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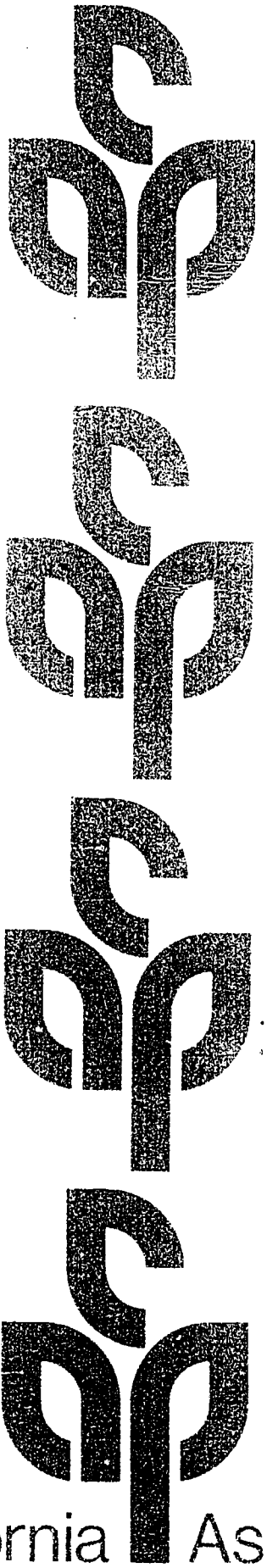
ABSTRACT

During the 1975-76 school year, all second and third grade pupils in California were tested in reading achievement and all students in grades six and twelve were tested in reading, written expression, spelling, and mathematics. Reading scores for second and third graders have been improving since 1966, but the 1975-76 scores show little improvement over the 1974-75 scores. Results for sixth grade reveal that students improved in all four areas tested. The greatest improvement was in mathematics and the least in written expression. For the second year, grade six scores have improved after several years of decline. Students taking the twelfth grade test improved in all areas of the test. Greatest improvement was recorded in spelling; least in reading. 1975-76 was the first year of improvement for students in grade 12 after 5 years of declining scores. Analyses of the specific test results and comparisons of the performance of California students to national averages are presented. Test scores are analyzed in terms of school characteristics and student background factors such as ethnicity, language, and socioeconomic status. (EVH)



Student Achievement in California Schools

1975-76 Annual Report

California Assessment Program

California Assessment Program

Student Achievement in California Schools

1975-76 Annual Report

Prepared Under the Direction of
Alexander I. Law, Chief
Office of Program Evaluation and Research

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I. Summary of Findings

During the 1975-76 school year, all second and third grade pupils in California, 290,848 and 289,015 respectively, were tested in reading achievement, and all pupils in grades six (330,008) and twelve (245,700) were tested in the basic skills of reading, written expression, spelling, and mathematics.

Grades Two and Three Results

Reading achievement scores for pupils in grades two and three have been improving steadily since the first statewide testing in those grades was conducted in 1966. For the past two years, however, the rate of incline has been leveling off. The results for 1975-76 show that these gains were maintained in grades two and three. Table 1 presents these virtually identical scores for 1974-75 and 1975-76. These results were based on the third year of use for the Reading Test, a test constructed specifically to assess the broad range of reading programs in California's public schools. Special equating studies which compared the performance of California students to that of students across the nation showed that California scored slightly above the national average for both grade levels; from the 52nd to the 54th percentile rank for grade two, and from the 52nd to the 57th for grade three, depending on the particular national norm group being used for the comparison.

Grade Six Results

All pupils in grade six took the Survey of Basic Skills: Grade 6, another test developed specifically for the California Assessment Program. Table 1 shows that California pupils improved in all four of the areas tested: reading, written expression, spelling, and mathematics. Improvement was greatest in mathematics, a 2.4 percent correct increase, and least in written expression, .9 percent correct. This is the second year of improving scores in grade six, after several years of declining scores.

Since this new test was developed specifically for use in California, it does not have national norms. A special study conducted in 1974-75 showed how California pupils compared to the national norming samples of various standardized tests. They performed at approximately the national average in reading (48th to 53rd percentile on a scale of 1-99 with the national average at 50), slightly below the national average in mathematics (44 to 51) and below in written expression (43 to 46). The improvements observed in 1975-76 render these estimates slightly on the conservative side.

Grade Twelve Results

All students in grade 12 took the Survey of Basic Skills: Grade 12, the third set of tests developed specifically for use in California schools. Table 1 shows that California students improved in all areas of the test: reading, written expression, spelling, and mathematics. Improvement was greatest in spelling (2.7 percent) and least in reading (.6 percent). This is the first year of improvement for students in grade 12 after five years of declining scores.

A special study conducted in 1974-75 showed that California students were scoring moderately below national norms in mathematics (38 to 41 percentile rank, depending upon the test), slightly lower in reading (33 to 41 percentile rank), and considerably lower in written expression (25 to 32 percentile rank). In spite of the gains made in 1975-76, California students are still somewhat below national averages.

The major portion of this report on statewide testing for 1975-76 is devoted to an analysis of the specific results on the tests. Results are described in terms of the average percentage of questions answered correctly for the content areas of reading, written expression, and mathematics. Illustrative test questions accompany the results for each of the skill areas. Recognized authorities in each of the disciplines reviewed the results and commented upon the meaning of the results for California instructional programs. Their conclusions and implications are given for each grade level and content area.

Statewide performance was analyzed separately for a variety of subgroups of pupils and schools. Highest test scores were achieved by those pupils who spoke English fluently and also spoke a second language, if the second language was Chinese or Japanese. The next highest scoring pupils were those who spoke English only. High test scores were also associated with pupils whose parents were employed in the professions and with schools which had a small number of students who received Aid to Families with Dependent Children. Schools having high test scores at one grade level were likely to have high scores at other grade levels. Boys scored higher than girls in mathematics, whereas girls outscored boys by even wider margins in reading, written expression, and spelling. Only small differences were observed between schools and districts of different sizes; however, schools in very large urban areas scored quite a bit lower than schools in medium-size communities. Schools with less mobile pupil populations were likely to have higher scores than those with many transient pupils; however, it seems likely that any correlation between pupil mobility and test scores was due to the fact that schools in higher socioeconomic communities tended to have less mobile student populations.

Table 1

Number of Students Tested and Average Percent of Questions Answered Correctly by Grade Level and Content Area for 1974-75 and 1975-76

Grade level and content area	Number Tested	Average percent of questions answered correctly		
		1974-75	1975-76	Difference
Grade 2 -- Reading	290,848	67.6	67.7	+ .1
Grade 3 -- Reading	289,015	81.3	81.4	+ .1
Grade 6[a]	330,008			
Reading		62.8	64.8	+2.0
Written Expression		60.6	61.5	+ .9
Spelling		53.6	55.5	+1.9
Mathematics		58.5	60.9	+2.4
Grade 12[a]	245,700			
Reading		62.5	63.1	+ .6
Written Expression		56.4	57.1	+ .7
Spelling		61.0	63.7	+2.7
Mathematics		66.4	68.0	+1.6

[a] Since the tests in grades six and twelve were revised in 1975-76, results presented here are for those questions which were used both years.

II. Introduction to the Report

This report presents the results for the second year of the California Assessment Program, and the reader's attention is called to several features of the report:

- Information is presented not only for the major content areas of reading, written expression, and mathematics but also for a variety of skill areas within each major area.
- This is the first report on the California Assessment Program which presents information on the decline or improvement of performance in specific skill areas for all grade levels tested.
- Although tests were developed specifically to correspond to the skills and concepts being taught in California schools, special studies have been conducted to show how the performance of California students compares to that of several national samples.
- Recognized authorities in each professional field have presented their interpretations of the results for each of the content areas by identifying areas of satisfactory performance and areas that need attention.
- Sample test questions are given in the appendixes to illustrate the nature and range of skills demonstrated by California students.

The new assessment program was first fully implemented in 1974-75. In design, development, and procedures, it is unique in the nation. The goals of developing an assessment program that (1) is relevant to California schools; (2) covers the full range of instructional objectives; (3) provides program-diagnostic information at the local and state levels; and (4) takes a minimum of testing time have all been realized. In accord with the original plan for the development of the assessment program, future reports will contain the results of special studies focused on the performance and trends for different groups of California students.

Background and Assumptions

The California Assessment Program had its foundation in two legislative acts: (1) the California School Testing Act of 1969, a revision of a 1961 law which first required an achievement testing program in the public schools; and (2) the Miller-Unruh Basic Reading Act, which originally required reading tests in grades one, two, and three. The testing program was revised by 1972 legislation, and major changes were made in the program as a result of that legislation.

The changes in the statewide testing program were based on the principle that an efficient state testing program has to be limited in scope--that is, limited primarily to the task of furnishing useful information to state-level policy-makers and decision-makers. It was assumed that the program could not meet all of the many information needs of local school district personnel and that assessment information needed at the classroom level could best be collected by local school personnel.

In spite of this assumption, the program was designed to report as much information as possible to local personnel. Since all students at a grade level in all schools were tested, it was possible to provide very detailed analytical reports for each school, to supplement locally obtained information. In fact, the results of a survey of all districts in California showed that most districts have found this unique information very useful in evaluating and revising programs. Board members and other local citizens have relied heavily upon statewide results in making judgments about local needs and accomplishments, primarily because of the uniform and comparable nature of the information provided.

Bases for Revision of the Program

Two major problems were addressed through the revision of the statewide testing program:

1. Test breadth. The incomplete match between the relatively narrow range of skills measured by any one published standardized test, on the one hand, and the variety of instructional programs in California schools, on the other, made it difficult to assess the skills of California students or the effectiveness of the programs with any degree of assurance of fairness. Furthermore, it was not possible to assess the relative strengths and weaknesses of California students in order to have an indication of how instructional programs should be redirected, since the standardized tests being used yielded only total scores.

2. Testing time. Previous testing instruments required an inordinate amount of pupil time for the testing process--inordinate, at least, in relation to the usefulness of the results. The use of a new testing technique called matrix sampling has now reduced the amount of testing time at certain grade levels from as much as three and one-half hours to 30 minutes. Under this sampling method, all students at a grade level in all schools are tested, but each student takes only a portion of the total test. Results for an individual student cannot be obtained, but quite accurate estimates of the overall performance of groups of students can be computed.

Development of the New Tests

The development of tests related to California goals and objectives followed a rigorous procedure. The major steps are outlined below:

1. Statewide committees of content area experts were formed and charged

with the task of translating and delineating the general goals found in state-adopted curriculum frameworks into more specific objectives appropriate for assessment.

2. These specific objectives, or test content specifications, were then reviewed by personnel in all California school districts for completeness and relevance to their instructional programs. The revised specifications served as the basic guidelines for selecting and developing pools of test items. These documents were subsequently printed and distributed to all school districts under the general title Test Content Specifications.

3. These content specifications were sent to major test publishers who identified those test questions which matched the specifications. These were submitted to the Department of Education for review.

4. From the initially large pools of items, teams of classroom teachers reviewed and selected the items that were most appropriate for California students.

5. These items were then reviewed by linguists and minority group testing experts for any subtle biases against students of different language or cultural backgrounds.

6. The final pools of items, several hundred at each grade level, were then divided into several short tests or forms--from 10 to 18 per grade level. All test forms were made equivalent in difficulty and coverage of major skill areas.

Use of National Norms

Since 1962, the first year of statewide testing in California, all tests adopted for use have been commercially published instruments with "national" norms. The new tests described in this report were constructed specifically for use in California schools and were used in 1974-75 for the first time. Therefore, national norms were not available for these tests. The decision to develop tests which would not have national norms stemmed from several known problems associated with published standardized tests and their national norms, as used in a statewide assessment program.

No single test is given to all students in the country. Of necessity, a publisher's norm is, therefore, only an estimate of what the distribution of scores would be like if, in fact, the test had been taken by all students in the United States. For this reason, norms vary from publisher to publisher, sometimes in the extreme. In California's own recent history, the Stanford Reading Test was administered to all second-grade pupils in the 1969-70 school year, and the median California pupil scored at the 38th percentile of that publisher's norms. In the following year the Cooperative Primary Reading Test was administered to all second-grade pupils. The median California pupil scored at the 50th percentile of that publisher's norms. The different result was clearly a reflection more of the difference in norms than of the difference in reading achievement. Hence, one cannot indiscriminately

discuss "norms"; some are more accurate reflections of national averages than others. The difficulty, of course, is knowing which ones are most accurate.

A second problem with norms is that they are not updated very often. For instance, the Cooperative Primary Reading Test was normed during the 1965-66 school year. As a result, when those norms are referred to, it must be clearly understood that the comparisons being made are to the publisher's estimate of what scores on that test would have been if administered to all pupils in the country at that time. If reading scores for the nation had dropped continuously since 1965-66, an "average" score for California pupils might, in fact, reflect achievement far above current nationwide averages.

Another problem with the use of standardized tests in a statewide assessment program is that they rarely yield more than a total score and one, two, or three subscores for various skill areas within a content area. It is not only essential that an assessment program cover all the objectives within an area but also that it provide separate information for each of the key areas of learning. This specificity is a necessary prerequisite to the use of the test results in improving programs. Published standardized tests cannot meet this criterion. Nevertheless, comparisons to national averages are not only interesting but also useful as a basis for judging the overall relative effectiveness of California's instructional programs. Furthermore, California law (Education Code sections 5779 and 12850) requires that such information be made available. Consequently, a plan to provide this information has been developed. The California tests will be equated to standardized tests with new national norms as such norms become available. The effect of this equating process will be to show how the performance of California students compares with the most current estimates of pupil performance on a national level. The timeliness of these comparisons is especially important now that national trends show declining scores at some grade levels and improvement of scores at others.

Important Aspects of this Report

A Different Method of Reporting Test Results. The statistic used in this report to indicate the achievement levels of California pupils is the "average percent correct score." For a given set of test questions, this number is the percentage of correct test responses, with one response being equal to the answer of one student to one question, and the total number of responses being equal to the number of students multiplied by the number of items on the test. For example, if three students took a test with ten questions and if each of the three answered five of the ten questions correctly, the total number of responses would be 30, the total number correct would be 15, and the average percent correct score would be 50. It can also be said that the average student answered 50 percent of the questions correctly; or that, on the average, 50 percent of the questions were answered correctly.

It is hoped that the use of the average percent correct score and the simultaneous presentation of illustrative test questions or exercises will add to the clarity and usefulness of the findings. It should be easier, as a result, to see what California students are able to do.

Unfortunately, this method is so new in educational evaluation and assessment that guidelines and rule-of-thumb benchmarks are not available. Each reader will have to evaluate the adequacy of the results. The emphasis is on establishing realistic and necessary levels of actual competence rather than on the traditional comparing of results to a national norm.

It will be noted that most of the average percent correct scores hover around the 60s and 70s; however, some are down in the 30s, and some are up in the 90s. Two points must be kept in mind in interpreting these figures:

1. The major reason that the average scores are in the 60s and 70s, rather than the 90s, is that the aims of the instructional programs at each level in California schools go beyond the basic, minimal levels of performance expected of all students. In reading, for example, those skills which are mastered by most students by the end of the fourth grade are not tested in the sixth grade. Testing time is too valuable and the scoring and processing too expensive to justify gathering information which does not add to what is already known about California students.

2. It should be obvious that high scores in particular subskill areas do not necessarily indicate effective programs; nor low scores, the opposite. Some tasks are inherently more difficult. In reading, for example, it is not considered outstanding that by the end of grade three, nearly all students can immediately recognize and read certain short words; nor is it at all disappointing that only about 60 percent can answer certain questions requiring a student to recognize cause-and-effect relationships among sentences.

Use of Expert Interpretations. The overall results and especially the differences among various subcontent or skill areas have been reviewed by special advisory committees of highly respected educators in each field. It is hoped that their comments about the adequacy of the findings and their discussion of the implications for shifts in program emphasis will be helpful both to the professional educator and the lay citizen concerned with education in California. Obviously, however, not all readers will agree with the opinions of the specialists. Any discussion or inquiry which is stimulated by these opinions is useful in that it will help to clarify the proper objectives of the schools and foster realistic expectations of them.

Revisions of the Tests for 1975-76. The Reading Test was unchanged from 1974-75 to 1975-76; therefore, all figures for grades two and three are comparable. However, the Survey of Basic Skills for both grades six and twelve was substantially revised for two main reasons. First, the test content specifications identified all the skills that should be tested and specified how they should be measured. However, appropriate test questions for many skill areas were not available from test publishers or other sources when the 1974-75 version of the Survey was developed. Working with the advisory committees and other teachers,

new questions were generated, field-tested, and included in the 1975-76 version. Second, some of the questions used in the 1974-75 edition of the test were included because they were the only acceptable questions available at the time. Recognizing the need to keep the tests unchanged for several years to come, it seemed wise to replace these test questions with more appropriate ones for the 1975-76 edition of the Survey.

These revisions do not weaken the conclusions made in this report about the changes in test performance from 1974-75 to 1975-76. All comparisons were based on a substantial number of "common" questions, i.e., those used in both versions of the Survey tests. In most cases, the number of common items alone exceeds the total number found in a published standardized test.

III. Reading Achievement in Grades Two and Three

Synopsis of Findings

Over the past four years, the rate of improvement of second and third grade reading achievement test scores in California has been leveling off at a position slightly above the national average. This pattern was maintained again in 1975-76, with the test results very similar to those of 1974-75. In addition, the patterns of strengths and weaknesses have remained essentially unchanged. The areas of strength in 1974-75--sight words, phonetic analysis, synonyms, and comprehension--remained high, and the areas in need of improvement--denotation and structural analysis--remained weak. The Primary Grades Reading Assessment Advisory Committee observed in 1975 that a continued weakness in denotation and structural analysis could have a critical impact on comprehension at higher grades.

Test Scope and Changes

The Reading Test: Second and Third Grades is the instrument used to assess reading achievement at the end of the second and third grades. It was developed for use specifically in California. When the test was first administered in May, 1974, it contained 212 items covering four major content areas: word identification, vocabulary, comprehension, and study-locational skills. The test was revised before its second administration in May, 1975. Content coverage was increased, and the test was lengthened to 250 items; 150 items were common to both versions of the test. The third administration of the test was conducted in May, 1976. For that administration, the test was unchanged from the year before.

Reading Results for 1974-75 and 1975-76

Test scores at grades two and three for 1975-76 were essentially unchanged from the 1974-75 results, as shown on Tables 2 and 3. Slight increases occurred--from 67.56 to 67.70 percent at the second grade and from 81.33 to 81.44 at the third grade. Although total test scores remained essentially unchanged from 1974-75 to 1975-76, small changes in certain skill areas were observed. At grade two, study-locational skills scores rose 1.7 percent, with identical gains being registered in both alphabetizing and using a table of contents. At grade three, scores in antonyms rose by 2.0 percent. Those results were the only changes greater than one percent.

A clear picture of what was measured in the Reading Test can be obtained from Appendix A. All the skill areas included in the test are listed in the appendix, and the reader will find for each skill area a description of the way the students' knowledge of each skill was measured, the number of test

Table 2

Grade 2 Reading Test Results
for 1974-75 and 1975-76

Skill area	Number of questions	Average percent correct, 1974-75	Average percent correct, 1975-76	Gain or loss in Score[a]
Reading--Total	250	67.6	67.7	+ .1
Word Identification	60	75.4	75.5	+ .1
Vocabulary	60	67.7	67.6	- .1
Comprehension	110	61.3	61.3	--
Study-Locational	20	75.5	77.2	+1.7

[a] A (+) sign indicates that the 1975-76 score was higher than that of 1974-75 and a (-) sign indicates that the 1975-76 score was lower than the 1974-75 score.

Table 3

Grade 3 Reading Test Results
for 1974-75 and 1975-76

Skill area	Number of questions	Average percent correct, 1974-75	Average percent correct, 1975-76	Gain or loss in score
Reading--Total	250	81.3	81.4	+ .1
Word Identification	60	85.8	85.6	- .2
Vocabulary	60	82.6	82.9	+ .3
Comprehension	110	77.0	76.7	- .3
Study-Locational	20	88.0	88.0	--

questions included to measure that skill area, data on pupil performance in that skill area, and an illustrative test question. While none of the illustrative test questions was used in the test, all follow the identical format of the items that were in the test and are of approximately equal difficulty to those used in the Reading Test. It will be helpful to refer to Appendix A when reading the discussion and implications of the Reading Test results, which follow. Skill areas such as "structural analysis" and "denotation" are discussed, and it is possible to get a better understanding of these terms by reviewing the appropriate sections in the table.

Discussion and Implications of Reading Test Results

The Primary Grades Reading Assessment Advisory Committee was convened to review the results of the 1975-76 testing. Although the following discussion is based upon the observations made by the members at that meeting, the Department of Education takes full responsibility for its content. Since the judgments made are subjective, it would be surprising if all readers agreed with the logic and conclusions presented. They are offered as one set of "expert opinions." They are not a final consensus, but they should serve as a stimulus to further inquiry and discussion of proper objectives of instructional programs.

