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ABSTRACT

Achievement in reading and mathematics of students at elementary schools participating in the Columbus (Ohio) 1989 School Improvement Program (SIP) has improved for the seventh year in a row, but achievement of low income students remains below that of other students. The goal of SIP, an effective schools project, is to improve the academic achievement of students' basic skills and to lessen the disparity between students from different socioeconomic backgrounds. The Comprehensive Tests of Basic Skills (CTBS) at grades 2-8 and the Metropolitan Achievement Tests (MAT) at grade 1 were administered as a pretest and a posttest to 8,600 students in 33 schools. The following major findings are reported: (1) increases in reading comprehension achievement were slightly greater than expected; (2) increases in mathematics computation achievement were substantial, with 29.1 percent more of the students at grade level on the posttest than on the pretest; (3) low income students scored consistently lower than other students during the 7 years of the program; and (4) overall patterns of increases in student achievement have been consistent for the 7 years of the program. Statistical data are included on 13 tables. The following material is appended: (1) a list of schools participating in SIP, 1982-86; (2) a list of schools participating in schoolwide testing, 1988-89; and (3) a graph comparing various test scores to the normal curve. A list of four references is also appended. (FMW)

FINAL EVALUATION REPORT
EFFECTIVE SCHOOLS REPORT

July 1989

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FINAL EVALUATION REPORT
EFFECTIVE SCHOOLS PROGRAM
1988-89

ABSTRACT

Program Description: Various school improvement efforts, which were implemented in a total of 27 Columbus schools during the period 1982-86, have continued at some schools during the 1988-89 school year. The goal of these efforts, as in the past, was to emphasize those factors which educational research has identified to be characteristic of effective schools, or schools in which all pupils regardless of socioeconomic background succeed in acquiring a mastery of basic skills, particularly in reading and mathematics. Effective schools are characterized by a sense of mission, strong instructional leadership, high expectations for students as well as school staff, frequent monitoring of pupil progress, a positive learning climate, sufficient opportunity for learning to occur, and parent/community involvement in the school program.

Time Interval: The effective schools effort coincided with the school year. A pretest was administered in late September, 1988, and a posttest in April, 1989. Students included in the pretest-posttest analysis must have taken both pretest and posttest in the same school and must have had a valid score on each.

Evaluation Design: The evaluation of the effective schools effort was accomplished by the administration of a pretest-posttest of student achievement using the Comprehensive Tests of Basic Skills (CTBS; 1981) at grades 2-8. The Metropolitan Achievement Tests (MAT6, 1985) was administered at grade 1. In this report information is presented to answer the following evaluation questions:

1.1 How did students score on the standardized achievement tests in relation to the national norm group?

1.2 How did students of different socioeconomic status score on the standardized achievement tests in relation to the national norm group?

Major Findings: Pretest-posttest scores in both reading and mathematics were obtained from approximately 8,600 pupils in grades 1-8 attending the 33 participating schools. Analyses of these scores, obtained from the Comprehensive Tests of Basic Skills (CTBS; 1981) in grades 2-8, and the Metropolitan Achievement Tests (MAT6, 1985) in grade 1, showed the pupils' change in achievement was slightly greater than expected in Reading Comprehension. The growth in Mathematics Computation was substantial with 29.1% more of the pupils at grade level on the posttest than at grade level

on the pretest. The comparable figure for Reading Comprehension was 5.4%. Analyses indicated that pupils from lower income families scored consistently lower in both reading and mathematics. This has been true for each of the seven years that effective schools research has been conducted in the Columbus schools. In fact, the pattern of pupil growth in mathematics and reading, regardless of which standardized test was used, also has been consistent during the seven years of effective schools research. The growth in pupil achievement as measured by NCE points and the percent of pupils at grade level from the fall pretest to the spring posttest has been consistently larger for mathematics than for reading. The following table summarizes the achievement gains for all pupils in reading and mathematics for the past seven years. The reader is advised that the expected change between pretest and posttest is zero. Also, it should be noted that for 1988-89, grade 1 test data were excluded from the data reported in this abstract. The pretest level for grade 1 was found to be too difficult for low-achieving pupils, while the posttest level for grade 1 was found to be too easy for the average and above-average pupils.

Table 1

Achievement Gains as Measured
by Change in NCE Points and Percent
of Pupils at Grade Level from Pretest
to Posttest in Each Program Year

Program Year	Reading		Mathematics	
	Average NCE Change	% at Grade Level Change	Average NCE Change	% at Grade Level Change
1982-83	4.2	11.9	13.6	31.4
1983-84	4.9	11.7	10.8	23.4
1984-85	0.6	0.5	9.5	19.2
1985-86	2.9	3.1	12.7	25.8
1986-87	2.1	2.8	13.0	25.9
1987-88	2.5	3.3	14.1	30.9
1988-89	2.2	5.4	13.4	29.1

FINAL EVALUATION REPORT
EFFECTIVE SCHOOLS REPORT
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Program Description

An effective school, according to Edmonds (1982) and other educational researchers (Brookover 1978, 1982), is one in which all pupils succeed in acquiring a mastery of basic skills, regardless of the pupils' socioeconomic backgrounds. Effective schools have the following characteristics in common, according to the State Department of Education Division of Equal Educational Opportunities (1981):

1. A Sense of Mission
2. Strong Building Leadership
3. High Expectations for All Students and Staff
4. Frequent Monitoring of Student Progress
5. A Positive Learning Climate
6. Sufficient Opportunity for Learning
7. Parent/Community Involvement

The School Improvement Program (SIP) was implemented in a total of 27 Columbus schools during a four year period, from 1982 to 1986 (Appendix A). The goal of SIP was to improve the academic achievement of pupils in the basic skill areas, particularly in reading comprehension and mathematics computation, as well as to lessen the disparity in achievement levels between pupils of different socioeconomic backgrounds. Providing building level inservice programs related to the characteristics of effective schools was a key element in the program effort, as were yearly assessments of educational needs at each school, and the administration of a pretest and posttest at each school during the school year.

Although the SIP officially ended with the 1985-86 school year, school improvement efforts have continued at a number of schools (Appendix B). During the 1988-89 school year, a total of 33 schools administered the Comprehensive Tests of Basic Skills (CTBS; 1981) at grades 2-8, and the Metropolitan Achievement Tests (MAT6, 1985) at grade 1, as a pretest of student achievement during September, 1988. The testing was done at each school at the request of the building principal. In addition to these 33 schools, 24 tenth-graders were tested at West High School as part of the Community College Preparation Program (CCPP). The CCPP results are not included in this report. The Department of Evaluation Services, as well as the Department of Assessment and Testing, provided technical assistance to the schools in the areas of providing and distributing necessary materials, collecting the resultant data, analyzing the data, and reporting the results to the schools.

