students

The CMSP curriculum has been seriously tested in Phase II at the Marta Valle Model School site where successive incoming 7th grade populations have had reading proficiency levels below the 30th NP. In effect, the CMSP materials developed that enabled a ground/zero approach at PS 19 in Phase I with great success proved to be less effective for entering 7th grade students whose reading and math skills were very low -- including the large proportion of students designated as being Limited English Proficient (LEP).

The transition from elementary school (6th grade) to middle school (7th grade) coursework poses a great obstacle for students who read at low proficiency levels or who are designated Limited English Proficiency (LEP), with the latter eligible for greater support through English as a Second Language (ESL) programs. In response to this reality the curriculum needed to be shaped and structured so that students have proportionately more time to engage in supplemental reading and writing related to the books students read in the Humanities course. In a broader sense, the CMSP model curriculum which was developed at PS 19 will require extensive modifications to meet the needs of the lesser prepared students entering the Marta Valle Model School site at the 7th grade. This will take time and will extend beyond the Phase II project period.

Curriculum development in Phase II effort proceeded along two lines: 1) creating a school day curriculum which from the students viewpoint is different in each of the 5 periods (as shown in Figure 12), but for the teaching team is structured in such a way where students are given



considerably more learning time to reinforce and enhance their reading and writing proficiency; and 2) utilizing a combination of CD-ROMs, textbooks and hands-on projects so that students gain the experience of a given concept or unit of study from a variety of perspectives.

Curriculum development efforts also included expanding and adding much more depth to materials that have been created for after-school and Saturday morning tutorials and for the Summer Foundations Program. These materials are to be linked to the regular school day program and proportionately give students in need much more review time to build a base for mastery of course materials.

3.4 Student Mathematics and Reading Test Score Data at CMSP/Marta Valle

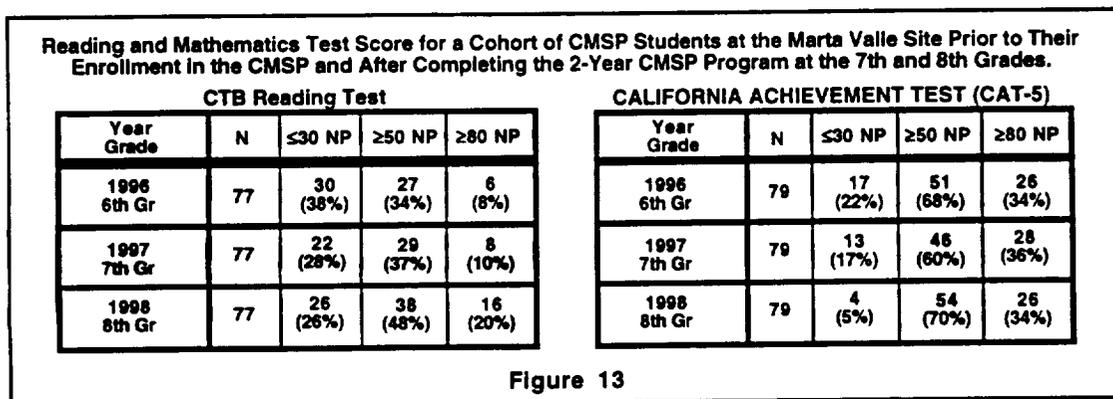
Standardized Reading (CTB) and Mathematics (CAT-5) were given in late April of 1997. Data from the Regents Course I Mathematics examinations taken by New York City high school students city wide for the 1996/97 and 1997/8 school years are indicated below in Figures 15 with CMSP comparative achievement data in the same school years in Figure 14.

The results of the math CAT-5 test once again showed CMSP students at the 7th and 8th grades outperforming comparable students in Community School District #1 (CSD #1) by wide margins (CMSP 64% vs. CSD #1 43%). CTB Reading scores by CMSP students however showed only small gains which pointed to the very low reading proficiency level of entering CMSP 7th graders from PS 19 and PS 20 in 1995 and 1996. In addition to low reading scores of incoming students, there was also a significant increase in the English as a Second language (ESL) population. ESL students constituted almost one-third of the CMSP 7-8th grade student population in the 1996/97 school year.

Incoming 7th grade students with low reading scores plus the proportionately larger ESL population impacted the 7th grade Humanities curriculum development efforts in 1996 and 1997. Materials were modified to give much greater instructional support and time so that 7th grade students could build reading skills and gain a strong academic foundation before entering the 8th grade. This strengthening of the 7th grade Humanities curriculum seemed to have paid some dividends -- as reading and writing assessments of 8th graders (at the school level) show that they have benefited from the more structured and supportive 7th grade Humanities curriculum.

To gain a sense of year-to-year test score movement over a 3-year Reading and Math testing period, a cohort of students' test scores that entered the Model School at the 7th grade in the Fall of 1996 was analyzed. Figure 13 shows the test score results on CTB Reading and CAT-5 Mathematics tests for a cohort of students that were tested at the 6th grade before they entered the Model School in April of 1996 -- and thereafter at the Model School in April of 1997 and 1998. As shown for the CTB reading test there was little movement in grade level performance (at and above the 50NP) from the 6th to 7th grade -- 34% to 37%. However, there was a substantial increase of 11 points -- 37% to 48% -- from the 7th to 8th grade. This positive movement from the 7th to 8th grades was also reflected in the number and percentage of students who scored above the 80NP -- 8(10%) to 16 (20%). While this upward trend at and above the 50 NP was noteworthy, the movement of students out of the at or below the 30 NP was less than expected -- from (30) 38% in the 6th grade to 26 (33%) in the 8th grade.