Scores on the Reading Test continued to be satisfactory in all major areas at both grade levels, and the overall scores changed little from 1974-75. However, in 1975 the committee noted two specific areas in which scores were relatively low: structural analysis and denotation. In last year's annual report, the committee explained the meaning of these two terms and the importance of mastering these skills to later success in reading. Student performance in the two areas was still relatively weak, in 1975-76, with scores in both these areas being unchanged at both grades. For this reason, it seemed advisable to reprint the recommendations made in the 1974-75 annual report:

> "Current reading programs in the primary grades in California place emphasis on the learning of decoding skills. These programs should be encouraged to continue, but at the same time additional emphasis needs to be placed on the development of vocabulary skills in pupils by increasing their ability to identify the meaning of words as used in a specific context. Sentence syntax clues and word structure clues need to be included in the development of this skill. There also exists a need to supplement reading programs so that each pupil has experience with as wide a variety of reading matter and thinking skills as possible.
>
> Word identification skills and vocabulary skills are, of course, both essential to comprehension. Given the weaknesses cited, one might expect comprehension scores for pupils in the second and third grades to be low, but in the judgment of the advisory committee, they are quite satisfactory. One might then ask, "Why be concerned with weaknesses in structural analysis and denotation skills as long as comprehension remains satisfactory?" Weaknesses in structural analysis and denotation are the type of language deficits which, like certain nutritional imbalances, bring trouble only after a long deficit period.

We have long been aware of the historic flare-up of reading difficulties at the fourth-grade level, where the curriculum places heavier emphasis on reading in content areas. By emphasizing functional practice of varied sentence patterns, teachers can plan action which will help prevent such problems."[1]

There was considerable growth in reading skills between the testing at the end of the second grade and that at the end of third grade. In 1974-75, second graders answered 75 percent of the questions in word identification correctly; a year later as third graders, they answered 86 percent of the questions correctly. The growth in the three other major areas was even greater: from 68 to 83 percent in vocabulary; 61 to 77 percent in comprehension; and 76 to 88 percent in study-locational skills. While the scores of second grade pupils in most areas were quite satisfactory to the committee in 1975, it was evident that as third graders they were making solid growth as well.

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[1] Student Achievement in California Schools: 1974-75 Annual Report, Sacramento, California State Department of Education, 1975, pp. 14-15.

IV. Reading Achievement in Grades Six and Twelve

Synopsis of Findings

California's sixth and twelfth grade students showed an increase in reading achievement on questions common to both the 1974-75 and 1975-76 versions of the Survey of Basic Skills. Grade six increased by 2.0 percent correct on 53 common reading questions and showed positive gains in all reading skill areas. Likewise, grade twelve scores increased by .6 percent correct on 71 common items, showing gains in all areas except literal comprehension which decreased slightly and interpretive-critical comprehension, which remained exactly the same.

For the past several years, reading achievement in California schools has been below national norms at both the sixth and twelfth grades. In spite of the increases shown in reading on the Survey of Basic Skills, grade six pupils continue to score marginally below, and grade twelve, considerably below national norms. See Chapter 8, "Comparisons with National Norms," for details.

The Reading Advisory Committee scrutinized the test results, item by item. By weighing the percent correct scores for each item against their expectations of student performance at different ages, committee members were able to identify areas of relative strength and weakness. While the skill area strengths and weaknesses reported here are based upon the committee's analysis, the Department of Education assumes full responsibility for these findings. The Reading Assessment Advisory Committee members were pleased that both grades six and twelve showed increases in overall reading performance. In the review of sixth grade results, the committee expressed satisfaction with performance in only one skill area: literal comprehension. The committee indicated that additional emphasis is needed in all other reading skill areas at the upper elementary level. These areas are listed below.

1. Study-locational: using parts of a book, the dictionary, and other reference books

2. Structural analysis: recognizing the meanings of roots, prefixes, and suffixes (especially suffixes)

3. Vocabulary: developing knowledge of word meanings, awareness of context and the meaning of connecting words (such as: and, or, but, because, however)

4. Interpretive/critical: interpreting, evaluating, and inferring from information and ideas stated in written material

On the other hand, the Reading Advisory Committee members concluded that twelfth-grade performance measured up to their expectations in most reading skill areas including study-locational skills, vocabulary, and literal comprehension. The committee, however, expressed concern over the level of twelfth-grade performance in critical-interpretive comprehension, especially on items requiring inferences from details.

Reading Results for Grade Six

Test Scope and Changes

The reading section of the Survey of Basic Skills: Grade 6 was substantially revised from 1974-75 to 1975-76. While the reading portion of the test became longer, with an increase from 98 to 128 questions, it also became easier overall, with an average percent correct of 66.1 as compared to 55.8 in 1974-75. The inferential skill areas of interpretive and critical comprehension were combined for a more meaningful interpretation of comprehension results. In accordance with the wishes of the Reading Assessment Advisory Committee, over half of the test consisted of comprehension questions. A graphic presentation of the content of the revised grade six reading test is presented in Figure 1.

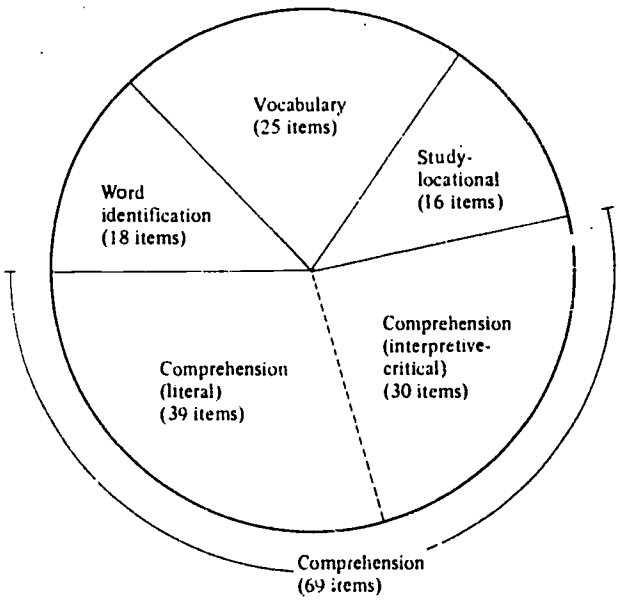


Fig. 1. Number of questions, by skill area, in the reading portion of the *Survey of Basic Skills: Grade 6*

In order that changes in statewide performance from year to year could be identified, 53 questions from the 1974-75 test were retained on the 1975-76 revision. The majority of the questions were in the area of literal and interpretive-critical comprehension (35 of the 53). Figure 2 illustrates the proportion of questions linking the 1974-75 and 1975-76 versions of the reading section of the Survey of Basic Skills: Grade 6.

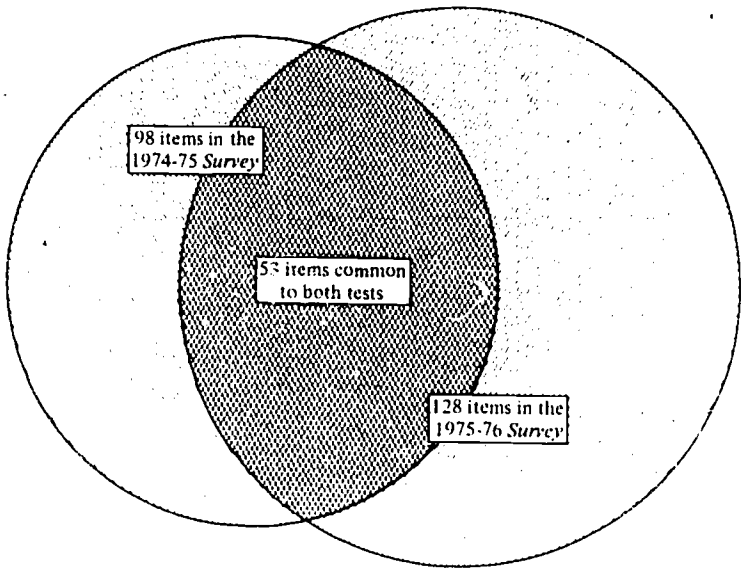


Fig. 2. Reading questions common to 1974-75 and 1975-76 *Survey of Basic Skills: Grade 6*

Skill Area Results for 1975-76, Grade 6

The average percent of correct responses for the reading section of the Survey of Basic Skills: Grade 6 in 1975-76 was 66.1. For the skill areas within reading, the percent correct scores ranged from 60.0 in study-locational to 74.3 in word identification. All of the results are presented in Table 4.

Table 4

Average Percent Correct Scores on the Reading Section of the Survey of Basic Skills: Grade 6, 1975-76

Skill area	Number of questions	Average percent correct
Reading	128	66.1
Word Identification	18	74.3
Vocabulary	25	67.1
Comprehension	69	64.9
Literal	39	68.4
Interpretive/Critical	30	60.5
Study-Locational	16	60.0

Comparison of 1974-75 and 1975-76 Results, Grade 6

There was an average increase of 2.0 percent correct on the 53 reading questions which appeared on both the 1974-75 and 1975-76 editions of the Survey of Basic Skills: Grade 6. Gains were made in all skill areas, the greatest being in vocabulary; and the least, in comprehension. These increases in sixth-grade reading performance are summarized and illustrated in Table 5. More detailed information about the changes in reading performance can be found in Appendix B.

Table 5

Changes in Reading Performance on Questions Common to the 1974-75 and 1975-76 Versions of the Survey of Basic Skills: Grade 6

Skill area	Number of common items	Gain or loss in score	-6 -4 -2 0 +2 +4 +6
Reading	53	+2.0	
Word Identification	4	+4.8	
Vocabulary	7	+8.5	
Comprehension	35	+0.7	
Literal	13	+0.7	
Interpretive/Critical	22	+0.7	
Study-Locational	7	+2.2	

Analysis and Interpretations of Skill Area Results, Grade 6

The Reading Assessment Advisory Committee, the group responsible for compiling the objectives of the reading section of the Survey of Basic Skills, scrutinized the test results item by item. They considered many factors, including the quality and difficulty of questions, the average percent correct scores, and changes in average percent scores from 1974-75 to 1975-76 on common questions. By weighing the findings against their expectations of student performance, the committee was able to arrive at some conclusions regarding strengths and weaknesses. Their comments are offered as one set of "expert opinions" to serve as a stimulus to further inquiry into the objectives of instructional programs.

Appendix B presents additional descriptions of the skill areas tested, more detailed test results, and illustrative test questions. It may be helpful to refer to these tables when studying the following analyses and interpretations.

Study-Locational. Sixteen study-locational items were used to measure such skills as dictionary usage, the ability to use parts of a book, and awareness of basic reference books. The average percent correct for this area was 61, with a gain of 2.2 percent correct on 7 items common to both the 1974-75 and 1975-76 tests. On 12 of the 16 study-locational questions, scores ranged from 40 to 70 percent correct.

About half (49 and 59 percent) responded correctly on two questions involving the use of the index of a book. Eighty-three percent were able to use sets of dictionary guide words, 63 percent recognized that the "n" in a dictionary entry means "noun," and 42 percent were able to use the pronounciation key. After reviewing these results item by item, the Reading Advisory Committee members agreed that more instructional emphasis in the basic study-locational skills, such as using the parts of a book, the dictionary, and other reference books, is desirable at the upper elementary level.

Word Identification. Fourteen questions assessed the ability of sixth-graders to identify the meanings of word parts such as prefixes and suffixes, while four questions involved the identification of sound-letter correspondences in words. The statewide average percent correct for this area was 74.3; scores of at least 75 percent correct were obtained on half (7 out of 14) of the suffix and prefix questions. The Reading Assessment Advisory Committee expressed disappointment with the proportion of pupils demonstrating mastery of the word identification questions. For example, they indicated that more than 75 percent of the students should have recognized that the prefix "un" in the word "undyed" makes the word mean "not dyed."

The committee concluded that more instructional emphasis should be given to the structural analysis of words (roots, suffixes and prefixes) in grades four, five, and six, as a means of improving reading comprehension. They underscored the importance of teaching suffixes in reading instruction since suffixes signal information as to both the meaning and function of a word in a sentence.

Vocabulary. The 25 vocabulary items on the sixth-grade reading test required students to recognize the meanings of words used in a paragraph. The average percent correct for this area was 67.1. Scores of at least 60 percent correct were obtained on 21 of the 25 questions. On five items common to both the 1974-75 and 1975-76 tests, there was an average increase of 8.5 percent correct.

While the reading committee was happy with the 8.5 percent increase and was more pleased with student performance in vocabulary than in word identification, they were still somewhat disappointed with the results in the vocabulary area. For example, members of the committee were disappointed that only 62 percent selected "middle or typical" as the correct meaning of the word "average"; (17 percent selected "little or small" as the definition of "average"; 10 percent, pencil or pen-sized; and another 10 percent, the size of a man's hand or foot). The committee observed that on this vocabulary item, as well as on several others, many students appeared to miscue consistently from the context. Furthermore, 29 percent of the students failed to identify the meaning of the word "pelandok," which was defined verbatim within a passage in the following sentence: "The people of Malaya have built up many folk tales and legends about the mouse deer or pelandok, as they call the attractive little animal." Committee members speculated that insufficient understanding of connecting words such as "or" and "as" may have accounted for some of the confusion displayed in using context clues. They concluded that more instructional emphasis should be given to vocabulary development, appropriate use of context, and the meaning of connecting words.

Literal Comprehension. The 39 literal comprehension items required pupils to answer questions based upon explicitly stated material in paragraphs. The average percent correct for this area was 68.4. On 30 of the 39 literal comprehension questions, scores of at least 60 percent correct were obtained; scores of at least 75 percent correct were obtained on 17 of the 39 questions.

After reviewing the results, item by item, members of the Reading Advisory Committee were pleased that the percent correct scores were so high since many questions required careful reading and discrimination between alternatives. They reviewed the kinds of errors made by students and noted certain patterns of recurring difficulty. One of the most common of these appeared to involve the students' inability to follow pronoun references from sentence to sentence. Consider, for example, the following item.

> "A new kind of star is shining over New York City. It is at the top of a tall, steel tower of an office building. It can be seen from a distance of five miles and tells by changing its color what kind of weather New York City is going to have. . ."

What can be seen from a distance of five miles?

- o New York City (5%)
- o A steel tower (13%)
- o An office building (5%)
- • A new kind of star (76%)

The percents in parentheses refer to the percentages of students selecting the respective answers. Those who failed to select the correct response may have failed to understand the referent of the pronoun "it" in the paragraph. Perhaps related to the problem of following pronoun reference was the confusion displayed by many pupils on another passage and question requiring the discrimination between characters described in a story and the narrator of the story; 37 percent successfully identified the relationship between the characters and narrator of the story on this question.

Another common difficulty for sixth-graders in literal comprehension involved the knowledge of word meanings, especially on those questions in which a word(s) had been substituted for another. The difficulty of such questions apparently corresponded with the degree of unfamiliarity of pupils with the key words involved. For example, 83 percent responded correctly on a question which required knowledge of the words "disagreeable odor," whereas only 39 percent selected the correct answer to a question requiring knowledge of the word "scoffed."

Answering some questions correctly required very careful reading, another factor apparently contributing to the difficulties of many pupils. On the following item, for example, 47 percent responded incorrectly even though the answer was stated explicitly in the passage.

> "A Roman boy wore a purple-bordered toga until sometime between the ages of 12 and 16, when he put away the toga of childhood and put on the plain white toga of manhood."
>
> When a Roman boy grew up he changed from
>
> - o a white toga to a toga bordered in purple. (11%)
> - o a purple toga to a toga bordered in white. (31%)
> - • a toga bordered in purple to a white toga. (52%)
> - o a toga bordered in white to a purple toga. (5%)

Performance on such questions caused the Reading Advisory Committee to speculate that there was a tendency for many to read carelessly without much attention to detail.

Interpretive-Critical Comprehension. Thirty interpretive-critical items required students not only to comprehend material explicitly stated in a paragraph but also to make inferences from that material as well. Since the interpretive-critical items were designed to measure the ability to

reason beyond explicitly stated material, one would expect these questions to offer a greater degree of difficulty than the literal, all other things being equal. The percent correct scores for the interpretive/critical skill area (60.5) versus literal (68.4) suggest the accuracy of this assumption. The proportion of students responding correctly on interpretive-critical items ranged from 30 to 88, depending on the question--a range reflecting a considerable spread of performance on these questions. To illustrate this range, 88 percent recognized the main idea of a passage at a fourth-grade readability level, whereas 30 percent correctly identified the writer's attitude toward characters in a story at a fifth-grade readability level. Seventy-six percent successfully discriminated between statements of fact and opinion while 31 percent inferred the time during which the incidents of a story took place. Thus, percent correct scores fluctuated from item to item, depending upon the difficulty of the passage and the difficulty of the question. With the substantial variability of pupil performance in mind, the Reading Committee concluded that greater instructional emphasis is needed in the critical skills of interpreting, evaluating, and inferring from information and ideas stated in written material.

Reading Results for Grade Twelve

Test Scope and Changes

As in the case of the grade six test, the reading section of the Survey of Basic Skills: Grade 12 was changed from 1974-75 to 1975-76. Although the number of questions remained essentially the same, half of the items were replaced by new ones on the revised test. In addition, the balance between the skill areas shifted toward a heavier proportion of comprehension questions. A graphic presentation of the content of the revised grade twelve reading test for 1975-76 is presented in Figure 3.

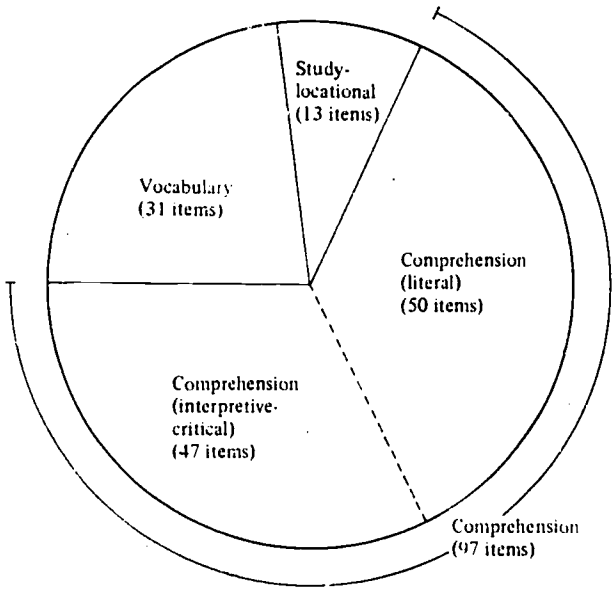


Fig. 3. Number of questions, by skill area, in the reading portion of the *Survey of Basic Skills: Grade 12*

Seventy-one questions from the 1974-75 reading test in the Survey of Basic Skills: Grade 12 were retained on the 1975-76 revision of the test. These items (one-half of the 1975-76 test) served as a link between the two years

in order that statewide changes could be identified. While all reading skill areas were covered by some common questions, the majority were in the areas of vocabulary (20) and comprehension (47). Figure 4 illustrates graphically the proportion of questions linking the original and revised reading test portion of the Survey of Basic Skills: Grade 12.

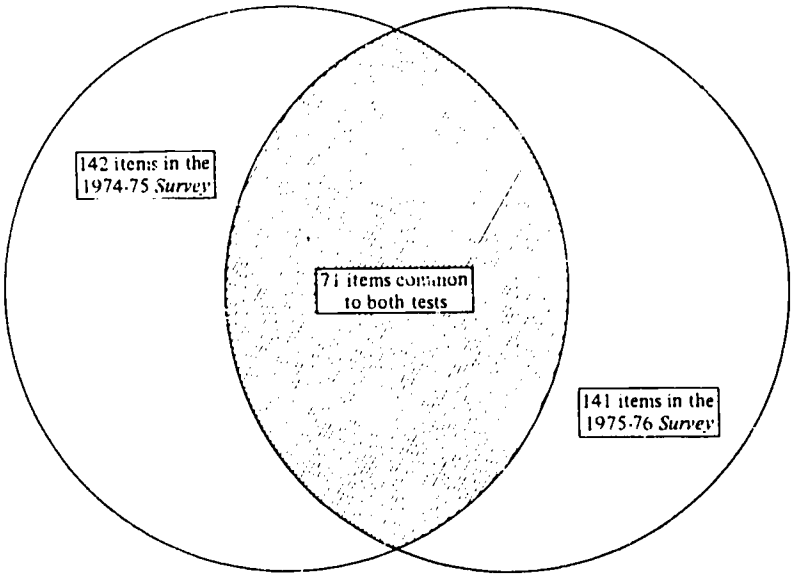


Fig. 4. Reading questions common to 1974-75 and 1975-76 *Survey of Basic Skills: Grade 12*

Skill Area Results for 1975-76, Grade Twelve

The average percent of correct responses for the reading section of the Survey of Basic Skills: Grade 12 was 64.1. The reading skill area percent correct scores ranged from 60.1 (interpretive-critical comprehension) to 68.4 (study-locational). The number of questions and percent correct scores for all twelfth-grade skill areas are summarized in Table 6.

Table 6

Average Percent Correct Scores on the Reading Section of the Survey of Basic Skills: Grade 12, 1975-76

Skill area	Number of questions	Average percent correct
Reading	141	64.1
Vocabulary	31	61.3
Comprehension	97	64.5
Literal	47	69.2
Interpretive/Critical	49	60.1
Study-Locational	13	68.4

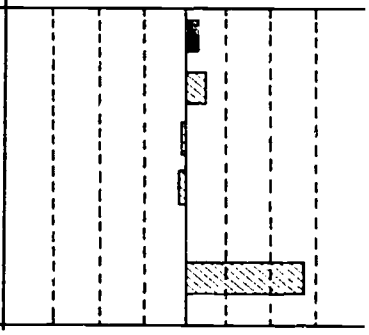
Comparison of 1974-75 and 1975-76 Results, Grade 12

On the 71 questions appearing in both the 1974-75 and 1975-76 Survey of Basic Skills: Grade 12, the students showed an average increase of .6 percent correct. This increase derived mainly from vocabulary and study-locational items; it failed to hold true for comprehension, which dropped slightly overall. These changes in reading performance on common questions are summarized in Table 7. More detailed information about the changes in reading performance can be found in Appendix C.

