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ABSTRACT

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EDUCATION PROGRAM

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Janella Rachal
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Bureau of Evaluation
Office of Research and Development
Louisiana Department of Education

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ABSTRACT

This study examined the relationship between student performance in language arts and mathematics following State-funded remedial services addressing identified deficient skills and variables selected to represent potential additional instruction in these same skills; participation in Chapter 1, participation in special education, and retention in the grade at which the pretest had been administered. The students were those who had been administered the Louisiana Basic Skills Test in 1982 and who had received remedial services in 1982-83. For students who were retained in Grade 2 the posttest was the 1983 Grade 2 Basic Skills Test; promoted students were administered a parallel test developed for the program's evaluation. All of the analyses controlled for students' pretest scores.

In general the results showed no difference in performance after remediation between students who had been promoted or retained, those in special or regular education, those receiving or not receiving Chapter 1, and those provided with remedial services at different times during the school year. Students who qualified for remediation in both subject areas had lower post-program performance than those who qualified in a single subject.

INTRODUCTION

The concern for educational accountability that has developed in the past decade has focused primarily on student mastery of the basic skills. This has led to a number of minimum competency testing programs that are generally related to State-identified skills lists and often used for promotion or graduation decisions. As early as 1980 Jaeger and Tittle identified 38 states with minimum competency testing programs in operation or development. The existing programs differed in the grade levels tested, the uses made of resulting test information, and the choice of a single test for a State or local school system options in test selection (Impara, 1980).

Minimum competency testing is also related directly to compensatory education. Cuban argued that testing was useful only if it identified low achieving students and pointed the way to provide and improve remedial services (1980). Baratz (1980) and Christie and Casey (1983) have also stressed the importance of early identification with the concomitant provision of remedial instruction. However, a number of early studies reported that compensatory education programs to alleviate deficiencies uncovered through minimum competency testing had either wide ranges of state fiscal support or were not funded at all (Bossone, 1978; NIE, 1978; Ramsbotham et al, 1978).

Remedial services cost money, and few states can afford to spend their educational dollars lightly. In 1982 Louisiana introduced the State-Funded Compensatory/Remedial Program. This program required that all students who did not meet the performance standards on the State Basic Skills Tests (BST) in language arts and/or mathematics be provided with remedial

services in their identified deficient skills. The BST was introduced at the second grade in 1980 and was administered to all public school students (regular and special education) addressing the State minimum standards. A grade level has been added each year, with second and third grade students tested in spring 1983 and grades 2 through 4 tested in 1984.

Appropriations for the State-Funded Compensatory/Remedial Program provided \$350 per student per remedial area (language arts or mathematics) in 1982-83 and \$254 in 1983-84. Thus, in the first year local school systems received either \$350 or \$700 from the State for every child failing to achieve mastery on the BST, depending upon whether the student qualified for remedial services in one or both subject areas tested. The State legislation required that all qualifying students be provided these services. This is a costly program, and one that will grow more so as additional grade levels are enfolded in the BST testing.

Purpose of the Study

The purpose of this study is to determine the relationship between post-program performance on the basic skills and factors in the educational environment associated with extra-program costs as measured among participating students. These factors include the following:

- 1) special education services
- 2) Chapter 1 services
- 3) promotion or retention
- 4) scheduling of services during summer, regular year, or at both times

Cost efficiency was the underlying rationale in selecting these factors for examination. In considering the special education variable, if special

education students were found to exhibit smaller gains than regular education students, this would argue that such students should be exempted from the program or that program services for these students should differ from those provided to regular education students. If Chapter 1 students exhibited larger gains than others, the finding would warrant further study to determine whether Chapter 1 participation represented a supporting instructional effect or a duplication of services. Promotion was important in order to determine if second grade skill deficiencies could be corrected without a repetition of regular classroom instruction. Finally, scheduling was examined because school systems needed to know if both summer school and regular year remedial services were equally effective. School systems had reported that, if transportation costs were not prohibitive, it was administratively more efficient to offer compensatory/remedial education during the summer following the BST administration and preceding the next year of school.

A secondary purpose served by this study was to refine the ongoing evaluation of the State-Funded Compensatory/Remedial Program. That evaluation is the responsibility of the Bureau of Evaluation within the Office of Research and Development of the Louisiana Department of Education. This study is an initial examination of factors potentially associated with program gains. The role of these factors in explaining student gains is a preliminary step in determining additional program factors to be examined, with the ultimate goal being that of providing useful information about program factors that are associated with success.