The data in Figure 13 appears to suggest that students who enter the school with reading levels at and below the 30 NP need much more personal attention and time (both during the school day and after school) that the CMSP in its present organization in Phase II can accommodate. This is in contrast to student test score gains made in Phase I where there was significant movement of students out of the at and below the 30 NP as was earlier shown in Figure 1 -- from 10 (28%) students at the 6th grade to 4 (10%) students at the 8th grade. The major differences in the Phase I and Phase II Model School programs was the very high level of personal attention that was provided to students during Phase I because of the smaller school size and also because of the greater use of college students as Teaching Assistants. It is expected that with addition of a structured Summer Foundations Program (with a greater emphasis in Reading) plus stronger ties to area colleges that students' year-to-year test score performance in both Reading and Math will rise significantly at all NP levels in the future.



The CAT-5 Mathematics test score results can be viewed somewhat differently. While there were minimal gains in the at and above the 50 NP from the 6th grade to the 8th grade -- from 51 (68%) to 54 (70%) -- there was significant movement of student scores out of the at and below the 30 NP range -- from 17 (22%) students at the 6th grade to 4 (5%) students at the 8th grade. This positive shift out of the low end of the test score spectrum significantly reduced the academic spread of the class and is in keeping with math test score results generally obtained using the CMSP ground/zero mastery approach. However, the striking year-to-year gains in the CAT-5 math test made by students in Phase I were bolstered by the significant gains that students made in the Reading tests. This was not the case with the student population in Phase II where mastery of Humanities coursework was limited by students' low entry Reading test scores and the large proportion of students designated as Limited English Proficient.

3.4.1 Student Course I Mathematics (Algebra) Achievement -- 1997 and 1998

Because of the lower performing entry level of CMSP students who entered the 8th grade in the Fall of 1995 and in the Fall of 1996, their progress in a first course in algebra (New York State Course I Mathematics Regents program) was not as strong as it was with previous 8th graders enrolled in Phase I. Therefore, it was decided not to administer the NY State Course I Mathematics Regents Examination in June 1996 (and in June 1997) as originally planned. In early Spring of 1996 and again in 1997, it was felt that a majority of students needed additional time and attention to master the course materials. As a result the course was extended for one term to give all students the opportunity to excel in their algebra coursework. The Course I Mathematics Examination is normally taken by high school students at the 9th and 10 grades. The lengthening of the algebra course and examination by one term still put the CMSP students ahead of comparative students who take the examination at the completion of the 9th and 10th grades.

Figure 14 shows the results of CMSP student performance on the Regents Course I Math examination given in January 1997 and in January 1998 (Phase II) along with the results obtained by CMSP students in June 1995 at PS 19 (Phase I). The data indicates that that the additional term was warranted. However, the additional term does point to the reality of the lesser prepared 7th grade student population that entered the CMSP in Phase II. It remains to be seen what effect curriculum changes, additional levels of instructional support and the implementation of the Summer Foundations Program will have on future CMSP students' achievement and pace in prealgebra and algebra coursework. While the achievement of the CMSP students taking the Regents examination in January of 1997 and 1998 was less than the students taking the examination in June 1995 in Phase I, their achievement was still impressive-- given their lesser preparedness as 7th graders and the fact that more students took the test.

CMSP Student Performance On The New York State Regents Course I Mathematics (Algebra) Examination -- June 1995, January 1997 and January 1998

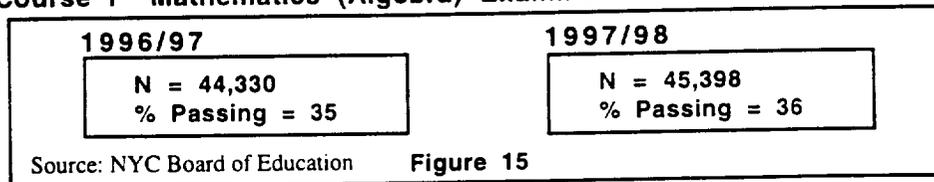
N	<35 (%)	<55 (%)	<65 (%)	≥65 (%)	≥70 (%)	≥80 (%)	≥90 (%)
JUNE 1995 - Phase I							
49	1 (2%)	2 (4%)	5 (10%)	45 (90%)	43 (86%)	41 (84%)	29 (59%)
JANUARY 1997 - PHASE II							
72	0 (0%)	5 (7%)	11 (16%)	61 (85%)	53 (74%)	43 (60%)	25 (35%)
JANUARY 1998 - PHASE II							
77	6 (8%)	22 (29%)	27 (35%)	50 (65%)	46 (60%)	35 (45%)	19 (25%)

Figure 14

Despite the lesser preparation of students as they entered the 7th grade, all of the students in Phase II were introduced to high school coursework through their study of algebra in the 8th grade. While it took the students one term longer to complete the Regents algebra course, they had the experience of doing abstract mathematical work and gained a sense of the rigor of the NY State Regents high school program of study they would encounter in all 9-12 grade academic subjects. Those students who did not pass the examination or wanted to attain higher test scores were given the opportunity to retake the examination at the end of the school year in June 1997 and 1998.