Table 7

Changes in Reading Performance on Questions Common to the 1974-75 and 1975-76 Versions of the Survey of Basic Skills: Grade 12

Skill area	Number of common items	Gain or loss in score	-6 -4 -2 0 +2 +4 +6
Reading	71	+0.6	
Vocabulary	20	+1.0	
Comprehension	47	-0.1	
Literal	26	-0.2	
Interpretive/Critical	21	0	
Study-Locational	4	+5.6	



Analysis and Interpretation of Skill Area Results, Grade 12

The members of the Reading Advisory Committee, which compiled the objectives of the reading section of the Survey of Basic Skills, were shown the results of the grade twelve reading test, item by item. By comparing the scores with their expectations of twelfth-graders, the committee was able to identify areas of strength and weakness as they did for grade six. They again considered the difficulty and quality of test questions and the gains or losses on common questions in arriving at these judgments.

Appendix C presents additional descriptions of the skill areas tested, more detailed test results, and illustrative test questions. It may be helpful to refer to these tables when studying the following analyses and interpretations.

Study-Locational. The study-locational questions assessed such study skills as the ability to use the dictionary, parts of a book, and reference materials. As is evident from Table 6, this area presented the second least difficulty for twelfth-grade students; the average percent correct for the study-locational questions was 68.4. For example, 77 percent knew the purpose of a glossary; 70 percent, the purpose of an index; 86 percent, the purpose of a bibliography. On a question requiring knowledge of information provided by an almanac, 67 percent responded correctly. After reviewing these results, item by item, the Reading Advisory Committee indicated that performance in this area was generally adequate. However, some members of the committee were concerned about the level of performance on the dictionary usage questions. For example, 28 percent of the pupils were able to determine the origin of a word from a dictionary entry; 36 percent identified the dictionary meaning appropriate to a given word in a sentence; and 39 percent recognized that a word in a dictionary entry could be used as a verb.

Vocabulary. The 31 vocabulary items required students to identify the meanings of words both in and out of context as well as the opposite meanings of words given out of context. The statewide percent correct for vocabulary was 61; on 20 of the 31 items, scores of 60 to 90 percent correct were obtained. There was considerable variability among scores, which ranged from 20 to 91 percent correct. The vocabulary item presenting the greatest difficulty was one requiring students to note the connotation of a word used sarcastically in a passage. On this particular question, 20 percent selected the correct answer. On the other hand, the easiest vocabulary question was the word "excessively" presented in the context of a limerick; 91 percent of the students selected the correct meaning: "very." Committee members expressed surprise over the difficulty caused by some words and the lack of difficulty caused by others. For example, 83 percent of the students correctly identified the meaning of the word gargantuan, while only 46 percent did so for the word famished. There was an average increase of 1.0 percent correct on the 20 common vocabulary questions from 1975 to 1976. Encouraged by the improvement shown on these items, as well as by overall performance in the area, the Reading Advisory Committee concluded that student performance in vocabulary was satisfactory.

Literal Comprehension. On the 47 literal comprehension items, students were required to identify from a paragraph explicitly stated elements which were restated or paraphrased in some way. The average percent correct for this category was 69, with 37 of the 47 items ranging from 60 percent correct to 94 percent correct, and over half (28 of the 47 items) ranging from 70 percent correct to 94 percent correct. Percent correct scores varied with the difficulty of the passage and the difficulty of the question. For example, in the middle of a passage estimated at a high tenth-grade readability level, the following sentence appeared:

> "The origins of the word (beat) are obscure,"
>
> A rote question based specifically upon this sentence was:
>
> "According to the paragraph, the origins of the word "beat" are _____."

Even though the answer was stated verbatim in the passage, only 83 percent selected the word "obscure," a fact which suggested some carelessness in reading and answering the questions. Another question was derived from two sentences in the first paragraph of a three-paragraph passage, which was estimated at an eighth-grade level of readability:

> "Even the first machines, although they weren't as intricate as ours today, were too big to fit in the front room of a cottage. They cost something to make, too."
>
> On a related question asking:
>
> "The reason people did not set up machines in their cottages":

Ninety-one percent selected "size and cost," an answer which had been paraphrased and not merely restated from the foregoing sentences.

There were two literal questions based upon a lengthy passage estimated at a college readability level. On these two questions, 63 percent identified correctly the author's attitude, and 75 percent selected the major idea of the passage. Performance was still better on another college-level passage entitled "The 14-Year-Old Dropout." Within this article the following sentence appeared: "And the unemployment rate for those who take early flight from the classroom ranges up to five times the dismal jobless figure of 8.2 percent for the nation as a whole." On the related question, "According to the writer, reducing the compulsory attendance age would result in _____," eighty-three percent selected the correct answer: "unemployment."

After reviewing the twelfth graders' performance on these questions, item by item, the Reading Advisory Committee concluded that while twelfth-grade students (like sixth graders) did not appear to read carefully for detail on some items, they did perform at an acceptable level on most literal comprehension questions.

Interpretive-Critical Comprehension. Forty-nine interpretive-critical comprehension items were used to assess California twelfth graders' abilities to reason with ideas and information explicitly stated in a paragraph, poem, or graph. The average percent correct for this skill area was 60.1, an average reflecting the fact that of the various reading skills, this particular skill area presented the greatest degree of difficulty to students. The percent correct scores on the majority (43 out of 49) of these questions ranged from the 40s through the 80s. Thus, as with literal comprehension, twelfth-graders' performance on interpretive-critical comprehension fluctuated considerably. For example, on a skiing article, estimated at an eleventh-grade readability level, 94 percent recognized how the author's problem, described in the article, could have been avoided. However, on the same passage, only 42 percent were able to identify which paragraph reflected the author's love for skiing, even though the paragraph included such clues as: "the beckoning slopes"; "I lost no time in heading for the nearest tow"; and "After a stimulating afternoon . . ." On the basis of performance on this particular item, the Reading Advisory Committee speculated that many twelfth-graders are not skilled at reading "between the lines" of a passage.

Another type of common difficulty occurred on questions requiring students to infer from details. For example, in a ninth-grade-level passage describing the War of the Roses, the following sentence appeared: "Henry VII's reign (1485-1509) was a time of rebuilding for England." On a question asking at what time Henry VII ruled, only 28 percent recognized that it was at the time of the voyages of Columbus. Answering this question correctly involved: (1) reading carefully enough to notice the stated dates; and (2) knowing the time of the voyages of Columbus. The Reading Advisory Committee speculated that the majority of twelfth-graders must have known when Columbus made his voyages, but that probably many students simply failed to read the passage with sufficient care and thought to notice the clue provided. While students were weak on items requiring careful reading and inferences from detail they were more successful on several questions involving the identification of the main idea or intent of an article. The difficulties displayed by students on the critical-interpretive questions led the Reading Committee to express some concern over twelfth-graders' competencies in this inferential skill area. The committee's reactions tended to coincide with those of Roger Farr, a reading specialist at the University of Indiana, who recently reviewed the reading test results for the National Assessment of Educational Progress and concluded that more programs stressing higher-level reading skills in the upper grades are probably needed.

V. Written Expression Achievement in Grades Six and Twelve

Synopsis of Findings

For both the sixth and twelfth grades, there was an overall improvement on written expression questions common to both the 1974-75 and 1975-76 versions of the Survey of Basic Skills. Grade six performance increased by .9 percent correct on 30 common written expression items, and gains appeared in all sixth-grade skill areas except for punctuation and capitalization. Grade twelve increased by .7 percent correct on 70 common items, showing gains in all skill areas except for language choices, which decreased slightly.

Over the past few years, California sixth and twelfth-grade students have been scoring below national norms in written expression. In spite of the increases shown in written expression on the Survey of Basic Skills, grade six pupils continue to score marginally below and grade 12 considerably below national norms. See Chapter 8, "Comparisons with National Norms," for details.

The English Language Assessment Advisory Committee expressed satisfaction over the gains made by both grades six and twelve on the common written expression questions. After reviewing the results, item by item, in the light of the maturity of most 11- and 17-year-olds in written expression, committee members observed patterns of strength and weakness in the performance of students at both grade levels. While the skill-area strengths and weaknesses are based upon the committee's judgments, the Department of Education accepts full responsibility for interpretations in this report.

The committee concluded that sixth-grade pupils displayed a respectable command of most written expression skill areas, including word forms, standard English usage, language choices, sentence recognition and sentence manipulation. Members of the committee expressed concern, however, over the level of performance shown by sixth graders on punctuation and capitalization questions, a concern which was underscored by the fact that these were the two written expression skill areas showing a decline in percent correct on common questions. They also expressed some misgivings about the level of performance shown by pupils on some subskills within language choices, notably that of identifying the most specific, vivid word within the context of a sentence.

Some of the same strengths and weaknesses appeared in the analysis of twelfth grade written expression performance. As in grade six, word forms, language choices, and sentence recognition emerged as strengths, and capitalization, punctuation and specific word choices (in language choices) emerged as weaker areas.

As the committee observed in 1975, twelfth-grade students encountered difficulties with sentence manipulation questions partly because they failed to equate effectiveness with economy of expression. Twelfth-grade performance on paragraph questions appeared to be a composite of strengths and weaknesses. While students demonstrated strength in identifying irrelevant material in paragraphs, they had difficulty with more abstract questions involving transitional words and consistency of time development. This pattern of strengths and weaknesses in written expression tends to parallel a finding reported by the National Assessment of Educational Progress that while many seventeen-year-olds have mastered the basics of written English, they seldom go beyond the basics.

Written Expression Results for Grade Six

Test Scope and Changes

The written expression and spelling sections of the Survey of Basic Skills: Grade 6 were changed substantially from 1975 to 1976. While the written expression and spelling sections of the Survey increased in the number of skill areas covered and in the total number of questions, the overall difficulty of both sections decreased.

In written expression, the number of reported skill areas increased from five to seven, the result of adding standard English usage and of splitting both sentence recognition/manipulation and capitalization/punctuation into four separate skill areas. The total number of written expression questions increased from 112 to 128. The number of questions within the various skill areas increased in every area except for punctuation and capitalization, both of which decreased in numbers of questions.

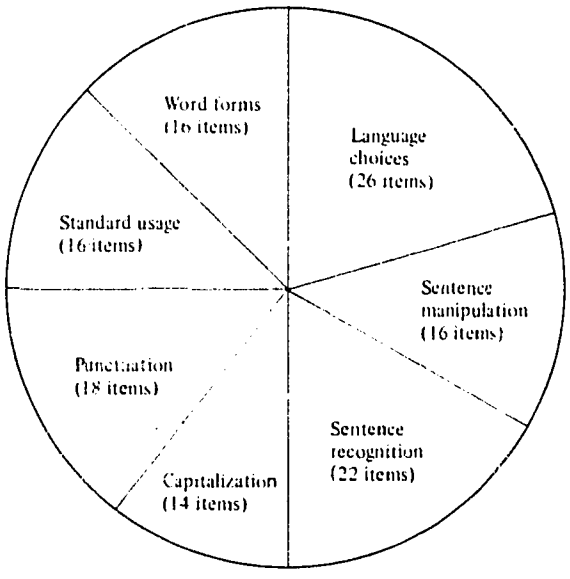


Fig. 5. Number of questions, by skill area, in the written expression section of the *Survey of Basic Skills, Grade 6*

In spelling, two skill areas were broken out: basic spelling relationships and word forming. The total number of spelling questions increased from 56 to 64. A graphic presentation of the content of the revised grade six test of written expression for 1975-76 is presented in Figure 5.

Although many new questions were added to the 1975-76 edition of the written expression section of the Survey of Basic Skills: Grade 6, 30 questions from the 1974-75 test were retained for purposes of comparison. Most of these were in the areas of punctuation (9), capitalization (8), word forms (5), and standard usage (4). Of the 64 questions on the spelling section of the 1975-76 test, exactly half (32) were common to the 1974-75 test as well. Twenty-eight of these were in the area of basic spelling relationships, and the other four, in word forming.

The number of questions common to both the first-year and second-year written expression section of the Survey of Basic Skills: Grade 6 is illustrated in Figure 6.

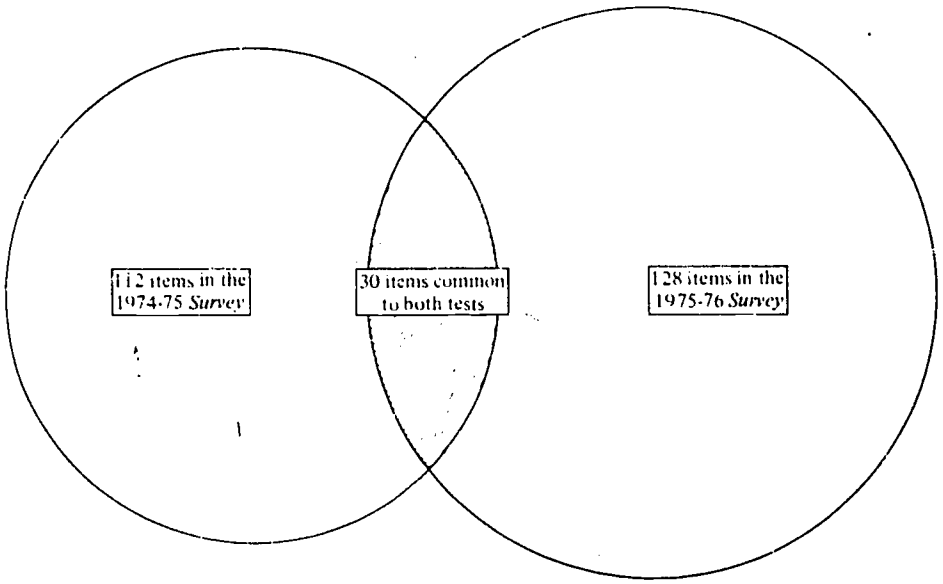


Fig. 6. Written expression questions common to 1974-75 and 1975-76 *Survey of Basic Skills: Grade 6*

Skill Area Results for 1975-76, Grade 6

The average percent of correct responses for the written expression section of the Survey of Basic Skills: Grade 6 was 62.5. The average percent correct

scores for the skill areas within written expression ranged from a low of 52.4 in punctuation to a high of 82.4 in word forms. In spelling, the average percent correct was 63.6. These results are summarized on Table 8.

Table 8

Written Expression and Spelling Scores by Skill Area, of the Survey of Basic Skills: Grade 6, 1975-76

Skill area	Number of questions	Average percent correct
Written Expression--Total	128	62.5
Word Forms	16	82.4
Standard Usage	16	73.1
Language Choices	26	54.4
Sentence Recognition	22	62.3
Sentence Manipulation	16	61.7
Capitalization	14	57.4
Punctuation	18	52.4
Spelling--Total	64	63.6
Relationships	35	58.1
Word Forming	29	70.2

Comparison of 1974-75 and 1975-76 Results, Grade 6

Because the Survey of Basic Skills was substantially revised for 1975-76, it is not meaningful to assess progress from year to year through direct comparisons of average percent correct scores. However, it is possible to compare percent correct scores on common questions, the link between the two versions of the test.

On the 30 written expression questions common to both the 1974-75 and 1975-76 tests, there was an average increase of .9 percent correct. These gains were reflected in all areas except for capitalization and punctuation. On

the 32 common spelling items, there was a gain of 1.9 percent. These are presented and illustrated on Table 9. More detailed information about the changes in performance in written expression can be found in Appendix D.

Table 9

Changes in Written Expression and Spelling Performance on Questions Common to the 1974-75 and 1975-76 Editions of the Survey of Basic Skills: Grade 6

	No. of items common to 1975 & 76[1]	Change in percent correct from 1975 to 76	-6 -4 -2 0 +2 +4 +6
Written Expression	30	+ .9	
Word Forms	5	+4.8	
Standard Usage	4	+1.6	
Capitalization	8	-2.3	
Punctuation	9	-1.3	
Spelling	32	+1.9	
Relationships	28	+2.4	
Word-forming	4	-1.8	

[1] Skill areas with fewer than 4 common questions were not included in the table.

Analysis and Interpretation of Skill Area Results, Grade 6

Members of the English Language Assessment Advisory Committee, the group responsible for compiling the objectives of the written expression and spelling sections of the Survey of Basic Skills, reviewed the 1975-76 assessment results as they did previously for the 1974-75 results. The committee members judged the adequacy of student performance in light of the inherent difficulty of the skill, the particular items used to measure that skill, and changes in performance from 1974-75 to 1975-76.

After reviewing the results of the 1974-75 written expression test in 1975, committee members concluded that performance in all skill areas measured up to their expectations of sixth graders except for punctuation, specifically, that of contractions, possessives and parts of an address. In 1976 the

English advisory committee again concluded that sixth graders displayed a respectable command of most written expression skill areas including word forms, standard English usage, language choices, sentence recognition and sentence manipulation. Committee members, however, were disappointed with the 1975-76 pupil performance on capitalization and punctuation items. The committee's disappointment over the level of performance in these areas was intensified by the fact that these were the only two skill areas showing a decline in performance on questions common to both the 1974-75 and 1975-76 tests. They also expressed concern over some subskills within language choices, notably that of identifying the audience intended by the author of a prose passage and selecting the most specific, vivid word for a sentence.

Appendix D presents additional descriptions of the skill areas tested, more detailed test results, and illustrative test questions. It may be helpful to refer to these tables when studying the following analyses and interpretations.

Word Forms, Standard Usage, Language Choices. Of all the skill areas, word forms and standard English usage presented the least amount of difficulty to students which is evident in Table 8. In both areas, percent correct scores were at least 80 on two-thirds of the questions. After reviewing these high percent correct scores and noting the average gains on the common questions from 1974-75 to 1975-76, the English committee was extremely encouraged.

On the following word forms question, for example, 93 percent selected "shortest" instead of "short," "shorter," and "shortly" for the sentence "Carmen is the _____ of all the girls in class." Of the suffixes tested in this section (-ed, -ing, -s, -ly, -er, -est, 's) the discrimination between s and 's caused the greatest difficulty, probably because students could not use sound as a basis for selecting the correct answer.

In standard English usage, performance was even more impressive. For example, 93 percent selected "doesn't" rather than "don't" for the sentence "The ending _____ make sense to me," and 89 percent chose "Daisy and I" rather than "Daisy and me" in the sentence: "_____ are good friends." One of the few usage questions to cause difficulty was the choice of "Us girls" versus "We girls" in the sentence "_____ are throwing a party"; 37 percent selected "We girls" on this item. Since many of the word choices made on the test would not have been natural to those pupils with language backgrounds departing from standard English, some members of the English Advisory Committee concluded that sixth-grade performance on word forms and standard English usage questions reflects effective instruction in California's elementary schools.

The language choices skill area consisted of 23 questions assessing sixth-grade pupils' abilities to select the most vivid and specific word for a sentence, to identify attitudes conveyed by words or groups of words, and to identify the audience intended by the author of a prose passage or letter. A glance at Table 8 reveals that language choices

was the skill area second in difficulty for pupils, with an average percent correct score of 54.4. The English advisory committee concluded that pupils demonstrated a fairly respectable command of the language choices area as a whole, particularly on those questions involving the identification of attitudes conveyed by words. For example, 92 percent correctly selected a sentence showing that a speaker was pleased.

However, committee members also observed that other language choices skills were in need of attention. For example, performance on four questions involving the identification of the audience intended by a writer was quite uneven as is reflected by the following percent correct scores: 33, 35, 54, and 82. The English advisory committee concluded that more instructional emphasis in this area is desirable for elementary pupils, since one of the first steps of the writing process is considering the communication needs of the audience.

Sixth-grade performance on questions requiring the choice of the most specific noun and vivid verb also varied considerably, with three-fourths of the scores (12 out of 16) ranging from 43 to 73 percent correct. On the specific noun questions, instructions, including an example, directed pupils to select the most specific and concrete word from a list of four choices for a blank in a sentence. Performance ranged from a high of 67 percent correctly selecting "mailman" as more specific than "worker," "man," and "adult" to a low of 38 percent correctly identifying "murderer" as more specific than "bad man," "lawbreaker," and "criminal." Performance also varied considerably on questions requiring the choice of the most vivid verb. For example 73 percent selected "swirled" over "went" and "ran" for the verb in the sentence "The bath water _____ down the drain"; whereas only 28 percent chose "slammed" over "put" and "placed" in this sentence: "The gunfighter _____ his gun in the holster." If pupils are to learn to use more descriptive and powerful words in their own writing, they probably need to be able to make such discriminations as those between dull and vivid verbs and between specific and general nouns. Thus, the English advisory committee expressed some concern over performance in these subskills of the language choices area.

Sentence Recognition and Manipulation. After reviewing the test results in the areas of sentence recognition and sentence manipulation, members of the English advisory committee agreed that performance in both areas measured up to, and in the case of sentence recognition, surpassed their expectations. Twenty-two sentence recognition items required students to identify complete sentences and sentence fragments, to discriminate between English and non-English word order, and to recognize run-on sentences. On over half of the sentence recognition items, percent correct scores ranged from 60 to 87. For example, when asked to identify the incomplete sentence from the following list, 69 percent correctly selected the second option.

- o Scott and Mary played baseball.
- • The dark clouds of dust.
- o The river is swift.
- o Glass windows may break quite easily.

Pupils experienced somewhat more difficulty identifying the number of sentences combined in a run-together construction than in identifying incomplete sentences. On the following item, for example, 61 percent recognized that two sentences were run together.

A shot rang through the canyon it echoed back and forth between the canyon walls.

- o 1
- o 2
- o 3
- o 4

While students handled the questions on incomplete sentences more successfully in general than those on run-on constructions, committee members observed that performance on run-on questions was respectable. In view of the difficulty of the skills involved, the English committee judged that sixth-grade performance in the area of sentence recognition was quite strong.