Description of the Study

Design

This study is limited to the first year of the State-Funded Compensatory/Remedial Program and thus includes only those students who took the Grade 2 BST in the spring of 1982. Several program constraints determined the study design. These constraints were (1) all students were provided with remedial services in their identified deficient second grade skills regardless of whether they were retained or promoted, and (2) in the spring of 1983, students were administered the BST appropriate to the grade in which they were enrolled, second or third. This produced two groups within the study design.

Retained students were administered the Grade 2 BST in both 1982 and 1983. For these students it was possible to use a pretest/posttest model. However, that model did not allow examination of the effect of promotion versus retention. In 1983 retained students were administered the Grade 2 BST, and promoted students were administered the Grade 3 BST. To examine the effect of repeated regular classroom instruction (present only in retained students), an additional test of the second grade basic skills was administered to samples of students at the close of the 1982 summer school and in late January 1983. This instrument was the Compensatory Education Test (CET), developed specifically for the evaluation of the program. The schematic diagram below outlines the testing schedule for the two groups of students, identified throughout the rest of this report by their post-program test: CET or BST.

	<u>Retained Grade 2</u>	<u>Promoted Grade 3</u>
Grade 2 BST, March 1982	x	x
Grade 2 CET, Summer 1982 or January 1983	x	x
Grade 2 BST, March 1983	x	

Instrumentation

The Grade 2 BSTs in language arts and mathematics were criterion referenced tests developed by the Louisiana Department of Education and measuring a total of 15 skills in each of the two subject areas. These skills were drawn from the State minimum standards and are listed in Appendix A. Each skill was measured by four multiple-choice items for a total of 60 items on each test. The language arts and mathematics mastery levels were set by the State Board of Elementary and Secondary Education at 75 percent correct. Deficient skills for qualifying students were administratively defined by the Department of Education as those on which the student scored less than 75 percent.

The CET for language arts and mathematics was developed by the Bureau of Evaluation using a simplified version of the item review process for the BST with items provided by a commercial item banking service. The skills measured, item structure, and mastery levels were the same as those for the BST. However, the CET cannot be considered a true "posttest" for the BST; it must be treated as a different instrument.

Sample

Samples for the two comparisons in the study (BST82 vs. BST83 and BST82 vs. CET83) were developed by matching student names from the two test

administrations. The CET had been administered to a sample of approximately 15 percent of the students participating in the program at the close of 1982 summer school and in late January 1983. Combining students from both of these testings for whom (1) it was possible to match tests, and for whom (2) information was available for all variables of interest, produced a sample of 602 students in language arts and 473 in mathematics.

Program participants who had been retained in the second grade were readministered the Grade 2 BST in March 1983. For these retained students, the sample of those for whom matching was possible and all relevant information was available produced a sample of 1,490 students in language arts and 843 students in mathematics. Those students who were retained in the second grade and who were included in the CET sample also appeared in the BST sample.

Data Collection

The data were collected through the regular accountability and evaluation procedures for the program. Classroom teachers administered the BST to their students, and compensatory/remedial teachers administered the CET. Local school system program coordinators drew the sample for the CET testing according to instructions from the Bureau of Evaluation to test all program participants at specified schools.

The compensatory/remedial teachers collected the additional student information used in the study on the "Student Profile: Grade 2" shown in Appendix A. A copy of this completed form for each participating student was submitted to the Bureau of Evaluation.

Data Analysis

Analysis of covariance was used for both comparisons. For the comparison examining CET performance, the student's total CET score expressed in the percent of items answered correctly was used as the dependent variable. The covariate was the student's percent correct on the 1982 BST and the independent variables were the following:

- classification as regular or special education;
- classification as receiving or not receiving Chapter 1 services;
- promotion to third grade or retention in second grade;
- participation in the program during summer school, the regular school year, or at both times; and
- qualification for program services in one subject area or in both language arts and mathematics.

Language arts and mathematics analyses were conducted separately.

Analysis of covariance, using 1983 BST percent correct as the dependent variable and controlling for 1982 BST performance, was also used for the BST comparison. In the analyses of both language arts and mathematics the independent variables were as listed:

- classification as regular or special education;
- classification as receiving or not receiving Chapter 1 services;
- participation in the program during summer school, the regular school year, or at both times; and
- qualification for program services in one subject area or in both language arts and mathematics.

The data were analyzed using the SAS (Statistical Analysis System) general linear models procedure for analysis of covariance.