CMSP students' enrollment and consistent achievement in Course I Mathematics (algebra) highlights one of the major objectives of the CMSP effort -- the enrollment and achievement in a first course in elementary algebra. By virtue of their enrollment in algebra at the 8th grade, CMSP students secured the background to enroll in higher level mathematics and science courses in high school -- including Precalculus and the Calculus in the 11th and 12th grades. This is in contrast to the general NYC high school population, where more than 50% of students do not pass the Course I Mathematics examination before high school graduation. This very low performance in algebra is underscored in Figure 15 which indicate passing rates of 35% and 36% respectively on the 1997 and 1998 Course I Mathematics Examination -- as compared to 85% and 65% for CMSP students.

New York City Wide Student Performance On The New York State Regents Course I Mathematics (Algebra) Examination -- 1996/97 and 1997/98



3.5 CMSP Replication in Other Urban School Districts

In Phase II, the CMSP evolved to a level where its 7-8th Grade curriculum and instructional model could be further developed and replicated in other urban middle schools. At a January 1997 conference in Haines City, Florida entitled Producing High Student Achievement sponsored by the National Center for Education and The Economy, members of the CMSP staff made a presentation that described the development and accomplishments of the CMSP. Attendees were particularly impressed with the very large test score gains in Reading and mathematics made by the 3 cohorts of CMSP students in Phase I -- plus the fact that the randomly selected CMSP students were able to complete a first course of high school algebra by the 8th grade at such high achievement levels.

As a result of the conference and other discussions with school officials in the Bronx, NY and in Cincinnati, OH planning and organization for CMSP replication took place in the Spring of 1997. Accordingly, a CMSP replication plan was organized and implemented as follows:

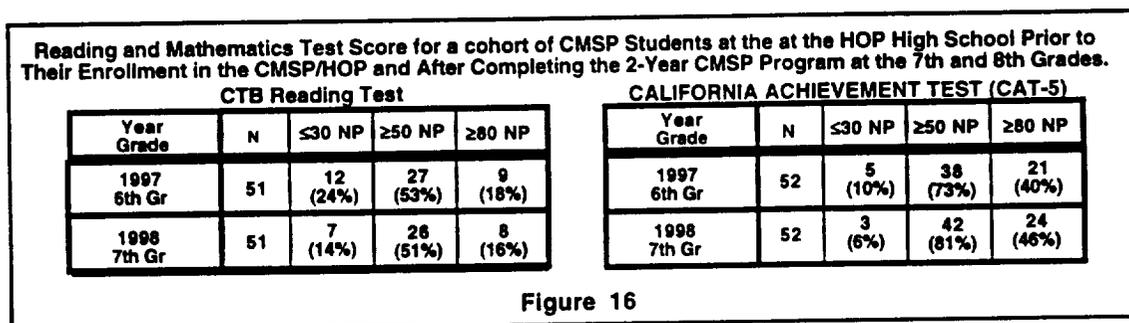
- 1) in the Fall of 1997, Health Opportunities (HOP) High School in the South Bronx, a 7-12 secondary school began a 7th grade CMSP component with 54 students drawn from Community School District #9; and Community School District #7.
- 2) in the Fall of 1997, Gamble Middle School in Cincinnati, OH, a K-8 school enrolled 55 of 115 students from its 6th grade class to participate in a 7th grade CMSP Model program.

Prior to above schools' decisions to participate in the CMSP there were visitations by Bronx and Cincinnati school officials and teaching staff to the CMSP/Marta Valle school site in Lower Manhattan. During their visits they were able to see and experience the CMSP in action. Of particular interest to the visitors was the highly structured CMSP curriculum which enabled a very supportive learning environment for all 7-8th grade students. The Bronx and Cincinnati teaching contingent also had a chance to experience the after-school and regularly scheduled Saturday morning tutorial sessions, where students have an opportunity to receive personalized assistance from teachers and college students. During this time they were able to gain an understanding of how the major elements of the CMSP operate interdependently to foster student and class achievement -- as noted earlier in Figure 3. .

3.5.1 Student Achievement in Math and Reading at HOP High School

Objective data on Reading and Math test scores were not available from the Gamble K-8 school in their first year of CMSP implementation. Feedback from participating Gamble teachers however was very positive with notable students' time on task and students' genuine involvement in schooling by virtue of the CMSP Humanities and Mathematics curriculum. At HOP High School -- because of their NYC location -- objective data was available for the 1997 and 1998 school year in the same form of standardized tests (CTB and CAT-5) administered to students at the CMSP/Marta Valle school site. The test scores for a cohort of CMSP/HOP students tracked from the 6th grade and after their participation in the CMSP for 8 months in the 7th grade in shown in Figure 16.