On 16 sentence manipulation items, students were asked to select the most effective sentence or sentence element and to expand a sentence for a given purpose. The average percent correct for this category was 61.7. There was a considerable spread of performance (41 to 85 percent correct) on seven questions requiring pupils to select the simplest and least wordy statement of an idea. On five out of seven of these, the scores were above 66 percent. For example, 68 percent selected the fourth option in the list below as the best sentence.

- o My baby sister went and broke the new radio.
- o The new radio was broke by my baby sister.
- o The new radio was broken because of my baby sister.
- • My baby sister broke the new radio.

Seven questions requiring pupils to expand a sentence by adding adjectives or adverbs in response to a given question caused considerable difficulty for students. On five out of seven of such questions, scores were quite consistent, with a range between 44 and 58 percent correct. This confusion over adverbs and adjectives was consistent with the expectations of the English advisory committee since sixth-graders are still developing in their control over modifying words and structures.

Capitalization and Punctuation. Thirty-two questions were used to assess the basic conventions of capitalization and punctuation. Sixth-grade performance on the questions in both areas displayed the following characteristics:

1. These two areas were among those causing the greatest degree of difficulty for pupils. Of all skill areas, punctuation

had the lowest average percent correct (52.4) while capitalization had the third lowest (57.4).

2. Performance tended to be quite consistent in both skill areas. On 10 out of 14 capitalization questions, scores ranged between 51 and 64 percent correct, while on 13 out of the 18 punctuation items, scores clustered between 40 and 60 percent correct.

3. These were the only two skill areas showing a decline from 1974-75 to 1975-76 on common questions. Capitalization declined by 2.3 percent correct on eight common questions; punctuation, by 1.3 percent correct on nine common questions.

As an illustration of the basic nature of the capitalization and punctuation questions and the typical level of performance, 59 percent noted the omission of a capital letter in the first word of this sentence:

• we are learning	(59%)
o about all the planets	(5%)
o in our solar system.	(14%)
o no mistakes	(19%)

Likewise, 60 percent noted the absence of any end punctuation in this sentence:

"What a beautiful sight"

While the percentage of sixth-grade pupils actually making such mistakes in their own writing is unknown, it is evident that on these items in the Survey of Basic Skills, 40 percent did not recognize certain basic errors. The English advisory committee expressed concern over both the general level of sixth-grade performance in capitalization and punctuation and the decline on the common questions since, in the committee's opinion, the mastery of basic editing skills is important if students are to effectively proofread their own writing.

Written Expression Results for Grade Twelve

Test Scope and Changes

While the written expression and spelling sections of the Survey of Basic Skills: Grade 12[1] were expanded substantially from 1974-75 to 1975-76, the

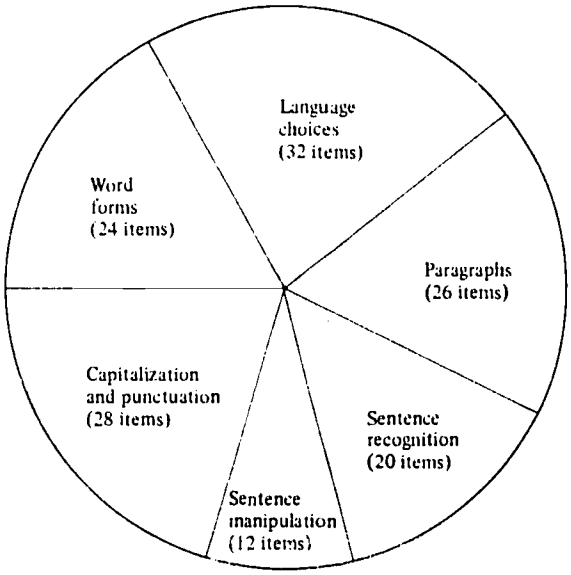


Fig. 7. Number of questions, by skill area, in the written expression section of the *Survey of Basic Skills: Grade 12*

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[1] A validity study of the written expression section of the Survey of Basic Skills: Grade 12 was conducted in 1975. Over 4,000 high school seniors wrote essays on one of five topics, and the essays were then rated holistically by trained evaluators. The school averages obtained by students on the Survey of Basic Skills: Grade 12 were correlated with the school averages obtained by students on the essay test. Schools that scored high on the written expression section of the Survey of Basic Skills tended to score high on the essay test and schools that scored low on one test, tended to score low on the other as well.

difficulty of both tests decreased overall. In written expression, the split of sentence recognition and manipulation into two distinct categories resulted in changing the number of reported skill areas from five to six. The total written expression test for grade twelve almost doubled in length, with an increase from 81 (1974-75) to 142 (1975-76) test questions. The addition of so many new questions resulted in the expansion of all written expression skill areas on the revised test. In spelling, the number of items increased from 54 to 72. The content of the revised grade twelve test of written expression for 1975-76 is presented graphically in Figure 7.

Seventy questions from the 1974-75 written expression section of the Survey of Basic Skills: Grade 12 were retained on the 1975-76 edition of the test so that statewide performance could be compared from year to year. The majority of these common questions were in the areas of capitalization and punctuation (22), language choices (19), and paragraphs (12). Of the 72 spelling questions on the revised test, 54 (three-fourths of the 1975-76 test) appeared on the 1974-75 test as well.

The proportion of questions linking the 1974-75 and 1975-76 tests of written expression in the Survey of Basic Skills: Grade 12 is illustrated in Figure 8.

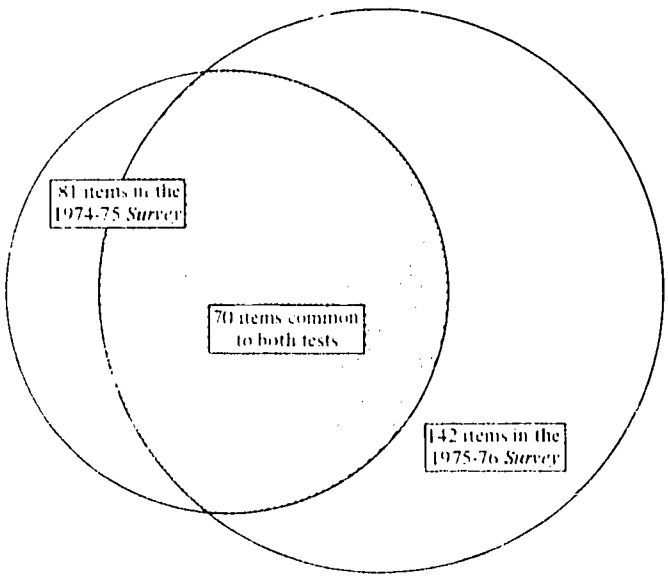


Fig. 8 Written expression questions common to 1974-75 and 1975-76 *Survey of Basic Skills: Grade 12*

Skill Area Results for 1975-76, Grade 12

The average percent of correct responses for the written expression section of the Survey of Basic Skills: Grade 12 was 62.3. For the skill areas within written expression, the average percent correct scores ranged from a low of 44.6 in sentence manipulation to a high of 72.6 in word forms. In spelling, the average percent correct was 68.0. The number of questions and average percent correct scores for all areas of written expression and spelling are summarized in Table 10.

Table 10

Written Expression and Spelling Scores by Skill Area, of the Survey of Basic Skills: Grade 12, 1975-76

Skill area	Number of questions	Average percent correct
Written Expression-Total	142	62.3
Word Forms	24	72.6
Language Choices	32	66.9
Sentence Recognition	20	67.3
Sentence Manipulation	12	44.6
Paragraphs	26	59.9
Capitalization and Punctuation	28	54.6
Spelling	72	68.0

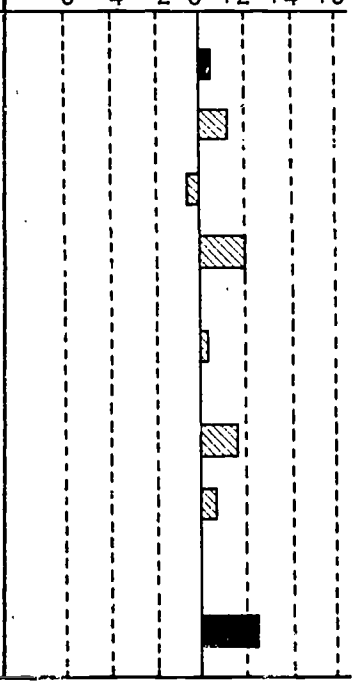
Comparison of 1974-75 and 1975-76 Results, Grade 12

There was an average increase of .7 percent correct on the 70 written expression questions which appeared on both the 1974-75 and 1975-76 versions of the Survey of Basic Skills: Grade 12. Increases, ranging from .4 to 2.0 percent correct, were shown in all written expression skill areas except for language choices, which reflected a decrease of .5 percent correct. On the 54 common spelling items, there was an increase of 2.7 percent correct. Changes in twelfth-grade written expression and spelling performance are summarized in Table 11. More detailed information about the changes in performance in written expression can be found in Appendix E.

Table 11

Changes in Written Expression and Spelling Performance on Questions Common to the 1974-75 and 1975-76 Editions of the Survey of Basic Skills: Grade 12

Skill area	No. of items common to 1975 & 76	Change in percent correct from 1975 to 76
Written Expression	70	+ .7
Word Forms	3	+1.4
Language Choices	19	- .5
Sentence Recognition	7	+2.0
Sentence Manipulation	7	+ .4
Paragraphs	12	+1.7
Capitalization & Punctuation	22	+ .9
Spelling	54	+2.7



Analysis and Interpretation of Skill Results, Grade 12

Members of the English Language Assessment Advisory Committee, the group responsible for compiling the objectives of the written expression and spelling sections of the Survey of Basic Skills, reviewed the 1975-76 assessment results as they did for grade six. Some committee members pointed out that while few persons expect sixth graders to have attained mastery of written expression--primarily because of lack of maturation--society seems to expect mastery by grade twelve. In fact, the process of maturation is still ongoing at age 17. They concluded that twelfth-grade test results, like those for grade six, should be examined in the light of developmental facts.

After reviewing twelfth-grade performance on the 1974-75 Survey of Basic Skills, the members of the English advisory committee observed this trend:

> Twelfth-grade performance indicated strength in such fundamentals as achieving subject-verb agreement in a sentence and identifying irrelevant material in a paragraph. On the other hand, the test

results indicated that students experienced greater difficulty on items requiring more linguistic sophistication, such as selecting economical, effective statements rather than wordier, less effective statements.[2]

Interestingly enough, this conclusion parallels a finding by the National Assessment of Educational Progress, an agency which has systematically investigated the actual writing performance of seventeen-year-olds over the last several years. NAEP found that "about half the seventeen-year-olds had some command of the basics of written English, but they seldom went beyond basics: they produced simple sentences and used primarily common words."[3]

After reviewing the 1975-76 written expression results, the English advisory committee again observed a general pattern of strengths and weaknesses revealing mastery in some fundamental aspects of word, sentence, and paragraph skills, and confusion in the more sophisticated facets of these language skills. The following discussion illustrates this trend in the areas involving word, sentence, and paragraph skills.

Appendix E presents additional descriptions of the skill areas tested, more detailed test results, and illustrative test questions. It may be helpful to refer to these tables when studying the following analyses and interpretations.

Word Forms, Standard Usage, Language Choices. On nine questions requiring students to select the correct suffix for a word in a sentence, percent correct scores ranged between 80 and 97--scores suggesting mastery of this fundamental skill. For example, 90 percent selected "walks" over "walk," "walked," and "walking" for the sentence: "After the rain the _____ were slippery." Furthermore, on 8 out of 13 language choices questions requiring students to identify correctly the attitude conveyed by a given word, percent correct scores ranged from 76 to 87. For example, 76 percent selected "poking around" over "objective methods," "scientific precision," and "coordinated efforts" as a writer's description of the search for a missing person.

Performance was also quite high on questions involving the identification of the audience intended by the author of a given paragraph(s). On four of the five audience questions, percent correct scores ranged from 78 to 94. However, the English advisory committee was not as pleased with student performance on questions involving the discrimination between specific and general sets of words. On 6 out of 10 such questions, percent correct scores clustered in the 40s and 50s. For example, 57 percent identified Newsweek as the most specific word in a list including "current events magazine," "publication," and "magazine." Performance in this skill area is a matter of concern because studies

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[2] Student Achievement in California Schools, 1974-75, Annual Report

[3] Johnson, Simon S., Update on Education, Denver: The Education Commission of the States, 1975.

of actual writing performance have shown that lack of specificity is one of the most common weaknesses in student writing.

Committee members also noted the confusion displayed by over half of the students tested on the following question involving consistency of pronoun reference:

"It is within the power of man
to control your own destiny."

On this item, only 44 percent recognized as error the use of the words, "your own." Thus, in the area of word choices the following pattern emerged: overall strength in such fundamentals as selecting the appropriate suffix for a word in a sentence, recognizing attitudes conveyed by words and groups of words, identifying the audience intended by the author of a passage; but overall difficulty on more complex tasks, such as discriminating between specific and general words and recognizing inconsistency in the use of pronoun reference in writing.

Sentence Recognition and Manipulation.

Twenty items were used to assess sentence recognition skills, such as identifying complete sentences, sentence parts, sentence patterns, and appropriate subject-verb relationships. The average percent correct for this category was 67.3, a number revealing that sentence recognition was the area of second least difficulty for students. On the other hand, 12 questions were used to assess students' sentence manipulation skills, such as selecting the most effective, economical sentences and recognizing the most effective combination of several short sentences. The average percent correct for these 12 questions (44.6) revealed that sentence manipulation questions were by far the most difficult ones for students.

The English advisory committee judged that performance on some basic sentence recognition questions involving the identification of sentence fragments was quite strong with four out of five scores clustering between 72 and 89 percent correct. However, as soon as committee members began to examine percent correct scores on more complex questions involving sentence manipulation, they noted a much lower proportion of students responding correctly. On four questions asking students to choose the most effective statement of an idea, 35, 24, 42, and 44 percent selected the clearest and most concise version. For example, students were asked to select the one most effective sentence of the following four:

- o She spoke to me in a very cool manner when we met each other yesterday. (54%)
- o When we met yesterday, I was spoken to in a very cool manner by her. (8%)
- o Her manner was very cool when meeting and speaking to me yesterday. (12%)
- • Yesterday she greeted me coolly. (24%)

The accompanying percents in parentheses are the percentages of students selecting the various choices. Only 24 percent selected the concise version. The other 86 percent selected the awkward, wordy, and stilted statements. The English committee concluded from these results that most high school seniors do not equate effectiveness with economy in written expression, a finding the committee considered to be quite significant. On six items requiring students to choose the most effective combination of several short sentences, the proportion responding correctly was again consistently low: 47, 52, 50, 43, and 50 percent. After reviewing the pattern of strengths and weaknesses with sentence skills, the English committee concluded that high school students need more instruction in sentence combining and sentence manipulation as a means of increasing economy and flexibility in their written expression.

Paragraphs. Twenty-six paragraph questions were used to assess such skills as identifying irrelevant material in a paragraph, recognizing inconsistent time development, identifying logical sequence, selecting the best summary statement of a group of ideas, and identifying transitional elements within a paragraph. The average percent correct for this area (59.9) revealed that the paragraphs section was among one of the more difficult areas of the test for students. As with the word choice and sentence questions, an interesting pattern of strengths and weaknesses appeared with the paragraphs items. On four out of the five questions requiring students to identify irrelevant sentences in paragraphs, percent correct scores in the 80s and 90s were obtained. Consequently, the English advisory committee was pleased that in most cases the majority of students could recognize sentences that departed from the main topic of a paragraph. Moreover, after noting the difficulty of several items which required students to unscramble the sequence of sentences within a paragraph, committee members expressed satisfaction with percent correct scores of 53, 74, and 60. However, members of the committee began to express some concern over performance on questions involving the achievement of paragraph unity through (1) consistency of time pattern and (2) transitional devices. On four questions requiring students to recognize inconsistent verb tense, the following percent correct scores were obtained: 66, 38, 27, and 35. For example, the following two sentences were given as part of a total paragraph:

(1) "Director William E. Colby admitted Tuesday the CIA kept a secret cache of deadly poisons and forbidden weapons ....

(2) Later, Dr. Frank Gordon identifies himself and two colleagues ...."

On a question asking students to identify the one sentence which was inconsistent with the time development, 35 percent selected sentence (2). On a question relating to another paragraph, students were asked to identify the sentence in which there was a shift from present to past tense; and 38 percent responded correctly. Thus, performance was essentially consistent whether the words "shift in verb tense" or "inconsistent time development" were used.

On seven questions involving the identification of transitional words and phrases, the following percent correct scores were obtained: 77, 72, 48, 61, 40, 76, and 24. Members of the committee expressed concern over twelfth-graders' uneven performance on these questions. For example, on two items involving recognition of the word "however" as a transitional element, 48 and 61 percent responded correctly, percentages revealing a disconcertingly low degree of familiarity with words commonly used as transitional devices. Thus, the English advisory committee concluded that while students seem to have a grasp of some fundamental aspects of the paragraph as a unit of composition, they need additional instruction in maintaining consistent verb tense and using transitional devices.

Capitalization and Punctuation. Twenty-eight punctuation and capitalization questions were used to assess students' editing skills, i.e., their abilities to recognize errors in capitalization and punctuation. The average percent correct for this area (54.6) revealed that of the various written expression skill areas, punctuation and capitalization presented the second greatest degree of difficulty to twelfth graders. There was considerable variability among the scores on the 28 questions, the percent correct scores ranging from 12 to 93, depending on the question. Scores clustered between 50 and 75 percent correct on about one half of the questions (13 out of 28). On five questions, scores over 75 percent correct were obtained. As was the case in 1975, the English committee expressed disappointment over the low proportion of students responding correctly on these questions.

On apostrophe usage questions, for example, the committee expected a higher proportion of students to demonstrate mastery than the following scores indicated: 12, 56, 65, 61, 64, and 46. Specifically, 46 percent selected the correct apostrophe placement for the word "children's," and 65 percent recognized the error in "should'nt."

Scores with comma usage fluctuated with the question: 78 percent identified the correct punctuation of an appositive, 57 percent correctly indicated that a comma should follow an introductory dependent clause, and 59 percent recognized that a nonrestrictive clause was correctly punctuated.

Percent correct scores tended to be somewhat higher, though still not high, on the capitalization items. On three questions involving the capitalization of specific geographical locations, the following percent correct scores were obtained: 68, 70, 78. Although the average percent correct on 22 punctuation and capitalization items common to the 1974-75 and 1975-76 tests showed an increase of .9, the English advisory committee continued to express concern over the level of performance in this area. The members concluded that students need more instruction in punctuation and capitalization in the context of student writing.

VI. Mathematics Achievement in Grades Six and Twelve

Synopsis of Findings

Student achievement in mathematics at grades six and twelve in California public schools improved during 1975-76. On items common to the 1974-75 and 1975-76 editions of the Survey of Basic Skills, there was an overall increase in correct responses of 2.4 percent for grade six and 1.6 percent for grade twelve.

The results of an equating study, which compared student performance on the Survey of Basic Skills: Grade Six and the Comprehensive Tests of Basic Skills, showed that California's sixth graders were below the publisher's national samples of 1968 and 1973. In spite of the increase in 1975-76, California pupils are probably still below those estimates of the national average. Since the achievement of California's twelfth graders in 1974-75 was far below the publisher's national sample on the Iowa Tests of Educational Development, they remain below the national average. The details of these California-national comparisons are described in Chapter 8, "Comparisons with National Norms."

In 1974-75 the members of the Mathematics Assessment Advisory Committee were asked to review the statewide results and to make suggestions for improving the quality of mathematics programs in California. The same committee was asked to review the results for 1975-76 and to make judgments regarding strengths and weaknesses of California's mathematics programs. Although the discussion in this section and in the following sections reflects the judgments of the Mathematics Assessment Advisory Committee members, the Department of Education assumes the responsibility for the contents of this report.

The committee's analysis of results on the revised Survey of Basic Skills: Grade 6 indicated that the performance of sixth graders in computational and application-related skills with whole numbers, fractions, and decimals was adequate. When 1975-76 scores were compared with those of 1974-75 significant gains were recorded in the area of measurement and reading of graphs. The performance in geometric skills was judged to be marginally satisfactory. The scores of sixth graders in the area of probability and statistics also showed a substantial gain over 1974-75, but their performance was still judged to be too low to be adequate.

The committee felt that increased instructional emphasis was needed to help sixth graders better understand place value, perform division of decimals, recognize equivalent fractions, and solve word problems. Also, because of

the widespread use of basic concepts of probability and statistics in the daily lives of the average citizen, the committee recommended that a continued instructional emphasis be given to the basic skills and concepts in that area.

The patterns of strengths and weaknesses in California's sixth graders' mathematics performance, for 1975-76, were similar to those found by the committee in their 1974-75 analysis of the results. In this regard, it is noteworthy that the performance of California sixth graders paralleled what was found nationally for nine and thirteen-year-olds. A few months after the publication of the California results, last year, the National Assessment of Educational Progress (NAEP) published a report based upon an analysis of NAEP mathematics test results. The NAEP results were analyzed by a panel of judges convened through the offices of the National Council of Teachers of Mathematics (NCTM). There was a remarkable similarity in the conclusions of the California committee concerning statewide results and the NCTM committee's conclusions regarding nationwide results.

An analysis of the results on the revised Survey of Basic Skills: Grade 12 indicated that twelfth graders continued to compute satisfactorily with whole numbers, fractions, and decimals. In basic skills related to algebra, grade twelve students made significant gains in achievement in such areas as solving equations, using formulas, and in interpreting information from tables or graphs. Continued improvement was noted in the knowledge of number facts. The performance on several comprehension and application items showed significant gains in 1975-76 over that of 1974-75, especially in the area of consumer-type applications. Of all the skill areas, twelfth graders showed the greatest gain in skills related to geometry. The committee believed that increased instructional emphasis was needed in the use of percents and the solution of word problems involving multiple operations.

