

MANUAL

California Achievement Tests Complete Battery

AND SEPARATE READING, ARITHMETIC, AND LANGUAGE TESTS

Lower Primary • GRADES 1 and 2 • Forms W & X

DEvised BY ERNEST W. TIEGS AND WILLIS W. CLARK

LOWER PRIMARY—MANUAL—GRADES 1 AND 2
CALIFORNIA ACHIEVEMENT TESTS—WXYZ SERIES

Note: This is the complete manual for administering, scoring, and interpreting the California Achievement Tests, Lower Primary, 1957 Edition, whether published as a complete battery booklet or as separate Reading, Arithmetic, and Language booklets. See page 3 for a complete Table of Contents.

1963 NORMS

1957 EDITION



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California Achievement Tests

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The Tests

The California Achievement Tests are designed for the measurement, evaluation, and diagnosis of school achievement. This series is composed of reliable and valid tests of skills and understandings in reading, arithmetic, and language. The items in the 1957 Edition were first rated for balance and appropriateness by competent curriculum and achievement test specialists. The separate elements of the battery were then integrated to yield meaningful and useful results.

The five levels of these batteries were carefully articulated to provide a sequential testing program from one level to the next. This important feature was given special care in standardizing the California Achievement Tests, 1957 Edition, and was maintained in the preparation of the 1963 norms. The continuity of the grade placement scale from the Lower Primary level upward was controlled by concurrent testing with the California Short-Form Test of Mental Maturity, 1963 Revision. The 1963 norms were based on a scaling procedure by which performance on the California Achievement Tests was related to performance on the 1963 Revision of the California Short-Form Test of Mental Maturity, which served as the criterion for controlling the achievement data. The achievement data used in the scaling procedures to establish the norms were obtained from a population sample representing a composite of the various curricular influences operating throughout the nation.

The joint administration of the California Achievement Tests and the California Short-Form Test of Mental Maturity, 1963 Revision, made possible estimates of Anticipated Achievement based on a nationwide standardization, controlled on grade placement, I.Q., and chronological age. Use of the Anticipated Achievement concept provides new avenues for evaluation and diagnosis of individual and class achievement.

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Appreciation is also extended to the educators who participated in the item evaluation of the 1957 Edition and to the individuals who made specific contributions as item writers: Mrs. Jean Bentwood and Mrs. Mary Reed of the Long Beach (California) School District.

Examinees may mark their responses in the booklets, on IBM machine-scoring answer sheets, on SCOREZE,¹ on Mark-Sense CAL-CARDS, or on Punch-Out Cards.

¹ SCOREZE, devised by Ethel M. Clark, is a special double answer sheet, one-half of which is self-scoring and diagnostic (contains diagnostic categories for all items). The other half can be machine scored. The diagnostic portion of SCOREZE is usually retained for use by the teacher or counselor. SCOREZE was devised for exclusive use with California Test Bureau instruments.

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California Achievement Tests

DESCRIPTION OF THE TESTS

The California Achievement Tests, Lower Primary, are a series of comprehensive tests designed for the three-fold purpose of facilitating evaluation, educational measurement, and diagnosis.

The California Achievement Tests have been so designed that they may be used by teachers with a minimum of formal training in standardized testing and in diagnostic procedures, as well as by specialists in the field. The tests may be administered, scored, and interpreted by following the appropriate directions in this manual.

For a discussion of the rationale and curricular comprehensiveness of the tests, see the section on Reliability and Validity on pages 8 to 13 of this manual. An explanation of potential uses of the instruments for educational diagnosis and educational measurement may be found in Part 2 on pages 15 to 23.

Each of the four alternate equivalent forms of the Lower Primary level of the California Achievement Tests is composed of three tests: Reading, Arithmetic, and Language.¹ These three tests are further divided into two parts each: the Reading Test consists of Reading Vocabulary and Reading Comprehension; the Arithmetic Test consists of Arithmetic Reasoning and Arithmetic Fundamentals; and the Language Test consists of Mechanics of English and Spelling. Then, as described below, the two parts of each test, with the exception of Reading Comprehension and Spelling, are also divided into sections.

READING VOCABULARY — TEST 1

The Reading Vocabulary Test consists of four sections—Word Form, Word Recognition, Meaning of Opposites, and Picture Association. The seventy-five items in this section sample thirteen different essential functional elements which serve as an aid to diagnosing a pupil's specific difficulties in the area of reading vocabulary.

Reading vocabulary is an essential factor of a reading achievement test, since a good vocabulary is a necessary element in the development of reading comprehension skills.

WORD FORM — SECTION A

Section A is made up of twenty-five items, each consisting of two words separated by a dotted line. If the two words are identical (except in type face),

¹ Four forms were used in the experimental work prior to publication. Only Forms W and X are published. Forms Y and Z are ready for publication if the demand warrants it.

PART 1

Description of the Tests and Related Data

the pupil marks S (for Same) on the line between them; if they are different words, he marks D. Various words and forms are used in these items, so that the diagnostic analysis may be divided as follows: identical or different words, lower case; identical or different words, capitals; and identical or different words, mixed forms (e.g., one word of the item is in capitals, the other in script). Also included are test situations in which the second word is a reversal of the first (e.g., saw - was).

The test is useful in determining specific problem areas in identifying words, such as incomplete knowledge of the alphabet, lack of visual discrimination, and reversals.

WORD RECOGNITION — SECTION B

This test is made up of twenty sets of three words each. It includes words in capitals and lower case. One of the three words in each set is pronounced by the examiner. The pupil responds by underlining the word pronounced. The items vary from those testing a recognition of gross differences in sound and word form to minor phonetic differences. Some of the word groups have identical initial sounds but different final or middle sounds, whereas some begin with dissimilar sounds but have ending sounds which are similar.

MEANING OF OPPOSITES — SECTION C

The items in this section are presented in fifteen boxes, each of which contains a key word, a response word, and two distractors. The pupil matches the key word with its opposite, indicating his response by drawing a line from one to the other.

The words used in this section range from simple, concrete terms to words representing abstract concepts, and are arranged in order of difficulty.

PICTURE ASSOCIATION — SECTION D

Section D contains fifteen items. Each item consists of a picture and some words or short phrases. The first nine items require simple, one-word identification of objects. Each of the remaining six involves identifying a simple three- or four-word interpretation of a pictured situation.

READING COMPREHENSION — TEST 2

The Reading Comprehension Test covers two areas — following directions and interpretation of material. These two fields are presented in the form of one fifteen-item test. The first five items require

the following of specific directions, which vary from simple instructions to those involving a choice in selecting the correct responses. The second part of the test consists of several brief stories, each of which is followed by a number of items referring to its contents. These test situations measure the pupil's ability to read and comprehend directly stated facts and to make deductions and inferences.

LETTER RECOGNITION

The test of Letter Recognition is not an integral part of the Reading Test and is not scored with it. It is presented for diagnostic purposes and is intended to be given to pupils who score very low in the Reading Test in order to help determine the level at which they are functioning in working with verbal symbols.

Each of the twenty-four items of the Letter Recognition Test consists of a letter of the alphabet, followed by four more letters. One of the four letters is the same as the stimulus letter and must be identified by the pupil. The items are presented in the form of lower case letters, capital letters, and combinations of the two.

ARITHMETIC REASONING - TEST 3

The Arithmetic Reasoning Test consists of two sections - Meanings and Problems. The objective of the authors is to provide simple situations which reveal the presence or absence of essential functional ability rather than to include problems in the solution of which differences in attention span and memory may operate as additional variables. The test is read to pupils in order to eliminate the reading factor.

MEANINGS - SECTION A

The thirty items in this section are divided into several subsections, each of which tests a specific element. The first three items test the pupil's understanding of the relationship of pictures to abstract number symbols, while the next six measure his ability to recognize the words which the symbols represent.

Items 10 through 24 test the pupil's comprehension of number concepts, relative size of numbers, knowledge of number sequence, the value of coins, and ability to tell time.

The remaining five consist of items on weight, time, basic geometric concepts, and simple arithmetical symbols and abbreviations.

PROBLEMS - SECTION B

Fifteen items, consisting of one and two-step problems based on simple arithmetic functions, are included in this section. The problems are read to pupils. Each item in the test booklet contains a box in which the answer is to be written. On the left of each box is given the number of objects, animals, or persons, with which the problem deals. Thus pupils may follow the essential data of each problem visually while it is being read to them.

ARITHMETIC FUNDAMENTALS - TEST 4

The Arithmetic Fundamentals Test is divided into sections on addition and subtraction, each sampling the essential functional elements of one of these areas.

An examination of the pupil's specific responses provides an aid for diagnosing difficulties in arithmetic fundamentals. The use of the pupil's specific test responses as a guide for remedial action is presented on pages 21 to 23 of this manual.

ADDITION - SECTION C

The twenty-five addition items in this section reveal the extent of pupil mastery of addition combinations appropriate to this level. The diagnostic analysis reveals which combinations cause difficulty, and whether or not the pupil understands the function of zeros in addition.

The first twenty items consist of number facts, while the last five involve more complicated arithmetic functions.

SUBTRACTION - SECTION D

This section includes twenty subtraction facts, including zeros, and reveals the extent of pupil mastery of them.

The first fifteen items consist of number facts, and the last five involve more complicated functions.

MECHANICS OF ENGLISH - TEST 5

Test 5 consists of three sections—Capitalization, Punctuation, and Word Usage. The three sections sample thirteen different elements of the mechanics of English and provide an aid in diagnosing the specific difficulties encountered by pupils in this area. As in the Arithmetic Reasoning Test, all items are read to pupils.

CAPITALIZATION - SECTION A

This section is designed to measure the extent to which the pupil knows the simplest uses of capital letters. Only one word in each of the twenty items requires capitalization.

The elements tested in this section are: names of persons or animals, the pronoun "I," first words of sentences, names of months or days, and names of cities.

PUNCTUATION - SECTION B

Section B consists of twenty items in unrelated sentences and a short story, devised to measure the pupil's knowledge of punctuation. The punctuation marks tested are periods, commas, and question marks.

WORD USAGE - SECTION C

The Word Usage section is made up of twenty-five sentences, each of which contains a correctly and an incorrectly used word, placed one above the other and enclosed in brackets.

The functional elements tested in this section include number, tense, good usage, person, and case.

SPELLING — TEST 6

Twenty carefully selected words are used in this test. These words are scaled in order of difficulty, and all of them appear in the first 500 words most frequently used in writing.² Spelling is included as a part of language because of its use as a means of written expression.

HANDWRITING

Handwriting is not an integral part of the Language Test, and handwriting norms are not pre-

CHANGES IN THE 1957 EDITION

The 1957 Edition of the California Achievement Tests represents some extensive changes in content and format from the previous edition. This is especially true with the Reading and Language Tests. The following paragraphs describe the changes in detail.

The 1950 Edition of the Primary Battery of the California Achievement Tests has been divided into the new Lower and Upper Primary levels. The type in the new tests has been enlarged for easier reading at these levels. The Lower Primary California Achievement Tests are so devised that the directions and questions for all but the Reading Test and the section testing number facts in addition and subtraction, are read to the pupils. Thus slow or poor readers are not penalized in tests not specifically designed to measure reading. Obviously, the sections dealing with addition and subtraction are non-verbal.

TEST 1 — READING VOCABULARY

Section A, Word Form, is the same type of test as that used in the previous edition, except that words in script replace those in italics. The number of items has been increased from twenty to twenty-five.

Section B, Word Recognition, is similar to that of the 1950 Edition, except that only capitals and lower case letters are used, while the previous edition also contained words in italics. The number of items has been increased from fifteen to twenty-five.

Section C, Meaning of Opposites, is new in format. Whereas in the original Primary test, each of three stimulus words was to be matched with one of five responses, the items in the revised test are arranged so that one stimulus word is associated with one of three responses in each item. The number of items has been decreased from twenty to fifteen.

Section D, Picture Association, is a new section of fifteen items.

TEST 2 — READING COMPREHENSION

The Reading Comprehension Test is not divided into sections in this revision. It contains five follow-

sented in the table of language norms. However, standardized handwriting scales, both cursive and manuscript (to aid in objectifying ratings), are provided on the scoring key to enable the examiner to estimate the quality of handwriting of each pupil if he desires. This scale represents the average handwriting of a large number of pupils, sampled at each grade. It is a composite rating of several competent judges. In scoring handwriting samples, the examiner uses the first five words of the spelling test. The first five words of each test are sufficiently simple so that the confusing influence of word difficulty is usually avoided. Furthermore, the pupil does not know that these words are to be rated; hence, the test provides a valid testing situation.

ing-directions items and ten comprehension items which test directly stated facts and inferences. Thus this Lower Primary test consists of fifteen of the same type of items as the easiest of the thirty items found in Sections D, E, and F of the previous Primary test. The titles of these three sections were: Following Directions, Directly Stated Facts, and Interpretations.

A Letter Recognition Test has been placed at the end of the Reading Test to serve as a diagnostic instrument to be used with pupils who possess so little reading skill that they do not perform adequately on the Reading Test.

TEST 3 — ARITHMETIC REASONING

Section A, Meanings, contains nine initial items which are considerably less difficult than any found in the former Primary test. They test the pupil's understanding of number symbols and their relationship to pictures and to the words for which the symbols stand. The remaining twenty-one items of this section test skills formerly tested in Sections A, B, and C, Number and Sequence, Money, and Number and Time, respectively. While Sections A to C formerly consisted of twenty items, the present Section A contains thirty.

Section B, Problems, has been increased from ten to fifteen items. However, these items are considerably less difficult than those in the original Primary test and involve number concepts that are common to first and second grades.

TEST 4 — ARITHMETIC FUNDAMENTALS

Section A, Addition, consists of twenty number facts and five items measuring more complex processes. The Addition section of the 1950 Edition of the Primary test contained fifty different number facts.

Section B, Subtraction, follows the same pattern as Section A, the only difference being that the Subtraction section contains fifteen number facts and five items involving higher processes.

There are no sections corresponding to Sections H and I, Multiplication Combinations and Problems, respectively, of the original Primary Arithmetic Test.

² Willis W. Clark, *A Spelling Dictionary for Elementary School Pupils* (Los Angeles: Los Angeles City School District, 1928), 62 pp.

TEST 5 — MECHANICS OF ENGLISH

Section A, Capitalization, consists of twenty unrelated sentences, each of which contains only one word which should be capitalized. The previous edition consisted of a story and a poem, in which ten words were to be capitalized. Some lines included more than one word to be capitalized.

Section B, Punctuation, consists of sixteen unrelated sentences and a four-line story. Section B of the original Primary test consisted of a story and a poem, in which five punctuation marks were to be capitalized.

RELIABILITY AND VALIDITY

RELIABILITY

Coefficients of reliability and related data for the ten profiled variables of the California Achievement Tests, Lower Primary, are given in Table 1. These data are compiled for a specific grade placement, grade 1.7 only. All reliability coefficients formula $r_{6c} = \frac{\bar{f}}{1 + 5\bar{f}}$ where \bar{f} = average reliability for the six tests equally weighted.³

A coefficient of reliability of .95 results when the coefficients of the six tests are applied to the formula $r_{6c} = \frac{\bar{f}}{1 + 5\bar{f}}$ where \bar{f} = average reliability for the six tests and their totals. Data are given both in raw scores and grade placement units.

For most purposes of profile interpretation, the error of measurement expressed in grade placement units rather than in raw score units is used.

³ Truman L. Kelley, *Interpretation of Educational Measurement* (New York: World Book Co., 1927), p. 73.

be indicated. For each of the twenty items in the new test, no more than one punctuation mark is required, while some of the lines in the previous edition needed more than one punctuation mark. Section C, Word Usage, is a new section. It consists of twenty-five items.

TEST 6 — SPELLING

A new Spelling Test, less difficult than that used in the original Primary Battery, has been devised. This test consists of twenty words, the first five of which are used to evaluate handwriting.

In interpreting individual scores, the standard error of measurement is usually more helpful than the reliability coefficient. The coefficient of reliability provides only a general indication of the confidence which one can place in a measuring instrument. However, the standard error of measurement indicates how closely the individual's obtained score approximates his true score. For example, the chances are two to one that the examinee's score will not differ from the true score by more than the standard error of measurement, or nineteen to one by more than twice the standard error of measurement.

Thus, the standard errors of measurement in grade placement units in Table 1 are interpreted as follows: On the Reading Vocabulary Test, the chances are two to one that the examinee's grade placement on the test will not vary more than 2 months (0.2 G.P.), and nineteen to one that it will not vary more than 4 months from his true grade placement.

Because of the limited number of items (15-30), the section scores of each test should be used only as guides to indicate the presence of pupil difficulties. (See section on Diagnostic Analysis of Learning Difficulties, page 21.)

TABLE I
RELIABILITY COEFFICIENTS AND RELATED DATA FOR THE CALIFORNIA ACHIEVEMENT TESTS,
LOWER PRIMARY LEVEL, GRADE 1.7*

VARIABLE	RELIABILITY COEFFICIENT	RAW SCORE			GRADE PLACEMENT	
		Mean	Standard Deviation	Standard Error of Measurement	Mean	Standard Deviation
1. Reading Vocabulary	.84	54.4	9.4	3.7	1.8	0.5
2. Reading Comprehension	.77	7.6	3.7	1.8	0.4	0.2
3. TOTAL READING	.88	62.0	12.3	4.2	1.9	0.5
4. Arithmetic Reasoning	.72	30.0	5.8	3.1	1.8	0.4
5. Arithmetic Fundamentals	.90	32.5	8.7	2.7	1.7	0.7
6. TOTAL ARITHMETIC	.90	62.5	13.0	4.2	1.8	0.5
7. Mechanics of English	.85	37.1	9.9	3.0	2.0	0.4
8. Spelling	.69	4.4	3.1	1.8	0.5	0.3
9. TOTAL LANGUAGE	.86	41.4	12.1	4.4	1.9	0.4
10. TOTAL BATTERY	.95	165.9	32.7	7.6	1.9	0.4

* Number of cases = 115.

VALIDITY

The discussion of validity evidence for the California Achievement Tests, Lower Primary, is presented under two headings: (1) Content Validity and (2) Construct Validity. In the first, the rationale for the test and the curriculum and item studies are reported. In the second, some important relationships between the California Achievement Tests and other tests and measures are presented.

CONTENT VALIDITY

The items in the California Achievement Tests, on which the validity ultimately depends, have been selected to measure many of the most universal subject-matter objectives of the curriculum. Curricula in science and social studies may differ widely in different school systems; but the basic skills, or tools of learning, are similar in all schools. Consequently, irrespective of the school test scores on this battery will show the extent of pupil mastery of the fundamental skills in terms of various derived scores.

This does not mean, however, that these tests measure only the ability of the examinee to reproduce facts in a rote manner or to perform only the strictly mechanical tasks in the basic skills. Each of the California Achievement Tests abounds in items that sample the ability of the examinee to make intelligent use of the facts and skills at his disposal, to solve new problems, to make inferences, and to draw conclusions.

The items of the California Achievement Tests, Lower Primary, have been developed over a period of years and through five editions. The items in the original edition, the Progressive Achievement Tests,⁴ were selected after a careful study of the curriculum objectives of the then most up-to-date city and state courses of study. The later 1937, 1943, 1949, and 1950 Editions⁵ were based on tests given to pupils in all sections of the United States. The increased use made of this battery is in itself an indication of the general appropriateness and applicability of the content of the tests.