The data clearly shows 7th grade entry level test scores in Reading and Math test scores which were substantially higher than students at the CMSP / Marta Valle school site where the ≥ 50 NP scores in Reading have averaged less than 35% in Phase II. At HOP incoming Reading test scores at the 7th grade as shown in Figure 16 were 52% and in Math they were 72%. These test scores were similar in scale to those attained by 6th graders before they entered the CMSP in Phase I as noted initially in Figure 1. The data in Figure 16 also shows that the dramatic gains that were made by students in Phase I were not apparent at HOP with a 1 point drop in Reading and a modest 8 point gain in Math. This was primarily due to the inexperience of the four teachers who made up the CMSP teaching staff at HOP. Two of the teachers were teaching school for the first time and only one of the teachers had experience working alongside experienced teachers at the CMSP/Marta Valle school site. Although CMSP core staff did meet with HOP teachers on a weekly basis after-school, a more effective staff development initiative would have an experienced CMSP teacher on site to coordinate the program during the school day. This core staff addition at the CMSP/HOP HS will take place for the 1998/99 school year and as a result significantly higher student achievement gains are expected.



3.5.2 Summer Staff Development and Training

The CMSP is distinctive enough in form and substance such that traditional seminars and workshops do not give replication teachers a sense of how the program operates. In working with new teachers over the years, the CMSP has found a reality-based approach to teacher training to be much more effective. Using this approach, teachers new to the CMSP are paired with experienced teachers and both are involved with teaching students within the actual environs of the CMSP/Marta Valle school site on the Lower East Side. The training and staff development takes place during a 4-week period in the Summer Foundations Program with incoming 7th grade students who have been previously identified as needing the additional support to develop a strong foundation in reading and mathematics. Because the summer support program is organized to emulate what students will encounter when they begin CMSP coursework in the Fall term, the replication teachers obtain a real sense of how the program operates as they work along side experienced CMSP teachers. The greater value of the training that takes place in the summer has to do with the students themselves and the progress they make in getting the needed academic preparation to be successful when the CMSP starts in the Fall term. The replication teachers as they are being trained work closely with experienced CMSP teachers to give students the necessary academic support.

As part of their stay during the summer, the replication teachers spend considerable time with the CMSP core staff and administrators to become knowledgeable and experienced in the organization and coordination of the 7th grade program. The summer experience at the CMSP also enables the visiting teachers to analyze the CMSP in the context of their home school's student population, environment and institutional resources. This is of great help in modifying the CMSP curriculum and project organization to meet the distinct needs of the participating school population, including the establishment of an operating budget and support services for students and teachers. These program modifications enable the participating school to replicate the CMSP as closely as possible and insure that students are provided with the necessary structure, support and time to make significant gains in their academic performance.

Replication of the CMSP will enable the CMSP to be further developed and tested in widely different school environments. Each of the schools and their urban environments offer unique characteristics that will help establish protocols, organization and budgeting to launch and maintain the CMSP replication. This multi-school project environment will subject the CMSP to a wide range of project parameters including: 1) the preparedness of students as they enter the 7th grade; 2) the training and experience of participant teachers; 3) the leadership of the school, and 4) the level of parental involvement.

4.0 CMSP's First Graduating Class

A major milestone in the CMSP effort was reached on June 20, 1997 when the first graduating class of 21 students were presented with high school diplomas. These 21 students started as 7th graders in the CMSP at PS 19 in the Fall of 1991. The academic preparation and support they received in the 7th and 8th grades served them well, as all students successfully completed a Regents course of study -- as shown in Figure 17. This program of study is the same as that given at the Specialized High Schools in New York City where admission is by competitive examination.

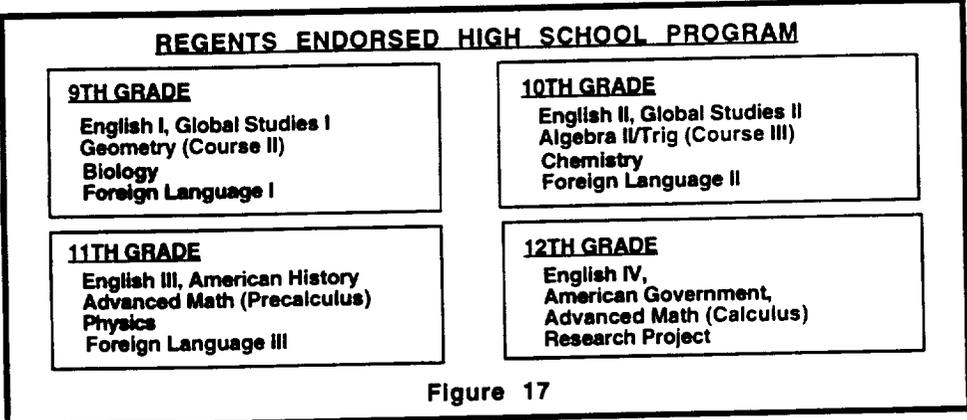


Figure 17

Fourteen of the 21 graduates received a Regents Endorsed Diploma which signifies that the students have passed rigorous New York State Regents examinations for each of the courses listed above. This high percentage (67%) of students stands in contrast to the very low 26% of students in Manhattan high schools (not counting Stuyvesant High School) who receive the Regents Endorsed Diploma awarded in June of 1997.

To illustrate the contrast in more absolute terms, the 14 CMSP students exceeded the actual number of students receiving a Regents Endorsed Diploma in 15 of the Manhattan schools -- even though many of these schools had considerably higher number of students in their graduating class -- see Figure 18 below.