The committee made the following recommendations aimed at improving mathematics achievement:

1. Emphasize skills related to the application of geometric concepts. Units in geometry must not be skipped or postponed to later grade levels.

2. Emphasize decimal notation and decimal computation skills in kindergarten through grade six.[1]

3. Continue to emphasize and use number theory concepts and number properties at all grade levels.

4. Emphasize instruction at all grade levels in the use and understanding of basic probability and statistical terminology common to everyday life.

[1]See Mathematics Framework for California Public Schools: Kindergarten Through Grade Twelve, Sacramento: California State Department of Education, 1975.

5. Continue strong emphasis on the fundamental skills and concepts of measurement at all grade levels.

6. Increase the emphasis placed on the development of a cohesive and consistent program designed to improve problem analysis and problem solving skills at all grade levels.

7. Give additional emphasis to the skills of reading and comprehension of technical materials at all grade levels.

Test Scope and Changes for the Grade Six Survey

The Survey of Basic Skills: Grade 6 was developed specifically to assess mathematics skills taught in most California schools through the sixth-grade level. The four major skill areas assessed in the Survey were: arithmetic, geometry, measurement and graphs, and probability and statistics. The 1975-76 test had a total of 160 items, 8 fewer than in 1974-75. Figure 9 illustrates the emphasis given to each of the skill areas in the total test. In the figure the skill area of arithmetic is subdivided into number concepts, whole numbers, fractions, and decimals. Only 7.5 percent of the test was devoted to the assessment of basic terminology and the intuitive approach to probability and statistics. A detailed description of the skills assessed in the Survey is given in Test Content Specifications for the Survey of Basic Skills: Mathematics. Appendix F gives a description of the major skills assessed in the Survey and presents illustrative test questions.

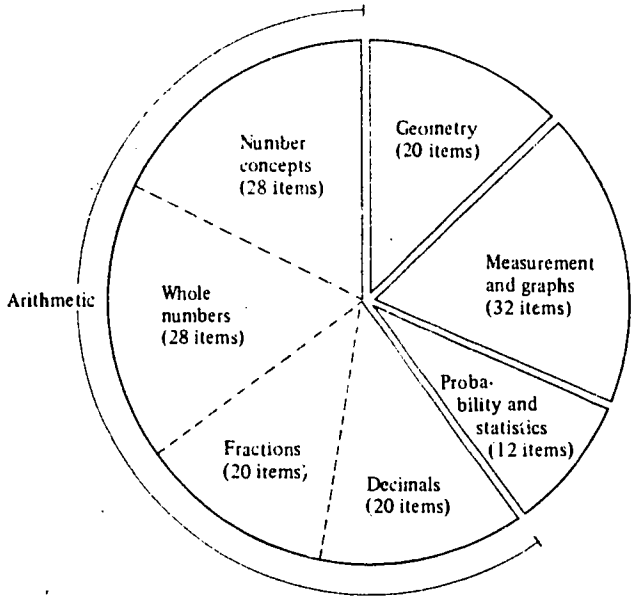


Fig. 9. Skill area emphases in the *Survey of Basic Skills: Grade 6*

The 1975-76 Survey of Basic Skills was a revised version of the 1974-75 Survey. Major revisions were made in the area of geometry and measurement and graphs; only minor revisions were made in other areas. The revisions were made to cover more adequately topics included in most K-6 curriculums in the state. In other cases, teacher-written items replaced those which item analyses and teacher comments deemed to be inadequate. However, the 80 common items across two years give data for longitudinal comparison of scores statewide. Figure 10 presents the degree of overlap in test content in the two versions of the Survey. The number of items in each of the skill area in 1974-75 and in 1975-76 and the number of items common in each skill area across two years are given in Appendix F.

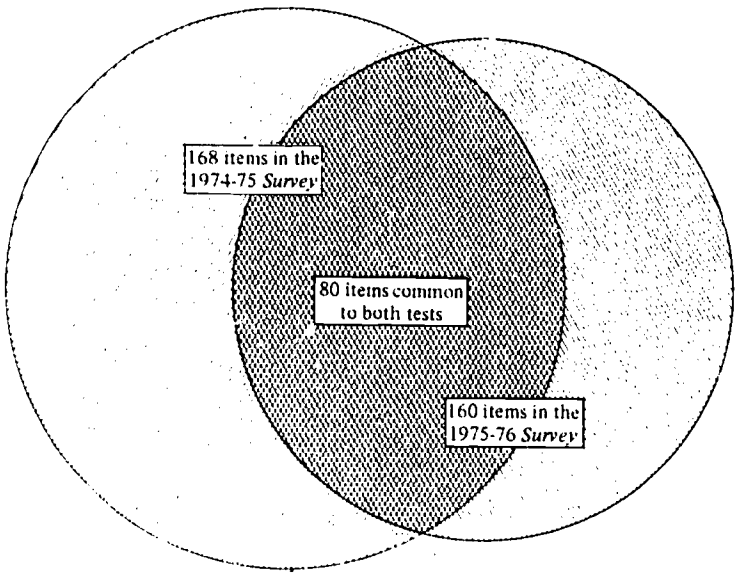


Fig. 10. Amount of content overlap in the 1974-75 and 1975-76 versions of the *Survey of Basic Skills: Grade 6*

Skill Area Results for Grade Six

Table 12 shows the achievement results of California sixth graders on the total test and in four major skill areas for 1975-76. A more detailed breakdown of skill area results, together with the description of skills assessed and an illustrative test question for each skill area, is given in Appendix F. The scores are expressed as the "average percent correct" score, which is the average number of items answered correctly by California pupils as a group. Presented another way, this score can be thought of as the number of items

answered correctly by an "average" California pupil. The average California sixth grader answered correctly 61.0 percent of the items in arithmetic; 58.8 percent, in geometry; 52.1 percent, in measurement and graphs; and 40.4 percent, in probability and statistics. Overall, the average grade six pupil answered 57.4 percent of the questions correctly.

Table 12

Average Percent Correct Responses in Mathematics Section of the Survey of Basic Skills: Grade 6, 1975-76

Content or skill area	Number of Items	Average percent correct
Arithmetic	96	61.0
Geometry	20	58.8
Measurement and Graphs	32	52.1
Probability and Statistics	12	40.4
Total test	160	57.4

Comparison of Performance for 1974-75 and 1975-76

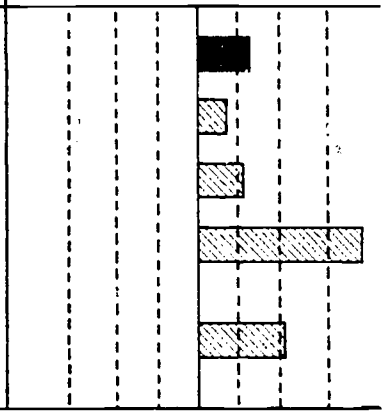
Since the 1974-75 and 1975-76 versions of the Survey of Basic Skills: Grade 6 were not identical, a direct comparison of scores for the two years is not possible. However, one-half of the items that were common to both years' tests should provide information on longitudinal trends statewide. Table 13 shows the number of items common across two years and the gains or losses in scores on the total test and in each skill area for 1975-76, as compared to that of 1974-75. Appendix F gives these differences for each skill at a finer level.

Table 13 shows that 80 items were common to the 1974-75 and 1975-76 tests. The performance of sixth graders improved by 2.4 percentage points overall, with the area of measurement and graphs showing the greatest gain of 7.2 and the area of arithmetic showing the least gain of 1.3. There was no major skill area in which sixth grade pupils' performance showed a negative trend or decline in scores.

Table 13

Changes in Mathematics Performance of California Students on Questions Common to the 1974-75 and 1975-76 Versions of the Survey of Basic Skills: Grade 6

Content or skill area	Number of common items	Gain (+) or loss (-) in score[1]	-6 -4 -2 0 +2 +4 +6
TOTAL	(80)	(+2.4)	
Arithmetic	57	+1.3	
Geometry	6	+2.1	
Measurement and Graphs	12	+7.2	
Probability and Statistics	5	+4.1	



[1]A (+) sign indicates that the 1975-76 score was higher than that of 1974-75 and a (-) sign indicates that the 1975-76 score was lower than that of 1974-75.

Committee Interpretations of Skill Area Results for Grade Six

In 1974-75 the members of the Mathematics Assessment Advisory Committee, who took the responsibility of developing the content of the Survey of Basic Skills: Grade 6, were asked to review the statewide test results and to judge the quality of the statewide mathematics programs. The judgments and recommendations are given in the 1975 edition of Student Achievement in California Schools 1974-75 Annual Report. The Mathematics Assessment Advisory Committee members were again asked to analyze 1975-76 test data obtained from the Survey. For assessing the longitudinal trends, the committee relied on the items common to two years' tests. The committee's collective judgments and interpretations for each skill area are described in the following paragraphs.

Arithmetic. In general, the 1975-76 scores indicated that pupils in the sixth grade were improving in achievement in those areas where they were weak in 1974-75 and were maintaining their level in those where they were performing well. For example, their performance in ability to read numerals was much better than in 1974-75. Likewise, the sixth grade students recognition of equivalent fractions showed improvement.

Sixth graders also showed improved performance both in fractions and decimals. A significant increase in percentage points in computation of decimals may be indicative of increased emphasis in the instructional program. However, since in grade six, decimals are usually taught in the latter part of the school year, whereas the test was given in late

April, the scores in this area of computation can be expected to be lower than in other areas. An earlier and more consistent development of computation skills with decimals, as recommended in the state mathematics framework, should help to improve achievement in this area.

There is still some need for improvement in the teaching of application-related skills. There were significant differences, both positive and negative, in the achievement of students on these application items. For example, nearly 70 percent of the students were able to find the total number of dollars a boy earned doing odd jobs, but only 38 percent were able to solve a problem involving ratios. Continued year-to-year variations in achievement scores on these application items may indicate the need for a more highly organized, cohesive program of instruction in problem-solving skills at all grade levels.

Geometry. The average percent correct score of 58 in geometric skills showed a satisfactory increase in student performance in this area over the 1974-75 performance, which was 48 percent correct. The change in the average score, at least to a large extent, was due to the modifications made in the geometry items. Fewer items were used (28 items in 1974-75 compared to 20 items in 1975-76). The items deleted tested topics seldom included in the K-6 curriculum. Other items were clarified, and pupils who understood the concepts were able to answer more items correctly. Pupils, however, did show improvement on the six items common to both years' tests.

Scores continued to be high on items requiring recognition of geometric shapes. Scores on comprehension and application items seemed to be satisfactory since some improvement in scores was evident. However, the number of items was too few to make a definitive statement.

The committee was pleased to note that 54 percent of the pupils could work with ideas of symmetry; 65 percent, with congruent triangles; and 79 percent, with similar triangles. However, the poorer performance with items dealing with the sum of the measures of the angles of a triangle being 180^{o} (26 percent correct) and the knowledge that two different intersecting lines meet in exactly one point (38 percent correct) were sources of some concern.

Measurement and Graphs. Overall, there was a significant improvement in 1975-76 in the student achievement scores in measurement and graphs, as compared to 1974-75. This improvement probably reflected the increased interest in measurement skills and concepts throughout the instructional program. Specifically, achievement was judged to be satisfactory in the area of reading simple circle, line, and bar graphs. Improvement was also shown in items dealing with graphs involving one variable. A significant decline in performance was noted in items where more complex graphs were used.

Items involving simple conversions within the U.S. customary system or within the metric system also showed improved performance by pupils. Items dealing with metric notation and terminology appeared to have caused some difficulties. For example, only 38 percent of the pupils were able to convert 1 decimetre to millimetres. However, items involving monetary units, as part of the metric system, continued to present only minimal difficulties.

Probability and Statistics. Skills in probability and statistics were assessed by 12 items. It was no surprise that the scores in this area were low, because very little instruction is given in probability and statistics at the elementary school level in California or elsewhere. However, there was evidence, based on the increased percent correct score for the five items carried over from the previous test, that increased emphasis had probably been given to this area in elementary school classrooms. The pupils' ability to answer the test items in this area depended upon their computational skills in addition and one-digit division; thus, interpretation of the improved scores was difficult. The test scores did indicate a need for more instruction in the understanding of terminology. For example, 40 percent of the pupils responded correctly to an item involving the word "average," but only 18 percent could do the same problem when the word "mean" was substituted for "average." Since probability and statistical concepts are used so commonly in everyday life--e.g., "chances of rain tomorrow," "average rainfall," "per capita income,"--the committee recommended that beginning probability concepts be introduced in the school mathematics curriculum before the sixth-grade level.

Test Scope and Changes for the Grade Twelve Survey

The mathematics section of the Survey of Basic Skills: Grade 12 was composed of items designed to measure skills in five major areas: arithmetic, algebra, geometry, measurement, and probability and statistics. Figure 11 identifies the number of items in each skill area and illustrates graphically the emphasis received by the skills in the composition of the Survey. About one-half of the mathematics test was devoted to arithmetic skills related to number concepts, whole numbers, fractions, and decimals. The area of probability and statistics had the least number of items in the test. A detailed description of the skills assessed in the Survey is given in Test Content Specifications for the Survey of Basic Skills: Mathematics, which was published by the Department of Education. Appendix G gives a description of the major skills assessed in the Survey and an illustrative test question for each major skill.

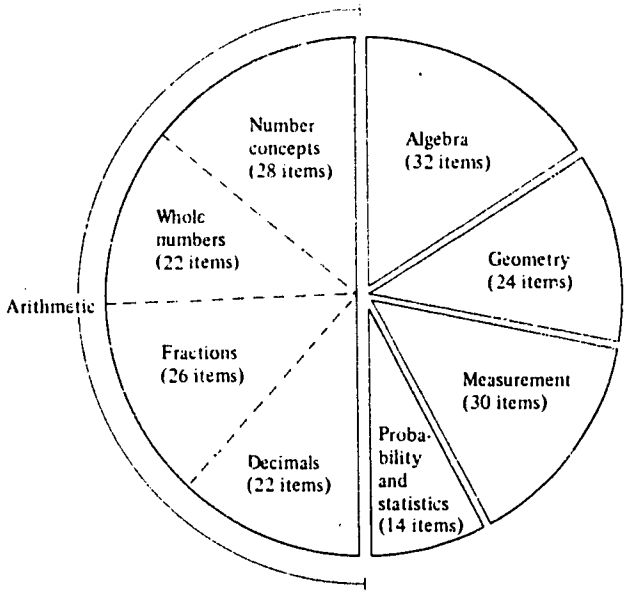


Fig. 11. Skill area emphases in the *Survey of Basic Skills: Grade 12*

The Survey used in 1975-76 was a revised version of the 1974-75 Survey. However, the revisions in the grade twelve test were relatively few; 156 items out of a total of 198 items were common to both years' tests. Figure 12 represents the degree of overlap in test items in the versions of the Survey for the two years. Of the 42 items which were either replaced by new items or modified in 1975-76, the alterations were often of a technical nature rather than substantive. For example, in 11 of the 42 items, one of the possible answers, "I don't know," was replaced by "None of these." Appendix G provides the number of items, at the finer level of skill areas, for the years 1974-75 and 1975-76. The appendix also gives the number of items that were common in both the years.

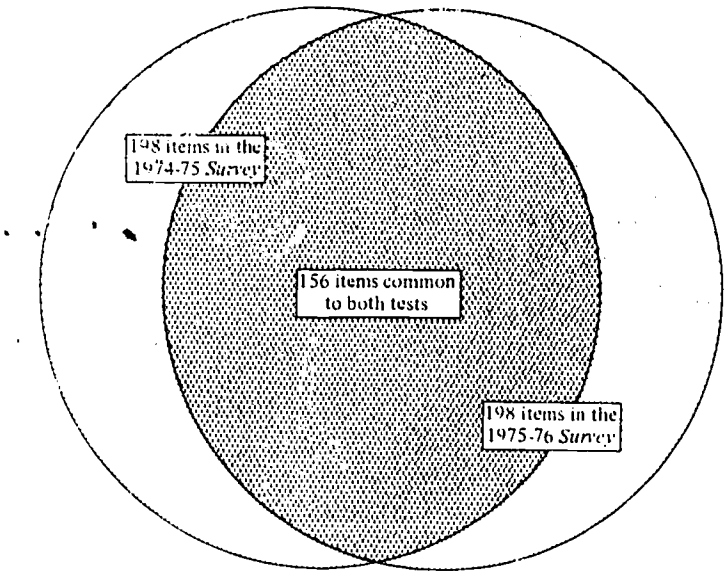


Fig. 12. Amount of content overlap in the 1974-75 and 1975-76 versions of the *Survey of Basic Skills: Grade 12*

Skill Area Results for Grade Twelve

Table 14 shows the achievement results of California twelfth graders on the total mathematics test and in the five major skill areas for 1975-76. A detailed breakdown of results for 1975-76, together with that of 1974-75, is given in Appendix G. The scores are expressed as the "average percent correct"

figures. The average percent correct scores for 1975-76 were 72.9 for arithmetic; 62.9, for algebra; 62.7, for geometry; 60.5, for measurement; and 57.2, for probability and statistics. The overall average percent correct was 67.0.

Table 14

Average Percent Correct Responses in Mathematics Section of the Survey of Basic Skills: Grade 12, 1975-76

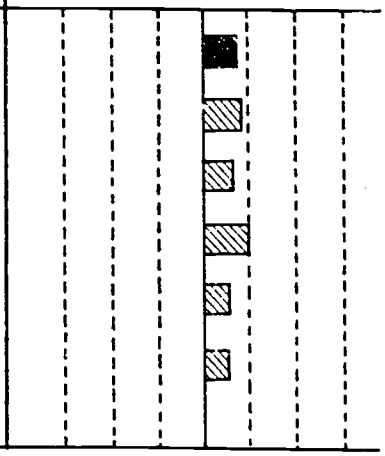
Content or skill area	Number of Items	Average percent correct
Arithmetic	98	72.9
Algebra	32	62.9
Geometry	24	62.7
Measurement	30	60.5
Probability and Statistics	14	57.2
Total test	198	67.0

Comparison of Performance for 1974-75 and 1975-76

Since the 1974-75 and 1975-76 versions of the Survey were not identical, a direct comparison of scores for the two years is not possible. However, 79 percent of the items that were common to both years' tests should provide information on longitudinal trends statewide. Table 15 presents the data on items common to the Survey for both years. The table gives the number of common items for the total test and for each major skill area. The table also gives a gain or loss score in percent correct units, both numerically and graphically. For example, the overall performance of twelfth graders improved by 1.6 percentage points; the area of geometry showed the greatest gain of 2.0, and the area of probability and statistics showed the least gain of 1.2. There was no major skill area in which twelfth graders showed a decline in scores. Appendix G provides a more detailed comparison of scores for 1974-75 and 1975-76.

Table 15

Changes in Mathematics Performance of California Students on Questions Common to the 1974-75 and 1975-76 Versions of the Survey of Basic Skills: Grade 12

Content or skill area	Number of common items	Gain (+) or loss (-) in score	Graph showing gain or loss -6 -4 -2 0 +2 +4 +6
TOTAL	(156)	(+1.6)	
Arithmetic	72	+1.8	
Algebra	32	+1.5	
Geometry	18	+2.0	
Measurement	22	+1.3	
Probability and Statistics	12	+1.2	

Analysis and Interpretation of Skill Area Results, Grade 12

In 1974-75 the members of the Mathematics Assessment Advisory Committee, who took the responsibility of developing the content of the Survey of Basic Skills: Grade 12, were asked to review the statewide results to judge the quality of mathematics programs and to pinpoint strengths and weaknesses. Their judgments and recommendations were given in the 1975 edition of Student Achievement in California Schools: 1974-75 Annual Report. The same committee was again asked to analyze test results obtained from the 1975-76 Survey. The committee members' collective judgments and interpretations for each skill are presented in the paragraphs that follow.

Arithmetic. The scores of twelfth graders indicated overall improvement in computational skills with whole numbers, fractions, and decimals. Eighty-five percent of the students multiplied a four-digit number by a three-digit number correctly. This represented an increase of 7 percentage points over the results for the same item in the 1974-75 test. Seventy-six percent could multiply 5.96 by 87.4 correctly, an increase of 3 percent over 1974-75. For applied items involving computation with whole numbers, fractions, and decimals, the scores indicated an improvement in all areas. In 1974-75, for example, only 56 percent of the students could find the answer for this problem: "The discount is 15% of $92.00. What is the sale price?" In the 1975-76 test, 60 percent of the students answered this problem correctly. There were similar increases on almost every application problem.

According to the committee, an increased instructional emphasis is needed in the areas of addition and subtraction of mixed numbers, division of decimals, and percents. Also, converting fractions to decimal form and decimals to fractions needs to receive attention in the instructional program. For example, only 45 percent of the students were able to change 3/8 to decimal form correctly. This was a 3 percent increase over the 1974-75 performance, but the committee believed that this achievement score was still too low.

Algebra. In general, the students' scores on the 1975-76 Survey showed gains over those of 1974-75. On the algebra items common to the two years, the average score in 1974-75 was 61.4 percent correct while in 1975-76 the average score was 62.9 percent correct. There was general improvement in the students' ability to use the algebraic skills required for solving equations with one unknown, obtaining information from line, bar and table graphs, doing simple word problems involving one unknown, and using metric units and metric vocabulary.