The Primary level of the 1950 Edition of the California Achievement Test was used in grades 1 to 14. In the 1957 Edition, as has been previously pointed out, two levels were produced — the Lower Primary designed for grades 1 and 2 and the Upper Primary for grades H-2-3-L4.⁶ Most of the more difficult items of the former Primary level were incorporated into the Upper Primary of the 1957 Edition, while the easier items were used in the Lower Primary level. The Mechanics of English Test, which was very brief in the former Primary, is almost entirely new. The Spelling Test is new.

While many of the items of the original battery have survived the numerous revisions, all of the

⁴ Ernest W. Tiegs and Willis W. Clark, *Progressive Achievement Tests* (Hollywood: Southern California School Book Depository, Ltd. now California Test Bureau, 1934).

⁵ As a result of the 1963 re-norming, the grade range for the Upper Primary level was extended downward to include Grade H2. At Grade H2, the Lower Primary may be more appropriate for some groups.

items included in the present edition have proven to be highly acceptable by modern standards. The items added to the 1950 Edition to produce the present edition were chosen after an examination of modern textbooks and courses of study.

Studies to assure statistical as well as curricular acceptability of the items were conducted. On the basis of this work, inferior items were removed and the acceptable ones retained. At the time the 1957 revision of the California Achievement Tests began, the items in the tests were arranged in four forms and administered to a common population. Time limits were removed so that each item could be read and attempted by all pupils in the sample. After the tests had been scored, the discriminating power and difficulty of each item were computed. On the basis of item difficulty and discrimination, as well as content, the items were rearranged into four comparable forms. The four forms were again administered to a new population and checked for comparability. A few final item shifts were then made.

The discriminating power of each item was determined for each grade by subtracting the per cent of correct responses of the bottom twenty-seven per cent of the pupils from the per cent of correct responses of the top twenty-seven per cent. The average discrimination for the two grades was then determined for each item. The average difficulty was obtained by determining the per cent of pupils in each grade that responded correctly to each item and then computing the average of the two grades. The data in Table 2 represent these statistics for the items combined into sections and then into tests for each of the four forms of the battery.⁶

The over-all discrimination of the four forms of the tests, expressed as phi coefficients, is reported in Tables 3 through 8. Phi coefficients are indices of the power of each item to discriminate between those who score high and those who score low in terms of the total score for each test. A study of these tables reveals that only 6 per cent of the Reading Test items, 7 per cent of the Arithmetic items, and 6 per cent of the Language items have phi coefficients of less than .20. The inclusion of these items in the tests can be explained on two bases: (1) Some of the items were retained because of their curricular acceptability. An attempt has been made to cover a broad sampling of content in each test. This means that several items are included for which complete mastery should be expected. Examples are items testing the ability to count pictured objects and items calling for choices between responses, such as "is" and "are," when they are used in sentences. (2) A number of the items were very easy or very difficult. High discrimination with items at these extremes is more rarely attained than with items of moderate difficulty. These items are, nevertheless, desirable, as most sections open with easy items designed to motivate the slower pupil and end with difficult items which provide sufficient ceiling for the more advanced examinee.

⁶ See footnote 1 on page 5.

SUMMARY OF ITEM DATA FOR FORMS, TESTS, AND SECTIONS OF THE CALIFORNIA ACHIEVEMENT TESTS, LOWER PRIMARY*

TEST AND SECTION	NO. ITEMS	DIFFICULTY INDEX				DISCRIMINATION INDEX		
		W	X	Y	Z	W	X	Y
1. Reading Vocabulary	75	71	71	71	71	40	39	39
A. Word Form	25	84	83	84	82	29	29	28
B. Word Recognition	20	73	73	74	74	48	48	46
C. Meaning of Opposites	15	49	48	49	49	42	41	41
D. Picture Association	15	70	70	70	70	44	43	45
2. Reading Comprehension	15	52	54	54	52	46	45	45
3. Arithmetic Reasoning	45	67	67	67	67	45	44	43
A. Meanings	30	68	69	68	68	43	42	40
B. Problems	15	65	65	65	65	50	50	50
4. Arithmetic Fundamentals	45	59	59	59	59	53	52	52
C. Addition	25	58	58	58	58	57	57	57
D. Subtraction	20	60	60	60	60	44	44	44
5. Mechanics of English	65	67	66	66	66	50	49	50
A. Capitalization	20	61	60	60	60	66	66	66
B. Punctuation	20	52	50	51	51	55	51	56
C. Word Usage	25	78	78	78	78	28	28	28
6. Spelling	20	41	43	41	40	70	70	70

* The forms are W, X, Y, and Z. Item difficulty is expressed in per cent of success of the total group; item discrimination is the difference in per cent of success of the two extreme 27% groups, i.e., item difficulty differentials.

**TABLE 3
DISTRIBUTION OF PHI COEFFICIENTS OF ITEMS OF THE READING VOCABULARY TEST
LOWER PRIMARY, GRADE 2***

PER CENT OF CORRECT RESPONSE	PHI COEFFICIENTS								
	.09 and below	.10-.19	.20-.29	.30-.39	.40-.49	.50-.59	.60-.69	.70 and above	Total
90-100	5	9	17	6	1	—	—	—	38
80-89	2	2	5	26	37	6	—	—	78
70-79	—	1	2	5	14	30	13	—	65
60-69	—	—	3	4	6	6	16	12	47
50-59	—	—	1	3	5	8	9	4	30
40-49	—	—	3	8	2	4	3	2	22
30-39	—	—	1	2	8	5	1	1	18
20-29	—	—	—	—	1	1	—	—	2
10-19	—	—	—	—	—	—	—	—	—
0-9	—	—	—	—	—	—	—	—	—
Total	7	12	32	54	74	60	42	19	300

* Read this table as follows: of a total of 300 items (in the four forms of the Reading Vocabulary Test) thirty-eight had a difficulty percentage of 90-100. Of these thirty-eight, five had a phi coefficient of .09 and below; nine of .10-.19; seventeen of .20-.29; six of .30-.39; and one of .40-.49.

**TABLE 4
DISTRIBUTION OF PHI COEFFICIENTS OF ITEMS OF THE READING COMPREHENSION TEST
LOWER PRIMARY, GRADE 2**

PER CENT OF CORRECT RESPONSE	PHI COEFFICIENTS								
	.09 and below	.10-.19	.20-.29	.30-.39	.40-.49	.50-.59	.60-.69	.70 and above	Total
90-100	—	—	—	2	2	—	—	—	2
80-89	—	1	—	3	4	2	—	—	9
70-79	—	—	—	—	—	—	1	—	2
60-69	—	—	—	1	1	—	—	3	4
50-59	—	—	—	1	2	3	1	3	9
40-49	—	—	—	1	2	4	1	2	15
30-39	—	—	—	1	2	4	1	7	16
20-29	—	—	—	2	1	—	—	—	3
10-19	—	—	—	—	—	—	—	—	—
0-9	—	—	—	—	—	—	—	—	—
Total	—	2	8	12	10	5	15	7	60

TABLE 5
DISTRIBUTION OF PHI COEFFICIENTS OF ITEMS OF THE ARITHMETIC REASONING TEST
LOWER PRIMARY, GRADE 2

PER CENT OF CORRECT RESPONSE	PHI COEFFICIENTS						Total	
	.09 and below	.10-.19	.20-.29	.30-.39	.40-.49	.50-.59	.60-.69	
90-100	8	4	7	2	9	1	—	21
80-89	—	—	5	5	12	20	4	18
70-79	—	—	—	2	2	10	14	41
60-69	—	—	—	—	4	5	4	46
50-59	—	—	—	—	3	2	5	24
40-49	—	—	—	—	—	1	5	21
30-39	—	—	—	3	—	—	—	3
20-29	—	—	—	1	—	—	—	4
10-19	—	—	—	1	—	—	—	2
0-9	—	—	—	—	—	—	—	—
Total	8	7	19	19	36	39	27	180

TABLE 6
DISTRIBUTION OF PHI COEFFICIENTS OF ITEMS OF THE ARITHMETIC FUNDAMENTALS TEST
LOWER PRIMARY, GRADE 2

PER CENT OF CORRECT RESPONSE	PHI COEFFICIENTS						Total	
	.09 and below	.10-.19	.20-.29	.30-.39	.40-.49	.50-.59	.60-.69	
90-100	—	—	2	1	5	1	—	1
80-89	—	2	2	4	9	20	12	50
70-79	—	1	—	2	2	12	16	23
60-69	—	—	—	—	2	3	4	56
50-59	—	—	—	—	—	1	3	25
40-49	—	—	—	—	1	4	2	6
30-39	—	—	—	—	2	1	6	8
20-29	—	—	—	1	4	—	—	10
10-19	—	—	1	—	—	—	—	6
0-9	—	3	2	2	—	—	—	8
Total	3	7	7	11	25	47	38	180

TABLE 7
DISTRIBUTION OF PHI COEFFICIENTS OF ITEMS OF THE MECHANICS OF ENGLISH TEST
LOWER PRIMARY, GRADE 2

PER CENT OF CORRECT RESPONSE	PHI COEFFICIENTS						Total	
	.09 and below	.10-.19	.20-.29	.30-.39	.40-.49	.50-.59	.60-.69	
90-100	1	14	11	3	11	3	—	29
80-89	—	3	5	6	5	17	4	27
70-79	—	2	2	2	13	15	29	33
60-69	—	1	4	1	1	12	12	15
50-59	—	—	—	—	1	2	6	80
40-49	—	—	—	—	1	1	2	51
30-39	—	—	3	—	1	1	6	8
20-29	—	—	1	2	—	8	1	14
10-19	—	—	1	3	2	6	2	11
0-9	—	2	19	24	23	33	56	7
Total	2	19	24	23	33	56	47	260

TABLE 8
DISTRIBUTION OF PHI COEFFICIENTS OF ITEMS OF THE SPELLING TEST
LOWER PRIMARY, GRADE 2

PER CENT OF CORRECT RESPONSE	PHI COEFFICIENTS						Total	
	.09 and below	.10-.19	.20-.29	.30-.39	.40-.49	.50-.59	.60-.69	
90-100	—	—	—	—	—	—	—	—
80-89	—	—	—	—	—	—	—	—
70-79	—	—	—	—	—	—	—	—
60-69	—	—	—	—	—	—	—	2
50-59	—	—	—	—	—	—	2	4
40-49	—	—	—	—	—	—	1	6
30-39	—	—	—	—	—	—	1	13
20-29	—	—	—	—	—	—	22	23
10-19	—	—	—	—	—	—	6	21
0-9	—	—	—	—	—	—	4	15
Total	—	—	—	—	—	—	44	80

CONSTRUCT VALIDITY

The strong positive relationship between school achievement and intelligence or mental maturity has long been recognized. This is illustrated in Table 9, which gives a summary of mean grade placements for the six principal components of the *California Achievement Tests*, the totals for the three subject areas, and for the Total Battery. Since the *California Test of Mental Maturity Series* was used to control age and intelligence for determining grade placements on the CAT, mean grade placement values were correlated with the Intellectual Status Index. The mean I.S.I. of the population tested in Grade 1.7 is 106, indicating that achievement above 1.7 should be expected. (See the discussion of I.S.I., page 44 of this Manual.)

TABLE 9

CORRELATION COEFFICIENTS AND RELATED DATA FOR THE CAT, LOWER PRIMARY LEVEL, AND THE CTMM-SF, LEVEL 1, GRADE HI*

TESTS	CAT		COEFFICIENTS	
	Mean (G.P.)	S.D. (G.P.)	I.S.I.†	r
Reading Vocabulary	2.0	.5	.63	
Reading Comprehension	2.0	.7	.56	
TOTAL READING	2.0	.5	.63	
Arithmetic Reasoning	1.9	.4	.69	
Arithmetic Fundamentals	1.9	.6	.62	
TOTAL ARITHMETIC	1.9	.5	.72	
Mechanics of English	2.0	.5	.58	
Spelling	1.8	.6	.52	
TOTAL LANGUAGE	2.0	.5	.61	
TOTAL BATTERY	2.0	.5	.71	

* N = 281; A.G.P. = 1.7; C.A. = 84 months; Mean I.S.I. = 106; S.D. = 15.4.

† For discussion of I.S.I., see page 44 of this Manual.

TABLE 10

**CORRELATION COEFFICIENTS AND RELATED DATA FOR OTHER STANDARDIZED TESTS VS. TEST 1
READING VOCABULARY, LOWER PRIMARY**

TEST *	GRADE	NO. OF CASES	OTHER TEST	COEFFICIENTS			TEST 1 — READING VOCABULARY	
				Mean	S.D.	r	r†	r‡
Metropolitan Word Pictures	2	125	21.7	11.0	.84	.86	.94	.46.6
Word Recognition	2	125	17.7	5.4	.78	.81	.93	.46.6
Word Meaning	2	125	13.3	8.2	.82	.85	.94	.46.6
Stanford Word Meaning (Test 2)	2	86	10.9	6.6	.44	.48	.55	.49.6
								.12.9

TABLE 11

**CORRELATION COEFFICIENTS AND RELATED DATA FOR ONE STANDARDIZED TEST VS. TEST 2
READING COMPREHENSION, LOWER PRIMARY**

TEST *	GRADE	NO. OF CASES	OTHER TEST	COEFFICIENTS			TEST 2 — READING COMPREHENSION	
				Mean	S.D.	r	r†	r‡
Stanford Paragraph Meaning (Test 1)	2	86	11.6	.77	.62	.57	.66	.4.9

TABLE 12

**CORRELATION COEFFICIENTS AND RELATED DATA FOR OTHER STANDARDIZED TESTS VS. TEST 3
ARITHMETIC REASONING, LOWER PRIMARY**

TEST *	GRADE	NO. OF CASES	OTHER TEST	COEFFICIENTS			TEST 3 — ARITHMETIC REASONING	
				Mean	S.D.	r	r†	r‡
Metropolitan Arithmetic Numbers (Test 4)	2	125	45.8	11.6	.71	.79	.93	.28.4
Stanford Arithmetic Reasoning (Test 4)	2	86	11.9	3.7	.77	.79	.99	.31.1

* Metropolitan Achievement Tests, Primary 1, Form R, and Stanford Achievement Test, Primary, Form J.

† Pearson product-moment r corrected for range on the California Achievement Tests.

‡ Pearson product-moment r corrected for range on the California Achievement Tests and for attenuation on both tests. This would be the relationship between the two tests if both had a reliability coefficient of 1.00.

TABLE 13

**CORRELATION COEFFICIENTS AND RELATED DATA FOR OTHER STANDARDIZED TESTS VS. TEST 4
ARITHMETIC FUNDAMENTALS, LOWER PRIMARY**

TEST*	GRADE	NO. OF CASES	OTHER TEST			COEFFICIENTS			TEST 4 — ARITHMETIC FUNDAMENTALS	
			Mean	S.D.	r	r†	r‡	Mean	S.D.	
Metropolitan Achievement Tests, Primary 1, Form R, and Stanford Achievement Test, Primary, Form J.	2	125	45.8	11.6	.65	.68	.75	21.4	10.7	
Stanford Arithmetic Computation (Test 5)	2	86	14.3	7.5	.71	.71	.80	28.1	11.2	

* Metropolitan Achievement Tests, Primary 1, Form R, and Stanford Achievement Test, Primary, Form J.

† Pearson product-moment r corrected for range on the California Achievement Tests.

‡ Pearson product-moment r corrected for range on the California Achievement Tests and for attenuation on both tests. This would be the relationship between the two tests if both had a reliability coefficient of 1.00.

**TABLE 14
CORRELATION COEFFICIENTS AND RELATED DATA FOR ONE STANDARDIZED TEST VS. TEST 6
SPELLING, LOWER PRIMARY**

TEST*	GRADE	NO. OF CASES	OTHER TEST			COEFFICIENTS			TEST 6 — SPELLING	
			Mean	S.D.	r	r†	r‡	Mean	S.D.	
Stanford Spelling (Test 3)	2	86	10.4	5.8	.53	.83	.92	4.1	4.8	

* Stanford Achievement Test, Primary, Form J.

† Pearson product-moment r corrected for range on the California Achievement Tests.

‡ Pearson product-moment r corrected for range on the California Achievement Tests and for attenuation on both tests. This would be the relationship between the two tests if both had a reliability coefficient of 1.00.

The 1963 Re-Norming

There were three principal reasons for developing the 1963 norms for the California Achievement Tests:

1. With the 1963 Revision of the California Test of Mental Maturity Series, it became necessary to re-norm the California Achievement Tests in order to maintain the proper relationship between the intelligence and achievement test results. The revised California Short-Form Test of Mental Maturity served as the new standard of performance for controlling the CAT norms. It could not be assumed that an IQ of 100 would be the same on the 1963 Revision of the CTMM Series as it was on the 1957 Edition. Therefore, it was necessary to select a new population and to administer both the CAT and CTMM to this sample. This joint administration of intelligence and achievement tests was similar to the dual standardization of the 1957 Edition of these two series. However, since the content of the California Achievement Tests remained the same, it was necessary only to develop new norms and to relate them to the 1963 Revision of the CTMM Series. The 1963 Revision of the California Short-Form Test of Mental Maturity was scaled to the 1960 Revision of the Stanford-Binet Intelligence Scale, Form L-M.⁷ The Stanford-Binet was used as a criterion instrument because it provided a stable and well-established

standard of measurement in terms of I.Q. scores.

2. Newly determined age-grade relationships also made it necessary to re-norm the CAT. These new age-grade relationships resulted from two separate studies. In the first, all data received for students who participated in the standardization of the 1963 Revision of the CTMM Series were examined for grade assignment in relation to age. From these data a composite modal distribution was made. In the second independent study, school systems from all parts of the nation were sampled. These represented schools of various sizes, and communities of various sizes, as well as urban and rural areas. The age-grade relationships from this sampling were compared with the data from the first study in order to verify the consistency of the findings. Where differences were found, the relationships were adjusted as necessary.
3. During the time since the 1957 norms were developed, a variety of changes in curriculum have occurred. Differences in emphasis and time of introduction of various basic skills into the course of study have resulted. These changes could substantially influence achievement test performance in any of the basic skills at any point throughout the grade ranges covered by the CAT. In this respect, the CAT re-norming program has led to an up-dating of the norms.

⁷ Lewis M. Terman and Maud A. Merrill, Revised Stanford-Binet Intelligence Scale, Third Revision (Boston: Houghton Mifflin Company, 1960).

California Achievement Tests

The California Achievement Tests are designed to promote the important educational purposes of measurement, evaluation, and diagnosis. The most comprehensive measure yielded by an achievement test is the total battery score. This score is of value as the most reliable indicator of an individual's or a group's total achievement status. Measurement continues through to the smallest unit scores for which reliability and normative data are provided. Diagnosis and evaluation begin with the subject-area scores and proceed through the various subdivisions of the test to the smallest units, namely, the individual items. From an instructional point of view, the greatest values of achievement testing are realized when all scores, subscores, and responses to items are utilized in measurement, evaluation, and diagnosis. This part of the manual is devoted to explaining these uses of the California Achievement Tests results.

The uses that are made of test results should be in harmony with the objectives of the local educational program. However, as new uses for test results emerge, educators are urged to examine their testing programs to see if they are deriving the maximum benefit from them. Hence, it is recommended that users of the California Achievement Tests consider all applications of the test results discussed here, examine them in terms of their educational objectives, and overlook no possibilities for capitalizing to the fullest upon information obtained from the test results.

DIAGNOSTIC PROFILE

The results of the California Achievement Tests are presented in the form of section, test, subject-area, and total battery scores. The interpretation of these data, whether with individuals or groups, is greatly simplified by the organization of the scores into profile form. A sample profile for the California Achievement Tests, Lower Primary Level, appears on page 17.