Results

Student Characteristics

Characteristics of the students included in the CET and BST samples are shown in Table 1. For the CET, the language arts sample (602) was larger than that for mathematics (473). In both subject areas the distribution of students was similar, with the exception of two variables. Language arts students were more likely than those in mathematics to have participated in the regular year program and not only in summer school, and language arts students were more likely than mathematics students to have qualified for services in only a single subject area. The language arts and mathematics groups were similar in that for most variables the subgroup with the higher 1982 BST score exhibited higher CET performance. The only exception to this was in examining the scores of students following different service schedules for language arts. Here those students served only in summer school had the highest initial BST scores while those who received only regular year program services showed the highest average CET performance. When other variables were examined, performance was consistently higher for regular education students, for those who had participated in Chapter 1, for those who had been promoted to grade 3, and for those qualifying for remedial services in only a single subject area.

The students in the BST sample included, by definition, only those who had been retained in second grade and readministered the Grade 2 BST. Here again the language arts sample (1,490) was larger than that for mathematics (843). Among the language arts students tested, pretest and posttest performance was consistently higher for regular education students, for those who had received Chapter 1 services, and for those who qualified for

TABLE 1. STUDENTS IN COMPENSATORY EDUCATION TEST SAMPLES
(PROMOTED AND RETAINED)

	Language Arts Sample (N = 602)				Mathematics Sample (N = 473)			
	Number	Percent	1982 BST Mean	1983 CET Mean	Number	Percent	1982 BST Mean	1983 CET Mean
Regular Education	481	79.9	59.80	78.68	401	84.8	62.17	81.33
Special Education	121	20.1	57.51	73.36	72	15.2	60.76	77.25
Chapter 1	289	48.0	61.30	78.72	184	38.9	61.24	78.92
No Chapter 1	313	52.0	57.53	76.59	289	61.1	62.42	81.85
Retained Grade 2	363	70.3	58.28	76.92	257	54.3	60.58	78.95
Promoted Grade 3	239	39.7	60.96	78.66	216	45.7	63.60	82.80
Remediation During:								
Regular year only	443	13.6	59.88	78.09	264	55.8	63.19	82.47
Summer only	2	0.3	63.33	75.00	63	13.3	62.57	82.12
Regular year and summer	157	26.1	57.77	76.30	146	30.9	59.46	76.91
Remediation In:								
One subject	377	62.6	62.93	81.93	131	27.7	66.59	88.84
Two subjects	225	37.4	53.33	70.33	342	72.3	60.19	77.59

STUDENTS IN BASIC SKILLS TEST SAMPLES
(RETAINED ONLY)

	Language Arts Sample (N = 1490)				Mathematics Sample (N = 843)			
	Number	Percent	1982 BST Mean	1983 BST Mean	Number	Percent	1982 BST Mean	1983 BST Mean
Regular Education	1322	88.7	58.98	89.71	746	88.5	61.77	89.29
Special Education	168	11.3	58.61	88.49	97	11.5	59.78	87.97
Chapter 1	692	46.4	59.32	90.01	391	46.4	61.10	89.25
No Chapter 1	798	53.0	58.61	89.20	452	53.6	61.92	89.04
Remediation During:								
Regular year only	1026	68.9	59.61	89.70	571	67.7	61.89	89.36
Summer only	110	7.4	61.14	89.56	61	7.2	61.45	88.58
Regular year and summer	354	23.8	56.31	89.21	211		60.62	88.70
Remediation In:								
One subject	825	55.4	62.83	92.27	175	20.8	66.00	91.95
Two subjects	665	44.6	54.12	86.23	668	79.2	60.37	88.40

remedial assistance in a single subject area. In mathematics, pretest and posttest scores were greater for regular education students and for those qualifying for a single subject area.

CET Performance: Language Arts

The analysis of covariance for the CET in language arts is presented on Table 2. The model had an R-square value of .3063, accounting for approximately 31 percent of the observed variance among CET scores, and the effect of the overall model was significant ($p < .05$). Within the model the covariate (pretest score) and two of the other variables had probability levels of less than .05. These variables included classification as regular or special education and qualification for one or two subject areas. The least square means for these two variables showed that when initial differences on the BST were taken into account, regular education students had significantly higher adjusted CET language arts scores than special education students, and students who qualified for remediation in language arts alone had significantly higher adjusted CET mean scores than those who qualified for services in both subject areas.