Evaluation Design

The major findings from the administration of the pretest-posttest of student achievement using the Comprehensive Tests of Basic Skills (CTBS; 1981)

at grades 2-8, and the Metropolitan Achievement Tests (MAT6, 1985) at grade 1, are reported herein in response to the following evaluation questions:

1.1 Question: How did students score on the standardized achievement tests in relation to the national norm group?

1.2 Question: How did students of different socioeconomic status score on the standardized achievement tests in relation to the national norm group?

Major Findings

The following is a report on those activities that received technical support services from the Department of Evaluation Services, namely the standardized achievement test administration.

1.1-1.2 Pretest-Posttest of Student Achievement

A major characteristic of effective schools is the monitoring of pupil achievement in the basic skill areas. As part of this process, the pupils in 33 schools were administered tests of basic mathematics and reading skills twice during the school year. The pretest was administered during September, 1988, and the posttest was administered during April, 1989.

The two reading tests and two mathematics tests from the Comprehensive Tests of Basic Skills (CTBS; 1981) were used for grades 2-8. The CTBS tests used were: Reading Vocabulary, Reading Comprehension, Mathematics Computation and Mathematics Concepts/Applications. The Word Attack test was also administered to pupils in grades 2-3. Form U of the test was used throughout all grade levels tested in the fall. Form V of the test was used in grades 3, 5, 6 and 8 for the posttest in the spring. At grades 2, 4, and 7 Customized Tests of Reading and Mathematics were used in the spring posttest. The customized tests provided estimates of performance on the appropriate CTBS tests. The levels and forms of the test used were the same for both the reading and mathematics tests.

At the request of the Division of Elementary Schools, the Metropolitan Achievement Tests (MAT6, 1985) was administered to first-graders in both the fall and spring. The three reading tests and one mathematics tests used at grade 1 were: Vocabulary, Word Recognition Skills, Reading Comprehension, and Mathematics. Unlike the CTBS on which Total Reading is composed of Reading Vocabulary and Reading Comprehension, the MAT6 Total Reading score is composed of all three reading subtests. The Primer level, form L was used in both the fall and spring, and for both the reading and the mathematics tests. The levels and forms of the test used for each grade level, for both the pretest and the posttest, are summarized in Table 1. It should be noted that the test scores obtained from the administration of the MAT6 at grade 1 may not reflect true pupil performance in all cases due to the inappropriateness of the test levels used at the time of the pretest and posttest. The pretest level was found to be too difficult for low-achieving pupils, while the posttest level was found to be too easy for the average and above-average pupils. Consequently, caution is advised in the interpretation of test scores at grade 1.

Table 1

CTBS Test Levels and Forms
by Grade Level

Grade	Pretest		Posttest	
	Level	Form	Level	Form
1	Primer	L	Primer	L
2	D	U	D*	V*
3	E	U	E	V
4	F	U	F*	V*
5	G	U	G	V
6	G	U	G	V
7	H	U	H*	V*
8	H	U	H	V

*Customized Tests of Reading and Mathematics provided estimates of performance on this CTBS test.

To be included in the evaluation sample a pupil had to have taken a pretest and posttest in the same school and had to have a valid score on both the pretest and the posttest. Also, pupils in kindergarten and special education classes were not included in the evaluation sample. Of the 10,372 pupils pretested, 8,614 (83.1%) met the selection criteria and were included in the evaluation sample.

The remainder of this report is a description of the pretest-posttest results. The reader is advised that the values in the change columns in Tables 2-12 may vary by one-tenth of a point from the values obtained from subtracting the pretest values from the posttest values. This variation is due to rounding and is not an error in computation. Also, in interpreting these results the reader should be aware of the types of scores used in carrying out the data analysis. First, the raw score is simply the number of items on which the pupil marked only the correct response. Second, the percentile (%ile) score indicates how the pupil's raw score compares with the raw scores of the pupils in the norming group. A percentile score of 70 indicates that the pupil did as well or better than 70% of the pupils in the norming group. The percentile is not an equal unit of measurement, but does provide comparative information regarding the pupil's performance. Third, the normal curve equivalent (NCE) is a standard score with a mean of 50 and a standard deviation of about 21. Unlike the percentile, the NCE is an equal unit of measurement. This means that the distance between any two points in the NCE distribution is the same and represents the same amount of change (see Appendix C for the distribution of different types of scores). A major advantage of NCE scores is that arithmetic operations can be done with them. For example, pretest-posttest change scores can be computed and averaged. While percentile scores are used in this report, the NCE score represents the most accurate picture of pupil growth. The pretest-posttest analyses also provide the percent of pupils who scored at or above grade level and the percent of pupils who scored above the 36th percentile. The latter analysis was done to depict the percent of pupils considered to be far enough below grade level to require remediation according to ECIA Chapter 1 state guidelines.

Table 2 contains a summary of pretest, posttest, and change scores for the Word Attack/Recognition Test (grades 1-3) for all participating schools reported by grade level. The data in Table 2 show that the total average growth in Word Attack/Recognition skills for all pupils was greater than expected. While the expected NCE change for the normal school population is zero NCE points during the course of a school year, the total average change for participating schools was 6.8 NCE points. The greatest average gain in NCE points was achieved at grade 3 with 11.7 NCE points, while a smallest gain was at grade 2 with 1.6 NCE points. The average NCE score on the posttest was 45.6, whereas the norm group, or national average would be 50.0.

For the Word Attack/Recognition Test, 25.3% of the pupils were at grade level on the pretest, while 43.8% of the pupils were at grade level on the posttest for a gain of 18.5%. Grade 3 showed the greatest increase in pupils at grade level from pretest to posttest with 27.0%, while grade 2 showed the smallest increase in pupils at grade level from pretest to posttest with 6.9%.

Table 3 contains a summary of pretest, posttest, and change scores for the Reading Vocabulary Test (grades 1-8) for all participating schools reported by grade level. The data in Table 3 show that the total average growth in Reading Vocabulary skills for all pupils was greater than expected. While the expected NCE change for the normal school population is zero NCE points during the course of a school year, the total average change for participating schools was 1.7 NCE points. The greatest average gain in NCE points was achieved at grade 4 with 5.8 NCE points, while a loss of -3.9 NCE points was encountered at grade 1. The average NCE score on the posttest was 46.0, whereas the norm group, or national average would be 50.0.