The profile graphically illustrates, in terms of grade placements, the achievement of the pupil in Reading, Arithmetic, and Language. An examination of the profile will reveal subject areas in which the pupil is strong, typical, or weak relative to a chosen criterion. A more refined picture of the pupil's achievement in the three major areas is made possible by the relative grade-placement positions of the raw scores in Reading Vocabulary, Reading Comprehension, Arithmetic Reasoning, Arithmetic Fundamentals, Mechanics of English, and Spelling. An even more detailed analysis may be initiated through the use of the Diagnostic

Analysis of Learning Difficulties described on page 21.

The Diagnostic Profile Sheet for the California Achievement Tests has been redesigned for use with the 1963 norms. It is easily distinguishable from the one used with the 1957 norms. On the revised form, the profile is drawn on a horizontal rather than a vertical plane. Several other changes have been made to facilitate interpretation of the data. The form now resembles the machine form, known as the Individual Record Sheet; hence, users accustomed to one form can readily adapt to the other.

The Diagnostic Profile Sheet appears on the outside back cover of the booklet and is also available as a separate sheet. In both cases the Diagnostic Analysis of Learning Difficulties is printed on the reverse of the sheet. An adaptation of the battery profile, for use with the separate Reading, Arithmetic, and Language Tests, is included on the back cover of the separate booklets.

PREPARATION OF THE PROFILE

The profile sheet has been devised to allow for charting those data which school personnel find useful in their interpretation of results from the CAT. Each school system should determine which scores and grade placements best meet its particular evaluative purposes. Profiles may then be completed according to local needs. The following directions apply to the separate test profiles as well as to the battery profile.

1. Record the raw score for each section in the row of boxes labeled "Raw Score." Then add the section scores and enter the totals. Obtain the total subject-area raw scores by adding the sub-totals. For example, on the Reading Test, enter the raw scores for Test 1 — Sections A, B, C, and D in the appropriate boxes; on the sample profile, these are 24, 18, 13, and 14. These are added for the total Reading Vocabulary score (69 in the sample). Find the score for Test 2, Reading Comprehension, then add the scores for Tests 1 and 2 for the Total Reading score (82 in the sample). Record each sub-total and total raw score in the appropriate box. For the Total Battery raw score, add the total scores for the three subject-area tests. On the sample, the Total Battery score is 217; this is recorded in the box immediately above the total possible score of 265.

PART 2

Uses and Interpretation

2. Obtain grade-placement equivalents for each total raw score (test, subject-area, battery) from Table 20, 1963 Grade Placement and Age Norms, on page 48. For each grade placement desired, read down the appropriate column (Reading Vocabulary, Reading Comprehension, Total Reading, etc.) until the pupil's raw score is found. Lay a straightedge under this figure and find the corresponding grade placement in the outer columns of the table. All grade placements are posted in the topmost row of boxes on the profile under the appropriate total score heading. On the sample, the score of 69 on Reading Vocabulary is equivalent to a grade placement of 2.9. The Total Reading grade placement is 2.9. The Total Battery grade placement is obtained in the same manner. On the sample, the Total Battery raw score of 217 is equivalent to a grade placement of 2.7. The second column from the right in Table 20 gives chronological ages in months which are typical for the grade placements in the outside columns. See item 4 below.

3. Plot raw scores across the profile chart. Locate the raw score for each section, test, or subject area on the vertical line directly under the raw-score box. Draw a circle around each section score and use a cross in a circle, \textcircled{X} , for totals. Using a straight-edge, draw lines connecting the section and total scores in each test. Note how this is done on the sample profile. The grade-placement equivalent for each score is found by referring to the scale at either side of the profile. For a more precise determination, see Table 20, 1963 Grade Placement and Age Norms, on page 48.

4. Record the pupil's actual grade placement (A.G.P.), Intellectual Status Index (I.S.I.), Grade Chronological Age (G.C.A.), and actual age at the time of testing (C.A.) in the four boxes to the right of the heavy black line which separates these boxes from the test scores. These may all be transferred from a pupil's profile sheet for the California Test of Mental Maturity Series.¹

- a. Chronological Age (C.A.) is obtained by subtracting the pupil's birthdate from the date of the test. The C.A. may be expressed in years and months, or in total months. Fractions of a month are disregarded. On the sample, the birthdate of the pupil tested in March of 1962 is June, 1954. Therefore, her C.A. is 7.9 or 93 months.

- b. Actual Grade Placement (A.G.P.), which represents the pupil's grade and month in grade at the time of testing, is deter-

mined by adding to his grade one-tenth of a grade-placement unit for each month of school completed, as shown in Table 15 below. A fraction of a month should not be counted. Thus, the second-grade pupil in the sample case, who was tested in the sixth month (March) of a school year that began in September, has an actual grade placement of 2.6. The A.G.P. will be the same for all members of a grade tested on the same date.

**TABLE 15
MONTH OF TESTING—GRADE PLACEMENT
RELATIONSHIPS***

	MONTHS	SEPTEMBER ENTRANCE	FEBRUARY ENTRANCE
September		.0	.5
October		.1	.6
November		.2	.7
December		.3	.8
January		.4	.9
February		.5	.0
March		.6	.1
April		.7	.2
May		.8	.3
June		.9	.4

*In this table, adjustments need to be made for schools that open as early as August or as late as October. If a school has semi-annual promotions, those pupils beginning the second half of the second grade in September would have an A.G.P. of 2.6 at the time of testing in October.

- c. Grade Chronological Age (G.C.A.) represents the typical age for a given grade at a particular month of the school year, and is also the same for all pupils of a grade tested on the same date. The G.C.A. is determined by entering Table 19 at the point corresponding to the pupil's actual grade placement. The chronological age paired with each A.G.P. in the table is the G.C.A. expressed in months. On the sample profile, the pupil had an A.G.P. of 2.6; consequently, her G. C. A. is 96 months, or three months in advance of her own chronological age of 93 months.

- d. Intellectual Status Index (I.S.I.) is determined by the same procedure used to find I.Q.'s except that the Grade Chronological Age, at the time of testing with the CTMM Series, is used as a reference point instead of the pupil's chronological age. The I.S.I. must be obtained from the tables in the corresponding level of the CTMM Manual, 1963 Revision using the pupil's Grade Chronological Age and total raw score. The appropriate I.Q. norm table is entered at the G.C.A. (the same for all members of the same grade tested at the same time), using the pupil's total raw score as the variable. The I.S.I. is the value found at the point in the table at which the G.C.A. and total raw score columns intersect. On the raw score columns intersect. On the

¹ It must be emphasized that I.Q.'s and I.S.I.'s obtained from the 1963 Revision of the CTMM Series can be used only in combination with the 1953 CAT norms. If a student's I.Q. was obtained from the 1957 CTMM Series, Anticipated Achievement values must be determined by using 1957 CAT norms and procedures.

FOR USE WITH 1963 NORMS

California Achievement Tests
Lower Primary - Grades 1 and 2 Form W

REVISED BY ERNEST W. LIEGS AND WILLIS W. CLARK
DIAGNOSTIC PROFILE SHEET

Name	gretchen	First	Middle	Last
Date of Birth	1962	Month	Year	Day
School	Woodland	City, Address		
Test	22			
Test Date of 1962	3			
Test Month	6			
Test Year	10			

REVISED BY ERNEST W. LIEGS AND WILLIS W. CLARK
DIAGNOSTIC PROFILE SHEET

REVISED BY ERNEST W. LIEGS AND WILLIS W. CLARK
DIAGNOSTIC PROFILE SHEET

1. READING					
ARTHMETIC					
2. READING					
VOCABULARY					
COMPREHENSION					
3. ARITHMETIC					
4. ARITHMETIC					
5. MECHANICS OF LANGUAGE					
6. SPELL.					
7. MECHANICS OF LANGUAGE					
8. PREDICTION					
9. READING					
10. READING					
11. MEANINGS					
12. MEANINGS					
13. MEANINGS					
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15. MEANINGS					
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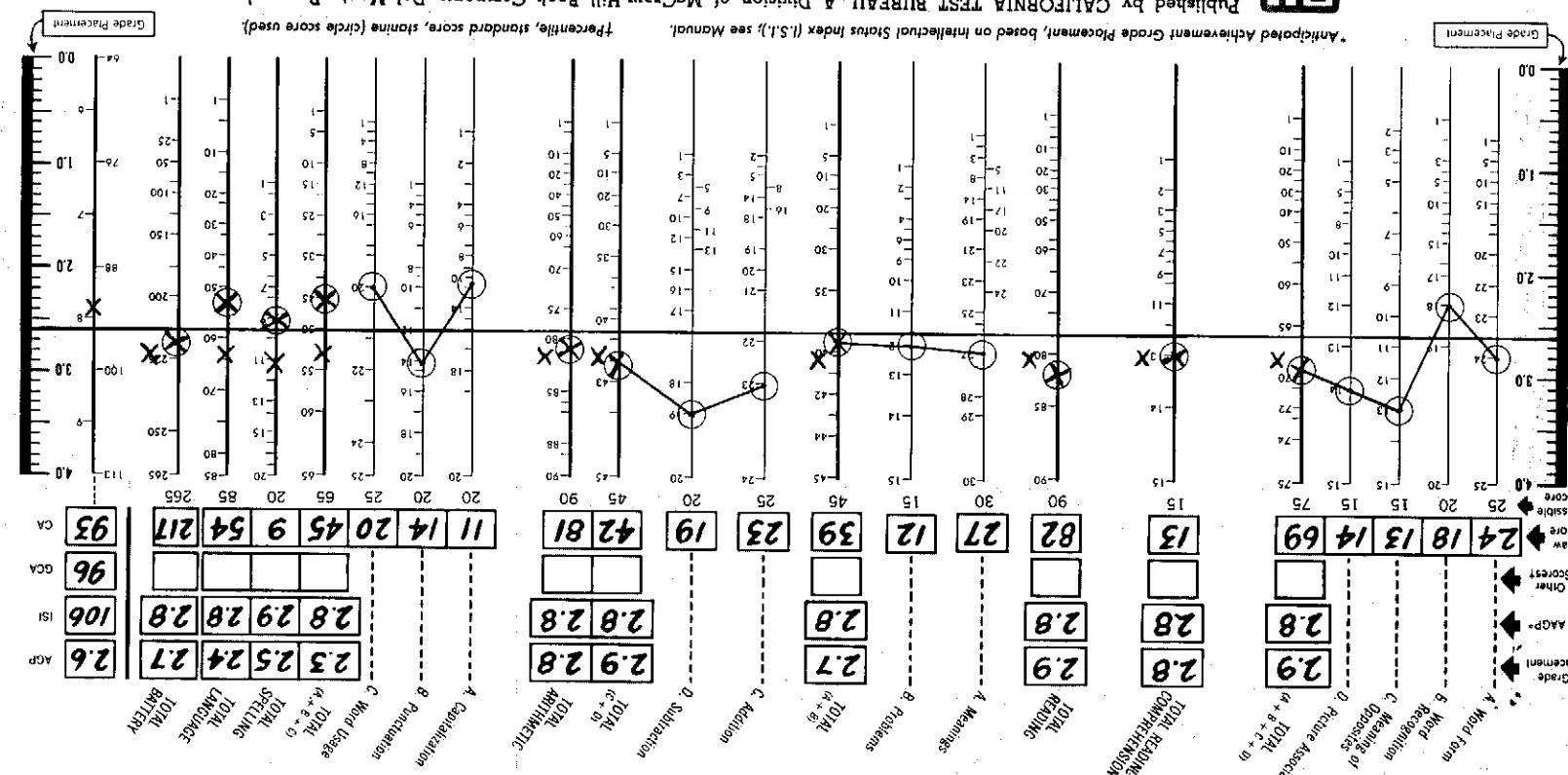


FIG. I. Sample Diagnostic Profile.

Published by CALIFORNIA TEST BUREAU, A Division of McGraw-Hill Book Company, Del Monte Research Park, Monterey, California. Copyright © 1963 by McGraw-Hill, Inc. All Rights Reserved. Printed in the U.S.A.

sample profile, the pupil's total raw score on the Short-Form (Level 1) was 74 and her G.C.A. was 96 months (2.6), yielding an I.S.I. of 106. If the CTMM testing was done in a previous school year, see the note at the end of this section for updating the I.S.I.

5. Draw a horizontal line across the profile sheet connecting the points at either side for the pupil's actual grade placement. This will permit a ready comparison of each of the scores in relation to actual grade placement. If desired, the pupil's chronological age may be plotted with an "X" on the vertical scale directly below the C.A. box. This scale is calibrated in both years and months. In the sample, the line has been drawn at the pupil's A.G.P. or 2.6. This line cuts the C.A. scale at a point between 88 and 100 months or at the pupil's Grade Chronological Age of 96 months. The distance between the line and the pupil's C.A. on the scale shows a three-month difference between her chronological age of 93 months and the Grade Chronological Age.
6. Obtain the Anticipated Achievement Grade Placement for each total score from Tables 24-26, using the pupil's I.S.I. and his actual grade placement at the time of testing. The three double-paged Anticipated Achievement Grade Placement Tables (for Grades 1 and 2) each contains the A.A.G.P.'s for half a school year. In the margins of each table are I.S.I.'s from 60 to 140. To obtain A.A.G.P.'s for a pupil, select the appropriate table for the pupil's actual grade placement at the time of testing. Enter the table at the pupil's I.S.I. and lay a straight-edge under the corresponding row of grade placements. Record the A.A.G.P.'s in the second row of boxes on the profile beneath each total grade placement. In the sample, an A.A.G.P. of 2.8 is obtained for all sub-test and total test scores with the exception of Spelling which has an A.A.G.P. of 2.9.

7. Plot A.A.G.P.'s on the profile, if desired, to show how the pupil's obtained scores differ from the performance that might be anticipated on the basis of his mental ability. Make an "X" on the heavy vertical line beneath each total score at the point that corresponds to the A.A.G.P. Note how this is done on the sample.
8. Obtain percentiles, standard scores, or stanines, if desired, from Tables 21-23. Each of these tables represents the high or low half of each grade within the grade range for a given level of the test. Enter the appropriate table with the pupil's raw score for the sub-totals and total for each subject area, and for the Total Battery. Using a straight-edge, find the percentile, standard score, or stanine corresponding to each score. At the bottom of the profile sheet, indicate which

of these scores is to be posted by circling "percentile," "standard score," or "stanine." Enter the selected scores in the row of boxes labeled "Other Scores."

NOTE: If the California Test of Mental Maturity (Long-Form or Short-Form) has been administered during a school year previous to that in which the CAT is given, the I.S.I. must be updated in order to determine precise Anticipated Achievement Grade Placements. As noted above, it is necessary to have the pupil's total raw score (or I.Q.) from the CTMM testing, as well as his own chronological age and his Grade Chronological Age. The G.C.A. changes as the pupil progresses through school; therefore, as his C.A. increases, a higher raw score is required to yield the same I.Q. It is assumed that the I.Q. remains relatively stable. At the time of the CAT testing, updating the I.S.I. necessitates finding the CTMM total raw score that yields the same I.Q. obtained on the earlier CTMM testing. The I.S.I. must reflect the pupil's grade placement at the time of the CAT testing in order to obtain the appropriate A.A.G.P.'s.

In the following steps for updating the I.S.I., the figures given in parentheses refer to the sample case used in both the CTMM and CAT manuals. These profiles show the data from concurrent testing in March of 1962. The process of updating this pupil's I.S.I. in order to secure A.A.G.P.'s for a March 1963 CAT testing is outlined below.

1. Obtain the pupil's C.A. in months for the CAT testing for which Anticipated Achievement is desired. (105 months, March 1963.)
2. Using the pupil's C.A. and I.Q. from the earlier CTMM testing, find the total raw score for the I.Q. at the increased C.A. This is done by entering the CTMM I.Q. tables at the pupil's current age (105 months) and following down to the I.Q. obtained in the previous testing (108). The total raw score value (between 79 and 80) listed at the side of the table is the figure needed to update the I.S.I.
3. Obtain the G.C.A. equivalent to the pupil's A.G.P. at the time of the CAT testing for which Anticipated Achievement is desired. (108 months, March, 1963—one year after the testing which is profiled in this manual) As the pupil's current C.A. and her current G.C.A. occur in the same table, it is possible to read directly across the row in which the I.Q. was found to obtain her I.S.I.
4. Re-enter the appropriate I.Q. table in the CTMM manual with the updated total raw score (between 79 and 80) and read across to the point of intersection with the column headed by the pupil's current G.C.A. (108 months for Grade 3.6). The value at this point (105) is the updated I.S.I. This I.S.I. may then be used to enter the 1963 CAT norm tables to find current Anticipated Achievement Grade Placements.

INTERPRETATION OF THE PROFILE

The CAT profile sheet portrays the performance of an individual in the three basic subject areas and their component parts in terms of certain reference standards—actual, obtained, and Anticipated Achievement Grade Placements, and other derived scores (percentiles, standard scores, and stanines). Determination of whether a pupil is achieving satisfactorily in school depends upon the reference standard applied. He may be achieving at his actual grade placement or above, and still not be performing up to expectancy in relation to his mental ability. The reverse may also be true: A pupil may be achieving below actual grade placement and yet be doing well in terms of his mental ability. The same applies to entire schools or school systems. For instance, a school system whose pupils have a mean I.Q. of 115 and a mean achievement at or slightly above grade placement may have greater cause for concern than a system whose pupils have a mean I.Q. of 93 and a mean achievement somewhat below actual grade placement. If ability and achievement within a school system are either exceptionally high or low, the norms for "typical" populations are not appropriate standards to use in evaluating test results without making necessary adjustments. In such districts, it may be advisable for school personnel to set up local expectancies in terms of percentiles, standard scores, or stanines derived from their own testing.

To obtain the most realistic picture of an individual pupil's achievement, different reference standards must be applied as a basis for interpretation. The profile provides a means of comparing the pupil's performance with (1) the typical performance of others who are at the same actual grade placement (A.G.P.), (2) those who obtain the same raw scores (grade placements), and (3) those of a precisely-defined grade, age, and ability group (A.A.G.P.). Raw scores may also be converted to percentiles, standard scores, or stanines, if desired. These derived scores can be readily compared with the scores of other pupils as well as with the individual's own performance on the various parts of the test. The profile thus may be used for either inter- or intra-individual comparisons. The following interpretation of the sample profile will assist in making the fullest use of all scores.

The pupils chosen for the sample CAT profiles are the same ones whose scores are profiled in the CTMM Manual for the corresponding level. This was done to exemplify the joint use of the two tests. As the norms for the two batteries were established on results from the same population, there is a valid basis for establishing expectancies in the form of Anticipated Achievement Grade Placements.

The horizontal line drawn across the profile sheet connecting the grade placement scale on either side represents the pupil's actual grade placement (2.6). That line cuts through the chronological age scale at the age typical for pupils in Grade 2.6 or 96 months. It is important in interpreting a profile to note the extent to which the age of a pupil deviates from the Grade Chronological Age, since grade-placement norms reflect age in

relation to actual grade placement as well as to mental ability. This is basic to an understanding of the Anticipated Achievement concept.

In the sample profile, the grade placements obtained by the pupil in the Reading and Arithmetic Tests are above the line which indicates her actual grade placement. Her grade placement (2.4) in the Language Test, however, falls two months below her A.G.P. Scores which lie above the actual grade placement reference line are interpreted to mean that the pupil's performance on those test units is better than the average performance of the norm group at the same actual grade placement. Scores below the reference line receive the opposite interpretation. Scores that fall on or near the reference line may be considered typical for pupils of that grade assignment.