CET Performance: Mathematics

The results for CET mathematics performance are shown on Table 3. This model was statistically significant ($p < .05$) and accounted for about 18 percent of the variance among mathematics scores on the CET (R-square = .1803). Aside from the covariant factor of initial BST score, the only significant variable was qualification for services in one or two subject areas. For this variable, the adjusted mean scores of students who qualified for remediation in mathematics alone were significantly greater ($p < .05$) than those of other students.

TABLE 2. ANALYSIS OF COVARIANCE, 1983 CET PERFORMANCE: LANGUAGE ARTS

Source	Degrees of Freedom	Sum of Squares	Mean Square	F-Value	Probability Value	R-Square
Model	7	46025.79	6575.11	37.47	0.0001*	0.3063
Error	594	104234.51	175.48	-	-	-
Corrected Total	601	150260.30	-	-	-	-
Regular Ed. <u>vs</u> Special Ed.	1	1425.97	-	8.13	0.0045*	
Chapter 1 <u>vs</u> No Chapter 1	1	408.30	-	2.33	0.1277	
Promoted <u>vs</u> Retained	1	2.15	-	0.01	0.9118	
Regular <u>vs</u> Summer <u>vs</u> Both	2	67.42	-	0.19	0.8253	
One <u>vs</u> Two Remediations	1	3893.83	-	22.19	0.0001*	
1982 BST Language Score	1	25185.06	-	143.52	0.0001*	
Effect	Adjusted CET Mean	Probability Value				
Regular Education	75.73					
Special Education	71.63	0.0045*				
Chapter 1	72.80					
No Chapter 1	74.56	0.1277				
Retained Grade 2	73.74					
Promoted Grade 3	73.62	0.9118				
Regular Year	75.64	regular <u>vs</u> summer: 0.5356				
Summer School	69.80	regular <u>vs</u> both: 0.9795				
Regular and Summer	75.61	summer <u>vs</u> both: 0.5398				
Remedial Subject	76.56					
Remedial Subjects	70.80	0.0001*				

* p \leq .05

TABLE 3. ANALYSIS OF COVARIANCE, 1983 CET PERFORMANCE: MATHEMATICS

Source	Degrees of Freedom	Sum of Squares	Mean Square	F-Value	Probability Value	R-Square
Model	7	25263.96	3609.14	14.61	0.0001*	0.1803
Error	465	114896.00	247.09	-	-	-
Corrected Total	472	140159.96	-	-	-	-
Regular Ed. <u>vs</u> Special Ed.	1	536.87	-	2.17	0.1411	
Chapter 1 <u>vs</u> No Chapter 1	1	339.36	-	1.37	0.2418	
Promoted <u>vs</u> Retained	1	21.08	-	0.09	0.7704	
Regular <u>vs</u> Summer <u>vs</u> Both	2	868.99	-	1.76	0.1735	
One <u>vs</u> Two Remediations	1	4821.12	-	19.31	0.0001*	
1982 BST Mathematics Score	1	9823.82	-	39.76	0.0001*	
Effect	Adjusted CET Mean	Probability Value				
Regular Education	82.54					
Special Education	79.50	0.1411				
Chapter 1	80.08					
No Chapter 1	81.95	0.2418				
Retained Grade 2	80.79					
Promoted Grade 3	81.24	0.7704				
Regular Year	82.16	regular <u>vs</u> summer: 0.8737				
Summer School	81.79	regular <u>vs</u> both: 0.0642				
Regular and Summer	79.10	summer <u>vs</u> both: 0.2879				
Remedial Subject	84.84					
Remedial Subjects	77.20	0.0001*				

* p ≤ .05

BST Performance: Language Arts

The analysis of covariance for BST performance shown in Table 4 is a true pretest/posttest measure, since the same instrument was used in both test administrations. This model (which is limited to students retained in the second grade) was statistically significant and accounted for 23 percent of the variance among posttest scores (R-square = .2285). The only factors with probability levels of less than .05 were the covariant pretest scores and qualification for services in one or both areas. The adjusted means showed that students qualifying for language arts remediation alone exhibited significantly higher posttest performance.

BST Performance: Mathematics

With the exception of the controlled pretest score, only one factor examined in Table 5 had a significant effect on posttest BST performance in mathematics. The total model had a probability value of less than .05 and an R-square of .1464. The sole significant factor was the number of subject areas for which the student qualified. As in other analyses reported here, students qualifying for services in a single subject had significantly greater ($p < .05$) adjusted posttest scores than students qualifying in both subjects.