For the Reading Vocabulary Test, 36.2% of the pupils were at grade level on the pretest, while 41.5% of the pupils were at grade level on the posttest for a gain of 5.3%. Grade 8 showed the greatest increase in pupils at grade level from pretest to posttest with 16.3%, while grades 6 showed a small decrease in pupils at grade level from pretest to posttest with -1.9%.

Table 4 contains a summary of pretest, posttest, and change scores for the Reading Comprehension Test (grades 1-8) for all participating schools reported by grade level. The data in Table 4 show that the total average growth in Reading Comprehension skills for all pupils was slightly greater than expected. While the expected NCE change for the normal school population is zero NCE points during the course of a school year, the total average change for participating schools was 1.4 NCE points. The greatest average gain in NCE points was achieved at grade 3 with 6.5 NCE points, while grades 1, 5, and 8 showed losses of -1.8, -0.6, and -3.2 NCE points respectively. The average NCE score on the posttest was 46.0, whereas the norm group, or national average would be 50.0.

For the Reading Comprehension Test, 35.8% of the pupils were at grade level on the pretest, while 41.3% of the pupils were at grade level on the posttest for a gain of 5.5%. Grade 7 showed the greatest increase in pupils at grade level from pretest to posttest with 15.1%, while grades 5, 6, and 8 showed decreases in pupils at grade level from pretest to posttest with -3.6%, -2.8%, and -7.1% respectively.

TABLE 2

MEDIAN PERCENTILE, MEAN NORMAL CURVE EQUIVALENT,
PERCENT AT GRADE LEVEL, AND PERCENT ABOVE THE 36TH PERCENTILE
FOR THE POSTTEST, PRETEST, AND CHANGE SCORES FOR
WORD RECOGNITION (GRADE 1) AND WORD ATTACK (GRADES 2-3)
REPORTED BY GRADE LEVEL

		<------ POST TEST ------>				<------ PRE TEST ------>				<----- CHANGE ----->		
GRADE LEVEL	NO. TESTED	MEDIAN %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE	MEDIAN %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE
1	1680	44.0	45.2	43.2	51.9	24.0	38.0	21.3	29.6	7.2	21.9	22.3
2	1644	34.0	42.2	36.4	47.2	29.0	40.5	29.5	42.9	1.6	6.9	4.3
3	1545	52.0	49.5	52.2	69.1	30.0	37.9	25.2	43.2	11.7	27.0	25.9
TOTAL	4869	44.0	45.6	43.8	55.8	27.0	38.8	25.3	38.4	6.8	18.5	17.3

TABLE 3

MEDIAN PERCENTILE, MEAN NORMAL CURVE EQUIVALENT,
PERCENT AT GRADE LEVEL, AND PERCENT ABOVE THE 36TH PERCENTILE
FOR THE POSTTEST, PRETEST, AND CHANGE SCORES FOR
READING VOCABULARY (GRADES 1-8) REPORTED BY GRADE LEVEL

		<------ POST TEST ------>				<------ PRE TEST ------>				<----- CHANGE ------>		
GRADE LEVEL	NO. TESTED	MEDIAN %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE	MEDIAN %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE
1	1348	27.0	42.2	34.4	42.5	46.0	46.1	32.9	51.8	-3.9	1.5	-9.3
2	1410	41.0	46.7	42.2	53.3	34.0	44.5	35.9	47.7	2.2	6.3	5.6
3	1520	35.0	42.7	36.8	48.9	33.0	40.6	32.6	44.3	2.1	4.2	4.6
4	1439	48.0	49.1	46.3	62.5	36.0	43.3	36.8	50.0	5.8	9.5	12.6
5	1311	46.0	48.0	45.8	62.0	44.0	46.9	41.2	57.4	1.1	4.6	4.7
6	258	46.0	47.9	40.3	64.0	44.0	46.6	42.2	58.5	1.2	-1.9	5.4
7	278	47.0	49.4	43.5	67.3	39.0	45.0	38.5	50.7	4.3	5.0	16.5
8	227	50.0	48.5	54.2	62.1	41.0	45.9	37.9	54.6	2.6	16.3	7.5
TOTAL	7791	42.0	46.0	41.5	54.8	38.0	44.3	36.2	50.4	1.7	5.3	4.4

TABLE 4

MEDIAN PERCENTILE, MEAN NORMAL CURVE EQUIVALENT,
PERCENT AT GRADE LEVEL, AND PERCENT ABOVE THE 36TH PERCENTILE
FOR THE POSTTEST, PRETEST, AND CHANGE SCORES FOR
READING COMPREHENSION (GRADES 1-8) REPORTED BY GRADE LEVEL

		<------ POST TEST ------>				<------ PRE TEST ------>				<----- CHANGE ------>		
GRADE LEVEL	NO. TESTED	MEDIAN %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE	MEDIAN %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE
1	1644	29.0	39.2	28.8	42.3	30.0	41.1	22.8	41.5	-1.8	6.0	.8
2	1313	44.0	44.9	45.2	55.4	36.0	44.8	34.7	47.1	.1	10.4	8.3
3	1536	46.0	48.4	46.4	61.8	35.0	41.9	33.1	48.0	6.5	13.3	13.9
4	1417	46.0	49.5	44.7	66.1	44.0	47.6	42.8	57.5	1.8	1.9	8.5
5	1305	43.0	47.2	40.0	56.8	45.0	47.7	43.6	60.9	-.6	-3.6	-4.1
6	254	42.0	47.8	43.3	60.2	43.0	45.1	46.1	57.1	2.7	-2.8	3.1
7	272	51.0	52.6	52.9	75.0	41.0	45.4	37.9	54.0	7.2	15.1	21.0
8	226	46.0	47.3	46.0	59.7	50.0	50.5	53.1	65.5	-3.2	-7.1	-5.8
TOTAL	7967	42.0	46.0	41.3	57.0	37.0	44.6	35.8	51.3	1.4	5.5	5.7

Table 5 contains a summary of pretest, posttest, and change scores for Total Reading (grades 1-8) for all participating schools reported by grade level. The data in Table 5 show that the total average growth in Total Reading skills for all pupils was greater than expected. While the expected NCE change for the normal school population is zero NCE points during the course of a school year, the total average change for participating schools was 2.7 NCE points. The greatest average gain in NCE points was achieved at grade 7 with 6.1 NCE points, while a slight decrease occurred at grade 8 with -0.4 NCE points. The average NCE score on the posttest was 46.3, whereas the norm group, or national average would be 50.0.