The limits within which scores must fall to be considered "typical" will vary according to the purposes of the user and the characteristics of the pupil population. These limits are commonly determined by the standard error of measurement of the test (see page 8). Thus, a grade placement of 2.9 for Total Reading Vocabulary, with a standard error of measurement of .2 grade-placement units, may fluctuate two units either way—up to 3.1 or down to 2.7. Variation within this range for an individual is interpreted as being within normal expectancy because the "true" score lies at some point within this range.

Limits for typical scores should be established at the local level by the personnel responsible for interpreting test results. When an individual's scores depart markedly from these limits, three factors should be investigated: (1) placement of curriculum content at specific grade levels, either higher or lower than usual; (2) the chronological age of the pupil; and (3) his mental maturity. Individuals or groups older than average for their actual grade placement are generally more mature and have been exposed to more learning opportunities than typical pupils at the same grade level. Thus, when other factors are held constant, it is expected that older individuals and groups will perform better on achievement tests than will pupils who are at age and grade. Pupils with higher-than-average mental ability for their actual grade placement can also be expected to do better than average on achievement tests.

The concept of Anticipated Achievement was developed to provide realistic expectancies for an individual pupil by accounting for his mental maturity as measured on the CTMM Series, his chronological age, and his actual school experience (see pages 44-46). The pupil in the sample profile has an I.S.I. of 106. Using 100 as a point of reference—he same as with the I.Q.—this means that the Anticipated Achievement Grade Placement for a pupil of her age, I.Q., and grade would be above norm. Likewise, a pupil with an I.S.I. of 94 would have an A.A.G.P. below actual grade placement.

Examination of the sample profile shows that the pupil has an actual grade placement of 2.6 and a Total Battery Grade Placement of 2.7. Using

Diagnostic Analysis of Learning Difficulties*

California Achievement Tests—Lower Primary Battery

1. Reading Vocabulary

A. WORD FORM

- 1, 3, 4 Identical words,
lower case
- 2, 7, 12 Different words,
lower case
- 14, 19, 23 Different words,
capitals

TEST OF LETTER RECOGNITION

D. SUBTRACTION

- 1, 2, 3 Lower case
- 4, 5, 6 Mixed forms
- 7, 8, 9, 10 Capitals
- 11, 12 Mixed forms
- 13-24 Mixed forms
- 15 Number facts
- 1, 3, 5 Subtracting zeros
- 16-20 Two-place simple subtraction
- 20 Borrowing

3. Arithmetic Reasoning

A. MEANINGS

- 6, 8, 9, 11 Identical words,
mixed forms
- 13, 15, 22 Different words,
mixed forms
- 5, 10, 18 Reversed words
- 1, 11 Gross differences
- 2, 3, 5 Initial sounds
- 7, 9, 12 Final sounds
- 13, 16 Middle sounds
- 4, 6, 10 Initial sounds
- 8, 14, 15 Middle sounds
- 19, 20 Final sounds

5. Mechanics of English

A. CAPITALIZATION

- 1, 2, 3 Picture-symbol association
- 4, 5, 6 Recognizing numbers
- 7, 8, 9 Names of persons
or animals
- 10, 11, 16 Praise in "I"
- 17, 18, 19 Writing numbers
- 12, 20 Sequence of numbers
- 13, 14, 15 Comparison of numbers
- 21, 22, 23 Value of coins
- 24, 25 Telling time
- 26, 27, 28 Weight & time concepts
- 29, 30 Symbols & abbreviations

C. MEANING OF OPPOSITES

B. PROBLEMS

- 1-15 Basic vocabulary
- 1, 2, 3, 5, 6 One-step problems
- 8, 10, 11 Two-step problems
- 12, 15 Three-step problems
- 4, 7, 14 Budgeting
- 5 Sharing
- 10-15 Location of objects

C. WORD USAGE

- 1, 2, 8, 11 Number
- 14, 25 Tense
- 2, 3, 9 Good usage
- 10, 11, 19 Good usage
- 23, 24 Person
- 5, 7, 13 Good usage
- 15, 16, 17 Good usage
- 18, 20 Case

2. Reading Comprehension

D. ARITHMETIC FUNDAMENTALS

- 1, 2 Simple directions
- 3, 4, 5 Directions requiring choice
- 6, 7, 8, 11 Directly stated facts
- 9, 10, 14, 15 Inferences
- 1-20 Number facts
- 6, 6, 11, 18 Adding zeros
- 21-25 Two-place simple addition
- 22, 25 Carrying

* Consult Part 2 of the Manual for uses.

FIG. 2. Sample Diagnostic Analysis of Learning Difficulties.

the I.S.I. derived from the CTMM-SF, an Anticipated Achievement Grade Placement of 2.8 for the Total Battery was assigned as a reasonable expectation for a pupil of her age and mental ability in the high second grade. Her total achievement on the CAT battery (2.7) is one month above her actual grade placement (2.6) and one month below her Anticipated Achievement Grade Placement (2.8). These grade placements and age factors are all essential to the proper interpretation of the pupil's scores.

In the three subject areas of Reading, Arithmetic, and Language, the pupil obtained grade placements of 2.9, 2.8, and 2.4, respectively. It is apparent that her achievement in Reading and Arithmetic is slightly above expectation in view of her actual grade placement and at the level that would be all essential to the proper interpretation of the pupil's scores.

To facilitate detailed analysis, the items of the California Achievement Tests are grouped into sections. For example, the Reading Vocabulary Test is subdivided into four sections: (1) Word Form, (2) Word Recognition, (3) Meaning of Opposites, and (4) Picture Association. The number of items in each of the eleven sections of the Lower Primary Level is relatively small, ranging from fifteen to thirty. The reliability of individual sections does not justify attaching specific grade placement values to the section scores. The section scores are most helpful, however, in identifying areas which the teacher can explore for pupil weaknesses. The correct use of the section profile is to identify areas in which the teacher should proceed with the Diagnostic Analysis of Learning Difficulties described in this section.

Turning again to the sample profile, the Anticipated Achievement Grade Placement for the Total Battery is two months higher than the actual grade placement. It is necessary to study the pupil's profile for strengths and weaknesses in terms of two criteria: the "typical" achievement of pupils at Grade 2.6—indicated by the line drawn across the profile—and the Anticipated Achievement Grade Placements assigned for this pupil with an I.S.I. of 106 which are plotted with an "X" on each line for total scores. Weak areas lie in the Language Test, in both Mechanics of English and

anticipated for this pupil. In Total Reading her performance is three months above her A.G.P. (2.6) and one month above her A.A.G.P. (2.8). In the Arithmetic Test, she demonstrates similar achievement, obtaining a grade placement two months above her A.G.P. and equal to her A.A.G.P. Her Language Test scores, however, place her below her actual grade placement in Mechanics of English, Spelling, and Total Language.

The profile thus shows that this pupil achieves at expectancy in Reading and Arithmetic and below expectancy in Language. Although her Total Battery Grade Placement is one month above her A.G.P., it is one month below her A.A.G.P. There are several aspects of her achievement which should be studied in view of her mental ability represented by an I.Q. of 108.

INDIVIDUAL DIAGNOSTIC ANALYSIS

Effective classroom diagnosis is characterized by a continuing search for keys to learning difficulties. Most classroom diagnostic work is informal and involves no standardized tests. Teachers take their clues from pupils' verbal and written work. Naturally, they also capitalize on what the pupils do or fail to do on standardized achievement tests. The California Achievement Tests aid in making this search more productive. The examination of the scores of the six tests, as described in the above section on Interpretation of the Profile, is the first step in the identification of pupil weaknesses. It is suggested, however, that the search continue to the finer elements of the tests.

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Spelling, since the pupil who is expected to achieve at 2.8 and 2.9 actually achieved at 2.3 and 2.5. Scores which indicate a need for study of this pupil's performance are found in the following sections: Test 5—Section A, Capitalization and Section C, Word Usage; and Test 6, Spelling. Her skills in Word Recognition, Test 1—Section B, also should be studied in terms of her total performance and her ability.

DIAGNOSTIC ANALYSIS OF LEARNING DIFFICULTIES

The next step in the diagnostic process is a study of the Diagnostic Analysis of Learning Difficulties. As shown by the sample on page 20, the arrangement of the form corresponds to the order of the tests and sections found in the profile. Thus, the numbers and letters correspond to the tests and sections, respectively. Under each section are the names of the various categories or functional elements. The numbers of the test items which cover each of the categories are listed and bracketed with the names of these elements.

Individual responses to various test items should be examined in those sections where low scores reveal achievement below expectancy. The functional elements with which the pupil is having difficulty in each of the sections should be determined and checked on the Diagnostic Analysis of Learning Difficulties. Wrong responses to items 1, 2, 8, and 14 in Test 5—Section A, for example, may indicate a deficiency in capitalization of names of persons or animals; wrong responses to items 2, 3, 9, 10, 12, etc., in Test 5—Section C may indicate that the pupil lacks ability to use tense correctly.

Since the California Achievement Tests, Lower Primary Level, are designed to measure achievement over a two-year span, there will be items in the test that sample skills for which mastery is not normally expected of second-grade pupils. This is true to a greater degree of high first-grade pupils. Thus, teachers should examine the Diagnostic Analysis of Learning Difficulties in advance to determine the categories for which achievement approaching mastery is to be expected. Under ordinary testing conditions, an

omitted item should be interpreted to mean that the pupil did not know the answer. An analysis of omissions will no doubt reveal that the majority occur in categories that test elements that have not yet been introduced in the course of study.

Any deficiencies indicated by the Diagnostic Analysis of Learning Difficulties should be individually verified by the teacher or counselor. It then may be determined to what extent the pupil requires remedial work in specific skills or areas of learning. The purpose of the Diagnostic Analysis is to identify for further study those particular areas in which deficiencies in pupil performance may exist. In no case should this rough screening be interpreted as the sole or final indicator of a pupil's strengths or weaknesses, since the small numbers of items in some categories do not provide sufficiently high reliabilities.

One measure of reliability is shown in the following table, which presents the chances against a pupil's obtaining all correct responses by guessing. Because many of the test items provide multiple choices, chances are increased that any difficulty with functional elements will show up in the Diagnostic Analysis.

TABLE 16
CHANCES AGAINST GUESSING CORRECT
RESPONSES

NUMBER OF TEST ITEMS PER DIAGNOSTIC CATEGORY	NUMBER OF CHOICES PER TEST ITEM	2	3	4	5
2	4:1	9:1	16:1	25:1	
3	8:1	27:1	64:1	125:1	
4	16:1	81:1	256:1	625:1	
5	32:1	243:1	1024:1	3125:1	

Properly used and interpreted, the Diagnostic Analysis is therefore a valuable source of clues to areas in which a pupil's performance should be more thoroughly investigated. See the following section on Further Diagnostic and Remedial Materials.

Note on the sample Diagnostic Analysis form that a blank space is provided in front of each of the categories. These spaces may be used by the teacher to check areas in which the pupil is deficient, or to enter textbook pages or assignments in which these elements are discussed. It will be helpful if the specific items missed or omitted in problem areas are underlined or circled. As the pupil masters particular items or areas, these items may be checked off the form.

The complete Diagnostic Analysis appears on the reverse of the separate profile sheet and on the inside back cover of the battery test booklet. The portions of the form that apply to each of the subject-area tests are printed beside the partial profile on the back cover of the Reading, Arithmetic, and Language Test booklets.

Use the Diagnostic Analysis form printed in the test booklet to check the items missed by the pupil in each test and category. This is best done at the time the booklets are being scored with the hand-

scoring key. Completion and checking of the Diagnostic Analysis will be simplified if the sheet is detached and kept in the teacher's class file or the pupil's cumulative folder.

FURTHER DIAGNOSTIC AND REMEDIAL MATERIALS

Diagnostic analysis and interpretation of test results on the profile identify curriculum areas in which class and individual pupil performance shows weaknesses. Before proceeding with remedial work, the teacher needs to determine the categories and functional elements in which achievement may be expected to approach mastery in terms of the course of study, and to rule out those categories which are to be taught in subsequent grades. In some of the basic skills and functional elements, further diagnosis will be indicated in order to obtain more conclusive evidence of the need for remedial work. The next step involves curricular readjustments to teach those aspects of the basic skills identified by the above processes; these readjustments may relate to entire classes or groups, or to individual pupils as indicated by educational diagnosis. In the following paragraphs are suggested materials which will assist school personnel in such further diagnostic and remedial work.

For a general discussion of the broader aspects of evaluation pertaining to individual and group educational diagnosis, teachers and administrators are referred to the publication of Adams and Torgerson.² Although the procedures described are somewhat different, the theoretical basis for identifying needs and for strengthening skills of individuals and groups is in harmony with the preceding section.

The analysis of reading difficulties indicated by the California Reading Test will be refined and reinforced through use of the Diagnostic Reading Scales developed by Dr. George D. Spache.³ The Scales are individually-administered exercises designed to evaluate basic reading skills and to identify specific deficiencies that prevent pupils from reading satisfactorily. The reading materials are graduated from Grades 1 through 8, and are appropriate for both normal and retarded readers at the elementary level and for retarded readers at the junior and senior high school levels. The test battery comprises three word-recognition lists, twenty-two reading passages, and six supplementary phonics tests. The graded word-recognition lists are used to determine a tentative level of performance and an appropriate point for entering the reading passages. These passages yield three reading levels for each pupil: the Instructional Level (oral reading), the Independent Level (silent reading), and the Potential Level (auditory comprehension). The Scales are a valuable extension of the informal reading inventories used by many teachers, with the added advantages of validation and standardization.

² Theodore L. Torgerson and Georgia Sachs Adams, *Measurement and Evaluation for the Elementary-School Teacher* (New York: Dryden Press, 1954).

³ George D. Spache, *Diagnostic Reading Scales* (Monterey, California Test Bureau, 1963).

A number of bulletins and technical reports concerned with the use and interpretation of tests, identification of learning difficulties, and other aspects of educational diagnosis are available upon request from the California Test Bureau.

ANALYSIS AND USE OF GROUP DATA

In many situations, the teacher will find it valuable to use the test scores of the entire class for the purpose of analyzing group deficiencies and taking necessary remedial action. The *California Achievement Tests* provide a comprehensive picture of areas of class difficulty in the fundamental skills measured by the tests. The following discussion outlines the manner in which the analysis may be made.

Each package of *California Achievement Tests* booklets contains a Class Record Sheet. Instructions for entering data are included on the sheet. At the bottom of the Class Record Sheet is a summary of class data with space for entering the number of pupils achieving each grade placement (as shown by the test scores and norms for the Reading, Arithmetic, and Language Tests). Space is also provided for showing the number of pupils who have attained each percentile rank on each test.

If the summary of class data on the Class Record Sheet indicates that the class as a whole is measuring up to expected achievement in fundamental skills, remedial action will be directed primarily toward individual pupils. However, in those areas in which the class is shown to be below desired achievement, further analysis may be helpful. Class grade placements in each test section may be reviewed. When the median grade placement of the class falls below an expected level for a particular section or sections, a diagnostic analysis may be made in a manner similar to that for an individual analysis.

A complete Diagnostic Analysis of Learning Difficulties is printed on the back of each Class Record Sheet for making either a partial or a completed diagnosis. The Class Diagnostic Analysis form is used to summarize the data recorded on the individual forms. On the back of the Class Record Sheet, after each pupil's name, the teacher checks the functional elements which have been identified by item numbers on the individual Diagnostic Analysis of Learning Difficulties.

The individual achievement test data, the summary of class data, and the diagnostic analysis will provide the teacher with a wide range of information on which to base instructional planning. Uses of these data contribute to (1) grouping of pupils according to their mastery of basic skills for educational activities; (2) assignment of appropriate activities to meet the specific needs of individuals, groups, or a total class; and (3) educational guidance of pupils who demonstrate a generalized learning problem.

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A master grade summary may be prepared by combining the percentile or grade-placement data from each class summary into grade summaries in a single school or school system. The California Test Bureau publishes a report form called Summary of Survey Data for making master grade summaries for school systems. This may be used to provide administrators and supervisors with an overview of the range of achievement of each grade in the fundamental skills measured by the tests. Grade or school medians or averages in the fundamental skills may be determined from the master grade summary for many administrative purposes.

Standardized testing programs are administered for one principal purpose: to improve instruction and learning. To this end, it is essential in all

uses and interpretations of test results that school personnel be aware of the mental or physical

handicaps, the social and emotional problems, or

the language difficulties which may limit individual

performance and achievement. The potential

values of a standardized testing program will be

realized to the extent that interpretation of profiles,

educational diagnosis, and follow-up remedial pro-

grams are performed within the context of case

history data and the teacher's observations of individual pupils in the classroom.

PART 3

Directions for Administration

California Achievement Tests

GENERAL INSTRUCTIONS TO THE EXAMINER

The California Achievement Tests yield standardized and diagnostic data for three areas of basic skills. They may be administered as a complete battery; as separate Reading, Arithmetic, or Language Tests; or as individual sections of these tests. Familiarization with the general instructions that follow and adherence to procedures are essential for obtaining accurate and meaningful results.

TIME LIMITS

Each of the test sections has a time limit which must not be exceeded. The established time limits allow most pupils to try all of the items, or to complete enough items to reveal the extent of their skill mastery. Therefore, though strict time limits are imposed, the California Achievement Tests are primarily power rather than speed tests.^{1,2}

When a pupil finishes a section before time is called, he must not be allowed to go back to previous sections. However, if all pupils complete a test section in less than the specified time, the examiner should proceed with the next section.

It should be remembered that the time limits include only actual working time. Thus, timing should not start on any test section until the pupils are actually told to begin.

The total working time for the battery is 1 hour and 29 minutes. The instructions for marking answers, reading the printed instructions, and marking sample items will require additional time. Time must also be allowed for answering procedural questions, filing in identifying data, and distributing and collecting materials.

CAUTION AGAINST COACHING

It is important that pupils understand clearly the manner in which they are to mark their responses. However, the examiner should remember that this is a test and not a learning activity; therefore

¹ Lee J. Cronbach, *Essentials of Psychological Testing*, Second Edition (New York: Harper and Brothers, 1960), pp. 222-223.

² Anne Anastasi, *Psychological Testing*, Second Edition (New York: The Macmillan Company, 1961), pp. 38-39.

fore, the correct response should in no way be indicated for any items except the samples.

REST PERIODS

It is permissible to have a break or rest period after any section of the California Achievement Tests battery or between the separate tests. These may be recesses, lunch periods, or regular class activities. At the conclusion of each of the three subject tests (Reading, Arithmetic, or Language), booklets are collected, constituting a natural break in the test administration. At this level, it is recommended that only one of the subject-area tests be administered at any one sitting.

TESTING YOUNG PUPILS

Because of the immaturity and inexperience with formal testing of the children for whom this test is designed, it is advisable to give this Battery in groups of six to fifteen pupils. It is necessary for the teacher to fill in the identifying data on the back cover of the booklet. It is of special importance that the pupil's chronological age be accurate.

CHOOSING CORRECT DIRECTIONS

This manual is used for Battery as well as separate test administrations. Alternate directions for starting a test are presented in two boxes. Test battery administration parts are given first, followed by the separate test parts. It is important that the examiner read through those parts of the instructions for administration which he is going to use before beginning any testing!