Significant gains were made in finding the solution to equations involving fractional forms. For example, 87 percent of the students were able to solve this equation correctly in 1975-76: $\frac{4}{x} = \frac{2}{3}$. This represented a 3 percent increase over the 1974-75 results. In application-related skills the students made significant gains in solving problems using given formulas and in interpreting data from tables and from bar and line graphs.

Geometry. The average correct response for the common geometry items in the 1974-75 test was 62.5. The average correct response for the common geometry items in 1975-76 was 64.5, a 2.0 percentage point increase. The committee believed that this increase was indicative of a desirable student growth in geometry skills in grades seven through twelve. Again in 1975-76, the scores of twelfth graders were particularly high in geometric items dealing with knowledge of facts; 86 percent were able to distinguish a quadrilateral from other geometric figures, a significant increase over the 1974-75 performance. Several items in applications and comprehension showed significant gains; e.g., a difficult problem requiring analysis of several properties of an isosceles right triangle was correctly answered by 41 percent of the students. However, there was a significant decrease in the number of students who could analyze a numerical relationship identifying points inside or outside a circle.

In general, as in 1974-75, the students' scores on items involving applications and understanding of geometric concepts were lower than scores on items involving knowledge of facts. For example, in contrast with the good understanding of symmetry demonstrated by sixth-grade students, only 37 percent of the twelfth-grade students appeared to comprehend this concept.

The committee urged continued instructional emphasis upon basic geometric skills. A weakness in the ability to perceive and use geometric relationships can affect the student's problem-solving ability. Many practical problems start with and involve geometric figures as models of real life situations.

Measurement. The twelfth-grade students' scores in measurement skills improved in 1975-76. Specifically, computing with denominate numbers remained at a satisfactory level, with only the division process causing any major difficulty. Achievement in the process of choosing an appropriate unit of measure and conversion within the U.S. customary and metric systems also continued to be satisfactory. Scores on items involving application of measurement skills were not as high as those in the knowledge of facts area. However, the general performance in 1975-76 was not significantly different from that in 1974-75. The measurement skill area that showed significant improvement was that of consumer applications. For example, 40 percent of the students answered this item correctly in 1975-76 while 34 percent answered the same item correctly in 1974-75:

A housewife will pay the lowest price per ounce for rice if she buys:

(a) 12 ounces for 40 cents
(b) 14 ounces for 45 cents
(c) 1 pound, 12 ounces for 85 cents
(d) 2 pounds for 99 cents

Increased instructional emphasis is still needed in using measurement skills in problem analysis and problem solving, according to the committee. These skills are used to solve a wide variety of practical everyday problems, and competency in these areas is needed by every citizen.

Probability and Statistics. The twelfth-grade students were able to answer correctly, on the average, 60.1 percent of the common items in 1975-76. The students' responses indicated an improvement on 12 items repeated from the 1974-75 test. The students appeared to be familiar with the intuitive approach to probability. For example, 75 percent of the students identified "the probability of a spinner stopping on Region 5" when they were provided with a picture of a spinner divided into six equal regions. There was a significant decrease in the students' performance on an item repeated from the 1974-75 test. On this item the students were required to identify the chance of getting two heads when two coins were tossed. The response choice used had the the form "1 in 4." It is possible that this decrease in performance was due to confusion between the concepts of "probability" and that of "odds." This suggested the importance of developing proper terminology in the instructional program.

In the opinion of the committee, a good instructional program in basic probability and statistics is essential for students to make a better appraisal of the world around them. Thus, the continued inclusion of probability and statistics in the instructional program is strongly recommended.

VII. Relationship of Background Factors to Test Scores

The relationships among achievement test scores and a variety of background variables were examined, and those relationships are described in this section. However, from the analyses performed, it is not possible to determine which background variables cause test scores to be high or low. Any conclusions made about causal relationships would be erroneous; they can come only after more intensive analyses of the data. The comparisons reported here are presented for the general interest of the reader and, hopefully, to establish a basis for further investigations.

Relationships in the Lower Grades

The relationships among test scores from the Reading Test for Grades Two and Three and the background factors--such as Entry Level Test score, socioeconomic index, pupil mobility, school size, and language spoken--remained the same in 1975-76 as they were in 1974-75. In summary, it was found that (1) the schools with the highest Entry Level Test scores tended to have the highest reading test scores; (2) schools with pupils from families with the highest socioeconomic status tended to have the highest reading test scores; (3) schools with the largest number of mobile pupils tended to have the lowest scores; (4) schools with the largest enrollments tended to have the lowest scores; and (5) schools with the largest percentages of bilingual pupils tended to have the lowest scores. The reader is referred to pages 57-61 of the Student Achievement in California Schools: 1974-75 Annual Report for a detailed description of these relationships.

Relationships in the Upper Grades

The relationships of most of the variables to the scores at grade six and grade twelve were found to be similar. Also, the relationships demonstrated similar trends for the content areas of reading, written expression, spelling, and mathematics. The following sections describe the relationships among the variables and the grade six reading scores. When results for other content areas and grades were different from those of grade six reading, they are described in the text.

Achievement Index. The achievement index for grade six was derived from the grade three score achieved on the state Reading Test; and for grade twelve, from the grade six score on the Survey of Basic Skills. The achievement index was computed from the most recent prior year scores. Achievement index was the single highest correlate of test scores at both grade levels. Schools having high achievement indexes tended to have high test scores, and those having low achievement indexes tended to have low test scores. There is nothing surprising about this finding. It merely confirms what one would expect; schools which score high at one grade level tend to score high at other grade levels. (See Figure 13.)

Percent AFDC. Percent AFDC is the percent of students in the school whose families were receiving assistance under the Aid to Families with Dependent Children (AFDC) program. Percent AFDC correlated moderately negatively with the test scores at all grade levels, i.e., schools having a low percentage of students in this category tended to have high test scores. This relationship was stronger at the school level than at the district level. (See Figure 14.)

Number of Students Tested. There was no consistent relationship between the number of students tested in a school (school size) and the test scores; however, the scores did differ for schools with different numbers of students tested. It was found that the schools in the middle-size categories scored higher than the extremely small or extremely large schools. (See Figure 15.)

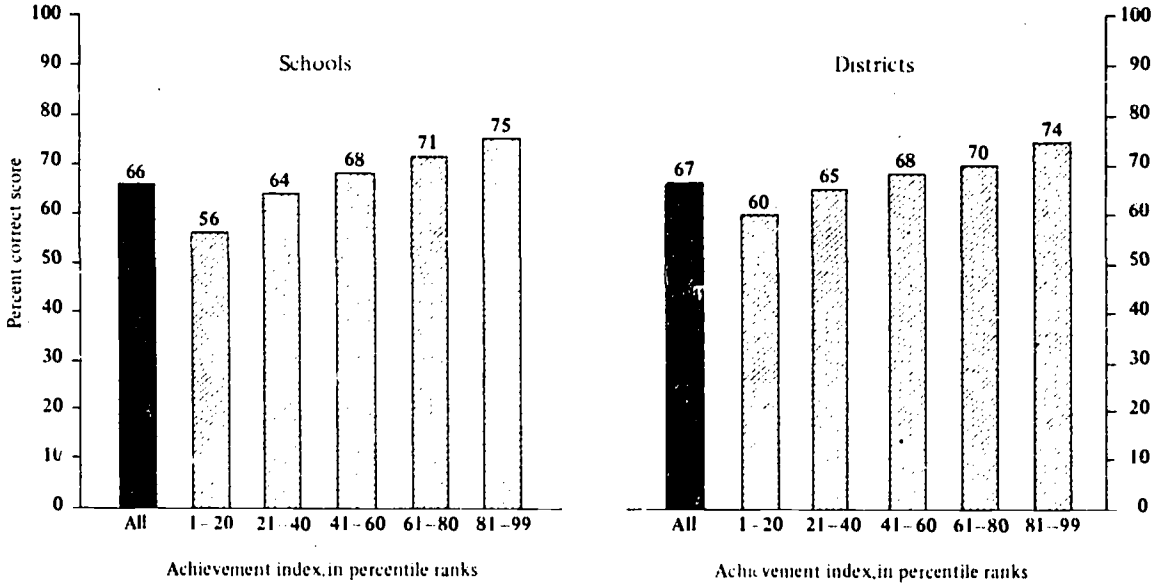
Sex of Student. Test performance did differ for boys and girls. The girls achieved higher test scores than boys in reading, written expression, and spelling; boys achieved higher scores than girls in mathematics. The discrepancy between the scores of girls and boys in reading, written expression, and spelling was greater than the discrepancy in the mathematics scores. (See Figure 16.)

Bilingualism. Data concerning the ability of pupils to speak a language other than English was available for pupils in grades two, three, and six. The relationship of this variable with test scores was consistent at all three grades and in all content areas. Pupils who spoke English only scored very highly. Pupils who spoke fluent English and a second language, other than Spanish or a Philippine dialect, had higher test scores than pupils who spoke English only. Limited English pupils scored far below the other groups. (See Figure 17.)

Type of School District. The relationship between test scores and type of school district--unified, high school, or elementary--was found to be very weak. In grade six, the scores from elementary districts tended to be slightly lower than the scores from unified districts. In grade twelve, the scores of high school districts were slightly higher than those from unified school districts. (See Figure 18.)

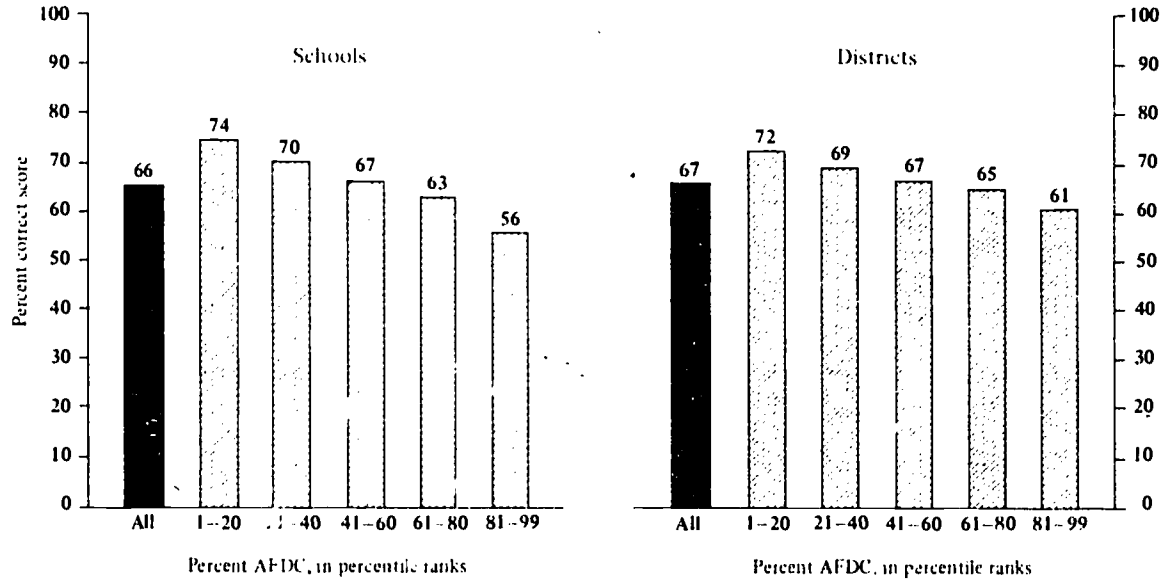
Location of the School. Each school was placed in one of five categories according to the population of the surrounding community: (1) city of more than 300,000 population; (2) city of more than 100,000 but less than 300,000; (3) community of more than 25,000 but less than 100,000; (4) community of 2,500--25,000; or (5) rural area, less than 2,500 population. The test scores were found to be different for these categories of schools. The schools in location categories (3) and (4), middle size communities, had the highest test scores followed by schools in categories (5) and (2), rural and large cities. The schools in category (1), very large cities, had the lowest test scores. (See Figure 19.)

Fig. 13. Reading scores, by achievement index, from the *Survey of Basic Skills: Grade 6*, 1975-76



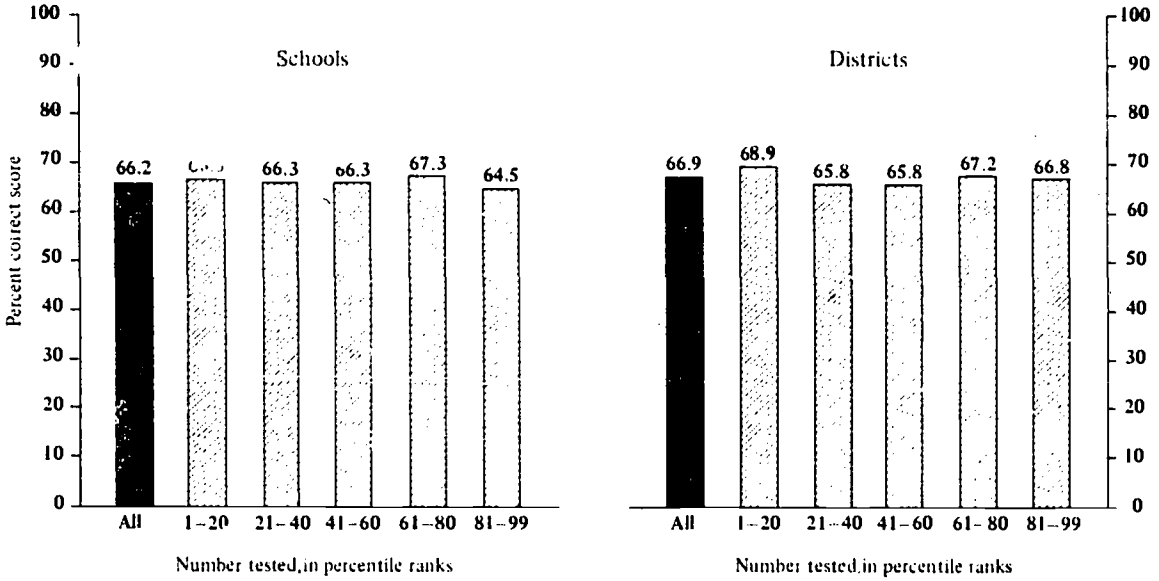
Note: Schools or districts with the highest achievement index had the highest test scores.

Fig. 14. Reading scores, by percent AFDC, from *Survey of Basic Skills: Grade 6*, 1975-76



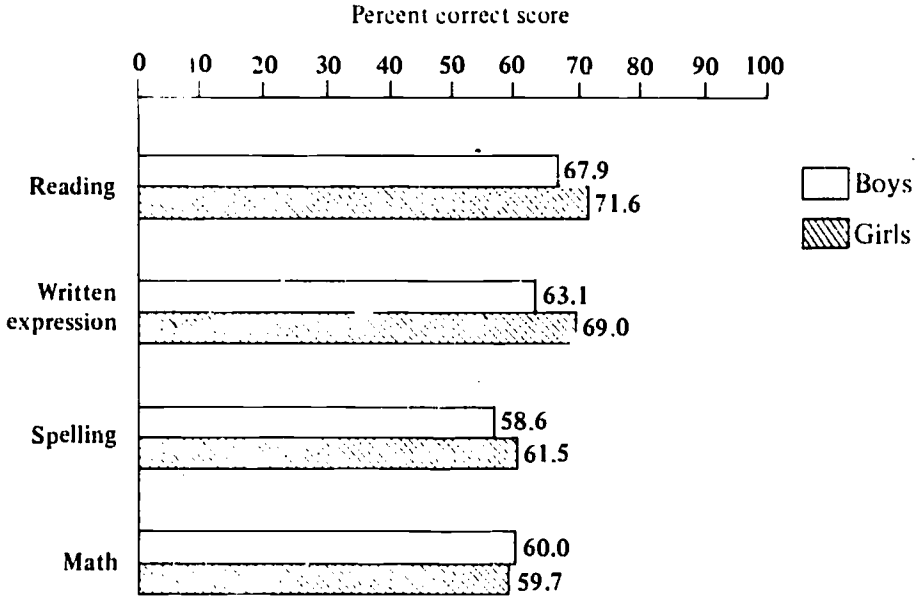
Note: Schools or districts with the largest percentages of AFDC had the lowest test scores.

Fig. 15. Reading scores, by number tested, from the *Survey of Basic Skills, Grade 6*



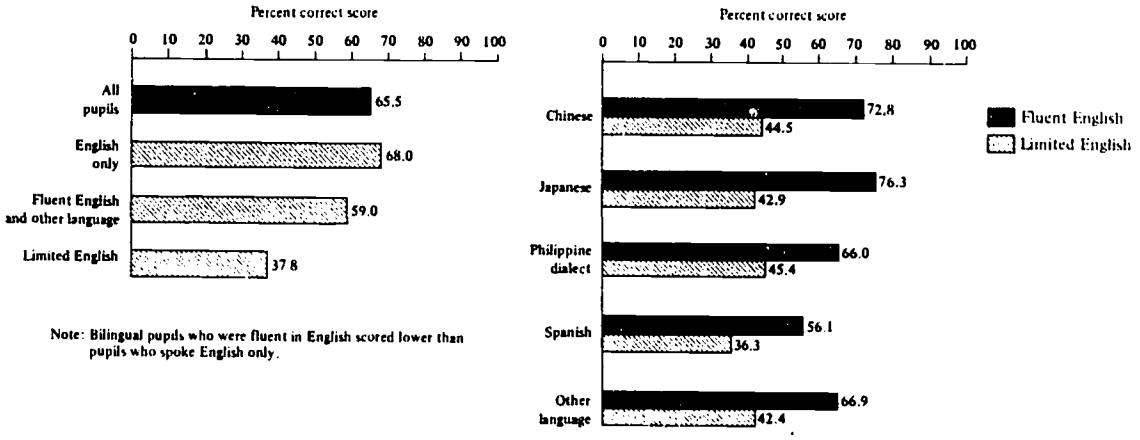
Note: Schools with the largest number of pupils tested had the lowest reading test scores; districts with number tested in the 21st through 60th percentiles had the lowest test scores.

Fig. 16. Survey scores, by sex, from the *Survey of Basic Skills: Grade 6*, 1975-76



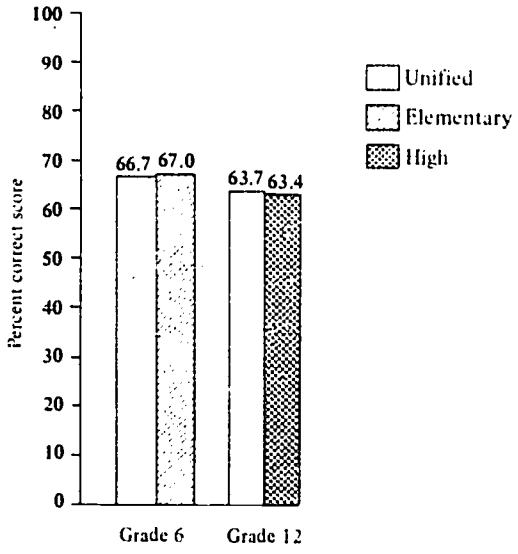
Note: Girls scored higher than boys in reading, written expression, and spelling; boys scored higher than girls in mathematics.

Fig. 17. Reading scores, by fluency in English and other language spoken, from *Survey of Basic Skills: Grade 6*, 1975-76



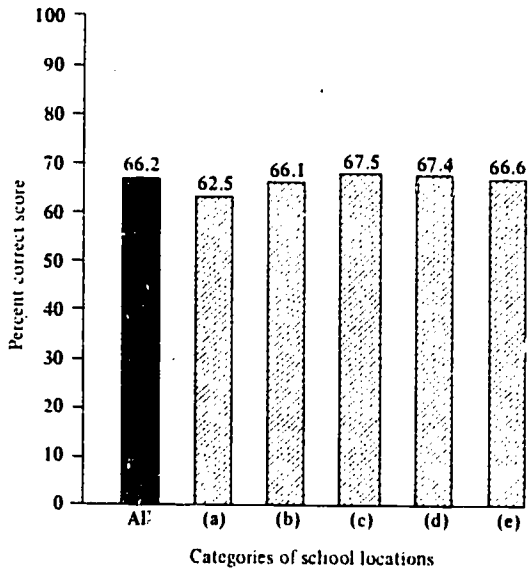
Note: Bilingual pupils who were fluent in English scored lower than pupils who spoke English only.

Fig. 18. Reading scores, by type of school district, from the *Survey of Basic Skills*, 1975-76



Note: Elementary school districts scored higher than unified school districts on the test for grade six; unified school districts scored higher than high school districts on the test for grade twelve.

Fig. 19 Reading scores by categories of school locations, from the *Survey of Basic Skills: Grade 6*, 1975-76



Note: Schools in large urban areas (a) scored lowest; those in small and medium sized communities (c and d) scored highest.

VIII. Comparisons with National Norms

Some of the difficulties in using the national norms presented by test publishers to judge the adequacy of the performance of California students are discussed in Chapter 2. Briefly, the two main problems are lack of timeliness and variation from publisher to publisher. Any comparison based on a single publisher's norm group (a national sample of students tested at a given point in time) can be quite misleading. To cope with this situation the Department's plan, as proposed in the 1974-75 annual report, is to compare California performance with the norms of a variety of tests on a periodic basis. This is done by giving a sample of California students both the published standardized test as well as the California test. The result of this type of "equating study" is to show how California students would have compared to a national norm group if, in fact, all California students had taken the published test.

In the light of recent national score trends, and the new indications of a reversal of the California trends as noted in this report, it is especially important that current and reliable comparisons be made and reported as often as possible. The plan proposed last year seems clearly to be the best approach. The only modification that seems desirable is that of making and presenting new comparative data whenever a major test is renormed, or a major publisher announces a new achievement test, rather than on a periodic basis.

The following sections present the national comparisons that are now available for each grade level.