GRADUATION CLASS OF 1997, NUMBER AND % REGENTS DIPLOMA

MANHATTAN High Schools	#Grad Class	No.Regents Diploma	% Regents Diploma
Stuyvesant	633	633	100
HS Health Professions	140	102	73
CMSP	21	14	67
Frederick Douglass Academy	67	38	57
Environmental Studies	76	41	54
Fiorello H. LaGuardia	378	183	48
A. Philip Randolph	196	81	41
Leaders/Public Service	43	12	28
Man Center for Math/Sci	126	35	28
7 Schools (24%-13%)	857	175	20
12 Schools (0%-9%)	864	48	6

Source: NYC Board of Education **Figure 18**

4.1 Disbursement of The First Cycle of CMSP Students --1991 to 1997

In the Fall of 1991, when the CMSP first started at PS 19, the enrollment was 61 students. The 21 students who graduated from the CMSP were students who chose to stay with the CMSP in 1993 at the completion of the 8th grade (even when there was no official CMSP high school program in place at the time). After the first year, the 61 students were reduced to 57 when 4 students moved away from Manhattan. At the end of the 8th grade, 12 of the remaining 57 students were accepted into the Specialized High Schools: 4 went to Stuyvesant HS, 4 to Brooklyn Technical HS, 1 to Bronx Science HS and 1 to LaGuardia HS. All twelve of these students graduated with Regents Endorsed Diplomas. The other students went to a variety of high schools and junior high schools at the 9th and 10th grades before the CMSP had an official high school program. Through informal contacts it is estimated that of the original 57 students, 49 graduated within the four year high school period ending in June 1997. This 86% graduation rate in 4 years is much higher than the average graduation rate of 48% in the city's high schools. Two of the students needed another term to accumulate the credit needed to graduate, while three others pursued the General Equivalency Diploma (GED) which they expected to receive in the Spring of 1998. There appears to be only three students who dropped out of the original 57 students who completed the 8th grade at PS 19. The high retention rate can be directly attributable to the very strong academic foundation that students gained in the 7-8th grade CMSP program experience at PS 19.

4.2 Going To College

As of January 1998, nineteen of the 21 CMSP graduate (Class of 1997) were accepted and 18 were attending colleges. One college student accepted to Trinity College chose to pursue an acting career and two students decided to join the military.

Table II below shows that 8 of the 19 students will be pursuing majors in Engineering (5), Computer Science (2) and Biology (1) at 4-year colleges. This is a significant percentage and attests to the strong academic foundations developed in the CMSP high school program. In addition, 4 CMSP students were accepted into competitive colleges: Trinity (2), University of Southern California (1), and Marymount College (1).

<u>No. of Students</u>	<u>College/University</u>	<u>Major</u>
2	Columbia University	Electrical Engineering
1	Polytechnic University	Computer Science
1	SUNY Stonybrook	Engineering Science
1	Brooklyn College	Computer Science
2	City College of New York	Electrical Engineering
1	City College of New York	Biology
1	University of Southern California (USC)	Business Administration
2	Trinity College	Liberal Arts*
1	Marymount College	Liberal Arts
1	John Jay College	Criminal Justice
1	Baruch College	Accounting
5	Borough of Manhattan Comm. College	Liberal Arts

Table II

The high proportion of students majoring in Engineering and Computer Science shows the value of exposing students to the real worlds of industrial and engineering college environments. Over their 6 year tenure in the CMSP, the graduating students of the Class of 1997 took numerous visits to the facilities of Con Edison, IBM, and the Schools of Engineering at The Cooper Union and Columbia University. During these visits, their awareness of careers in engineering was heightened by meeting engineers and scientists who work and teach in the engineering professions. CMSP's affiliation with the Schools of Engineering at The Cooper Union and Columbia University proved especially beneficial to students in the Class of 1997; they had the opportunity to take college level math courses (at The Cooper Union) and also received strong academic support from college students (from both institutions) who have served them as both tutors and mentors.

Students' (in the CMSP class of 1997) experiences taking Precalculus and Calculus courses at The Cooper Union plus their many excursions to local colleges of engineering in the last 4 years raised their awareness of the demanding nature of college study. The CMSP staff and teachers who taught and worked with the 21 students over the years fully expect them to succeed in college and to remain connected to the school to serve as both mentors and tutors for the CMSP students who will be following in their footsteps. Indeed, at least a dozen of the students from the CMSP Class of 1997 who attended college in New York City were involved in a month long program in January 1998 CMSP where they served as Teaching Assistants (TAs) for all CMSP middle school students.

5.0 An Idealized CMSP 7th and 8th Grade Curriculum Model

Since CMSP inception in 1991, there have been tremendous advances in the power of the personal computer, related software and in the growth of the Internet through the World Wide Web. This has presented both an opportunity and a problem. The opportunity is in the form of computer generated multi-media and information system which if integrated properly in the school day program will significantly alter the way teaching and learning takes place in the classroom. The problem stems from the continuing shortage of math and science teachers in the urban classroom which as of late is being worsened by the high paying job opportunities in the computer technology marketplace. Any future development of model school programs like the CMSP must take these two very important factors into account. An idealized CMSP curriculum model would incorporate advanced computer technology and Internet access as an inherent part of the model. And because of the integral nature of computer technology in the curriculum model, connections with local colleges would provide the model school with the necessary teaching assistance and technology expertise and experience.