Instructions for administering the tests start on the following pages, whether given separately or as a battery:

- | | |
|---|---------|
| Reading Test | Page 26 |
| Arithmetic Test | Page 28 |
| (Test 3 problems are read to pupils;
Form X follows Form W.) | |

- | | |
|---|---------|
| Language Test | Page 34 |
| (Language Test questions are read to
pupils; Form X follows Form W.) | |

DIRECTIONS FOR ADMINISTRATION FOR EITHER BATTERY OR SEPARATE TESTS

Reading Test

TIME ALLOTMENT (Testing time only):

Test 1. Reading Vocabulary.....	15 minutes
Section A	5 minutes
Section B	3 minutes
Section C	3 minutes
Section D	4 minutes
Test 2. Reading Comprehension.....	8 minutes
Total time.....	23 minutes

MATERIALS REQUIRED:

For each pupil —

- 1 test booklet—California Achievement Tests, Lower Primary Battery or the California Reading Test, Lower Primary, (Form W or X)
- 1 ordinary lead pencil with eraser attached or crayon
- 1 eraser (if not attached to pencil)
- 1 piece of scratch paper, about $8\frac{1}{2}'' \times 11''$

In addition, for the examiner —

- extra pencils or crayons
- extra erasers
- extra copy of test booklet (for demonstration purposes)
- stop watch, or watch or wall clock with second hand

It may be advisable for the teacher to fill in identifying data for each pupil before distributing booklets.

After checking to see that all pupils have pencils or crayons and erasers, distribute the test booklets, face-up.

From this point on, certain parts of these directions are printed in **this different type face** and preceded by SAY: These parts are to be read to pupils.

If pupils are to complete identifying data themselves, read the directions between the two horizontal lines; if they have already been completed, omit.

There are lines for your name, grade, age, and so on. Copy the information from the model on the board and fill in your own name, age—in years only, and date of birth. Also circle either "Boy" or "Girl" in the corner.

Give pupils time to record these data. Check to see that information is properly entered.

SAY: When you have finished, turn your booklet back to the front page and wait for further instructions.

Directions for giving the Battery booklet and the separate test are presented in the two boxes below this paragraph. Test Battery administration directions are given first, followed by separate Reading Test directions. Only one of the two is, therefore, to be read to pupils. Follow the directions in the appropriate box.

If administering the Battery booklet,

SAY: Now look at the bottom of the booklet. It says: "To Boys and Girls: This booklet has some games you will like. In taking this first part, you will show how many words you know and how well you can read. Do as many of them as you can. Do not turn this page until told to do so."

No one is expected to finish all of the parts or to do everything correctly. You may do very well even if you do not finish everything. If you do not know an answer, go on to the next question. You may come back to it later if you have time.

If administering the separate Reading booklet,

SAY: Now look at the bottom of the booklet. It says: "To Boys and Girls: This booklet has some games you will like. They will show how many words you know and how well you can read. Do as many of them as you can. Do not turn this page until told to do so."

No one is expected to finish all of the parts or to do everything correctly. You may do very well even if you do not finish everything. If you do not know an answer, go on to the next question. You may come back to it later if you have time.

First prepare on the chalkboard a model of the part on the back cover of the booklet in which identifying data are to be written. Complete the name of school, grade, teacher or examiner, date of test, and city, as they apply to your group. Note the space set off by parentheses in the middle of the second line for identifying data. This space is provided for teachers or examiners who wish pupils to indicate their section, class, room number, etc., in order to facilitate the handling of data and test booklets after tests have been scored.

SAY: Turn the booklet over. Notice in the light space in the upper right-hand corner that

SAY: If your pencil breaks or will not write, hold it up and I will give you another.

Now open the booklet to the next page which has a big 1 near the top and fold it back so that the 1 shows.

Demonstrate and be sure that all pupils have their booklets folded back to Test 1—Section A.

TEST 1 — SECTION A

Time limit, 5 minutes

SAY: This game will show how well you can recognize words that are the same and words that are different. These are the directions for this page: "Look at the words below. If two words are the same or mean the same, write S on the line between them. If they mean different things, write D."

Look at Sample A below the directions. (Point to it.) What is the first word in it? (Wait for the pupils to answer.) Yes, dog. What is the other word in the same line? (Wait for the pupils to answer.) Yes, dog. So an S is written on the line between the words. S means Same (Pause.)

What are the two words in Sample B? (Pause.) Yes, sit and fun. What is written between them? (Pause.) Yes, D, because D means different.

Ask if everyone understands and, if necessary, repeat the samples on the board. Be sure that pupils understand how they are to mark their answers before allowing them to proceed.

SAY: Now do all the others that you can on this page, beginning with number 1. Write an S or a D on each line. You may begin.

Circulate among the pupils to be sure that they have written an S or a D on the lines for the first two test items at least. However, do not tell them which of the letters to write.

After 5 minutes,

SAY: Now stop working and turn the page. Fold it back so you can see the page with the big 2 near the top.

TEST 1 — SECTION B.

Time required, about 3 minutes

SAY: This game will show how well you can recognize a word when I say it. These are the directions for this page: "Look at the boxes below. I shall read one word in each box. You are to draw a line under it."

Look at the box under Sample C. (Point to it.) Find the word, have. A line has been drawn under it. (Pause.) In the box under Sample D, find the word, ball. It has a line drawn under it.

Be sure that pupils understand how they are to mark their answers.

SAY: I am now going to read one of the words in each box and you are to draw a line under

it. Ready now for word No. 1. (Pronounce the test word for No. 1.) Draw a line under it.

(Allow 5 seconds.) Now look at box No. 2. (Pronounce the word.) Draw a line under it. (Allow 5 seconds.)

Follow this same procedure for each box, pronouncing once the words listed below for the form of the test being administered.

FORM W	FORM X
1. key	1. from
2. greet	2. them
3. full	3. clown
4. rocket	4. why
5. win	5. wrap
6. thunder	6. frown
7. sweet	7. brand
8. moan	8. road
9. tack	9. tip
10. ship	10. shot
11. cap	11. had
12. sing	12. throat
13. chase	13. where
14. rob	14. dug
15. pat	15. beat
16. strong	16. shirt
17. train	17. back
18. heat	18. swim
19. groan	19. ham
20. trout	20. whale

After the twentieth word has been pronounced and pupils have finished,

SAY: Now turn the booklet over to the page with the big 3 near the top.

TEST 1 — SECTION C

Time limit, 3 minutes

SAY: This game will show how well you can recognize words with opposite meanings. The directions for this page are: "Look at the boxes below. See the words with numbers in front of them. Draw a line from each of these words to the word on the other side which means the opposite."

Look at the box below the directions, marked Sample E. (Point to it.) The first word in the box is "yes." Look at the three words on the other side. Which word means the opposite of yes? (Pause.) "No" is the right answer. Therefore, a line has been drawn from the word, yes, to the word, no.

Be sure that pupils understand the directions and how to indicate their marks. Illustrate on the board if necessary.

SAY: Now do all the others that you can on this page, beginning with number 1.

After 3 minutes,

SAY: Now stop working and turn the page. Fold it back so you can see the page with the big 4 near the top.

TEST 1 — SECTION D

Time limit, 4 minutes

SAY: This game will show how well you can find the right word for a picture. The directions for this page are: "Look at the boxes below. In each box is a picture and some words opposite it. Draw a line under the word or words that mean the same as the picture."

Be sure that pupils understand the directions and how to indicate their marks. Illustrate on the chalkboard if necessary, as this method of answering is not the same as in the preceding section.

SAY: Now do all that you can on this page, beginning with number 1.

After 4 minutes,

SAY: Now stop working and turn the booklet over so that you see the page with the big 5 near the top.

TEST 2

Time limit, 8 minutes

SAY: This game will show how well you can follow instructions and answer questions. These are the directions for it: "Look at the sentences and stories below. Do what the sentences say and do what it says under each story."

Be sure that pupils understand the directions and how to indicate their marks, but do not read any of the sentences, stories, or directions preceded by a check mark (✓) in the test booklet.

SAY: Now do all that you can on this page, beginning with number 1. When you have finished this page, turn the page and continue working on the next page.

After 8 minutes,

TEST OF LETTER RECOGNITION

Time required, about 3-5 minutes (no time limit)

When giving this special section, after having completed the necessary preparations,

SAY: Now turn to the page that says "Letter Recognition" near the top. (Demonstrate and give help as needed.) This game will show how well you can recognize letters that are the same and letters that are different. Listen to the directions for this page. "Look at the letters below. Now put your finger under the first letter on the first line. Find another letter on the line that is the same as the first one. Draw a ring around it." Look at Sample f below the directions. (Point to it.) The first letter is w. A ring has been made around the letter opposite it which is also a w.

Be sure that pupils understand how they are to make their answers.

SAY: Now do all the others that you can on this page. Put a ring around the one letter among the four to the right that is the same as the first letter, beginning with No. 1.

Permit all pupils to complete the test.

Arithmetic Test³

TIME ALLOTMENT (testing time only):

Test 3. Arithmetic Reasoning 28 minutes

Section A 14 minutes

Section B 14 minutes

Test 4. Arithmetic Fundamentals 11 minutes

Section C 6 minutes

Section D 5 minutes

Total time 39 minutes

NOTE: It is permissible to have a break or rest period after any test section.

MATERIALS REQUIRED:

For each pupil—

- 1 test booklet—California Achievement Tests, Lower Primary Battery or the California Arithmetic Test, Lower Primary (Form W or X).
- 1 ordinary lead pencil with eraser attached or crayon
- 1 eraser (if not attached to pencil)

³If you are administering the Arithmetic Test only, be sure you have read the General Instructions to the Examiner on page 25 before proceeding.

In addition, for the examiner—
extra pencils or crayons
extra erasers
extra copy of test booklet (for demonstration purposes)
stop watch, or watch or wall clock with second hand

It may be advisable or necessary for the teacher to fill in identifying data for each pupil before distributing the separate Arithmetic booklets.

The Battery booklets will have been completed. After checking to see that all pupils have pencils or crayons and erasers, distribute the booklets, face-up, if pupils do not already have them from the Reading Test administration.

From this point on, certain parts of these directions are printed in this different type face and preceded by SAY.: These parts are to be read to pupils. Directions for giving the Battery booklet and the separate test are presented in the two boxes at the top of the next page. Test Battery administration directions are given first, followed by separate Arithmetic Test directions. Only one of the two is, therefore, to be read to pupils. Follow the directions in the appropriate box.

If administering the Battery booklet,
SAY: Open Your booklets to page 11 which says, "Arithmetic." (Help pupils find the place, if necessary.) Below that, find "To Boys and Girls: The games in this part of the booklet will show how well you can think and work problems. Do as many of them as you can. Do not turn this page until told to do so."

No one is expected to finish all of the parts or to do everything correctly. You may do very well even if you do not finish everything. If you cannot do a problem, go on to the next one. You may come back to it later if you have time.

Now turn to the next page, which has a big 1 near the top, and fold it back so that the 1 shows.

Demonstrate and be sure that all pupils have their booklets folded back to Test 3 — Section A.

From this point on, the directions are for Form W only. Directions for Form X begin on page 31.

If administering the separate Arithmetic booklet,

read the directions between the horizontal lines if pupils are to complete identifying data themselves; if data have already been completed, omit.

First prepare on the chalkboard a model of the part on the back cover of the booklet in which identifying data are to be written. Complete the name of school, grade, teacher or examiner, date of test, and city, as they apply to your group.

Note the space set off by parentheses in the middle of the second line for identifying data. This space is provided for teachers or examiners who wish pupils to indicate their section, class, room number, etc., in order to facilitate the handling of data and test booklets after tests have been scored.

SAY: Turn the test booklet over. Notice in the light spaces in the upper right-hand corner that there are lines for your name, grade, age, and so on. Copy the information from the model on the board, and fill in your own name, age — in years only, and date of birth. Also circle either "Boy" or "Girl" in the corner.

Give pupils time to record these data. Check to see that information is properly entered.

SAY: When you have finished, turn your booklet back to the front page and wait for further instructions.

When all pupils have finished,

SAY: Look at the bottom of your booklets. It says: "To Boys and Girls: This booklet has some games you will like. They will show how well you can think and work problems. Do as many of them as you can. Do not turn this page until told to do so."

No one is expected to finish all of the parts or to do everything correctly. You may do very well even if you do not finish everything. If you cannot do a problem, go on to the next one. You may come back to it later if you have time.

If your pencil breaks or will not write, hold it up and I will give you another.

Now open the booklet to the next page which has a big 1 near the top and fold it back so that the 1 shows.

Demonstrate and be sure that all pupils have their booklets folded back to Test 3 — Section A.

From this point on, the directions are for Form W only. The directions for Form X begin on page 31.

FORM W

TEST 3 — SECTION A (Form W)

Time required, about 14 minutes

SAY: Listen to the directions as I read them. Then do what I tell you to do. Look at the two rows of boxes. Each of the boxes in the first row has some things in it. Each of the boxes in the second row has a number in it. You are to count the number of things in each box in the first row, and then draw a line to the box in the second row that shows this number. Now look at Samples A and B (Point to them.) The boxes on one side have one triangle and two apples. The numbers 2 and 1 are in the boxes on the other side. A line has been drawn from the box with one triangle to the box with number 1 in it. A line has also been drawn from the box with the two apples to the box with number 2 in it.

Demonstrate, emphasizing that lines are to be drawn from the objects on the left to the numbers in the column on the right.

SAY: Now do the same thing with the other boxes. You may begin.

After 1 minute on this part,

SAY: Now turn to the next page with the big 2 near the top, fold your booklet back, and listen to the directions as I read them. Then do what I tell you to do. Look at the boxes below. Each of the boxes in the first row has a number in it. Each of the boxes in the other row has a word in it which means a number.

You are to draw a line from each box with a number to the box in the other row that has the word that means the same as that number.

Now look at Samples C and D. (Point to them.) In the first pair of boxes, the numbers 1 and 2 are written. In the other pair of boxes we find the words, two and one, written. A line has been drawn from the box with the number 1 to the box with the word, one. A line has also been drawn from the box with the number 2 to the box with the word, two. Demonstrate, emphasizing that lines are to be drawn from the numbers on the left to the words in the column on the right.

SAY: Now do the same thing with the other boxes. You may begin.

After 3 minutes on this part,

SAY: Now turn the booklet over so you can see the page with the big 3 near the top. "On this page are a few problems. Listen while I read them to you." The first three problems have some lines in them. You are to write the number that belongs on each line.

Problem 10: There are some pigs. Now fill in the number of pigs you see.

(Pause.)

Pause until all have had an opportunity to write in the number.

Problem 11: There are some birds. Now fill in the number of birds you see. (Pause.)

Problem 12 has a row of numbers. Some of the numbers have been left out. Write the numbers that are left out in the blank spaces. (Pause.)

SAY: In the next three problems we have three boxes with two numbers in each box. Draw a circle around the larger number in each box. Pause until all have tried this, then

SAY: In the next four problems are words that mean numbers. Write the number that means the same as each word on the line that follows it. (Pause.)

Problem 20 has a row of numbers. Some of the numbers have been left out. Write the numbers that are left out in the blank spaces. When this has been completed,

SAY: Now turn the page and fold it back so you can see the big 4 near the top. "Listen to the directions as I read them. Then do what I tell you to do."

Look at Problem number 21. It says: "10 pennies are the same as 1 nickel, 1 quarter, or 1 dime." One of the three answers is the right answer. Draw a line under it. I shall repeat. Repeat the problem. Pause for approximately ten seconds.

SAY: Now look at problem 22: "10 dimes are the same as 1 quarter, 1 nickel, or 1 dollar." One

of the three answers is the right answer. Draw a line under it. I shall repeat.

Repeat. Pause for approximately ten seconds.

SAY: Now look at problem 23: "1 dollar is the same as 4 quarters, 4 half dollars, or 4 dimes." One of the three answers is the right answer. Draw a line under it. I shall repeat.

Repeat. Pause for approximately ten seconds.

SAY: The next two problems have pictures of a clock. Study the minute hand and the hour hand of each clock. Then write the number that tells the correct time for each clock in the space in the sentence below it.

Pause for approximately twenty to thirty seconds.

SAY: The next problems have four possible answers. I am going to read a little story for each set of four answers. Listen to the story and decide which one of the four answers seems to be the most correct. Then draw a line under the answer that you think is the right one.

Problem 26. On the way to school Johnny found four sacks in a box. The sacks were all filled to the same size. They were not the same weight. What do you think was in the lightest sack? "Lemons, rice, corn, or potato chips." Draw a line under the answer that you think is the right one. I shall repeat.

Repeat the problem. Pause for answer.

SAY: Problem 27. Bill is a second grade boy. The other day the nurse weighed him. She wrote his weight on a sheet of paper. Which of the four weights do you think she wrote? "6 pounds, 35 pounds, 52 pounds, 106 pounds." Draw a line under the answer that you think is the right one. I shall repeat.

Repeat the problem. Pause.

SAY: Problem 28. Mary lives one block from school. Today she walked to school without stopping. How long do you think it took her? "3 minutes, 10 minutes, 20 minutes, 30 minutes." Draw a line under the answer that you think is the right one. I shall repeat.

Repeat the problem. Pause.

SAY: Problem 29. Mary asked her teacher to make a drawing of a circle. The teacher drew one. You are to draw a line under the answer that shows what the teacher drew. I shall repeat.

Repeat the problem. Pause.

SAY: Problem 30. A man told Johnny that he would give him a penny for every foot that he could broad jump. Johnny jumped as far as he could. The man then gave him seven cents. You are to draw a line under the answer that tells how far Johnny jumped. I shall repeat.

Repeat the problem. Pause.

SAY: Now turn the booklet over so you can see the page with the big 5 near the top.

TEST 3 — SECTION B (Form W)

Time required, about 14 minutes

SAY: "Listen to the directions as I read them. Then do what I tell you to do." I am going to read some problems to you. Each problem has some numbers. These numbers are written in your booklet. After I have read the problem, you are to work it. Then write the answer in the box. Are there any questions?"

After questions have been answered,

SAY: Now listen to Problem 1. Gail's mother hen had eight fluffy little chicks. When they were big enough to leave their mother, Gail gave a chick to each of her five best friends. How many chicks did Gail have left? Now write your answer in the box. I shall repeat.

Repeat the problem. Pause for answer.

SAY: Problem 2. Yesterday there were seven rulers in Miss Olson's second-grade room. Today Miss Benson's first-grade room borrowed five of the rulers. How many rulers are left? Now write your answer in the box. I shall repeat.

Repeat the problem. Pause.

SAY: Problem 3. Mother gave Helen five cents. Helen owed Jane two cents. After she paid Jane, how much money did Helen have left? Now write your answer in the box. I shall repeat.

Repeat the problem.

SAY: Problem 4. Roberta wanted to earn some money for Christmas. Her mother made some doughnuts for her to sell. On the first day, Roberta sold two boxes. The next two days she sold five boxes and one box. How many boxes did she sell? I shall repeat.

Repeat the problem.

SAY: Problem 5. Johnny, Tommy, and Frank were playing in Johnny's back yard. His dad gave Johnny five cookies and asked him to share them with his friends. Johnny gave Tommy one cookie and Frank two cookies. How many cookies did Johnny then have? I shall repeat.

Repeat the problem.

SAY: Problem 6. Eight pupils wanted to paint. There were places for only six pupils to paint. How many had to find something else to do? I shall repeat.

Repeat the problem.

SAY: Problem 7. Susan went on "trick or treat" last Halloween. She got five pieces of candy at the first house, one piece at the second, and three pieces at the third house. How many pieces of candy did she get from all three places? I shall repeat.

Repeat the problem.