For Total Reading, 33.3% of the pupils were at grade level on the pretest, while 41.2% of the pupils were at grade level on the posttest for a gain of 7.9%. Grade 1 showed the greatest increase in pupils at grade level from pretest to posttest with 19.5%, while grades 5 showed no change in pupils at grade level from pretest to posttest.

Table 6 contains a summary of pretest, posttest, and change scores for the Mathematics Computation Test (grades 2-8) for all participating schools reported by grade level. The data in Table 6 show that the total average growth in Mathematics Computation skills for all pupils was greater than expected. While the expected NCE change for the normal school population is zero NCE points during the course of a school year, the total average change for participating schools was 13.4 NCE points. The greatest average gain in NCE points was achieved at grade 7 with 21.2 NCE points, while the smallest gain was achieved at grade 8 with 6.2 NCE points. The average NCE score on the posttest was 54.3, whereas the norm group, or national average would be 50.0.

For the Mathematics Computation Test, 30.4% of the pupils were at grade level on the pretest, while 59.5% of the pupils were at grade level on the posttest for a gain of 29.1%. Grade 5 showed the greatest increase in pupils at grade level from pretest to posttest with 35.1%, while grade 8 showed the smallest increase in pupils at grade level from pretest to posttest with 17.0%.

Table 7 contains a summary of pretest, posttest, and change scores for the Mathematics Concepts and Applications Test (grades 2-8) for all participating schools reported by grade level. The data in Table 7 show that the total average growth in Mathematics Concepts and Applications skills for all pupils was greater than expected. While the expected NCE change for the normal school population is zero NCE points during the course of a school year, the total average change for participating schools was 8.3 NCE points. The greatest average gain in NCE points was achieved at grade 7 with 13.7 NCE points, while grade 8 showed a small loss of -3.4 NCE points. The average NCE score on the posttest was 52.5, whereas the norm group, or national average would be 50.0.

For the Mathematics Concepts and Applications Test, 38.5% of the pupils were at grade level on the pretest, while 51.6% of the pupils were at grade level on the posttest for a gain of 13.0%. Grade 7 showed the greatest increase in pupils at grade level from pretest to posttest with 31.2%, while grade 8 showed a decrease in pupils at grade level from pretest to posttest with -9.7%.

TABLE 5

MEDIAN PERCENTILE, MEAN NORMAL CURVE EQUIVALENT,
PERCENT AT GRADE LEVEL, AND PERCENT ABOVE THE 36TH PERCENTILE
FOR THE POSTTEST, PRETEST, AND CHANGE SCORES FOR
TOTAL READING (GRADES 1-8) REPORTED BY GRADE LEVEL

		<------ POST TEST ------>				<------ PRE TEST ------>				<----- CHANGE ------>		
GRADE LEVEL	NO. TESTED	MEDIAN %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE	MEDIAN %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE
1	1341	35.0	44.9	39.5	47.9	28.0	40.0	20.1	33.7	4.9	19.5	14.2
2	1591	39.0	43.1	39.5	51.9	31.0	43.1	31.8	43.0	-.0	7.7	8.9
3	1502	43.0	46.4	39.7	59.1	33.0	41.0	30.6	45.9	5.4	9.1	13.2
4	1448	45.0	48.9	43.9	63.3	41.0	45.6	39.6	55.3	3.4	4.2	7.9
5	1299	44.0	47.3	41.4	60.1	44.0	47.2	41.4	60.1	.1	-.0	.0
6	254	44.0	47.6	41.3	59.1	41.5	45.8	39.4	60.6	1.8	2.0	-1.6
7	278	46.5	50.9	47.1	70.5	36.5	44.8	36.3	50.0	6.1	10.8	20.5
8	226	45.5	48.0	46.5	62.8	44.0	48.3	42.9	42.4	-.4	3.5	.4
TOTAL	7939	43.0	46.3	41.2	57.2	36.0	43.6	33.3	48.4	2.7	7.9	8.8

TABLE 6

MEDIAN PERCENTILE, MEAN NORMAL CURVE EQUIVALENT,
PERCENT AT GRADE LEVEL, AND PERCENT ABOVE THE 36TH PERCENTILE
FOR THE POSTTEST, PRETEST, AND CHANGE SCORES FOR
MATH COMPUTATION (GRADES 2-8) REPORTED BY GRADE LEVEL

		<------ POST TEST ------>				<------ PRE TEST ------>				<----- CHANGE ------>		
GRADE LEVEL	NO. TESTED	MEDIAN %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE	MEDIAN %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE
2	1344	64.0	54.5	65.8	74.6	37.0	45.2	35.7	55.7	9.3	30.1	18.8
3	1540	51.0	50.2	52.3	60.3	24.0	35.1	20.8	37.3	15.1	31.5	23.0
4	1336	53.0	54.8	52.7	63.2	30.0	38.8	30.6	42.1	16.0	22.1	21.1
5	1298	61.0	55.1	63.0	72.0	32.0	41.8	27.9	45.2	13.3	35.1	26.7
6	258	63.0	54.3	60.5	70.2	37.0	43.8	36.0	53.1	10.5	24.4	17.1
7	275	78.0	67.5	78.9	82.9	48.0	46.3	47.3	63.6	21.2	31.6	19.3
8	229	62.0	56.2	66.4	75.1	48.0	50.0	49.3	63.3	6.2	17.0	11.8
TOTAL	6280	59.0	54.3	59.5	68.3	33.0	40.8	30.4	46.7	13.4	29.1	21.7

TABLE 7

MEDIAN PERCENTILE, MEAN NORMAL CURVE EQUIVALENT,
PERCENT AT GRADE LEVEL, AND PERCENT ABOVE THE 36TH PERCENTILE
FOR THE POSTTEST, PRETEST, AND CHANGE SCORES FOR
MATH CONCEPTS & APPLICATIONS (GRADES 2-8) REPORTED BY GRADE LEVEL