It is clear from the student participation and achievement in Phase I and II of the CMSP effort that there is great potential for making significant change in the way students learn and achieve at the 7th and 8th grade level -- especially in light of the advances in computer technology. The next step in the development of the CMSP is to create an idealized model that has more structure, support and learning time to assure that all students can attain excellence in their school work. Built into this idealized model there needs to be partnerships with local colleges which can provide teams of college students who can work closely with school teachers as Teaching Assistants (TAs).

Creating an idealized CMSP 7-8th grade curriculum provides the engaging possibility (based on CMSP work in Phase I and II) that almost all of the students who progress through the 7-8th grade CMSP program will enter the 9th grade strongly prepared to do rigorous high school coursework at high academic levels. In addition, the work done in the CMSP in Phase I and II clearly suggests that strong high school preparation can take place over a 2-3 year period regardless of the students' prior academic background in grades K-6. If this CMSP student performance can be replicated in different school environments, it would have great implications as to where priorities should be set and resources targeted to insure that students in urban middle schools enter the 9th grade with the necessary foundation to succeed in precollege programs of high school study.

5.1 A Curriculum Model Enhanced By Multi-Media

An idealized curriculum model shown in Figure 19 is organized as a 7-term program designed around a core of Humanities, Mathematics and Science/Technology courses. Given the experience in Phase II with students' very low Reading and Math levels, the idealized curriculum model formally adds three summer terms that surround the 7th and 8th grade school years. The three additional summer terms will give ample quality time for the Model School staff to both assess and work

CHANCELLOR'S MODEL SCHOOL PROJECT (CMSP)

7-TERM 7-8TH GRADE PROGRAM

Pre 7	7th Grade		Pre 8	8th Grade		Pre 9
	Fall	Spring		Fall	Spring	
<p>Low performing students selected from incoming 7th grade class. The bottom 20% but not greater than 40 students.</p> <p>Intensive 4-6 week program in Reading and Math focusing on topics that all 7th grade students will be studying in the first 3 weeks of the Fall term.</p> <p>Req'd Mastery performance on specific Reading and Math units.</p> <p>Summer students are automatically enrolled in the after-school program in the Fall to achieve mastery of selected units.</p>	<p>Humanities 1 Brother's Grimm Cutz Gone to Birmingham</p>	<p>Humanities 2 Room to Harold Square New Kids in Town Child of the Owl</p>	<p>Students performing below 80% level eligible to attend summer school. The bottom 20% scoring between 65-79% but not greater than 40 students.</p> <p>Summer coursework includes intensive review of 7th grade Spring program and a look at 8th grade course work to be given in the first 2 weeks of the Fall term.</p> <p>Students whose 7th grade performance was below 65, repeat the 7th grade.</p>	<p>Humanities 3 Violence (Short Stories) Roll of Thunder George's Blues</p>	<p>Humanities 4 No Pigs Would Die The Giver West Side Story</p>	<p>Students performing below 80% level eligible to attend summer school. The bottom 20% scoring between 65-79% but not greater than 40 students.</p> <p>Summer coursework includes intensive review of 8th grade Spring program and a look at 9th grade course work to be given in the first 2 weeks of the Fall term.</p> <p>Students whose 8th grade performance was below 65 repeat the 8th grade.</p>
	<p>Writing Applications - History/Technical Events 1 Medieval Times Space Explorations Civil Rights Movement</p>	<p>Writing Applications - History/Technical Events 2 Poetry/Word Play US & World Cultures World War II</p>		<p>American History 1 Making 13 Colonies Colonies to Countries Constitution Works</p>	<p>American History 2 War Terrible War Age of Extremes War, Peace & All Jazz</p>	
	<p>Problem Solving with Whole Numbers Addition & Subtraction Multiplication Division / Cum Review</p>	<p>Problem Solving with Fractions & Decimals Powers of Ten Estimate/Round Off Calculator Exercises</p>		<p>Course I Math (MQ1) Order of Operations 1st Degree Equations Sys of 1st Deg Equat</p>	<p>Course I Math (MQ2) Polynomials Quadratic Equations Logic & Probability</p>	
	<p>Whole Numbers Enhancement Skills/Mental Arithmetic Estimate/Rounding Off Computer Applications</p>	<p>Lines and Perimeters Area and Volume Circles & Cylinders Triangular Figures Composite Figures</p>		<p>MQ1 Applications Rectangular Coord. Graphing Equations Rates & Proportions</p>	<p>MQ2 Applications Angle Pairs/Triangles Pythagorean Theorem Inequalities, Statistics</p>	
	<p>Art, Science/Tech Project Applications 1 Typing Skills & Word Processing Coordinate Systems Mapping & Geography</p>	<p>Art, Science/Tech Project Applications 2 Branches of Science Line, Area, Vol Meas. Mass/Weight, Density Macro/Micro Measures</p>	<p>Astronomy** The Universe The Solar System Space Explorations Planet Earth & Moon</p>	<p>Intro Earth Science*** The Atmosphere Land masses Oceans Earth's Interior</p>		
	* Complementary Text: The Nature of Science		** Complementary Text: Exploring The Universe	*** Complementary Text: Exploring Planet Earth		

Figure 19

Note: Art & Music and Language projects are integrated in the above program to complement particular readings and/or mathematics concepts.

intensively with students who need the necessary preparation to succeed in the CMSP utilizing a ground zero/mastery approach. This additional summertime work should also enable almost all students to maintain course instructional pace and have the background to achieve at a mastery level during the regular school year. Further, it would provide time necessary for students to make up coursework that they did not fully master during the regular school year. Hopefully, with the additional time and resources provided by college teaching assistants and the visualizations and enhancement provided by advanced computer technology, future Model School students would be able to replicate the very high performance attained by CMSP students in Phase I -- especially in the completion and mastery of Course I Mathematics by the end of the 8th grade.