SAY: Problem 8. Apples can easily be divided into halves. If I divide five apples into halves, how many pieces will I have? I shall repeat. Repeat the problem.

SAY: Problem 9. Bob has a cat and a dog. He feels he is very strong because he can lift both of his pets at one time. How much does Bob lift if the dog weighs five pounds and the cat weighs two pounds? I shall repeat.

Repeat the problem.

SAY: Problem 10. Mae's mother had ten pounds of sugar. She gave half of the sugar to Mrs. Nelson. How many pounds of sugar did Mrs. Nelson get? I shall repeat.

Repeat the problem.

SAY: Problem 11. Jim's mother cut a pear into quarters. How many pieces were there? I shall repeat.

Repeat the problem.

SAY: Problem 12. Jane went to the store to buy some onions. She gave the clerk ten cents. The clerk gave her six cents change. How much did the onions cost? I shall repeat.

Repeat the problem.

SAY: Problem 13. Bob had seven rabbits. He gave four away. One of his rabbits then had two young ones. How many did he then have? I shall repeat.

Repeat the problem.

SAY: Problem 14. Jean decided to save her money to buy her mother a present. The first day she earned ten cents. The second day she bought some candy for four cents and then got two cents from her sister. How much money did she then have? I shall repeat.

Repeat the problem.

SAY: Problem 15. Mr. Nelson bought a pig that weighed two pounds. In three weeks, the pig doubled his weight. What did the pig then weigh? I shall repeat.

Repeat the problem.

SAY: Now turn the page and fold it back so you can see the page with the big 6 near the top. Directions for Test 4 — Section C are found on page 34.

TEST 3 — SECTION A (Form X)

Time required, about 14 minutes

SAY: Listen to the directions as I read them. Then do what I tell you to do." Look at the two rows of boxes. Each of the boxes in the first row has some things in it. Each of the boxes in the second row has a number in it. You are to count the number of things in each box in the first row and then draw a line to the box in the second row that shows this number.

Now look at Samples A and B. (Point to them.)
The boxes on one side have one triangle and two apples. The numbers 2 and 1 are in the boxes on the other side. A line has been drawn from the box with one triangle to the box with the number one in it. A line has also been drawn from the box with the two apples to the box with the number two in it.

Demonstrate, emphasizing that lines are to be drawn from the objects on the left to the numbers in the columns on the right.

SAY: Now do the same thing with the other boxes. You may begin.

After 1 minute,

SAY: Now turn to the next page with the big 2 near the top, fold your booklet back, and listen to the directions as I read them. Then do what I tell you to do. Look at the boxes below. Each of the boxes in the first row has a number in it. Each of the boxes in the other row has a word in it which means a number. You are to draw a line from each box with a number to the box in the other row that has the word that means the same as that number.

Now look at Samples C and D. (Point to them.) In the first pair of boxes, the numbers 1 and 2 are written. In the other pair of boxes, we find the words, two and one, written. A line has been drawn from the box with the number 1 to the box with the word, one. A line has also been drawn from the box with the number 2 to the box with the word, two.

Demonstrate, emphasizing that lines are to be drawn from the numbers on the left to the words in the column on the right.

SAY: Now do the same thing with the other boxes. You may begin.

After 3 minutes on this part,

SAY: Now turn the booklet over so you can see the page with the big 3 near the top. "On this page are a few problems. Listen while I read them to you." The first three problems have some lines in them. You are to write the number that belongs on each line.

Problem 10: There are some dogs. Now fill in the number of dogs you see. (Pause.)

Pause until all have had an opportunity to write in the number.

Problem 11: There are some birds. Now fill in the number of birds you see. (Pause.)

Problem 12 has a row of numbers. Some of the numbers have been left out. Write the numbers that are left out in the blank spaces. (Pause.)

SAY: In the next three problems we have three boxes with two numbers in each box. Draw a circle around the larger number in each box.

Pause until all have tried this, then

SAY: In the next four problems are words that mean numbers. Write the number that means the same as each word on the line that follows it. (Pause.)

Problem 20 has a row of numbers. Some of the numbers have been left out. Write the numbers that are left out in the blank spaces.

When this has been completed,

SAY: Now turn the page and fold it back so you can see the big 4 near the top. "Listen to the directions as I read them. Then do what I tell you to do." Look at problem number 21. It says, "5 pennies are the same as 1 dime, 1 quarter, or 1 nickel." One of the three answers is the right answer. Draw a line under it. I shall repeat.

Repeat the problem. Pause for approximately ten seconds.

SAY: Now look at problem 22: "2 quarters are the same as 1 dollar, 1 dime, or 1 half dollar." One of the three answers is the right answer. Draw a line under it. I shall repeat.

Repeat. Pause for approximately ten seconds.

SAY: Now look at problem 23: "10 nickels are the same as 1 half dollar, 1 quarter, or 1 dollar." One of the three answers is the right answer. Draw a line under it. I shall repeat.

Repeat. Pause for approximately ten seconds.

SAY: The next two problems have pictures of a clock. Study the minute hand and the hour hand of each clock. Then write the number that tells the correct time for each clock in the space in the sentence below it.

SAY: Pause for approximately twenty to thirty seconds.

SAY: The next problems have four possible answers. I am going to read a little story for each set of four answers. Listen to the story and decide which one of the four answers seems to be the most correct. Then draw a line under the answer that you think is the right one.

Problem 26. On the way to school Johnny found four sacks in a box. The sacks were all the same size. They were not the same weight. What do you think was in the lightest sack? "Bacon, beans, salt, cornflakes." Draw a line under the answer that you think is the right one. I shall repeat.

Repeat the problem. Pause for answer.

SAY: Problem 27. June is in the second grade. The other day the nurse weighed her. She wrote her weight on a sheet of paper. Which of the four weights do you think she wrote? "8 pounds, 20 pounds, 48 pounds, 102 pounds." Draw a line under the answer that you think is the right one. I shall repeat.

Repeat the problem. Pause.

SAY: Problem 28. Mary lives three blocks from school. Today she walked to school without stopping. How long do you think it took her? "2 minutes, 8 minutes, 25 minutes, 45 minutes." Draw a line under the answer that you think is the right one. I shall repeat.

Repeat the problem. Pause.

SAY: Problem 29. Mary asked her teacher to make a drawing of a triangle. The teacher drew one. You are to draw a line under the answer that shows what the teacher drew. I shall repeat.

Repeat the problem. Pause.

SAY: Problem 30. A man told Johnny he would give him one dollar a week if he would work for him. Johnny worked for the man for seven weeks and the man then gave him some money. You are to draw a line under the answer that tells how much money the man gave him. I shall repeat.

Repeat the problem. Pause.

SAY: Now turn the booklet over so you can see the page with the big 5 near the top.

TEST 3 — SECTION B (Form X)

Time required, about 14 minutes

SAY: "Listen to the directions as I read them. Then do what I tell you to do." I am going to read some problems to you. Each problem has some numbers. These numbers are written in your booklet. After I have read the problem, you are to work it. Then write the answer in the box. Are there any questions?

After questions have been answered,

SAY: Now listen to problem 1. Gail's mother cat had six cuddly little kittens. When they were big enough to drink milk from a dish, Gail gave a kitten to each of her four best friends. How many kittens did Gail have left? Now write your answer in the box. I shall repeat.

Repeat the problem. Pause for answer.

SAY: Problem 2. Yesterday there were eight erasers in Miss Olson's second-grade room. Today Miss Benson's first-grade room borrowed four of the erasers. How many erasers are left? Now write your answer in the box. I shall repeat.

Repeat the problem. Pause.

SAY: Problem 3. Mother gave Helen ten cents. Helen owed Jane six cents. After she paid Jane, how much money did Helen have left? Now write your answer in the box. I shall repeat.

Repeat the problem.

SAY: Problem 4. Sylvia wanted to earn some money for Christmas. Her mother made some candy for her to sell. On the first day, Sylvia sold six boxes. The next two days she sold two boxes and one box. How many did she sell? I shall repeat.

Repeat the problem.

SAY: Problem 5. Johnny, Tommy, and Frank were playing in Johnny's back yard. His dad gave Johnny seven pieces of candy and asked him to share them with his friends. Johnny gave Tommy three pieces and Frank two pieces. How many pieces of candy did Johnny then have? I shall repeat.

Repeat the problem.

SAY: Problem 6. Nine pupils wanted to paint. There were places for only five pupils to paint. How many had to find something else to do? I shall repeat.

Repeat the problem.

SAY: Problem 7. Peter's team got to bat three times during recess. They scored one run the first inning, five runs the second inning, and two runs the third. How many runs did they score in all three innings? I shall repeat.

Repeat the problem.

SAY: Problem 8. Bananas can easily be divided into halves. If I divide three bananas into halves, how many pieces will I have. I shall repeat.

Repeat the problem.

SAY: Problem 9. Bob has a cat and a dog. He feels he is very strong because he can lift both of his pets at one time. How much does Bob lift if the cat weighs two pounds and the dog weighs six pounds? I shall repeat.

Repeat the problem.

SAY: Problem 10. Mae's mother had eight pounds of sugar. She gave half of the sugar to Mrs. Nelson. How many pounds of sugar did Mrs. Nelson get? I shall repeat.

Repeat the problem.

SAY: Problem 11. Jim's mother cut an orange into halves. How many pieces were there? I shall repeat.

Repeat the problem.

SAY: Problem 12. Jane went to the store to buy an onion. She gave the clerk ten cents. The clerk gave her eight cents change. How much did the onion cost? I shall repeat.

Repeat the problem.

SAY: Problem 13. Bob had five rabbits. He gave three away. One of his rabbits then had two young ones. How many did he then have? I shall repeat.

Repeat the problem.

SAY: Problem 14. Jean decided to save her money to buy her mother a present. The first day she earned ten cents. The second day she bought some candy for five cents and then got two cents from her sister. How much money did she then have? I shall repeat.

Repeat the problem.

SAY: Problem 15. Mr. Nelson bought a pig that weighed three pounds. In three weeks, the pig doubled his weight. What did the pig then weigh? I shall repeat.

Repeat the problem.

SAY: Now turn the page and fold it back so you can see the page with the big 6 near the top.

Directions for Test 4 — Section C, for both Forms W and X, follow immediately.

FORMS W & X

TEST 4 — SECTION C (Forms W and X)

Time limit, 6 minutes

SAY: The directions for this game are: "Look at these problems. You are to add the numbers each time and write your answer under them."

If necessary, indicate where pupils are to mark their answers, but do not tell them what the answers are.

SAY: You may begin.

After 6 minutes,

SAY: Now stop working and turn the booklet over so you can see the page with the big 7 near the top.

TEST 4 — SECTION D (Forms W and X)

Time limit, 5 minutes

SAY: The directions for this game are: "Look at these problems. You are to subtract, or take away, in each problem and write your answer under it."

Circulate among the pupils and see that they are writing their answers in the right places. Any pupil may be told ONCE that he should "take away."

After 5 minutes,

SAY: Stop working on this game.

If this completes a testing period, collect the booklets. Be sure that you have received all of the booklets.

Language Test⁴

TIME ALLOTMENT (Testing time only):

Test 5. Mechanics of English	17 minutes
Test 6. Spelling (and Handwriting)	10 minutes
Total time	27 minutes

MATERIALS REQUIRED:

For each pupil —

- 1 test booklet, California Achievement Tests, Lower Primary Battery or the California Language Test, Lower Primary (Form W or X)
- 1 ordinary lead pencil with eraser attached or crayon
- 1 eraser (if not attached to pencil)

In addition, for the examiner —

- extra pencils or crayons
- extra erasers
- extra copy of test booklet (for demonstration purposes)
- stop watch, or watch or wall clock with second hand.

⁴If you are administering the Language Test only, be sure you have read the General Instructions to the Examiner on Page 25 before proceeding.

If administering the Battery booklet,

SAY: Open your booklets to page 21 which says, "Language." (Help pupils find the place if necessary.) Below that, find "To Boys and Girls: The games in this part of the booklet will show what you know about capital letters, periods, commas, and so forth, and how well you can spell. Do the best you can. Do not turn this page until told to do so."

No one is expected to finish all of the parts nor to do everything correctly. You may do very well even if you do not finish everything. If you do not know an answer, go on to the next sentence. You may come back to it later if you have time.

Now turn to the page with the big 1 near the top and fold it back so that the 1 shows.

Demonstrate and be sure that all pupils have their booklets folded back to Test 5—Section A.

From this point on, the directions are for Form W only. Directions for Form X begin on page 37.

If administering the separate Language booklet,

read the directions between the horizontal lines below if pupils are to complete identifying data themselves; if data have already been completed, omit.

First prepare on the chalkboard a model of the part on the back cover of the booklet in which identifying data are to be written. Complete the name of school, grade, teacher or examiner, date of test, and city, as they apply to your group. Note the space set off by parentheses in the middle of the second line for identifying data. This space is provided for teachers or examiners who wish pupils to indicate their section, class, room number, etc., in order to facilitate the handling of data and test booklets after tests have been scored.

SAY: Turn the booklet over. Notice in the light space in the upper right-hand corner that there are lines for your name, grade, age, and so on. Copy the information from the model on the board and fill in your own name, age—in years only, and date of birth. Also circle either "Boy" or "Girl" in the corner.

Give pupils time to record these data. Check to see that information is properly entered.

SAY: When you have finished, turn your booklet back to the front page and wait for further instructions.

When all pupils have finished,

SAY: Look at the bottom of your booklet. It says: "To Boys and Girls: This booklet has some games you will like. They will show what you know about capital letters, periods, commas, and so forth, and how well you can spell. Do the best you can. Do not turn this page until told to do so."

No one is expected to finish all of the parts nor to do everything correctly.

You may do very well even if you do not finish everything. If you do not know an answer, go on to the next sentence. You may come back to it later if you have time.

If your pencil breaks or will not write, hold it up and I will give you another.

Now open the booklet to the next page which has a big 1 near the top and fold it back so that the 1 shows.

Demonstrate and be sure that all pupils have their booklets folded back to Test 5—Section A.

From this point on, the directions are for Form W only. The directions for Form X begin on page 37.

FORM W

TEST 5 — SECTION A (Form W)

Time required, about 5 minutes

SAY: The directions for this game are at the top of the page. Listen while I read them: "Below are some sentences. You are to make an X on each word not already capitalized that should start with a capital letter." I shall read each sentence to you once and give you time to mark your answer afterwards. Remember to make only one X in each sentence. Are there any questions?

Be sure that pupils understand how to mark their answers before proceeding. Demonstrate how to make an X on the chalkboard.

SAY: I am now going to read the sentences.

Read each sentence slowly, in a clear, steady voice. Allow sufficient time after each sentence for pupils to mark the answer.

1. We heard Jim.
2. My parrot's name is Polly.
3. May I play a game?
4. When will you leave?
5. We are walking to school.
6. Fall starts in September.
7. We don't have school on Saturday.
8. Do you like Mary?
9. Mother baked a pie last Tuesday.
10. My family comes from Seattle.
11. May I have some cake?
12. We can swim in July.
13. My dad stayed in Cleveland.
14. I love my little dog, Spot.
15. I know that Baltimore is a city.
16. Shall I read it?
17. Did you close the door?
18. It often rains in October.
19. Do you think I should go?
20. My grandmother has gone on a trip.

Allow pupils time to finish marking their answers. Then,

SAY: Now turn to the page with the big 2 near the top.

TEST 5 — SECTION B (Form W)

Time required, about 5 minutes

SAY: **The directions for this game are at the top of the page. Listen while I read them.** "Below are some sentences and a story. You are to write in the periods, commas, and question marks that have been left out of the sentences and the story." Be sure to make your marks heavy and dark so that they are easy to see. I shall read each sentence to you once, giving you time to put in the periods, commas, or question marks afterwards. Remember that only one period, or comma, or question mark is left out in each line. Are there any questions?

Be sure that pupils understand how to mark their answers before proceeding.

SAY: **I am now going to read the sentences.**

Read each sentence below slowly, in a clear, steady voice. Allow sufficient time after each sentence for pupils to insert the punctuation.

1. He is lazy.
2. Should we run?
3. I help my mother very often.
4. Where is your cat?
5. We like school.
6. Susan lives in Eugene, Oregon.
7. Who sent you here?
8. I am drying dishes.
9. We went to see Dr. Brown.
10. Will you go to the zoo?
11. I walked with Mark, Jim, and Ray.
12. Have you seen my new bicycle?
13. He finished on March 11, 1956.
14. How did you hurt your finger?
15. The date was August 30. ('Aug' appears in the booklet.)
16. My brother asked me for a bat, a mask, and a glove.

Then,

SAY: **I shall now read the story, giving you time after each line to put in the periods, commas, and question marks as you did in the sentences.**

Read the following story, pausing after each sentence to allow pupils to insert the punctuation.

Mary got a package for her birthday.

In it were apples, peaches, and cherries.

Do you think Mary liked her present?

Yes, she said that she liked it very much.

Allow pupils time to finish inserting the punctuation. Then,

SAY: **Now turn to the page with the big 3 near the top.**

TEST 5 — SECTION C (Form W)

Time required, about 7 minutes

SAY: **The directions for this game are at the top of the page. Listen while I read them.** "Each sentence below has two words placed one above the other. You are to make an X on the one which you think is correct in each sentence."

I shall read the sentence the first time using the top word, the next time using the bottom word, and give you time afterwards to mark the word you think is right. Are there any questions?

Be sure that pupils understand how to mark their answers before proceeding.

SAY: **I am now going to read the sentences.**

Read each pair of the following sentences slowly, in a clear, steady voice. After the reading of the second sentence in each pair, pause to allow sufficient time for pupils to mark the answer.

1. He are my cousin.
He is my cousin.
2. Can you went out now?
Can you go out now?
3. Beth come home and cried.
Beth came home and cried.
4. We were told to sit down.
We was told to sit down.
5. Mark read the poem too the class.
Mark read the poem to the class.
6. My sister am six years old.
My sister is six years old.
7. I have read those books before.
I have read them books before.
8. She were a nice girl.
She was a nice girl.

SAY: **Now go on to the next page.**

9. He run all the way to school.
He ran all the way to school.
10. She see the cow in the barn.
She saw the cow in the barn.
11. I am a good pupil.
I are a good pupil.
12. A man came to the door.
A man comed to the door.
13. I didn't hear no noise.
I didn't hear no noise.
14. There were no ducks on the lake.
There was no ducks on the lake.
15. I try not to talk too much.
I try not to talk two much.
16. Is this here your pencil?
Is this your pencil?
17. He can read very well.
He may read very well.

SAY: **Now go on to the next page.**

18. She will give me them dolls.
She will give me these dolls.
19. We have runned many blocks.
We have runned many blocks.
20. When can I come again?
When may I come again?
21. She doesn't read well.
She don't read well.
22. She and I are good friends.
She and me are good friends.
23. I just began my lessons.
I just begun my lessons.

24. I have just wrote a poem.

I have just written a poem.

25. Isn't most houses painted white?

Aren't most houses painted white?

Allow pupils time to finish marking their answers. Then,

SAY: Now turn to the page with the big 4 near the top.

TEST 6

Time required, about 10 minutes

SAY: The directions for this game are, "Write the words that are pronounced." I shall give you

- some words to spell. I shall read each word, use it in a sentence, and then read it again. Then you will write the word that I read on the line I name. On line 1, write the word, (Read word No. 1, the sentence, and then repeat word number 1. Pause.) On line No. 2, write the word, _____ (Repeat the above routine for each word.)**
- When pupils have had the opportunity to write the last word of this test,

SAY: Stop. Put your pencils down.

Collect the booklets. Be sure that you have received all of them.