		<------ POST TEST ------>				<------ PRE TEST ------>				<----- CHANGE ----->		
GRADE LEVEL	NO. TESTED	MEDIAN %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE	MEDIAN %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE
2	1620	52.0	51.6	51.5	62.4	37.0	42.0	35.9	51.8	9.6	15.6	10.6
3	1528	49.0	51.0	45.9	67.0	34.0	40.5	31.5	46.1	10.6	14.4	20.9
4	1406	49.0	55.3	49.9	68.9	41.0	46.0	40.8	56.4	9.3	9.2	12.5
5	1284	56.0	52.1	57.1	71.6	46.0	47.2	43.5	64.4	5.0	13.6	7.2
6	258	49.0	48.9	48.4	65.1	46.0	45.8	40.7	61.6	3.1	7.8	3.5
7	282	65.0	60.2	70.6	84.0	43.0	46.5	39.4	57.8	13.7	31.2	26 2
8	227	49.0	48.4	48.9	66.1	53.0	51.8	58.6	70.9	-3.4	-9.7	-4.8
TOTAL	6605	51.0	52.5	51.6	67.8	41.0	44.2	38.5	55.2	8.3	13.0	12.6

Table 8 contains a summary of pretest, posttest, and change scores for Total Mathematics (grades 1-8) for all participating schools reported by grade level. The data in Table 8 show that the total average growth in Total Mathematics skills for all pupils was greater than expected. While the expected NCE change for the normal school population is zero NCE points during the course of a school year, the total average change for participating schools was 12.3 NCE points. The greatest average gain in NCE points was achieved at grade 1 with 16.9 NCE points, while grade 8 showed a small gain of 1.0 NCE point. The average NCE score on the posttest was 53.1, whereas the norm group, or national average would be 50.0.

For Total Mathematics, 30.5% of the pupils were at grade level on the pretest, while 54.9% of the pupils were at grade level on the posttest for a gain of 24.4%. Grade 1 showed the greatest increase in pupils at grade level from pretest to posttest with 32.4%, while grade 8 showed the smallest gain in pupils at grade level from pretest to posttest with 4.8%.

A major theme of most of the literature on effective schools is that a school is effective if the economically disadvantaged pupils in the school learn the basic skills to the same extent as pupils not economically disadvantaged. Analyses of the pretest-posttest data were made to determine the degree to which the achievement gains of pupils in the school district subsidized lunch program were comparable to the gains of pupils not in the lunch program. A pupil whose Student Master File record indicated that the pupil was receiving either a free or reduced price lunch was included in the subsidized lunch group. The achievement gains of these pupils were compared with the gains of pupils not involved in the subsidized lunch program.

Tables 9 and 11 contain a summary of the pretest, posttest, and change scores for the Total Reading Test (grades 1-8) reported by subsidized lunch category. Of the 7,939 pupils taking the test, 69.0% (5,477) were counted in the subsidized lunch category. At each grade level, for both the pretest and the posttest, the mean NCE was lower for the pupils in the subsidized lunch category. At many grade levels the difference between the means for the two categories was substantial. The difference between the percent at or above grade level and the percent above the 36th percentile for the two categories was consistently in the same direction as the NCE results.

When pretest-posttest change was compared, the mean NCE change was found to be slightly smaller for the pupils in the subsidized lunch category in all grades but 3, 4, and 5. Based upon the data contained in Tables 9 and 11 pupils in the subsidized lunch category tended to: (a) score lower on the pretest; (b) score lower on the posttest; and (c) show slightly less growth between the pretest and the posttest at most grade levels.

Tables 10 and 12 contain a summary of the pretest, posttest, and change scores for the Total Mathematics Test (grades 1-8) reported by subsidized lunch category. Of the 8,119 pupils tested, 68.8% (5,588) were counted in the subsidized lunch category. At each grade level, for both the pretest and the posttest, the mean NCE was lower for the pupils in the subsidized lunch category. The difference between the percent at or above grade level and the difference between the percent above the 36th percentile for the two categories was consistently in the same direction as the NCE results.

TABLE 8

MEDIAN PERCENTILE, MEAN NORMAL CURVE EQUIVALENT,
PERCENT AT GRADE LEVEL, AND PERCENT ABOVE THE 36TH PERCENTILE
FOR THE POSTTEST, PRETEST, AND CHANGE SCORES FOR
TOTAL MATHMATICS (GRADES 1-8) REPORTED BY GRADE LEVEL

		<------ POST TEST ------>				<------ PRE TEST ------>				<----- CHANGE ------>		
GRADE LEVEL	NO. TESTED	MEDIAN %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE	MEDIAN %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE
1	1515	51.0	51.9	53.2	60.2	21.0	35.0	20.8	29.8	16.9	32.4	30.4
2	1605	56.0	52.9	56.1	67.4	37.0	43.6	33.7	50.2	9.3	22.4	17.3
3	1524	50.0	50.8	51.0	65.7	29.0	37.6	25.5	39.6	13.2	25.5	26.1
4	1428	50.0	53.7	50.1	64.3	32.5	40.4	30.7	44.8	13.3	19.4	19.5
5	1280	58.0	54.7	60.6	73.4	39.5	43.8	34.6	52.8	10.9	26.0	20.5
6	257	58.0	52.9	56.4	75.1	42.0	46.4	42.0	60.3	6.5	14.4	14.8
7	283	72.0	62.8	74.2	83.7	44.0	46.6	44.5	61.1	16.3	29.7	22.6
8	227	53.0	51.6	55.1	71.8	51.0	50.6	50.2	71.8	1.0	4.8	-.0
TOTAL	8119	54.0	53.1	54.9	67.1	33.0	40.7	30.5	45.2	12.3	24.4	21.9

TABLE 9

MEAN NCE, PERCENT AT GRADE LEVEL AND PERCENT ABOVE 36TH PERCENTILE FOR THE POSTTEST, PRETEST AND CHANGE SCORES FOR TOTAL READING TEST (GRADES 1-8)
REPORTED BY SUBSIDIZED LUNCH CATEGORY WITHIN GRADE LEVEL