Discussion

In the judgment of the authors, the factors examined in this study have a weak effect upon student performance gains in the compensatory/remedial program. This judgment is based upon two assumptions. The first is that explained variance values ranging from 15 percent to 31 percent may

TABLE 4. ANALYSIS OF COVARIANCE, 1983 BST PERFORMANCE: LANGUAGE ARTS

Source	Degrees of Freedom	Sum of Squares	Mean Square	F-Value	Probability Value	R-Square
Model	6	45899.95	7649.99	73.17	0.0001*	0.2285
Error	1483	155057.27	104.56	-	-	-
Corrected Total	1489	200957.21	-	-	-	-
Regular Ed. <u>vs</u> Special Ed.	1	149.38	-	1.43	0.2322	-
Chapter 1 <u>vs</u> No Chapter 1	1	25.71	-	0.25	0.6200	-
Regular <u>vs</u> Summer <u>vs</u> Both	2	462.51	-	2.21	0.1099	-
One <u>vs</u> Two Remediations	1	1728.72	-	16.53	0.0001*	-
1982 BST Language Score	1	32086.25	-	306.88	0.0001*	-

Effect	Adjusted BST Mean	Probability Value
Regular Education	89.52	0.2322
Special Education	88.49	
Chapter 1	89.15	0.6200
No Chapter 1	88.87	
Regular Year	88.83	regular <u>vs</u> summer: 0.5313
Summer School	88.16	regular <u>vs</u> both: 0.0596
Regular and Summer	90.03	summer <u>vs</u> both: 0.1055
One Remedial Subject	90.17	0.0001*
Two Remedial Subjects	87.84	

* $p \leq .05$

TABLE 5. ANALYSIS OF COVARIANCE, 1983 BST PERFORMANCE: MATHEMATICS

Source	Degrees of Freedom	Sum of Squares	Mean Square	F-Value	Probability Value	R-Square
Model	6	11262.23	1877.04	23.90	0.0001*	0.1464
Error	836	65666.93	78.55	-	-	-
Corrected Total	842	76929.17	-	-	-	-
Regular Ed. <u>vs</u> Special Ed.	1	22.73	-	0.29	0.5907	
Chapter 1 <u>vs</u> No Chapter 1	1	20.90	-	0.27	0.6061	
Regular <u>vs</u> Summer <u>vs</u> Both	2	15.36	-	0.10	0.9068	
One <u>vs</u> Two Remediations	1	359.57	-	4.58	0.0327*	
1982 BST Mathematics Score	1	9326.60	-	118.74	0.0001*	

Effect	Adjusted BST Mean	Probability Value
Regular Education	89.55	
Special Education	89.02	0.5907
Chapter 1	89.45	
No Chapter 1	89.12	0.6061
Regular Year	89.48	regular <u>vs</u> summer: 0.6586
Summer School	88.93	regular <u>vs</u> both: 0.9568
Regular and Summer	89.44	summer <u>vs</u> both: 0.7020
One Remedial Subject	90.11	
Two Remedial Subjects	88.45	0.0327

* $p \leq .05$

be important from the point of view of research, but from the standpoint of evaluation, they are not powerful enough to support program decisions. The second assumption is that a strong model would have to identify manipulable variables. Those factors that were consistently significant were the student's initial BST score and whether the student qualified for remediation in one or two subject areas. Program administrators have no control over those characteristics through which a student qualifies for participation.

For this particular study it is the lack of statistically significant differences that is most relevant. Although differences were not tested for statistical significance, they show that gain from the initial BST to the CET or to the second BST was high for both language arts and mathematics: students learned the basic skills in which they were deficient. Those variables for which there are no significant differences between levels of students show that compensatory/remedial instruction is equally effective for different kinds of students: regular and special education, those receiving or not receiving Chapter 1 services, those who are promoted or retained, and those provided services at different times.

The data shown here must be interpreted within the context of other studies. An earlier report of issues raised by local program administrators (Rachal, 1984a) raised the question of whether special education students could profit from remedial instruction provided by a teacher who was not certified in special education. The evidence is that in most cases the relative gains of special education students are indistinguishable from those of students in regular education. A second question was that of the potential for cost inefficiency if instruction addressing deficient basic skills were duplicated for program participants

who were retained in the second grade or receiving Chapter 1 services. An earlier study contrasting the performance gains of retained students who qualified for the program with those of retained students who did not qualify for services found that the effect of program participation was significant beyond that of repeating a year of regular classroom instruction (Rachal, 1984b). A similar analysis should be made of participation in Chapter 1.