SPELLING WORDS, FORM W

1. as He was dressed AS a clown. as
2. it IT is a fine day. it
3. can I CAN do many things. can
4. cat I have a little CAT. cat
5. fox The FOX is a sly animal. fox
6. away The stars are far AWAY. away
7. gave You GAVE me your word. gave
8. night She slept all NIGHT. night
9. near We live NEAR the school. near
10. afternoon He takes a nap in the AFTERNOON. afternoon
11. letter Please write me a LETTER. letter
12. when I don't know WHEN he came. when
13. left She LEFT her coat on the bench. left
14. yard Let's play in our YARD. yard
15. brother John is my BROTHER. brother
16. few There are FEW peaches on the tree. few
17. morning I take a bath every MORNING. morning
18. church I like to go to CHURCH. church
19. friend He is my best FRIEND. friend
20. beach I like to go to the BEACH. beach

HANDWRITING

No separate directions are needed for the administration of the handwriting test. The pupil provides the samples for scoring handwriting when he writes the first five spelling words. However, the examiner is reminded that the pupil's grade placement is not affected if handwriting samples are not scored; handwriting is not an integral part of the language test score.

Be sure that pupils understand how to mark their answers before proceeding. Demonstrate how to make an X on the chalkboard.

SAY: I am now going to read the sentences.

Read each sentence slowly, in a clear, steady voice. Allow sufficient time after each sentence for pupils to mark the answer.

1. We called Bob.

2. My dog's name is Spot.

3. May I have an apple?

4. Where do you live?

5. We are going to the store.

6. School starts in September.

7. We wash clothes on Monday.

8. Have you seen Helen?

9. Father bought a new hat last Thursday.

10. Mother visited in Oakland.

11. May I go with you?

12. We start a new year in January.

13. My uncle lives in Dallas.

14. I lost my pet duck, Squeaky.

15. I think Detroit is a big city.

16. When may I go?

17. Did you see the birds?

FORM X

TEST 5 — SECTION A (Form X)

Time required, about 5 minutes

SAY: The directions for this game are at the top of the page. Listen while I read them: "Below are some sentences. You are to make an X on each word not already capitalized that should start with a capital letter." I shall read each sentence to you once and give you time to mark your answer afterwards. Remember to make only one X in each sentence. Are there any questions?

18. The last month is December.
 19. Do you think I can jump high?
 20. My aunt was here yesterday.

Allow pupils time to finish marking their answers. Then,

SAY: Now turn to the page with the big 2 near the top.

TEST 5 — SECTION B (Form X)

Time required, about 5 minutes

SAY: The directions for this game are at the top of the page. Listen while I read them. "Below are some sentences and a story. You are to write in the periods, commas, and question marks that have been left out of the sentences and the story." Be sure to make your marks heavy and dark so that they are easy to see. I shall read each sentence to you once, giving you time to put in the periods, commas, or question marks afterwards. Remember that only one period, or comma, or question mark is left out in each line. Are there any questions?

Be sure that pupils understand how to mark their answers before proceeding.

SAY: I am now going to read the sentences.

Read each sentence below slowly, in a clear, steady voice. Allow sufficient time after each sentence for pupils to insert the punctuation.

1. He is tired.
2. Can you come?
3. I drink my cocoa very hot.
4. Who took my candy?
5. We sang carols.
6. Lee comes from Tampa, Florida.
7. Why did you call?
8. I am staying here.
9. We all looked at Mrs. Jones.
10. Will you hand me my coat?
11. I visited Frank, Steve, and Bill.
12. Did you find your notebook?
13. They started work on May 22, 1956.
14. When did you see the circus?
15. The date was January 21. ("Jan" appears in the booklet.)
16. My cousin sent me a coat, a hat, and a shirt.

Then,

SAY: I shall now read the story giving you time after each line to put in the periods, commas, and question marks as you did in the sentences.

Read the following story, pausing after each sentence to allow pupils to insert the punctuation.

John went to visit his aunt.

She gave him ice cream, cake, and cocoa. His mother says that he does.

Do you think he likes to visit her?

His mother says that he does.

Allow the pupils time to finish inserting the punctuation, then

SAY: Now turn to the page with the big 3 near the top.

TEST 5 — SECTION C (Form X)

Time required, about 7 minutes

SAY: The directions for this game are at the top of the page. Listen while I read them. "Each sentence below has two words placed one above the other. You are to make an X on the one which you think is correct in each sentence." I shall read the sentence the first time using the top word, the next time using the bottom word, and give you time afterwards to mark the word you think is right.

SAY: Are there any questions? Be sure that pupils understand how to mark their answers before proceeding.

SAY: I am now going to read the sentences. Read each pair of the following sentences slowly, in a clear, steady voice. After the reading of the second sentence in each pair, pause to allow sufficient time for pupils to mark the answer.

1. She are my friend.
She is my friend.
2. He will not go to school.
He will go to school.
3. Jimmy come in last.
Jimmy came in last.
4. Most of us were tired.
Most of us was tired.
5. Jim went too the circus.
Jim went to the circus.
6. My father am a baker.
My father is a baker.
7. Are those your socks?
Are them your socks?
8. It were a nice day.
It was a nice day.

SAY: Now go to the next page.

9. The dog run up the street.
The dog ran up the street.
10. I see that movie long ago.
I saw that movie long ago.
11. She says that I am very nice.
She says that I are very nice.
12. Dad came through the gate.
Dad comed through the gate.
13. You didn't give me no candy.
You didn't give me any candy.
14. There were not many days left.
There was not many days left.
15. Don't eat too much.
Don't eat two much.
16. Is this here the dress you like?
Is this the dress you like?
17. Who can tell me the score?
Who may tell me the score?

SAY: Now go on to the next page.

18. I'll give you one of them apples.
I'll give you one of these apples.
19. Have you run the race yet?
Have you runned the race yet?

20. Can Jimmy eat with me?

May Jimmy eat with me?

21. She doesn't look well.

She don't look well.

22. Father and I are going on a trip.

Father and me are going on a trip.

23. The show began at seven.

The show begun at seven.

24. Has she wrote to you yet?

Has she written to you yet?

25. Isn't there thirty days in April?

Aren't there thirty days in April?

Allow pupils time to finish marking their answers. Then,

SAY: Now turn to the page with the big 4 near the top.

TEST 6 (Form X)

Time required, about 10 minutes

SAY: The directions for this game are: "Write the words that are pronounced." I shall give you some words to spell. I shall read each word, use it in a sentence, and then read it again. Then you will write the word that I read on the line 1 name. On line 1, write the word, _____ (Read word No. 1, the sentence, and then repeat word number 1. Pause.) On line No. 2, write the word, _____ (Repeat the above routine for each word.)

When pupils have had the opportunity to write the last word of this test,

SAY: Stop. Put your pencils down.

Collect the booklets. Be sure that you have all of them.

SPELLING WORDS, FORM X

1. at at
2. in I keep my toys IN a box.
3. pig I saw a little PIG.
4. read Can YOU READ that sign?
5. take TAKE care of yourself.
6. know He doesn't KNOW my name.
7. coming Are you COMING to the party?
8. grow Will the flowers GROW well here?
9. father My FATHER is very tall.
10. send Did you SEND her a gift?
11. glad I am GLAD that you waited for me.
12. fix Can you FIX this chair?
13. came He CAME home late.
14. might Father MIGHT go sooner than we thought.
15. without He went out WITHOUT a coat.
16. white I have a new WHITE dress.
17. bakery My father owns a BAKERY.
18. other No OTHER plan seems right.
19. would He WOULD like to play a new game.
20. everybody Not EVERYBODY can read.

HANDWRITING

No separate directions are needed for the administration of the handwriting test. The pupil provides the samples for scoring handwriting when

he writes the first five spelling words. However, the examiner is reminded that the pupil's grade placement is not affected if handwriting is not scored; handwriting is not an integral part of the language test score.

California Achievement Tests

DIRECTIONS FOR SCORING

Scoring procedures for the California Achievement Tests are adaptable to a variety of users' needs, from the scoring of individual tests to the processing of results on a school-, district-, or statewide basis. The following sections provide instructions for the most efficient means of scoring responses. The specific steps should be carefully observed in order to obtain the most accurate results.

After tests have been scored, the results may be transferred to profile sheets. Raw scores are converted to derived scores by means of the norms tables, pages 48-51. Step-by-step instructions for obtaining grade placements, Anticipated Achievement Grade Placements, percentiles, standard scores, or stanines are given in Part 2 under "Preparation of the Profile."

STANDARD RULES FOR SCORING

Listed below are the standard rules for scoring that are followed by all California Test Bureau scoring centers. These rules were applied to the processing of all data for the 1963 norming of the CAT:

1. The score for each section and test is the number of right responses.
2. An item for which two or more responses are marked is not scored.
3. An omitted item is not scored.
4. If three or more items in any one section have more than one mark, no derived scores (grade placements, percentiles, standard scores, or stanines) should be reported for that section.
5. If no item in a separately-timed section of the California Achievement Tests has been marked, that test section is declared not attempted. If one or more items in a timed section have been marked — even if all responses are wrong — that section has been attempted, and the score is combined with other acceptable test section scores to obtain test and Total Battery scores. (A zero raw score is given to a section in which all attempted items have been incorrectly an-

swered. The derived score corresponding to a zero raw score is the lowest derived score given in the norms tables.)

6. No derived score can be obtained for a test when a section is not scorable (see items 4 and 5 above); no derived score can be obtained for the Total Battery when a test is invalidated.

HAND-SCORING PROCEDURES

The hand-scoring key should be used according to the following steps:

1. Fold the key along the vertical lines separating the columns and line up the answers on the key with the corresponding ones in the booklet. Make sure that you have the correct test and section number for the form you are using (as marked in the column heading) before proceeding to score a page.
2. The score for each test is the number right. Each item is to be considered either right or wrong. Mark the correct answers, count the number right, and record the number correct in the box provided at the end of each test in the booklet. (See "Standard Rules for Scoring.")
3. Transfer the score for each test to the appropriate box on the Diagnostic Profile Sheet on the back of the booklet.

A test booklet may be marked with the correct answers and used in place of the key as an aid in scoring. If desired, the key may be cut up into smaller strips (one for each page of the test) along the solid vertical lines and mounted on cardboard for more convenient scoring.

USE OF THE HANDWRITING SCALE

In rating cursive writing, compare the samples obtained with those of the handwriting scale on the scoring key. The corresponding grade placements and age equivalents may be read directly from the middle of the scale. When an obtained sample appears to fall between the scale samples, use the grade placement and age opposite the line which separates the scale samples.

If desired, three or more individuals may judge the same samples, and their ratings may be averaged, thus tending to give a more accurate or reliable judgment.

PART 4

Directions for Scoring and Norms

NORMS

The WXYZ Series of the California Achievement Tests, 1957 Edition, was re-normed according to a research plan designed to control bias from any one section of the country or any one type of educational program or school system.

The performance of the normative sample used in the 1963 re-norming represents a composite of a variety of curricular influences operating in school systems in several locales throughout the United States. In re-norming all levels of the California Achievement Tests, the complete program involved 15,351 concurrent administrations of the California Achievement Tests battery and the corresponding level of the California Short-Form Test of Mental Maturity. This included the re-administration after a one-year interval of both tests to 1,884 students within a single school system in order to assess the test-retest reliability of the two instruments, as well as to provide reliability data in addition to those computed using the Kuder-Richardson formula 21.

The total sample used in the norming process was obtained from two distinct sampling phases: (1) independent class units from seven geographic regions representing forty-nine states, and (2) complete school systems, including all students in Grades 1 through 12 from five school systems located in the northeastern, eastern, central, and western areas of the United States. Data from the complete systems, representing several different normative groups, each of which had a considerable degree of internal homogeneity, were used to check the consistency of the norms.

Within each grade, the norms are based on age-controlled samples representing an eighteen-month range (i.e., mean chronological age, plus or minus nine months). Norms based on this age-controlled sample therefore reflect the performance of students who for the most part have progressed through school at the normal rate. This age range allows for variations in entrance age and promotional practices within a system, but eliminates pupils who are patently atypical in age for the grade.

All pupils in the norm sample were administered the appropriate level of the 1963 Revision of the California Short-Form Test of Mental Maturity and the California Achievement Tests within a short time interval. The 1963 Revision of the Short-Form, which was scaled to the 1960 Revision of the Stanford-Binet Intelligence Scale, Form L-M, served as the reference for describing and controlling the norm sample.

The cases obtained from each of the two sampling phases were combined and then each case was categorized for processing according to grade placement and chronological age characteristics. All cases falling within the specified chronological age boundaries at each grade level were used. Since the same group was tested with both instruments, obtained performance at each level was used in establishing the relationship between the mean Short-Form total raw score and the mean raw

score on each of the ten CAT variables. After the relationship of the Short-Form and CAT scores had been established, the obtained performance of the sample was adjusted through statistical procedures to conform to a standard population having mental ability characteristics specified in terms of mean I.S.I.¹ scores for each grade. The adjusted values of the ten CAT variables were then plotted and smoothed to determine grade placements. These initial plots were empirically derived from data based on October testing; all other grade placement values lying between these plotted points were determined by interpolation.

The CAT norms are designed to ensure a continuous grade placement scale. The processes of scaling and determining grade placement equivalents, as described above, provide for this continuity of measurement. Data from the two phases of the sampling complemented each other. The separate classroom unit phase supplied data from cases whose performance represented a cross-section of the many different educational influences affecting the nation's schools. On the other hand, the testing of the complete systems provided data based upon educational characteristics common to a given school system — such as educational objectives, curricular and instructional influences, and administrative practices operating within the system. This homogeneous background provided a basis for verifying the continuity of the grade placement scale. Thus, the complete systems testing reflects the functioning of the norms within each grade and from grade to grade covering a twelve-grade span. The testing of the complete school systems produced data which are in effect comparable to those obtained from longitudinal studies.

In summary, the 1963 norms for the California Achievement Tests, Lower Primary Level, are the result of a controlled normative design that required, within each grade, a normal distribution of mental ability and typical age-grade relationships. The number of cases used at each grade for the level is shown in column 2 of Table 17 below. Columns 3 and 4 show the specified controls applied to the norm sample at each grade.

TABLE 17
CHARACTERISTICS OF SAMPLE POPULATIONS
USED TO ESTABLISH 1963 NORMS FOR THE
CALIFORNIA ACHIEVEMENT TESTS,
LOWER PRIMARY LEVEL

GRADE	NO. OF CASES	MEAN I.S.I.*	MEAN C.A. (in Months)
1	1131	100	83 ^f 89
2	1216	100	

* S.E. of Mean I.S.I. for 1000 cases is less than $\frac{1}{2}$ I.S.I. point.

^f For Grade 1-6.

In addition to the sampling design, a number of other quality controls were imposed on the norming and treatment of the data.

¹ See page 44 for definition of I.S.I.

1. Special efforts were made to have the participants include only classes designated as typical for the community. Neither accelerated nor retarded classes were included. Mixed classes—i.e., those consisting of more than one grade level—were avoided.
2. No classes which had been recently administered either the California Achievement Tests or the CTMM, Long- or Short-Form, were included. This restriction avoided the possibility of spurious practice effects.
3. Most testing was done on Tuesdays, Wednesdays, and Thursdays—days which did not immediately follow or precede holidays or special events. This tended to minimize the influence of fatigue following a weekend or the disturbance created by special events.
4. Because the total testing time for both batteries was more than two hours, testing was distributed over two or three days in order to prevent the examinees from becoming test-weary.

There has been much misunderstanding and misuse of norms in the past. Norms should not be regarded as rigid standards to be attained by all school groups under all circumstances. Instead, they should be regarded as relatively stable points of reference to be used in interpreting the results of testing in a particular school or community. Norms reflect the typical performance of defined groups of similar individuals on test items which have been carefully selected and validated. When the obtained scores of a testing program from a particular school or community are significantly above or below the test norms, it simply means that these scores are above or below the average scores of the norm sample. Such results do not necessarily indicate superior or inferior school work. The testing program reveals facts without interpreting them; interpretation is the responsibility of local school personnel.

Among the factors which may account for deviations from test norms are differences in courses of study, materials of instruction, time allotments, and emphasis on certain skill areas, as well as differences in the quality of teaching and the age and intelligence of students. Norms should serve as a point of departure in investigating the reasons for the obtained results and in determining the desirability of possible modifications of the factors which account for the obtained results.

For discussion of the uses, profiling, and interpretation of test results with reference to the 1963 norms for the California Achievement Tests, see Part 2 of this manual, pages 15-23.

GRADE PLACEMENT SCALE

The units on the grade placement scales of the California Achievement Tests correspond to Years and months. The full scale range is from Grades 1.0 to 14.0 inclusive through the five levels. Each year or unit of the grade placement scale is subdivided into decimal values corresponding to ten months of the normal school year.

1. The raw scores of the six tests of the battery, and their totals, are converted into grade placement units. A point on the grade placement scale represents the average achievement of pupils of designated chronological age in the national norm sample whose median I.Q. is 100 for Grades 1 through 7, 101 for Grade 8, 102 for Grade 9, 103 for Grade 10, 104 for Grade 11, and 105 for Grade 12. Thus, a point on the grade placement scale (1.0, 2.0, etc.) is an empirically-scaled derived score based on a sample from the national norm group, having precisely set and defined I.Q. and chronological age requirements. All values on the grade placement scale, in the tables, and on the profile were determined from the data of actual cases at each point. Hence, the units throughout the grade placement scale indicate as accurately as possible the meaning of test scores for individuals of average intelligence and typical chronological age at each grade classification, based upon empirical data.

The grade placement scale is related to chronological age (which served as a control in its construction) in such a way that achievement test scores can be obtained for an individual or class of any chronological age. The grade placement scale thus permits flexibility in the interpretation of the test results. These are summarized as follows:

1. Actual grade placement norms are most frequently employed as a basis for interpretation. Individual grade placements or class medians are compared to a typical nationwide group of the identical actual grade placement.
2. Age norms use chronological age as the criterion for interpretation. Individual ages or class medians are compared to a typical nationwide group of the identical chronological age.
3. Anticipated Achievement norms are relatively new devices which go a step beyond expectancy tables. A discussion of Anticipated Achievement concludes this section.

PERCENTILES, STANDARD SCORES, AND STANINES

Tables 21 through 23 are used to obtain percentiles, standard scores, and stanines for the subtotals and total raw scores in each subject area and for the Total Battery.

1. Percentile norms provide a comparison of individual students with each other, with their summarized group percentiles, and with a sampling of the nationwide population. They can also be used for compiling useful cumulative records. A percentile can be described as a point on a 100-point scale which gives the per cent of cases that falls below that particular point. For example, a student whose test performance places him at the 70th percentile rank equals or exceeds 70 per cent of the sample on which the test was standardized. This score may also be

interpreted to mean that the remaining 30 per cent of the individuals in the standardization group exceeded his test performance.

2. Standard scores make up a linear scale of which about fifty points (representing a range of five standard deviations) comprise the practical range of scores. They can be used for the comparison of individual students with each other, with their summarized group scores, and with a sampling of the nationwide population. They can also be used, like percentile ranks, for interpreting data in cumulative records. Unlike percentile ranks, standard scores can be used in computations which combine and average data.

3. The stanine scale is an adaptation of the standard score scale utilizing larger intervals than the standard score units. While there are fewer stanines, they have correspondingly greater stability. Stanines are a type of standard score with a mean of 5 and a standard deviation of 2. Like other standard scores, stanines can be used in computations which combine and average scores from different tests when the standardization populations are the same.