			<----- POSTTEST ------>			<----- PRETEST ------>			<----- CHANGE ------>		
GRADE LEVEL	SUBSIDIZED LUNCH	NO. TESTED	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE
1	YES	856	39.5	31.8	39.4	36.8	13.2	24.1	2.7	18.6	15.3
	NO	485	54.5	53.2	62.9	45.7	32.2	50.7	8.8	21.0	12.2
GRADE TOTAL		1341	44.9	39.5	47.9	40.0	20.1	33.7	4.9	19.5	14.2
2	YES	1099	39.3	31.7	44.0	39.9	24.7	36.3	-.6	7.0	7.7
	NO	492	51.4	57.1	69.5	50.2	47.8	57.9	1.2	9.3	11.6
GRADE TOTAL		1591	43.1	39.5	51.9	43.1	31.8	43.0	.0	7.7	8.9
3	YES	1078	43.7	32.8	52.1	37.9	24.0	39.1	5.7	8.8	13.0
	NO	424	53.3	57.1	76.9	48.7	47.4	63.2	4.6	9.7	13.7
GRADE TOTAL		1502	46.4	39.7	59.1	41.0	30.6	45.9	5.4	9.1	13.2
4	YES	1041	46.4	36.9	57.6	42.3	32.0	48.9	4.1	4.9	8.7
	NO	407	55.3	61.7	77.6	53.9	59.2	71.7	1.4	2.5	5.9
GRADE TOTAL		1448	48.9	43.9	63.3	45.6	39.6	55.3	3.4	4.2	7.9
5	YES	910	44.7	34.2	53.3	44.6	35.5	54.6	.1	-1.3	-1.3
	NO	389	53.2	58.4	76.1	53.3	55.3	73.0	-.1	3.1	3.1
GRADE TOTAL		1299	47.3	41.4	60.1	47.2	41.4	60.1	.1	.0	.0
6	YES	172	45.9	37.8	57.6	44.3	36.0	59.3	1.5	1.7	-1.7
	NO	82	51.3	48.8	62.2	48.9	46.3	63.4	2.4	2.4	-1.2
GRADE TOTAL		254	47.6	41.3	59.1	45.8	39.4	60.6	1.8	2.0	-1.6
7	YES	186	48.4	44.1	67.2	42.7	29.0	44.6	5.7	15.1	22.6
	NO	92	56.1	53.3	77.2	49.2	51.1	60.9	6.9	2.2	16.3
GRADE TOTAL		278	50.9	47.1	70.5	44.8	36.3	50.0	6.1	10.8	20.5
8	YES	135	44.6	39.3	54.8	45.3	34.8	57.8	-.8	4.4	-3.0
	NO	91	53.0	57.1	74.7	52.8	54.9	69.2	.2	2.2	5.5
GRADE TOTAL		226	48.0	46.5	62.8	48.3	42.9	62.4	-.4	3.9	.4
TOTAL		7939	46.3	41.2	57.2	43.6	33.3	48.4	2.7	7.9	8.8

TABLE 10

MEAN NCE, PERCENT AT GRADE LEVEL AND PERCENT ABOVE 36TH PERCENTILE FOR THE POSTTEST, PRETEST AND CHANGE SCORES FOR TOTAL MATHEMATICS TEST (GRADES 1-8) REPORTED BY SUBSIDIZED LUNCH CATEGORY WITHIN GRADE LEVEL

GRADE LEVEL	SUBSIDIZED LUNCH	NO. TESTED	POSTTEST MEAN NCE	POSTTEST % AT GR. LV.	POSTTEST % ABOVE 36 %ILE	PRETEST MEAN NCE	PRETEST % AT GR. LV.	PRETEST % ABOVE 36 %ILE	CHANGE MEAN NCE	CHANGE % AT GR. LV.	CHANGE % ABOVE 36 %ILE
1	YES	954	47.6	45.6	54.2	31.7	14.8	22.6	15.9	30.8	31.6
	NO	561	59.2	66.1	70.4	40.5	31.0	41.9	18.7	35.1	28.5
GRADE TOTAL		1515	51.9	53.2	60.2	35.0	20.8	29.8	16.9	32.4	30.4
2	YES	1115	49.0	48.6	61.8	40.8	26.3	43.5	8.2	22.3	18.3
	NO	490	61.9	73.1	80.2	50.1	50.6	65.3	11.7	22.4	14.9
GRADE TOTAL		1605	52.9	56.1	67.4	43.6	33.7	50.2	9.3	22.4	17.3
3	YES	1095	48.1	45.6	60.9	34.8	19.7	32.8	13.3	25.8	28.1
	NO	429	57.8	64.8	78.1	44.8	40.3	57.1	13.0	24.5	21.0
GRADE TOTAL		1524	50.8	51.0	65.7	37.6	25.5	39.6	13.2	25.5	26.1
4	YES	1027	50.5	44.7	59.0	37.6	24.6	38.1	12.8	20.1	20.9
	NO	401	62.0	64.1	77.8	47.6	46.4	62.1	14.4	17.7	15.7
GRADE TOTAL		1428	53.7	50.1	64.3	40.4	30.7	44.8	13.3	19.4	19.5
5	YES	897	52.5	56.5	69.1	42.2	30.3	48.9	10.3	26.2	20.2
	NO	383	59.9	70.2	83.3	47.4	44.6	61.9	12.5	25.6	21.4
GRADE TOTAL		1280	54.7	60.6	73.4	43.8	34.6	52.8	10.9	26.0	20.5
6	YES	174	50.8	50.0	70.1	44.5	37.9	56.3	6.3	12.1	13.8
	NO	83	57.5	69.9	85.5	50.4	50.6	68.7	7.0	19.3	16.9
GRADE TOTAL		257	52.9	56.4	75.1	46.4	42.0	60.3	6.5	14.4	14.8
7	YES	189	59.2	68.8	81.0	43.8	38.1	56.1	15.4	30.7	24.9
	NO	94	70.2	85.1	89.4	52.1	57.4	71.3	18.1	27.7	18.1
GRADE TOTAL		283	62.8	74.2	83.7	46.6	44.5	61.1	16.3	29.7	22.6
8	YES	137	50.8	53.3	69.3	48.4	46.7	68.6	2.3	6.6	.7
	NO	90	52.9	57.8	75.6	53.9	55.6	76.7	-1.0	2.2	-1.1
GRADE TOTAL		227	51.6	55.1	71.8	50.6	50.2	71.8	1.3	4.8	.0
TOTAL		8119	53.1	54.9	67.1	40.7	30.5	45.2	12.3	24.4	21.9

TABLE 11

MEAN NORMAL CURVE EQUIVALENT, PERCENT AT GRADE LEVEL, AND PERCENT ABOVE THE 36TH PERCENTILE FOR THE POSTTEST, PRETEST, AND CHANGE SCORES FOR TOTAL READING (GRADES 1-8) REPORTED BY SUBSIDIZED LUNCH CATEGORY

		<----- POSTTEST ------>			<----- PRETEST ------>			<----- CHANGE ------>		
SUBSIDIZED LUNCH	NO. TESTED	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE
YES	5477	43.1	34.1	50.5	40.6	26.7	41.9	2.5	7.4	8.6
NO	2462	53.5	56.9	72.1	50.2	48.1	62.8	3.3	8.8	9.3
TOTAL	7939	46.3	41.2	57.2	43.6	33.3	48.4	2.7	7.9	8.8