The school day in the idealized 7-8th grade curriculum model shown in Figure 19 is organized in a block schedule of five one-hour periods -- much the same as the block schedule utilized in the Model School in Phase II. The major difference would be in the way computer technology and connections to the Internet influence students grasp and deeper understanding because of the visual access and dynamic presentations -- and most importantly by students' ability to become independently involved with the research and completion of assigned projects.

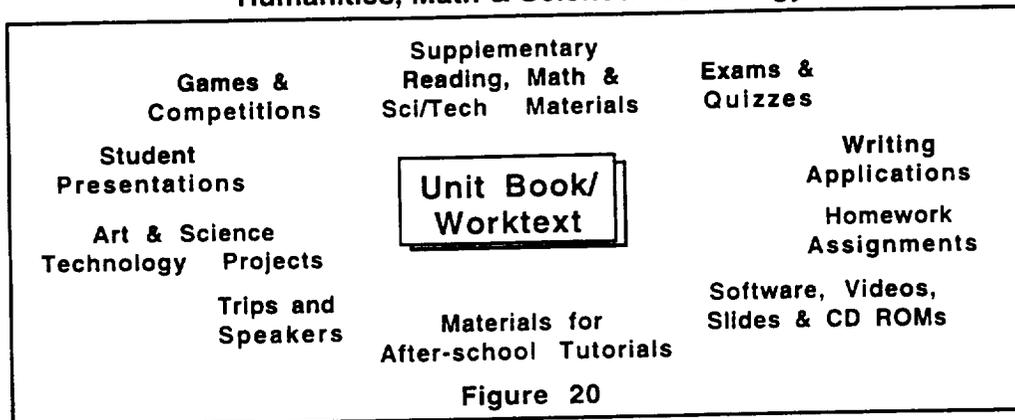
The idealized curriculum model would be developed around "state of the art" computer labs that network 30 computers driven by a high-speed server with the processing power to take full advantage of selected multi-media CD-ROMs and the Internet. It is clear from preliminary work using the CD-ROMs in Phase II that the ensuing CD ROM digital images and animations definitely help students visualize and better understand important concepts in science, mathematics, Geography and world cultures. As designed, selected CD-ROMs would be utilized in the 2nd and 5th periods (see Figure 19) to enhance teaching and learning. The topics during these particular periods lend themselves to the dynamic visualizations currently available on CD ROM. Beginning in the 1st term of the 7th grade during the 5th period, traditional typing and word processing software would be bolstered with multi-media Atlas software which will introduce students to the sounds, mapping and digital images of the earth, its continents and oceans and the demographics of regions and countries.

Throughout the first term, CD-ROM driven projects would be developed around media and information searches to give students an opportunity to learn and experience the power of the computer to access and compile data and information related to given Humanities and Geography topics. In the ensuing three terms in the 7th and 8th grade, the 2nd and 5th period will utilize a combination of CD-ROMs, Internet access, textbooks and hands-on projects so that students gain the experience of a given concept or unit of study from a variety of perspectives as indicated in Figure 19 above. A continuing strand of geographical scale will connect all 4 terms in the 5th period beginning with the world atlas in the 1st term, proceeding with geographical and scientific measures (length, area, volume, mass and density) in the second term and then expanding to the solar system and the universe in the 3rd term, then back to planet Earth in the 4th term.

A major focus in the development of the idealized curriculum model would be on creating 2nd and 5th period classroom projects at the 7th and 8th grade level that would give students hands-on project experience and multi-media experiences on almost a daily basis. These projects would be designed as 2-3 week modules that could be easily scheduled as learning opportunities arise to complement topics in the Humanities and Math/Science/Technology coursework. The effort would be driven by the high quality of animation, graphics and multi-media that CD-ROMs provide -- and in the not too distant future through the Internet when T1 type lines and video streaming become available to public school systems. Currently, CD ROMs bring powerful moving images of people, places, historical events and depict with great clarity all phases of science from microscopic views to views of the solar system and the universe -- the latter courtesy of NASA space explorations of the planets and vivid cosmic images available from the Hubble Space telescope.

CMSP materials in the idealized curriculum model would be structured in a comprehensive curriculum package as shown in Figure 20. Structured in this way, participant teachers will have an array of materials they can use to complement and enhance each of the unit books or worktexts used in Humanities, Math and Science/Technology coursework. The curriculum package will also include references to the equipment and instrumentation necessary to run the software, videos, slides and CD-ROMs and also links to the Internet for teachers and students to research given topics in further detail.