Comparison of Results in Grades Two and Three

The Reading Test: Second and Third Grades was used for the third time in 1975-76. Table 16 presents the results of an equating study designed to show how the performance of California pupils compares to that of pupils nationwide, i.e., it shows how California pupils would have scored had they all taken any one of several other tests with national norms.

For the test used in the previous testing program, the Cooperative Primary Reading Test it can be seen that the median (middle) California pupil was at about the 53rd and 52nd percentile for the second and third grades respectively, when the study was conducted in 1973-74. For other tests with more recent norms (1968, 1972, and 1973) the percentile ranks are estimated to be 55, 54, and 52 for the second grade. For the third grade the ranks are 57 and 57 for 1968 and 1973.

Since second grade performance has not changed appreciably since that time, it can be assumed the median California pupil is somewhere between the 52nd and 55th percentile rank. Third grade scores, however, increased moderately from 1973-74 to 1974-75. Therefore, the range of 52-57 should be considered a

lower-level estimate.

One could conjecture, of course, that students across the nation might have improved since 1973, and therefore, that the comparisons presented here are over-estimates. The tests used in the comparisons presented here are the most recently normed ones available at this time. So at this time there is neither any support for this hypothesis, nor any data available to refute it. There is evidence that several major test batteries will be normed in the next year or two. The comparison of California students with these new norms should prove useful.

Comparison of Results for Grade Six

Last year's report presented the results of a special study on the new Survey of Basic Skills: Grade 6 and the test in previous use, the Comprehensive Tests of Basic Skills, Form Q (CTBS-Q). The results are shown on Table 17. It can been seen that the average California pupil was at the 48, 43, and 44 percentile ranks for reading, language, and mathematics, respectively. This was reported as an increase over 1973-74 when all sixth graders actually took the CTBS-Q and the median California pupil scored at the 44, 37, and 38 percentile ranks.

Information is also presented for other tests with more recent norms. The most up-to-date information (1973) is from the new form of the Comprehensive Tests of Basic Skills, i.e., Form S. This information is taken from the equating tables provided by the publisher. It can be seen that according to these estimates, California students are at the 52, 46, and 51 percentile ranks for reading, language, and mathematics, respectively.

Information is also presented for two other tests for the area of reading only, the Metropolitan Achievement Tests (MAT) and the California Achievement Tests (CAT). These tests were both normed in 1970. They were two of eight tests included in a special nationwide study known as the Anchor Test Study which was conducted for the United States Office of Education by Educational Testing Service. From the report of this study it is possible to compare any score on the CTBS-Q with either the MAT or CAT. The results for the MAT and CAT are nearly identical. California students compare slightly more favorably with national norms on these tests than on the CTBS-Q and about the same as on the new CTBS, Form S.

Since scores in all content areas improved on the Survey of Basic Skills: Grade 6 in 1975-76, the national percentile ranks on Table 17 are low estimates, especially for reading and mathematics. For reading, it is safe to conclude that California students can now read better than the national samples of 1968, 1970, and 1973. In mathematics, they are approximately equal to the national average, and in written expression, it is quite likely they are still below the national average.

Comparison of Results for Grade 12

Last year's report included the results of a special study designed to relate the new Survey of Basic Skills: Grade 12 to three other tests: (1) the test previously used in the statewide testing program, the Iowa Tests of Educational Development (1962), (2) the Tests of Academic Progress (1970), and (3) the

Sequential Tests of Educational Progress (1970). The tests with newer norms showed California students at a greater disadvantage than had been reported on the basis of the Iowa Tests of Educational Development. The results of this study are presented in Table 18. In spite of moderate increases in 1975-76 on the Survey of Basic Skills: Grade 12, California is still undoubtedly below national averages; least in mathematics and most in written expression. For reading, the national performance of the median California student varies from 33 to 41; for written expression from 25 to 37; and for mathematics from 38 to 41.

Table 16

California Pupil Performance as of 1973-74
on Various Standardized Tests
Grades Two and Three

Name of test	National norm date[a]	Publisher's percentile rank of California median in 1973-74	
		Grade 2	Grade 3
Test used prior to the Reading Test:			
Cooperative Primary Reading Test	1966	51 (53)[b]	52 (52)[b]
Other Tests:			
Comprehensive Tests of Basic Skills, Form Q	1968	55	57
Comprehensive Tests of Basic Skills, Form S	1973	52	57
Stanford Achievement Test	1972	54	--

[a] This is the year in which the publisher actually tested a national sample of pupils.

[b] Results are for 1972-73 when all California pupils actually took the Cooperative Primary Reading Test. All other entries are for 1973-74, the year of the equating study.

Table 17

California Pupil Performance as of 1974-75
on Various Standardized Tests
Grade Six

Name of test	National norm date[a]	Publisher's percentile rank of California median in 1974-75		
		Reading	Written Expression	Mathematics
Test used prior to the Survey of Basic Skills: Grade 6:				
Comprehensive Tests of Basic Skills, Form Q	1968	48 (44)[b]	43 (37)[b]	44 (38)[b]
Other Tests:				
Comprehensive Tests of Basic Skills, Form S	1973	52[c]	46[c]	51[c]
Metropolitan Achievement Test	1970	52[d]		
California Achievement Test	1970	53[d]		

[a] This is the year in which the publisher actually tested a national sample of pupils.

[b] Scores for 1973-74 when all California sixth grade pupils took the Comprehensive Tests of Basic Skills, Form Q. All other entries are for 1974-75, the year the special study was performed.

[c] Based on correspondence tables provided by the publisher for relating Comprehensive Tests of Basic Skills, Form Q scores to Comprehensive Tests of Basic Skills, Form S scores.

[d] Based on correspondence tables printed in: Anchor Test Study, Washington, D.C., U.S. Government Printing Office, 1974.

Table 18

California Pupil Performance as of 1974-75
on Various Standardized Tests
Grade Twelve

Name of test	National norm date[a]	Publisher's percentile rank of California median in 1974-75		
		Reading	Written Expression	Mathematics
Test used prior to the Survey of Basic Skills: Grade 12:				
Iowa Tests of Educational Development	1962	41 (47)[b]	32 (34)[b]	41 (48)[b]
Other Tests:				
Tests of Academic Progress	1970	33	25	38
Sequential Tests of Educational Progress	1970	34	27	41

[a] This is the year in which the publisher actually tested a national sample of pupils.

[b] Results for 1973-74 when all students took the Iowa Tests of Educational Development. All other entries are for 1974-75, the year the special study was performed.

Appendixes

APPENDIX A

Reading Performance, by Skill Area, of California Second and Third Grade Pupils, 1974-75 and 1975-76

Skill area	Description of skills assessed	Number of questions	Average percent of questions answered correctly[1]				Illustrative test question[2]
			Grade Two		Grade Three		
			1974-75	1975-76	1974-75	1975-76	
I. WORD IDENTIFICATION	(Total and averages for word identification skill areas)	(60)	(75.4)	(75.5)	(85.8)	(85.6)	Teacher says: "Mark the word that goes best with the picture."
A. Sight words	The pupil must choose the word that names the object which is pictured.	5	83.9	84.5	92.7	92.6	 o spool o spoon o stool
B. Phonetic analysis	(Total and averages for phonetic analysis skill area, a subcategory of word identification)	(45)	(76.5)	(76.5)	(86.1)	(85.9)	
1. Consonants	The pupil must choose the word that has a letter that is not sounded.	15	73.9	73.9	84.5	83.8	Teacher says: "Mark the word that has a letter that is not sounded." o right o lift o spent
2. Vowels	The pupil must choose the printed word that has the same vowel sound as the oral stimulus word.	20	80.3	80.3	87.8	88.1	Teacher says: "Mark the word that has the same vowel sound in its middle as the vowel sound in the word run." o cut o ran o fin
3. Spelling patterns	The pupil must choose the printed word that rhymes with the oral stimulus word.	10	72.9	72.7	84.9	84.9	Teacher says: "Mark the word that rhymes with the underlined word." show o blow o down o cow
C. Structural analysis	The pupil must identify root words, suffixes, compound words, and contractions.	10	65.8	66.3	80.9	80.8	Teacher says: "Mark the combination of letters that is the correct division of the underlined word." firehouse o fi + rehouse o fire + house o firch + ouse

[1] The only values presented in this column are averages. The percentages for individual items varied from the average value by 20 or more points.

[2] It is important to remember that these sample test items are presented for illustrative purposes only; therefore, they do not cover all of the skills tested, nor do they necessarily possess all the qualities of good test items.

Skill area	Description of skills assessed	Number of questions	Average percent of questions answered correctly				Illustrative test question
			Grade Two		Grade Three		
			1974-75	1975-76	1974-75	1975-76	
II. VOCABULARY	(Total and averages for vocabulary skill areas)	(60)	(67.7)	(67.6)	(82.6)	(82.9)	
A. Denotation	The pupil must choose the response word that best fills the blank in the sentence.	22	68.8	68.9	84.0	83.6	Teacher says: "Mark the word that goes in the blank in the sentence." Mother told Pat to ___ the back door. o leave o fast o close
B. Relational	(Total and averages for relational skill areas, a subcategory of vocabulary)	(38)	(67.0)	(66.8)	(81.8)	(82.5)	
1. Synonyms	The pupil must choose the response word that means the same as the underlined word in the phrase.	24	67.6	67.0	83.2	83.5	Teacher says: "Mark the word that means the same as the word that is underlined." a <u>small</u> dog o cute o little o happy o funny
2. Antonyms	The pupil must choose the response word that means the opposite of the printed stimulus word.	10	65.7	65.7	78.4	80.4	Teacher says: "Mark the word that means the opposite of the underlined word." <u>light</u> o evening o dark o bright
3. Homonyms	Though the format of this test item is the same as that used for denotation, the pupil must choose the response word from among three having the same sound.	4	66.5	67.2	82.4	81.5	Teacher says: "Mark the word that goes in the blank in the sentence." We have ___ dogs. o to o too o two

Skill area	Description of skills assessed	Number of questions	Average percent of questions answered correctly				Illustrative test question
			Grade Two		Grade Three		
			1974-75	1975-76	1974-75	1975-76	
III. COMPREHENSION	(Total and averages for comprehension skill areas).	(110)	(61.3)	(61.3)	(77.0)	(76.7)	
A. Literal	Given a passage of printed material, the pupil must choose the correct response to a written question that requires identifying or remembering elements in the passage which were explicitly stated.	77	62.5	62.3	77.9	77.5	Dear Children, I hope that you are having a good time and working hard. I have missed the whole class very much. Miss Smith has been telling me that you have been very helpful to her. Thank you for all your cards and flowers. I have even had a few surprise visits from some of you! I hope to be back as your teacher soon. Until then, your get well cards made me think of you. Your teacher, Mrs. Black What have the children sent Mrs. Black? o cards and telephone calls o cards and flowers o flowers and clothes o food and clothes
B. Interpretive	Given a passage of printed material, the pupil must choose the correct response to a written question that requires using ideas and information, explicitly stated, to paraphrase, infer from, relate, or generalize from elements in the passage.	33	58.7	59.1	74.9	74.9	Where has Mrs. Black been? o on a trip o teaching in another class o sick o visiting out of town
IV. STUDY-LOCATIONAL SKILLS	(Total and averages for study-locational skill areas)	(20)	(75.5)	(77.2)	(88.0)	(88.0)	
A. Alphabetizing	The pupil must choose which letter or word comes first in alphabetical order.	10	73.8	75.5	87.8	87.3	Teacher says: "Mark the word that comes first in alphabetical (ABC) order." o dent o drive o dart o dog

Skill area	Description of skills assessed	Number of questions	Average percent of questions answered correctly				Illustrative test question
			Grade Two		Grade Three		
			1974-75	1975-76	1974-75	1975-76	
IV. STUDY-LOCATIONAL SKILLS (Cont.)							
B. Table of contents	Given a table of contents and a page number, the pupil must choose the story that begins on the given page.	10	77.3	79.0	88.2	88.8	Teacher says: "A page number is underlined. Look at the table of contents and then mark the title of the story that begins on the page that is underlined." TABLE OF CONTENTS The Happy Puppy . . . 6 John's Pet Frog . . . 12 The Little Horse. . . 19 Moles . . . . . 28 The Lost Turtle . . . 32 Page 19 o The Happy Puppy o John's Pet Frog o The Little Horse o Moles

APPENDIX B

Reading Performance, by Skill Area, of California Sixth Grade Pupils for 1974-75 and 1975-76

Skill area	Description of skills assessed	1974-75		1975-76		Comparison of 1974-75 and 1975-76				Illustrative test question[2]
		No. of items	Percent correct[1]	No. of items	Percent correct[1]	No. of common items	Percent correct[1] 1974-75	Percent correct[1] 1975-76	Change	
TOTAL READING TEST		98	55.8	128	66.1	53	62.8	64.8	+2.0	
I. WORD IDENTIFICATION	The pupil must identify correct pronunciation of words used in context, root words, the meaning of affixes and contractions.	22	51.3	18	74.3	4	71.8	76.6	+4.8	The ending of the word tallest makes the word mean: o as tall as o less tall o taller than o most tall
II. VOCABULARY	The pupil must identify the meaning of a specific word in context.	20	52.3	25	67.1	7	52.1	60.6	+8.5	The boys made a hasty decision to go camping over the weekend. The word "hasty" as used here means: o hurried o wrong o thoughtful o hard
III. COMPREHENSION	Skills assessed in categories A and B.	(55)	58.7	(69)	64.9	(35)	63.4	64.1	+0.7	
A. Literal	The pupil must identify or remember elements which have been explicitly stated. These elements include main ideas, details, and cause-and-effect relationships.	22	63.8	39	71.4	13	70.9	71.6	+0.7	Travelers say our roads would be safer if we changed present road signs to picture symbols, or glymphs. With these picture signs it is not necessary for travelers to learn the language of a country to understand the directions. No words are used on the signs. Those who favor using glymphs in the United States admit that drivers would have to learn the picture symbols first. A glymph is a: o traveler o road o picture o word

[1] The only values presented in these columns are averages.

[2] These sample test items are presented for illustrative purposes only.

Skill area	Description of skills assessed	1974-75		1975-76		Comparison of 1974-75 and 1975-76				Illustrative test question
		No. of items	Percent correct	No. of items	Percent correct	No. of common items	Percent correct 1974-75	Percent correct 1975-76	Change	
III. COMPREHENSION (Cont.)										
B. Interpretive/ Critical[3]	The pupil must use ideas and information explicitly stated to infer from, relate, or generalize from elements in the materials read. These elements include main ideas, details, cause-and-effect, and author's purpose.	33	55.3	30	60.5	22	58.9	59.6	+0.7	Glymphs will probably help o prevent accidents. o the blind. o you learn to read. o you learn other languages.
IV. STUDY-LOCATIONAL	The pupil must identify which reference book to consult and be able to use parts of a book such as an index and table of contents.	11	53.3	16	60.0	7	62.4	64.6	+2.2	If you wanted to know the meaning of the word candid, the best book to use would be: o a dictionary o an encyclopedia o an atlas o the card catalog

[3] Interpretive and critical comprehension items have been combined into one reporting category this year. In the hierarchy of comprehension, these labels are not absolutes but indicate a difference of degree, not of kind. It was considered to be misleading to indicate that a particular comprehension item could clearly and unarguably be labeled either interpretive or critical comprehension.

APPENDIX C

Reading Performance, by Skill Area, of California Twelfth Grade Students
for 1974-75 and 1975-76

Skill area	Description of skills assessed	1974-75		1975-76		Comparison of 1974-75 and 1975-76				Illustrative test question[2]
		No. of items	Percent correct[1]	No. of items	Percent correct[1]	No. of common items	Percent correct[1] 1974-75	Percent correct[1] 1975-76	Change	
TOTAL READING TEST		142	71.3	141	64.1	71	62.5	63.1	+0.6	
I. VOCABULARY	The student must identify the meaning of a specific word in context; given a definition, the student will select from a list the word most nearly opposite in meaning.	54	72.9	31	61.3	20	60.3	61.3	+1.0	The word "peers" in the last sentence means: o other congressmen o the voters o Speakers of the House o committee chairmen
II. COMPREHENSION	Skills assessed in categories A and B.	78	69.9	97	64.5	47	62.8	62.7	-0.1	
A. Literal	From a paragraph or passage the student must identify or remember elements which have been explicitly stated. These elements include main ideas, details, sequence, and cause-and-effect relationships.	32	75.3	47	69.2	26	70.1	69.9	-0.2	The current reform described in these paragraphs was begun by: o Republican Congressmen o Democratic Congressmen o "Uncle Joe" Cannon o Democratic Senators
B. Interpretive/ Critical[3]	From a paragraph or passage the student must use ideas and information explicitly stated to paraphrase, infer from, relate, or generalize from elements. These elements include main ideas, details, cause-and-effect, and author's purpose.	46	66.3	50	60.1	21	53.7	53.7	-0-	In the future, committee chairmen will probably o opt for a cleaner system. o have to be more responsible. o be selected by "Uncle Joe." o examine the effects of the earthquake.
III. STUDY-LOCATIONAL	The student must identify which reference book to consult and be able to use parts of a book such as an index and table of contents.	10	73.7	13	68.4	4	70.6	76.2	+5.6	To discover last year's Gross National Product for the United States, you should consult: o a dictionary o a thesaurus o an almanac o an encyclopedia

[1] The only values presented in these columns are averages.

[2] These sample test items are presented for illustrative purposes only.

[3] Interpretive and critical comprehension items have been combined into one reporting category this year. In the hierarchy of comprehension, these labels are not absolutes but indicate a difference of degree, not of kind. It was considered to be misleading to indicate that a particular comprehension item could clearly and unarguably be labeled either interpretive or critical comprehension.

APPENDIX D

Written Expression and Spelling Performance, by Skill Area, of California Sixth Grade Pupils for 1974-75 and 1975-76[1]

Skill area	Description of skills assessed	1974-75		1975-76		Comparison of 1974-75 and 1975-76				Illustrative test question[3]
		No. of items	Percent correct	No. of items	Percent correct	No. of common items	Percent correct 1974-75	Percent correct 1975-76	Change[2]	
TOTAL WRITTEN EXPRESSION TEST		112	51.9	128	62.5	30	60.6	61.5	+0.9	
I. WORD FORMS (see Morphology, Test Content Specifications)	The pupil must select the appropriate suffix (-ed, -ing, -s, -ly, -er, -est, 's) for a word in a given sentence.	22	83.2	16	82.4	5	78.9	83.7	+4.8	Fill in the oval next to the word that best fits each sentence. The children were still ___ in the pool. o play o plays o playing o had played
II. STANDARD USAGE	The pupil must select the verb or pronoun in a sentence which reflects standard English usage.	4	48.7	16	73.1	4	48.7	50.3	+1.6	Fill in the oval next to the word that best fits each sentence. Leroy ___ the movie yesterday. o saw o seen
III. LANGUAGE CHOICES	The pupil must select the most vivid verb or specific noun for a given sentence.	13	63.7	26	54.4	1	90.2	92.5	+2.3	Pretend that you are writing a story. Fill in the oval next to the word that will give your reader the best picture of what's happening. The snake ___ across the grass. o moved o slithered o went

[1] The only values presented in the column Percent Correct are averages of the percents of questions answered correctly. The percentages for individual items may vary from the average value by 20 or more points.

[2] A (+) sign indicates that the 1975-76 score was higher than that of 1974-75 and a (-) sign indicates that the 1975-76 score was lower than that of 1974-75.

[3] It is important to remember that these sample test items are presented for illustrative purposes only; therefore, they do not cover all of the skills tested, nor do they necessarily possess all the qualities of good test items.

Skill area	Description of skills assessed	1974-75		1975-76		Comparison of 1974-75 and 1975-76				Illustrative test question
		No. of items	Percent correct	No. of items	Percent correct	No. of common items	Percent correct 1974-75	Percent correct 1975-76	Change	
VII. PUNCTUATION	The pupil must identify errors in the use of the period, question mark, exclamation point, comma, apostrophe, and quotation marks.	45	41.7	18	52.4	9	52.0	50.7	-1.3	Look at the underlined portion to see if there is an error. If you find an error in punctuation, fill in the oval next to the letter of that error. If there is no error, the answer is D. "I dont (A) mean to refuse the doctor's (B) advice, but I still believe that sunshine is the best cure for a cold," (C) said Aunt Olive. No error. (D) o A o B o C o D
VIII. SPELLING		56	49.5	64	63.6	32	53.6	55.5	+1.9	
A. Relationships	From a list of 3 or 4 words, the pupil must identify the incorrect spelling relationship for vowel and consonant sounds.	50	50.0	35	58.1	28	53.6	56.0	+2.4	Fill in the oval next to the misspelled word in each group. If there is no misspelled word, the answer is "all correct." o steam o screem o sleeve o All correct
B. Word Forming	The pupil must select the correct spelling pattern used in a variety of common word formations.	6	53.7	29	70.2	4	54.0	52.2	-1.8	Pairs of words are given below. In each pair, one word is spelled incorrectly. Fill in the oval next to the correct spelling. o steped o stepped

APPENDIX E

Written Expression and Spelling Performance, by Skill Area, of California Twelfth Grade Students for 1974-75 and 1975-76[1]

Skill area	Description of skills assessed	1974-75		1975-76		Comparison of 1974-75 and 1975-76				Illustrative test question[3]
		No. of items	Percent correct	No. of items	Percent correct	No. of common items	Percent correct 1974-75	Percent correct 1975-76	Change[2]	
TOTAL WRITTEN EXPRESSION TEST		81	54.9	142	62.3	70	56.4	57.1	+0.7	
I. WORD FORMS (see Morphology, Test Content Specifications)	The student must select the appropriate inflectional suffix (-ed, -ing, -s, -ly, -er, -est) for a given sentence, must discriminate between form class words (such as nouns and verbs) and structure words (such as prepositions), and must demonstrate dictionary skills for a variety of purposes.	5	67.0	24	72.6	3	61.0	62.4	+1.4	The dogs had ___ the long trek. o survival o survivors o surviving o survived
II. LANGUAGE CHOICES	The student must identify attitude-conveying words and phrases, must differentiate between specific and general sets of words, and must identify the audience of a prose passage.	21	59.8	32	66.9	19	60.5	60.0	-0.5	Which of the following is most specific? o plant o redwood o tree o living thing
III. SENTENCE RECOGNITION	The student must recognize complete sentences, sentence parts, sentence patterns and appropriate subject-verb relationships.	8	59.2	20	67.3	7	65.0	67.0	+2.0	Identify the group of words which is incomplete or needs additional words to complete the meaning. o Mack and Sonny skipped school. o The rising clouds of dust. o The day was hot and clear. o Twelve o'clock is lunch-time.