TABLE 12

MEAN NORMAL CURVE EQUIVALENT, PERCENT AT GRADE LEVEL,
AND PERCENT ABOVE THE 36TH PETRENTILE
FOR THE POSTTEST, PRETEST, AND CHANGE SCORES FOR
TOTAL MATHEMATICS (GRADES 1-8)
REPORTED BY SUBSIDIZED LUNCH CATEGORY

		<----- POSTTEST ------>			<----- PRETEST ------>			<----- CHANGE ------>		
SUBSIDIZED LUNCH	NO. TESTED	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE	MEAN NCE	% AT GR. LV.	% ABOVE 36 %ILE
YES	5588	49.9	48.9	62.1	38.1	24.6	39.2	11.8	24.2	22.9
NO	2531	60.2	68.1	78.1	46.5	43.4	58.4	13.7	24.7	19.7
TOTAL	8119	53.1	54.9	67.1	40.7	30.5	45.2	12.3	24.4	21.9

When pretest-posttest change was compared, the mean NCE was found to be larger for the pupils not in the subsidized lunch category in all grades but 3 and 8. In grades 3 and 8, pupils in the subsidized lunch category showed slightly more gain in NCE scores. Overall, however, pupils on subsidized lunch showed slightly less gain in NCE scores as shown in Table 12 (11.8 NCE growth for subsidized lunch category, and 13.7 NCE growth for other pupils). Based on the data contained in Tables 10 and 12, pupils in the subsidized lunch category tended to: (a) score lower on the pretest; (b) score lower on the posttest; and (c) show slightly less growth between the pretest and the posttest at most grade levels.

Summary

Activities related to the effective schools effort for the 1988-89 school year included the following:

1. Pretest-posttest scores in both reading and mathematics were obtained from approximately 8,600 pupils in grades 1-8 attending the participating schools. Analyses of these scores, obtained from the Comprehensive Tests of Basic Skills (CTBS; 1981), at grades 2-8 showed the pupils' change in achievement was slightly greater than expected in Reading Comprehension. The reader should be advised that grade 1 test data were excluded from the data reported in this summary. The pretest level for grade 1 was found to be too difficult for low-achieving pupils, while the posttest level for grade 1 was found to be too easy for the average and above-average pupils. The growth in Mathematics Computation was substantial with 29.1% more of the pupils at grade level on the posttest than at grade level on the pretest. The comparable figure for Reading Comprehension was 5.4%. Analyses indicated that pupils from lower income families continued to score consistently lower in both reading and mathematics. This has been true for each of the seven years that effective schools research has been conducted in the Columbus schools. In fact, the pattern of pupil growth in mathematics and reading, regardless of which standardized test was used, also has been consistent during the seven years of effective schools research. The growth in pupil achievement as measured by NCE points and the percent of pupils at grade level from the fall pretest to the spring posttest has been consistently larger for mathematics than for reading. Table 13 summarizes the achievement gains for all pupils in reading and mathematics for each of the seven years that effective schools research has been conducted.

Table 13

Achievement Gains as Measured
by Change in NCE Points and Percent
of Pupils at Grade Level from Pretest
to Posttest in Each Program Year

Program Year	Reading		Mathematics	
	Average NCE Change	% at Grade Level Change	Average NCE Change	% at Grade Level Change
1982-83	4.2	11.9	13.6	31.4
1983-84	4.9	11.7	10.8	23.4
1984-85	0.6	0.5	9.5	19.2
1985-86	2.9	3.1	12.7	25.8
1986-87	2.1	2.8	13.0	25.9
1987-88	2.5	3.3	14.1	30.9
1988-89	2.2	5.4	13.4	29.1

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Appendices

A. Schools Participating in SIP 1982-1986

B. Schools Participating in Schoolwide Testing

C. Comparison of Various Scores to the Normal Curve

Appendix A

Schools Participating in SIP 1982-1986

Schools Participating in SIP
1982-1986

Sch. Code	School Name	School Year 82-83	83-84	84-85	85-86
132	Crestview MS			X	X
148	Eastmoor MS		X		
202	Linmoor MS			X	X
225	Mohawk MS		X	X	X
242	Starling MS		X	X	
254	Wedgewood MS	X	X	X	
324	Beck ES		X	X	X
394	Devonshire ES			X	
410	East Linden ES		X	X	X
412	Eastgate ES		X	X	
414	Easthaven ES		X	X	
424	Fair ES	X	X	X	
428	Fairmoor ES		X	X	
468	Gladstone ES		X	X	
478	Heyl ES			X	X
481	Highland ES			X	X
502	Kent ES		X	X	X
510	Koebel ES			X	X
525	Linden ES			X	X
545	Medary ES		X	X	X
583	Pilgrim ES			X	X
591	Reeb ES		X	X	X
595	Salem ES		X	X	
607	Second ES			X	
645	Trevitt ES	X	X	X	X
662	West Broad ES	X	X	X	
674	Windsor ES	X	X	X	X