**CMSP Curriculum Package For Each Major Unit in
Humanities, Math & Science/Technology**



5.2 Partnerships with Local Colleges

The CMSP has a long history of developing organizational and curriculum models to increase the pool of African American and Hispanic students who are academically prepared to enroll and succeed in college study in science and engineering. The participation of the Schools of Engineering at Columbia University and The Cooper Union in the development of the CMSP in collaboration with the New York City Board of Education dates back to 1980. At that time, a national precollege effort involving colleges, industry and government/private foundations was mounted to increase the very limited pool of students graduating from urban high schools with the mathematics and science background to enroll and succeed in college programs in science and engineering.

The national precollege effort named the National Association of Precollege Directors (NAPD) of which the CMSP is a part, is still very active and currently involves over 120 engineering colleges working in consort with more than 1,000 schools that enroll over 60,000 students (from grades 6-12) in a variety of academic and science/technology project activities. Participation of the The Cooper Union and Columbia University engineering schools in the CMSP became increasingly important because of the rapid advances taking place in multi-media computer systems, interactive CD-ROMs and the Internet. College facilities and technical expertise were made available to assist CMSP students and teachers in setting up and using computer networks to enhance classroom instruction and learning. Also, college students played a valuable role in the CMSP by serving students both as teaching assistants, tutors and mentors -- with the latter giving students a personal view of the importance of schooling and high academic achievement.

The partnership models to be developed will build on the experiences that the CMSP has with the schools of engineering at The Cooper Union and the Columbia University. In the idealized CMSP Model, partnerships will be arranged to primarily support the school's instructional program. First and foremost will be the development and organization of a Teaching Assistant (TA) model whereby engineering college students will serve as tutors, mentors and technical specialists over the course of a

semester in return for either college credit or term long stipends. The college students will serve as teaching assistants under the guidance of a 7th or 8th grade teacher participating in the CMSP replication project. An independent study contract will be developed for the TA model consistent with the academic standards of the participating college. In granting college credit to participating college students, an Independent Study Contract overseen by a college professor will define TA objectives, scheduled school visits. Determinants of a final grade will include time and effort at the school, TA/teacher/students interactions, specific readings plus a mid-term and final paper.

The presence of college students as TAs in the classroom will significantly increase the academic support and enhancement available to students and teachers. In particular, engineering college students are uniquely equipped to serve as TAs for secondary mathematics and science classes because of their own concurrent study in an engineering college curriculum that is based heavily on the concepts of mathematics and science. As organized, teams of TAs from the local colleges will be assigned and travel to partnered schools several time per week -- during a 10 week period in a given semester -- to work closely with teachers and students. The TAs would be scheduled to work with designated classes in three tutorial modes on a weekly basis: 1) in-class group tutorials on Fridays, 2) after-school group tutorials on Wednesdays, and 3) group tutorials on Saturday mornings.

6.0 Conclusion

The disparity in secondary school achievement between minority students in urban public schools and their non minority counterparts in suburban public schools is a long standing problem that shows little sign of relief. And the continuing and growing shortage of qualified teachers in urban middle schools presents a particularly difficult obstacle to overcome. If the major resource in a school is its teaching staff, How then should this persistent urban educational problem be attacked and ultimately resolved? -- especially at a time when higher academic standards are being instituted as major and national educational reform initiatives. The solution seems to beg for increased school instructional resources as well as for strategies which give students more personal attention and positive experiences with multi-media computer technology. The above resources cited are all salient features of the small school movement and in private schools. However, the overwhelming majority of students in the inner cities are enrolled in neighborhood secondary schools where teaching resources and computer technology utilization are seriously lacking making future widespread student academic advancement a very challenging prospect.

The CMSP has demonstrated in a 7- year long project effort from 1991 to 1998 that given the appropriate curriculum structure, academic support and learning time, participating students could gain the necessary academic foundation to succeed in a rigorous program of study in high school. The fact that many of the participating CMSP students were able to make significant academic gains within a period of two years (at the 7th and 8th grades) regardless of their K-6 experiences, provides an alternate and unique model strategy towards dealing with the educational disparity in urban schools. The strategy has potential both for fostering student success and in preparation for high school. The CMSP experience also presents the case that the 7th grade need not be too late for students to regain and again establish their intellectual footing for academic scholarship. This is one of the more important findings of the CMSP effort. It suggests that real progress can be made in reducing the disparity in urban public schools by prioritizing available resources, organizing partnerships with local colleges and focusing change strategies at the critical middle school years.

Replication of the CMSP model in other urban middle school districts would be useful in demonstrating the transportability and viability of the CMSP model to increase student achievement and preparation for high school. CMSP replication would as a consequence establish a network of schools and colleges that could work together, share institutional resources and mount a uniform and large scale effort to make significant improvement in urban secondary schools in the future.

Reference Notes

1. Everson, H., Dunham, M., Signs of Success, Equity 2000, (New York: College Entrance Examination Board, 1996), p.14.
2. Jeter, A., "Mississippi Learning", re: The Algebra Project. New York Times Magazine, February 23, 1993, p. 28-72.
3. National Association of Precollege Director (NAPD). NAPD Organizational Directory (Washington, D.C.: NAPD, 1995).
4. National Action Council for Minorities in Engineering. (NACME). Inc., Crisis and Commitment : 1997 Annual Report, (New York: NACME, 1997).
5. Occhiogrosso, M., Course I, Reviewing Integrated Mathematics. (New York: Amsco Publications, 1990).
6. New York City Board of Education, Directory of Public High Schools, 1998-1999, (New York: 1998), p.10.