[1] The only values presented in the column Percent Correct are averages of the percent of questions answered correctly. The percentages for individual items vary from the average value by 20 or more points.

[2] A (+) sign indicates that the 1975-76 score was higher than that of 1974-75 and a (-) sign indicates that the 1975-76 score was lower than that of 1974-75.

[3] It is important to remember that these sample test items are presented for illustrative purposes only; therefore, they do not cover all of the skills tested, nor do they necessarily possess all the qualities of good test items.

Skill area	Description of skills assessed	1974-75		1975-76		Comparison of 1974-75 and 1975-76				Illustrative test question
		No. of items	Percent correct	No. of items	Percent correct	No. of common items	Percent correct 1974-75	Percent correct 1975-76	Change	
IV. SENTENCE MANIPULATION	The student must select the most economical, effective sentence and must be able to recognize effective coordination and subordination within sentences.	11	36.2	12	44.6	7	38.1	38.5	+0.4	Mark the sentence below which expresses the thought MOST EFFECTIVELY AND ECONOMICALLY. o He spoke to me in a very warm manner when we met each other Tuesday. o When we met Tuesday, I was spoken to in a very warm manner by him. o His manner was very warm when meeting and speaking to me Tuesday. o Tuesday he greeted me warmly.
V. PARAGRAPHS	The student must identify irrelevant material in a paragraph, recognize inconsistent time development, select the logical sequence of a group of sentences, select the sentence which best summarizes the ideas presented in one or more related paragraphs, and identify transitional elements within a paragraph.	14	60.4	26	59.9	12	61.0	62.7	+1.7	Which of the following phrases is used to indicate a connection between the two (given) paragraphs? o Could not know o Even so o They lead o They shape
VI. CAPITALIZATION AND PUNCTUATION	The student must recognize capitalization and/or punctuation errors in sentences.	22	51.7	28	54.6	22	52.8	53.7	+0.9	Identify any capitalization or punctuation errors in the underlined parts of the following sentence. The Hills, who have just returned from Lake Tahoe, are already planning next winter's trip. No error. A B C D o A o B o C o D

Skill area	Description of skills assessed	1974-75		1975-76		Comparison of 1974-75 and 1975-76				Illustrative test question
		No. of items	Percent correct	No. of items	Percent correct	No. of common items	Percent correct 1974-75	Percent correct 1975-76	Change	
VII. SPELLING	The student must decide if an underlined word in a given sentence is spelled correctly.	54	60.9	72	68.0	54	61.0	63.7	+2.7	Fill in the oval next to "right" if the word is spelled correctly or next to "wrong" if the word is spelled incorrectly. Carmen steped on my toes. o right o wrong

APPENDIX F

Mathematics Performance, by Skill Area, of California Sixth Grade Pupils for 1974-75 and 1975-76[1]

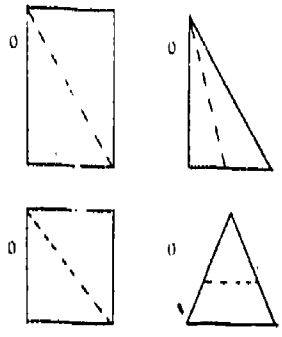
Skill area	Description of skills assessed	1974-75		1975-76		Comparison of 1974-75 and 1975-76				Illustrative test question[3]
		No. of items	Percent correct	No. of items	Percent correct	No. of common items	Percent correct 1974-75	Percent correct 1975-76	Change[2]	
TOTAL MATHEMATICS TEST		(168)	50.1	(160)	57.4	(80)	58.5	60.9	+2.4	
I. ARITHMETIC	(Skills assessed in categories A, B, C, and D in I. Arithmetic)	(84)	59.4	(96)	61.0	(57)	61.9	63.2	+1.3	
A. Number concepts	(Skills assessed in categories 1, 2, and 3 in A. Number concepts)	(24)	64.4	(28)	65.4	(15)	67.0	67.5	+0.5	
1. Number and numeration	The pupil must identify whole numbers, fractions, and decimals; identify place value; and recognize points on a number line.	12	72.6	13	75.0	8	75.3	76.5	+1.2	What digit is in the tens' place in 4,263? o 2 o 3 o 4 o 6 o None of these
2. Number theory	The pupil must recognize odd, even, prime, and composite numbers; and choose the lowest common multiple or greatest common factor of several numbers.	6	48.6	9	56.1	2	54.5	55.1	+0.6	What is the greatest common divisor of 8, 12 and 16? o 4 o 8 o 12 o 16
3. Number properties	The pupil must recognize commutative, associative, and distributive properties of operations on numbers.	6	63.8	6	58.6	5	58.7	58.2	-0.5	Name the missing number. 6 X 15 = ☐ X 6 o 9 o 15 o 90 o 540 o None of these

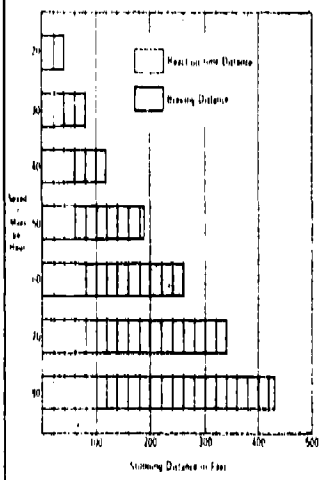
[1] The only values presented in the column Percent Correct are averages of the percents of questions answered correctly. The percentages for individual items vary from the average value by 20 or more points.

[2] A (+) sign indicates that the 1975-76 score was higher than that of 1974-75 and a (-) sign indicates that the 1975-76 score was lower than that of 1974-75.

[3] It is important to remember that these sample test items are presented for illustrative purposes only; therefore, they do not cover all of the skills tested, nor do they necessarily possess all the qualities of good test items.

Skill area	Description of skills assessed	1974-75		1975-76		Comparison of 1974-75 and 1975-76				Illustrative test question
		No. of items	Percent correct	No. of items	Percent correct	No. of common items	Percent correct 1974-75	Percent correct 1975-76	Change	
I. ARITHMETIC (Cont.)										
B. Whole numbers	(Skills assessed in categories 1 and 2 in B. Whole numbers.)	(20)	70.6	(28)	66.9	(16)	72.7	72.2	-0.5	
1. Computation	The pupil must perform addition, subtraction, multiplication, and division involving whole numbers.	12	79.3	16	77.4	12	79.3	79.5	+0.2	6003 -209 o 6,794 o 5,894 o 5,804 o 5,794
2. Application	The pupil must apply the four arithmetic operations on whole numbers in solving problems presented in a daily life context		57.6	12	52.9	6	59.5	57.6	-1.9	Joe packs tomatoes 4 to a box. If he has packed 15 tomatoes, which box is he now packing? o the fourth o the fifth o the sixth o the eighth
C. Fractions	(Skills assessed in categories 1 and 2 in C. Fractions.)	(20)	48.6	(20)	49.6	(11)	47.9	49.9	+2.0	
1. Computation	The pupil must perform addition, subtraction, multiplication, and division involving fractional numbers.	12	51.5	13	50.5	6	47.7	49.9	+2.2	3 x 4/7 o 1 2/7 o 2 2/7 o 4 4/7 o 7
2. Application	The pupil must use the four arithmetic operations on fractions, mixed numbers and fractions to demonstrate comprehension or ability to solve problems in a daily life context.	5	44.1	7	48.0	5	48.2	49.9	+1.7	Jack's spelling test had 99 words. He spelled 2/3 of the words correctly. How many words did Jack misspell? o 30 o 66 o 15 o 4
D. Decimals	(Skills assessed in categories 1 and 2 in D. Decimals.)	(20)	53.2	(20)	56.1	(13)	53.2	57.0	+3.8	

Skill area	Description of skills assessed	1974-75		1975-76		Comparison of 1974-75 and 1975-76				Illustrative test question
		No. of items	Percent correct	No. of items	Percent correct	No. of common items	Percent correct 1974-75	Percent correct 1975-76	Change	
I. ARITHMETIC (Cont.)										
1. Computation	The pupil must perform addition, subtraction, multiplication, and division involving decimal numbers.	12	53.5	12	59.7	9	52.5	58.0	+5.5	62.1 - 41.4 = o 10.7 o 20.7 o 21.7 o 57.06 o None of these
2. Application	The pupil must use the four arithmetic operations on numbers in decimal form to demonstrate understanding of principles and ability to solve problems in a daily life context.	8	52.6	8	55.8	4	54.8	54.8	-0-	The Wards' total expenses during the 8 days at the ranch were $491.60. What was the average cost per day? o $61.45 o $61.32 o $60.20 o None of these
II. GEOMETRY	(Skills assessed in categories A and B in II. Geometry.)	(28)	42.8	(20)	58.8	(6)	58.2	60.3	+2.1	
A. Knowledge of facts	The pupil must be able to identify basic geometric figures.	14	56.7	8	68.7	3	59.7	61.5	+1.8	 The figure above is called a: o pyramid o prism o cylinder o cone
B. Application	The pupil must be able to comprehend and apply basic geometric knowledge and concepts.	14	28.9	12	52.2	3	56.7	59.1	+2.4	Which of the following figures is divided by a line of symmetry? 

Skill area	Description of skills assessed	1974-75		1975-76		Comparison of 1974-75 and 1975-76				Illustrative test question
		No. of items	Percent correct	No. of items	Percent correct	No. of common items	Percent correct 1974-75	Percent correct 1975-76	Change	
III. MEASUREMENT AND GRAPHS	(Skills assessed in categories A and B in III. Measurement and Graphs.)	(44)	43.7	(32)	52.1	(12)	50.3	57.5	+7.2	
A. Knowledge of facts	The pupil must be able to estimate length and volume; convert length, mass, volume, and time from one unit to another unit; perform arithmetic operations on quantities of length, mass, volume, and time.	20	42.9	14	44.8	6	50.2	59.9	+9.7	3 yards 1 foot = o 4 feet o 7 feet o 10 feet o 13 feet
B. Application	The pupil must be able to solve problems related to measurement of length, area, mass, and volume.	24	44.4	18	57.8	6	50.3	55.1	+4.8	HOW MANY FEET BEFORE YOU CAN STOP?  Use the above graph to find the top safe speed for stopping within a maximum distance of 140 feet. o 30 miles per hour o 40 miles per hour o 50 miles per hour o 120 miles per hour
IV. PROBABILITY AND STATISTICS	(Skills assessed in categories A and B in IV. Probability and Statistics.)	(12)	25.4	(12)	40.4	(5)	39.2	43.3	+4.1	
A. Computation	The pupil must be able to compute probability of simple events and compute the mean, mode, and median of a set of given numbers.	6	29.1	6	42.4	2	51.6	56.9	+5.3	If an event is certain to occur, then the probability of that event is: o 1/2 o 1 o 100 o zero

Skill area	Description of skills assessed	1974-75		1975-76		Comparison of 1974-75 and 1975-76				Illustrative test question
		No. of items	Percent correct	No. of items	Percent correct	No. of common items	Percent correct 1974-75	Percent correct 1975-76	Change	
IV. PROBABILITY AND STATISTICS (Cont.)										
B. Application	The pupil must be able to solve problems related to elementary concepts in probability and statistics.	6	21.8	6	38.5	3	30.9	34.3	+3.4	A bowl contains one white marble, two red marbles, and three blue marbles. If you were blindfolded and then removed one marble from the bowl, what is the probability that the marble you removed would be red? o zero o 1/3 o 1/2 o 2/3 o None of these

APPENDIX G

Mathematics Performance, by Skill Area, of California Twelfth Grade Students for 1974-75 and 1975-76[1]

Skill area	Description of skills assessed	1974-75		1975-76		Comparison of 1974-75 and 1975-76				Illustrative test question[3]
		No. of items	Percent correct	No. of items	Percent correct	No. of common items	Percent correct 1974-75	Percent correct 1975-76	Change[2]	
TOTAL MATHEMATICS TEST		(196)	66.2	(198)	67.0	(156)	66.4	68.0	(+1.6)	
I. ARITHMETIC	(Skills assessed in categories A, B, C, and D in I. Arithmetic.)	(96)	72.1	(98)	72.9	(72)	73.5	75.3	(+1.8)	
A. Number concepts	(Skills assessed in categories 1, 2, and 3 in A. Number concepts.)	(26)	72.6	(28)	74.3	(19)	74.1	75.9	(+1.8)	
1. Number and numeration	The student must identify whole numbers, fractions, and decimals; identify place value; and recognize points on a number line.	12	69.9	14	71.0	7	69.6	70.5	+0.9	In which numeral is the digit 7 in the tens' place? o 976.3 o 97.63 o 9.763 o 0.9763
2. Number theory	The student must recognize odd, even, prime, and composite numbers; and choose the lowest common multiple or greatest common factor of several numbers.	8	74.1	8	76.2	6	77.3	78.6	+1.3	If n is an odd number, what can you say about n + 1? o It is always odd. o It is always even. o It is even or odd depending upon what n is. o None of these
3. Number properties	The student must recognize commutative, associative, and distributive properties of operations on numbers.	6	76.2	6	79.6	6	76.2	79.6	+3.4	□ X 7 = (4 X 7) + (5 X 7) What number goes in the □ above? o 2 o 8 o 9 o 20

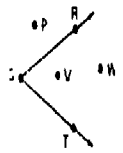
[1] The only values presented in the column Percent Correct are averages of the percents of questions answered correctly. The percentages for individual items vary from the average value by 20 or more points.

[2] A (+) sign indicates that the 1975-76 score was higher than that of 1974-75 and a (-) sign indicates that the 1975-76 score was lower than that of 1974-75.

[3] It is important to remember that these sample test items are presented for illustrative purposes only; therefore, they do not cover all of the skills tested, nor do they necessarily possess all the qualities of good test items.

Skill area	Description of skills assessed	1974-75		1975-76		Comparison of 1974-75 and 1975-76				Illustrative test question
		No. of items	Percent correct	No. of items	Percent correct	No. of common items	Percent correct 1974-75	Percent correct 1975-76	Change	
I. ARITHMETIC (Cont.)										
B. Whole numbers	(Skills assessed in categories 1 and 2 in B. Whole numbers.)	(22)	78.2	(22)	80.1	(15)	80.5	82.4	(+1.9)	
1. Computation	The student must perform addition, subtraction, multiplication, and division involving whole numbers.	14	86.0	14	80.9	10	85.4	87.7	+2.3	504 -99 o 405 o 415 o 495 o 505
2. Application	The student must apply the four arithmetic operations on whole numbers in solving problems presented in a daily life context.	8	64.4	8	78.7	5	70.8	71.9	+1.1	A parking lot has 25 rows with 18 spaces for cars in each row. If 3 rows are removed for a driveway, what is the greatest number of cars which can be parked on the lot? o 375 o 396 o 414 o 447 o None of these
C. Fractions	(Skills assessed in categories 1 and 2 in C. Fractions.)	(26)	67.2	(26)	66.0	(20)	66.1	67.5	(+1.4)	
1. Computation	The student must perform addition, subtraction, multiplication and division involving fractional numbers.	14	67.3	14	70.4	11	69.5	70.1	+0.6	4 x 4/7 = o 1 2/7 o 2 2/7 o 4 1/7 o 7
2. Application	The student must use the four arithmetic operations on fractions, mixed fractions, or whole numbers and fractions to demonstrate comprehension or ability to solve problems in daily life context.	12	67.0	12	60.9	9	62.0	64.3	+2.3	Jack's spelling test has 60 words. He spelled 3/4 of the words correctly. How many words did Jack misspell? o 80 o 45 o 15 o 4

Skill area	Description of skills assessed	1974-75		1975-76		Comparison of 1974-75 and 1975-76				Illustrative test question
		No. of items	Percent correct	No. of items	Percent correct	No. of common items	Percent correct 1974-75	Percent correct 1975-76	Change	
I. ARITHMETIC (Cont.)										
D. Decimals	(Skills assessed in categories 1 and 2 in D. Decimals.)	(22)	71.4	(22)	71.8	(18)	75.4	77.3	(+1.9)	
1. Computation	The student must perform addition, subtraction, multiplication, and division involving decimal numbers.	14	77.4	14	74.1	11	83.0	84.0	+1.0	786.4 - 34.87 = o 4.377 o 43.77 o 751.53 o 7,515.3
2. Application	The student must use the four arithmetic operations on numbers in decimal form to demonstrate understanding of principles and ability to solve problems in daily life context.	8	60.8	8	67.8	7	63.4	66.8	+3.4	If Beth can drive 18.7 miles on each gallon of gas, how many miles can she drive on 7 gallons? o 126.9 o 130.9 o 140.9 o 1309 o None of these
II. ALGEBRA	(Skills assessed in categories A and B in II. Algebra.)	(32)	61.4	(32)	62.9	(32)	61.4	62.9	(+1.5)	
A. Computation	The student must be able to perform addition, subtraction, multiplication, and division of algebraic variables; and identify a point shown on rectangular coordinates.	14	66.4	14	66.4	14	66.4	66.4	-0-	If $7x - 38 = 18$, then $x =$ o -8 o -5 o zero o 5 o 8
B. Application	The student must be able to construct an algebraic equation to solve a given problem and be able to interpret tables, charts, and graphs.	18	57.6	18	60.1	18	57.6	60.1	+2.5	The following formula can often be used to approximate the weight for boys between the ages of 1 to 7: $W = 8 + 2 \cdot 2\ A$ where W is the weight in kilograms and A is the boy's age in years. The formula tells that for each year older that a boy becomes, he should weigh: o 8 kilograms more o 8 kilograms less o 2.2 kilograms more o 2.2 kilograms less

Skill area	Description of skills assessed	1974-75		1975-76		Comparison of 1974-75 and 1975-76				Illustrative test question
		No. of items	Percent correct	No. of items	Percent correct	No. of common items	Percent correct 1974-75	Percent correct 1975-76	Change	
III. GEOMETRY	(Skills assessed in categories A and B in III. Geometry.)	(24)	64.3	(24)	62.7	(18)	62.5	64.5	(+2.0)	
A. Knowledge of facts	The student must be able to identify basic geometric sets and figures.	12	77.3	12	75.2	10	73.7	73.6	-0.1	 Which of the points are in the interior of angle RST? o P only o V only o V and W o R, S, and T
B. Application	The student must be able to comprehend and apply basic geometric knowledge and concepts.	12	51.3	12	50.1	8	48.6	53.1	+4.5	In the plane of a circle with radius 5.04 inches, if a point P lies 5.4 inches from the center of the circle, then P lies: o on the circle o at the center of the circle o outside the circle o inside the circle but not at the center
IV. MEASUREMENT	(Skills assessed in categories A and B in IV. Measurement.)	(30)	59.7	(30)	60.5	(22)	57.5	58.8	(+1.3)	
A. Knowledge of facts	The student must be able to estimate length and volume; convert length, mass, volume, and time from one unit to another unit; and perform arithmetic operations on quantities of length, mass, volume, and time.	12	64.0	12	71.6	8	69.8	71.0	+1.2	10 decimetres = 1 metre 1000 millimetres = 1 metre The length of a piece of chalk is 0.5 decimetre. What is its length in millimetres? o 0.05 o 5 o 50 o 500

Skill area	Description of skills assessed	1974-75		1975-76		Comparison of 1974-75 and 1975-76				Illustrative test question
		No. of items	Percent correct	No. of items	Percent correct	No. of common items	Percent correct 1974-75	Percent correct 1975-76	Change	
IV. MEASUREMENT (Cont.)										
B. Application	The student must be able to solve problems related to measurement of length, area, mass, and volume.	18	56.8	18	53.1	14	50.4	51.8	+1.4	A housewife will pay the lowest price per ounce for rice if she buys it at the store which offers: o 12 ounces for 40 cents o 14 ounces for 45 cents o 1 pound, 12 ounces for 85 cents o 2 pounds for 99 cents o None of these
V. PROBABILITY AND STATISTICS	(Skills assessed in categories A and B in V. Probability and Statistics.)	(14)	54.1	(14)	57.2	(12)	58.9	60.1	(+1.2)	
A. Computation	The student must be able to compute probability of simple events and compute the mean, mode, and median of a set of given numbers.	6	58.0	6	57.9	5	64.9	66.7	+1.8	Tom, Dick, and Harry lined up to enter their classroom. What is the probability that Tom was the first one in line? o zero o 1/3 o 2/3 o 1 o None of these
B. Application	The student must be able to solve problems related to elementary concepts in probability and statistics.	8	51.2	8	56.6	7	54.6	55.3	+0.7	Three of four boys each weighs 60 pounds. What is the weight of the fourth boy if the average of the weights of all four boys is 70 pounds? o 130 pounds o 100 pounds o 80 pounds o 65 pounds