Appendix B

Schools Participating in Schoolwide Testing

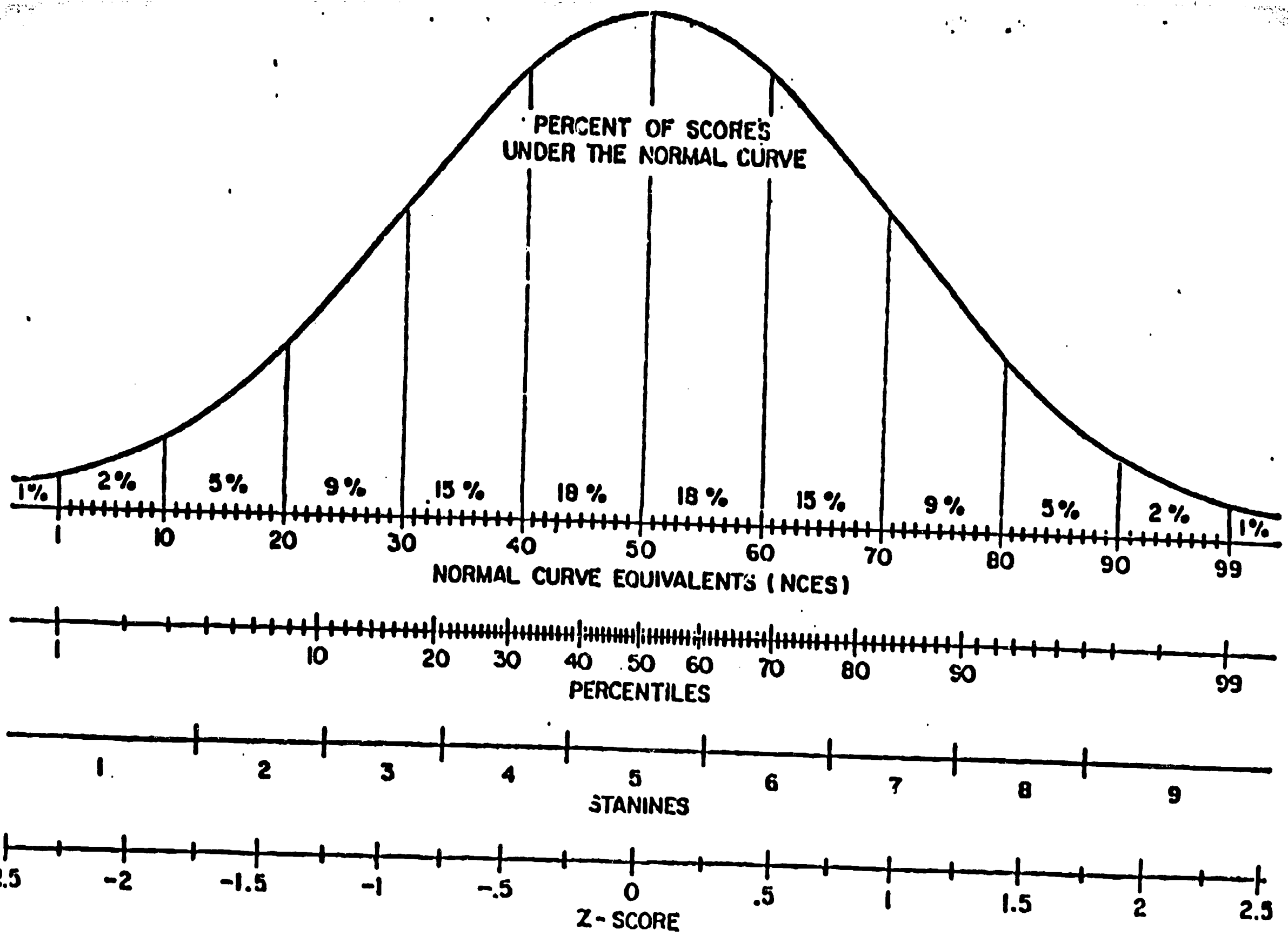
1988-89 Schools Participating in Schoolwide Testing

Sch. Code	School Name	Grades	Phone	Principal	Reason/Test Coordinator	Area Executive Director
070	West HS	10	5956	James Bailey	CCPP/Jim Cauley	Walt Richardson
112	Beery MS	6-8	5414	Charles Stack	Request/Violet Barnett	Tim Ilg
132	Crestview MS	6-8	6014	Daniel Jerman	Request/John Holland	Donald Taylor
308	Arlington Park ES	1-5	5453	Linda Gibson-Tyson	Request/Principal	Ed Lay
312	Avondale ES	1-5	6511	Essie Richardson	Request/Principal	Ed Lay
324	Beck ES	1-5	6513	Barbara Blake	Request/Principal	Ed Lay
344	Broadleigh ES	1-5	6144	Keith Diehlmann	Request/Principal	Shirley Mann
348	Burroughs ES	1-5	5923	Keith Rinehart	Request/Principal	Don Cramer
354	Cedarwood ES	1-5	5421	Mark Glasbrenner	Request/Principal	Shirley Mann
388	Dana ES	1-5	5925	Carolyn Moxley	Request/Principal	Don Cramer
394	Devonshire ES	1-5	5335	Susan Fossmeyer	Request/Principal	Ed Lay
410	East Linden ES	1-5	5459	Erma Taylor	Request/Principal	Ed Lay
412	Eastgate ES	1-5	6104	Joseph Fuchala	Request/Principal	Don Cramer
424	Fair ES	1-5	6107	Bernice Smith	Request/Principal	Shirley Mann
428	Fairmoor ES	1-5	6169	Lynne Wake	Request/Principal	Shirley Mann
432	Fairwood ES	1-5	6111	Marissa Craig	Request/Principal	Shirley Mann
440	Fifth ES	1-5	5564	Stanley Embry	Request/Principal	Ralph Pryor
454	Franklinton ES	1-5	6525	Evelyn Bell	Request/Principal	Don Cramer
466	Georgian Hts. ES	1-5	5931	Elizabeth Mahaffey	Request/Principal	Don Cramer
468	Gladstone ES	2-5	5565	Ronald Leithe	Request/Principal	Ralph Pryor
485	Hubbard ES	1-5	5572	Diane Gosser	Request/Principal	Ralph Pryor
502	Kent ES	1-5	6117	Lois Glover	Request/Principal	Don Cramer
525	Linden ES	1-5	6537	Jonathan Stuck	Request/Principal	Ralph Pryor
528	Livingston ES	1-5	5527	Robert Pritts	Request/Principal	Don Cramer
557	Moler ES	1-5	5529	Steven Stone	Request/Principal	Shirley Mann
575	Ohio ES	1-5	6130	Will Thomas	Request/Principal	Don Cramer
576	Olde Orchard ES	1-5	5388	Mary Six	Request/Principal	Shirley Mann
583	Pilgrim ES	1-5	6132	Lillian Richardson	Request/Pam Innis	Don Cramer
591	Reeb ES	1-5	5533	Nancy Zook	Request/Principal	Shirley Mann
631	South Mifflin ES	1-5	6135	Mary Sykora	Request/Principal	Ed Lay
645	Trevitt ES	1-5	6137	Rosa Jean Craig	Request/Principal	Ed Lay
662	West Broad ES	1-5	5964	Charles Pfaltzgraf	Request/Principal	Don Cramer
665	Westgate ES	1-5	5971	Krista Eisnaugle	Request/Principal	Don Cramer
674	Windsor ES	1-5	5906	Joyce Biltz	Request/Principal	Ralph Pryor

[1]Approximately 30 pupils taking the complete battery for CCPP.

Appendix C

Comparison of Various Scores to the Normal Curve


PERCENT OF SCORES
UNDER THE NORMAL CURVE
1%
2%
5%
9%
15%
18%
18%
15%
9%
5%
2%
1%
1
10
20
30
40
50
60
70
80
90
99
NORMAL CURVE EQUIVALENTS (NCES)
1
10
20
30
40
50
60
70
80
90
99
PERCENTILES
1
2
3
4
5
6
7
8
9
STANINES
-2.5
-2
-1.5
-1
-.5
0
.5
1
1.5
2
2.5
Z-SCORE