The data presented here, and the evaluation for which they were collected, reflect the first year of the Louisiana State-Funded Compensatory/Remedial Program. The findings suggest that lower relative gains should be expected from students with greater deficits, whether these deficits are expressed as low pretest scores in a given subject or as a need for remediation in both language arts and mathematics rather than in a single area. They also suggest (setting aside other instructional questions) that the decision to promote or retain a student, or when to schedule remedial services will not affect gain. Further, equal relative gains can be expected from students regardless of whether they receive additional supplementary educational services from Chapter 1 or special education.

Having found that the variables explored here have relatively little effect on the performance of students participating in the program, the evaluation will refine its model of program characteristics to be examined. Those that have been added for the second year's analysis include information about the compensatory/remedial teacher (e.g., retired, with or without special education experience, etc.) and type of class (e.g., pull-out, in-class, etc.).

STATE-FUNDED COMPENSATORY/REMEDIAL STUDENT PROFILE: GRADE 2 BST

PARISH: _____

STUDENT NAME: _____ I.D. (1-7) BST SCORES: LANG. ARTS _____ MATH _____

Student Grade and Enrollment Status as of / / Grade: 2 3 U (8) Enrollment: S M W O (9)

STATE-FUNDED C/R SUMMER SCHOOL INFORMATION		STATE FUNDED C/R REGULAR YEAR INFORMATION	
School: _____ (10-15)	School: _____ (30-35)	Special Ed: Y N (50)	
Comp. Ed. Teacher(s): LA _____ (16-18)	Comp. Ed. Teacher(s): LA _____ (36-38)	Chapter 1: L M (51)	
M _____ (19-21)	M _____ (39-41)	Regular Teacher: _____	
Hrs. Comp. Ed. Received: LA _____ (22-23) M _____ (24-25)	Hrs. Comp. Ed. Received: LA _____ (42-43) M _____ (44-45)		
Date Exited Comp. Ed.: LA / / (26-27) M / / (28-29)	Date Exited Comp. Ed.: LA / / (46-47) M / / (48-49)		

DIRECTIONS: Circle "A" if Skill Was Addressed, Circle "M" if Skill Was Mastered

LANGUAGE ARTS SKILLS	DIRECTIONS: Circle "A" if Skill Was Addressed, Circle "M" if Skill Was Mastered			MATHEMATICS SKILLS	DIRECTIONS: Circle "A" if Skill Was Addressed, Circle "M" if Skill Was Mastered		
	Deficient Skills	Addressed	Mastered		Deficient Skills	Addressed	Mastered
Vocabulary				Sets			
1. Apply meaning of vocabulary in context (52)				1. Recognize related and nonrelated objects (69)			
2. Classify words (53)				2. Order sets of pictures as designated (70)			
Phonetic Analysis				Numeration			
3. Identify final consonant sound (54)				3. Count to 100 by ones, fives and tens (71)			
4. Identify long vowel sound (55)				4. Recognize place value: ones and tens (72)			
Comprehension				5. Use ordinal numbers through tenths (73)			
5. Interpret meaning of words (56)				Whole Number Operations			
6. Interpret meaning of phrases (57)				6. Use basic facts: addition and subtraction (74)			
7. Interpret meaning of sentences (58)				7. Add three 1-digit numbers (75)			
8. Recall story details (59)				8. Add two 2-digit numbers (no regrouping) (76)			
9. Recall story sequence (60)				9. Subtract two 2-digit numbers (no regrouping) (77)			
10. Identify main idea (61)				Fractions and Operations			
Study Skills				10. Identify the fractions 1/2, 1/3, and 1/4 (78)			
11. Alphabetize to first letter (62)				Relations and Functions			
12. Follow written directions (63)				11. Identify position (over-under, etc.) (79)			
13. Locate various topics (64)				12. Identify the symbols +, =, and - (80)			
14. Use picture dictionary (65)				Measurement and Estimation			
Writing				13. Associate ¢ symbol with coins up to quarter (81)			
15. Capitalize proper nouns (66)				14. Tell time on the hour (82)			
Problem Solving				15. Choose number sentence for pictured action (83)			

Percentage language arts remediation time devoted to addressing prerequisites (67-68) %

Percentage mathematics remediation time devoted to addressing prerequisites (84-85) %

APPENDIX A: GRADE 2 BASIC SKILLS IN LANGUAGE ARTS AND MATHEMATICS



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