ANTICIPATED ACHIEVEMENT

HISTORICAL BACKGROUND

Educators have long been aware that achievement test scores reflect mental maturity in addition to acquired skills. Consequently, they have expected greater achievement from bright pupils than from average or dull pupils. When interpreting achievement test results, teachers have made subjective allowances for individual differences in mental maturity. Many have later found that bright pupils often failed to achieve up to expectancy while slower pupils tended to do better than expected.

In the history of educational measurement, various methods have been devised to integrate the interpretation of intelligence and achievement test data: educational ages and quotients, achievement ages and quotients, intelligence grade placements, scattergrams, etc. Some of these have helped test users interpret achievement scores of individual pupils at varying levels of mental age or performance on intelligence tests.

Horn² was among the first to produce practical formulas applying chronological age and mental age data and yielding an expected achievement which could be expressed in grade placement units. Horn's formulas were used to compile tables of expectancies in several school systems, and demonstrated that expected grade placement tables integrated intelligence and achievement test data much more accurately than could usually be done by subjective methods. However, the main deficiencies discovered in the use of Horn's formulas were that (1) no adjustment was made for

actual months of school experience, (2) performance of individual pupils was compared with that of unlike individuals, and (3) the formulas applied to achievement in the separate basic skills, disregarding intra-individual differences.

Clark³ subsequently devised a procedure for evaluating achievement results by adjusting achievement test norms for group deviations of intelligence.

The California Test Bureau, in its 1957 dual standardization of the *California Test of Mental Maturity Series* and the *California Achievement Tests* refined previous expectancy concepts by introduction of Anticipated Achievement.⁴ The administration of the two test batteries concurrently on a single population provided comparable intelligence and achievement normative data. The CAT norms represent the Anticipated Achievement of a certain grade placement and its related chronological age. The Anticipated Achievement tables found on pages 52-57 resolve the objections to the previously-described methods of defining expectancies. The tables adjust Anticipated Achievement to the actual months of school experience that the individual has had in terms of his actual grade placement. The values in these tables, expressed in grade placements, also allow for the comparison of the performance of an individual with the performance of like individuals rather than with that of an average. In addition, expectancies are set up for each of the basic skills and component parts of those skills.

ANTICIPATED ACHIEVEMENT GRADE PLACEMENTS

Anticipated Achievement Grade Placements are interpreted as the norm performance of a nationwide sample of pupils in the same grade, having comparable chronological age and mental age characteristics. Since these values have been established by a norming process (see below), they may be considered as the test performance which the pupil would be expected to attain. The Anticipated Achievement norms indicate, for each of the ten scores on the CAT, the expected influence of years of schooling as well as the interrelated effect of chronological age and mental age deviations from the national average. The effect of these two latter variables is controlled through the adjustment features incorporated in the Intellectual Status Index, which must be used to enter the tables on pp. 52-57. The I.S.I. differs from an intelligence quotient in that the chronological age typical of pupils at a particular grade level replaces the individual's chronological age as the reference point. (For procedures used to calculate the I.S.I., see Part 3 of the *CTMM Manual*, 1963 Revision.) The deviation of a pupil's actual test performance

³ Willis W. Clark, "Evaluating School Achievement in Basic Skills in Relation to Mental Ability," *Journal of Educational Research*, 46: 179-81, November, 1952.

⁴ See "New Concepts in Norms" by William M. Sharner, reprinted from *New Positive Values in the American Educational System* (Washington, D.C.: American Council on Education, 1959). Available upon request from the California Test Bureau. Also see the Technical Report on the *California Achievement Tests*, 1957 Edition.

² Alice M. Horn, *Uneven Distribution of Effects of Specific Factors* (Los Angeles: University of Southern California Press, 1941), 107 pp.

from his Anticipated Achievement should also be interpreted with consideration of the standard error of measurement. The reliability of an individual's score and the standard error of measurement applicable to this test score is discussed on page 8 of this manual. Anticipated Achievement, therefore, is an adjustment for pupils with chronological ages differing from the age-grade placements reported in the norm tables to give reasonable levels of performance that may be expected from individual pupils. It is an approach to individual pupil norms which tends to obviate the condition long recognized by test users: That group norms may be inappropriate if the local school, class, or individual tested differs significantly in some essential characteristics from the reference group on which the norms are based.

The Anticipated Achievement tables adjust the performance expected of a student through the procedures necessary to obtain the I.S.I. value. This device also provides for comparison of the performance of individual pupils with that of like individuals. Hence, if a pupil of 156 months C.A. and 168 months M.A. (I.Q. 106) is tested at Grade 8.3, the teacher should compare the performance of that pupil with the performance of other individuals having the same C.A., M.A., I.Q., and actual grade placement.

ADJUSTMENTS MADE THROUGH USE OF THE I.S.I.

The Intellectual Status Index establishes the pupil's rank order in a typical grade, contrasting individual assessment with group assessment and indicating deviations of the individual from the group. A pupil with a given I.Q. who is younger than the chronological age typical for his actual grade placement will have a lower I.S.I. than pupils with comparable I.Q.'s who are either at age or over-age for the same actual grade placement. The method of determining the I.S.I. provides a basis for adjusting expectancy downward for the younger, brighter pupil and upward for the older, slower pupil.

The effect of the adjustment through use of the I.S.I. can be demonstrated by a comparison of an over-age pupil with an under-age pupil. Pupils A and B were alike in the following respects:

Actual Grade Placement5.1
Grade Chronological Age127 months
Total Raw Score on CTMM72
Intellectual Status Index107
Mental Age139 months

They were different in two factors:

Chronological Age	Pupil A	Pupil B
Intelligence Quotient	118 months	135 months
	114	101
	'	'

Pupil A entered the first grade at the age of 5 years 10 months, Pupil B at the age of 7 years 3 months. Both progressed normally through the

grades so that each had the same number of months of school experience.

It can be seen that Pupil A is younger and brighter than Pupil B, although the identical mental age indicates that both have the capability of performing school tasks of the same difficulty. The Intellectual Status Index is the same for both pupils because they are in the same grade (5.1) and achieved the same total raw score on the CTMM. The I.S.I. of 107 represents an adjustment downward from an I.Q. of 114 for the younger pupil and upward from 101 for the older pupil. Therefore, the same achievement in the basic skills may be expected from both. There will be changes in the I.S.I. at subsequent levels for each of these pupils necessitating an updating of the I.S.I. at each CAT administration.

OTHER FACTORS IN THE INTERPRETATION OF ANTICIPATED ACHIEVEMENT

It is of paramount importance that differences in local courses of study be taken into account when interpreting any test scores. The overall curriculum is a very important factor in determining the rate at which achievement test scores increase from year to year. The nature of curricular offerings in general has important effects on achievement. Formal instruction in reading usually begins earlier than that in arithmetic and language. Progress in arithmetic is generally somewhat slower than in reading. It is also found that performance in arithmetic fundamentals tends to develop earlier than performance in arithmetic reasoning. Formal reading instruction generally ceases after elementary school. For a large percentage of the secondary school population, instruction in spelling and mathematics is negligible. By contrast, mechanics of English continues to be taught through secondary school and in many instances well into college.

Individual data from teachers' observations and cumulative records must be reflected in the interpretation of Anticipated Achievement Grade Placements. Individual abilities, attention span, emotional maturity, health status, breadth of experience outside of school, motivations, interests, and the like are all factors to be considered to bring expectancies into perspective. When individual test scores are interpreted with the use of all available data, including Anticipated Achievement Grade Placements, educational guidance and the interpretation of California Achievement Tests scores approach a degree of individualization unique in group standardized testing with group norms.

CONSTRUCTION OF THE ANTICIPATED ACHIEVEMENT TABLES

The Anticipated Achievement tables were developed by a multiple norming procedure. The same raw score grade placement equivalents established for the basic CAT norm tables were also used in developing the Anticipated Achievement norms. It was essential that recognized standards of performance be applied to the various norm groups represented in the Anticipated Achieve-

ment tables. The grade placement norms served that purpose because they represented criteria of performance based upon a population having a defined intelligence and chronological age status.

The maximum number of possible cases was selected from the total norm population on the basis of a defined actual grade placement and used to establish the Anticipated Achievement norms. Each student represented in the Anticipated Achievement sample population had been administered the appropriate level of both the California Short-Form Test of Mental Maturity, 1963 Revision, and the California Achievement Tests, 1957 Edition. The Short-Form scores obtained by the population representing a given grade were expressed in terms of I.S.I. values. The CAT scores for the same group were expressed in grade placements.

Samples of pupils with successively higher and lower I.S.I.'s were drawn from the selected norm population available at each grade. The ten scores of the CAT battery, representing performance of pupils located within each of the I.S.I. brackets above and below the middle range, were independently normed. Within each of these I.S.I. brackets, the mean grade placement was computed for each CAT score, based upon the performance of the population within that bracket. These obtained mean score values were then plotted and smoothed. The initially plotted values described

above were empirically derived from October testing. All Anticipated Achievement Grade Placement values representing other months of the school year were determined by interpolation.

The importance of adjusting achievement norms to reflect the mental ability level of a class or school is indicated in Table 18 which reports variations in median I.Q.'s for over 1,000 grade groups.

TABLE 18
PERCENTILE EQUIVALENTS FOR MEDIAN I.Q.'S
OF VARIOUS CLASSES AT GRADES 1-12*

PERCENTILE	GRADES 1-7	GRADE 8	GRADE 9	GRADE 10	GRADE 11	GRADE 12
99	115	116	116	117	118	120
95	111	112	112	113	114	116
90	108	109	109	110	111	113
80	105	106	106	107	108	110
70	103	104	104	105	106	107
60	101	102	103	104	105	106
50	100	101	102	103	104	105
40	98	99	99	100	101	102
30	96	97	97	98	99	100
20	93	94	95	96	97	99
10	89	90	92	93	94	95
5	85	86	88	89	90	91
1	80	81	84	85	86	87

*For data from original study, see Clark, op. cit., pp. 179-191.

TABLE 19
ACTUAL GRADE PLACEMENTS AND CORRESPONDING GRADE CHRONOLOGICAL AGES
FOR DETERMINING INTELLECTUAL STATUS INDEX

Gr. Pl.	C.A.														
1.0	76	3.0	101	5.0	125	7.0	150	9.0	174	11.0	197	13.0	220	15.0	243
1.1	77	3.1	102	5.1	127	7.1	151	9.1	175	11.1	198	13.1	221	15.1	244
1.2	78	3.2	103	5.2	128	7.2	153	9.2	176	11.2	199	13.2	222	15.2	245
1.3	80	3.3	104	5.3	129	7.3	154	9.3	178	11.3	200	13.3	223	15.3	246
1.4	81	3.4	106	5.4	130	7.4	155	9.4	179	11.4	202	13.4	224	15.4	247
1.5	82	3.5	107	5.5	132	7.5	156	9.5	180	11.5	203	13.5	226	15.5	248
1.6	83	3.6	108	5.6	133	7.6	158	9.6	181	11.6	204	13.6	227	15.6	250
1.7	85	3.7	109	5.7	134	7.7	159	9.7	182	11.7	205	13.7	228	15.7	251
1.8	86	3.8	111	5.8	135	7.8	160	9.8	183	11.8	206	13.8	229	15.8	252
1.9	87	3.9	112	5.9	137	7.9	161	9.9	184	11.9	207	13.9	230	15.9	253
2.0	88	4.0	113	6.0	138	8.0	163	10.0	186	12.0	208	14.0	231	16.0	254
2.1	89	4.1	114	6.1	139	8.1	164	10.1	187	12.1	210	14.1	232	16.1	255
2.2	91	4.2	116	6.2	140	8.2	165	10.2	188	12.2	211	14.2	234	16.2	256
2.3	92	4.3	117	6.3	142	8.3	166	10.3	189	12.3	212	14.3	235	16.3	258
2.4	93	4.4	118	6.4	143	8.4	167	10.4	190	12.4	213	14.4	236	16.4	259
2.5	95	4.5	119	6.5	144	8.5	168	10.5	191	12.5	214	14.5	237	16.5	260
2.6	96	4.6	121	6.6	145	8.6	169	10.6	192	12.6	215	14.6	238		
2.7	97	4.7	122	6.7	146	8.7	171	10.7	193	12.7	217	14.7	239		
2.8	98	4.8	123	6.8	148	8.8	172	10.8	195	12.8	218	14.8	240		
2.9	99	4.9	124	6.9	149	8.9	173	10.9	196	12.9	219	14.9	242		

Norms Tables

TABLE 20

**1963 GRADE PLACEMENT AND AGE NORMS
CALIFORNIA ACHIEVEMENT TESTS—LOWER PRIMARY LEVEL**

GRADE PLACEMENT	READING		ARITHMETIC		LANGUAGE		GRADE PLACEMENT	
	Reading Vocabulary		Arithmetical Fundamentals		Spelling Total Language		Age (in months)	
	Reading Comprehension	Arithmetical Reasoning	Total Arithmetic	Mechanics of English	Total Spelling	Total BATTERTY	Grade Placement	Age (in months)
0	—	—	—	—	—	—	64	0
.1	—	—	—	—	—	—	65	.1
.2	—	—	—	—	—	—	66.7	.2
.3	—	—	—	—	—	—	68	.3
.4	—	—	—	—	—	—	69	.4
.5	1	—	—	—	—	—	70	.5
.6	2.4	—	24	1	2.3	4.5	71.2	.6
.7	5.7	—	5.7	2.3	2.5	6.7	73	.7
.8	8.11	—	8.11	4	3	6.8	74	.8
.9	12.15	1	12.15	5.6	4.5	6.7	75	.9
1.0	16.21	—	16.21	7.9	6.7	10.12	76	1.0
1.1	22.28	—	22.29	10.12	8.12	13.14	77	1.1
1.2	29.34	2	30.36	13.15	13.19	26.35	78.9	1.2
1.3	35.39	—	37.41	16.18	20.24	36.43	80	1.3
1.4	40.43	3	42.46	19.21	25.27	44.49	107.21	1.4
1.5	44.46	4	47.50	22.24	28.29	50.54	122.33	1.5
1.6	47.49	5	51.54	25.26	30.31	55.58	134.45	1.6
1.7	50.52	6	55.58	27.28	32	59.61	146.55	1.7
1.8	53.54	7	59.61	29.30	33.34	62.65	156.65	1.8
1.9	55.56	8	62.64	31.32	35	66.67	166.72	1.9
2.0	57.58	9	65.67	33	36	68.70	173.82	2.0
2.1	59.60	10	68.69	34	37	71.72	183.89	2.1
2.2	61	—	70.71	35	38	73	190.94	2.2
2.3	62.63	11	72.73	36	—	74.75	195.201	2.3
2.4	64	—	74.75	37	39	76.77	202.7	2.4
2.5	65	12	76.77	38	40	78	208.12	2.5
2.6	66	—	78	—	—	79	213.16	2.6
2.7	67	—	79	39	41	80	217.20	2.7
2.8	68	13	80	40	—	81	221.24	2.8
2.9	69	—	81.82	—	42	82	225.29	2.9
3.0	70	—	83	41	—	83	230.33	3.0
3.1	71	—	—	43	84	57	234.36	3.1
3.2	—	—	84	42	—	85	237.40	3.2
3.3	72	14	85	—	—	86	241.43	3.3
3.4	73	—	86	43	44	87	244.46	3.4
3.5	—	—	—	—	—	—	247.48	3.5
3.6	74	—	87	44	—	—	249.52	3.6
3.7	—	—	88	—	—	88	253.56	3.7
3.8	—	—	89	—	—	89	257.58	3.8
3.9	—	—	—	—	—	18	259.61	3.9
4.0	75	15	90	45	45	90	262+	4.0

*Where two values appear on the same line, the first listed is the computed value. Subject, educational, or chronological age equivalent to grade placement.

Value 2
Value 1

TABLE 21

PERCENTILE RANKS — STANDARD SCORES — STANINES
1963 NORMS — HIGH 1

%ILE-INTERVAL	PERCENTILE RANK	RV	RC	TR	AR	AF	TA	ME	SP	TL	TB	STANDARD SCORE	
99	—	70.75	15	88.90	41.45	42.45	83.90	53.65	10.20	63.85	235.265	73	
98	—	69	14	86.87	40	—	82	52	—	61.62	229.234	72	
95	—	69	—	85	—	—	81	51	—	60	226.228	71	
95	67	—	13	83.84	39	41	80	50	9	59	222.225	70	
90	66	11	—	82	38	—	79	49	—	57.58	218.221	69	
90	65	—	12	80.81	—	—	78	48	—	56	214.217	68	
80	64	10	—	79	37	—	77	47	8	55	211.213	67	
80	63	—	11	77.78	—	40	76	46	—	53.54	206.210	66	
70	62	—	—	76	36	—	75	45	—	52	203.205	65	
70	61	9	—	75	—	—	—	44	7	51	200.202	64	
70	60	—	10	73.74	35	39	74	43	—	49.50	196.199	63	
70	59	—	—	72	—	—	73	42	—	48	193.195	62	
70	58	8	—	71	34	—	72	41	—	47	190.192	61	
60	57	—	—	69.70	—	38	71	40	—	46	186.189	60	
60	56	—	—	68	33	—	70	39	6	45	183.185	59	
60	55	7	—	67	32	—	69	38	—	44	180.182	58	
60	54	—	—	65.66	—	37	68	37	—	43	176.179	57	
50	53	—	—	64	31	—	67	—	—	42	172.175	56	
50	52	—	—	63	—	36	66	36	5	41	170.171	55	
50	51	6	—	56.57	—	32	61	32	—	36	165.157	51	
40	49	—	—	55	27	30.31	59.60	31	4	35	150.154	50	
40	48	5	—	52.53	25	27.28	51.53	28	—	31	135.139	47	
30	47	—	—	51	—	24	26	49.50	27	—	30	130.134	46
30	46	—	—	50	23	24.25	46.48	26	—	29	129.129	45	
30	45	4	—	48.49	—	23	44.45	25	3	28	120.124	44	
20	44	—	—	47	22	21.22	42.43	—	—	27	116.119	43	
20	43	—	—	46	21	20	40.41	24	—	26	112.115	42	
10	41	—	—	44	19	17	35.36	23	—	25	107.111	41	
10	40	2	—	41.42	17	15.16	32.34	21	—	23	98.102	39	
5	39	—	—	40	16	12.13	27.29	19	—	22	95.97	38	
5	38	—	—	39	15	11	24.26	—	—	21	88.94	37	
2	37	—	—	38	14	9.10	22.23	18	2	20	83.87	36	
2	36	—	—	37	—	8	20.21	17	—	18	78.82	35	
2	35	—	—	36	13	6.7	18.19	16	—	17	75.77	34	
1	34	—	—	35	12	5	16.17	15	—	16	71.74	33	
1	33	—	—	34	11	4	14.15	14	—	15	67.70	32	
1	32	—	—	33	10	3	12.13	13	—	14	63.66	31	
1	31	—	—	31	8	2	10.11	12	—	13	59.62	30	
1	30	—	—	30	7	1	9	11	—	12	55.58	29	
1	29	—	—	29	6	—	8.10	10	1	11	50.54	28	
1	28	—	—	28	5	—	7.10	9	—	10	46.49	27	

TABLE 22

**PERCENTILE RANKS — STANDARD SCORES — STANINES
1963 NORMS — LOW 2**

%ILE-INTERVAL		RAW SCORE										STANINE
%ILE-RANK	RV	RC	TR	AR	AF	TA	ME	SP	TL	TB	STANINE	
99	99	75	15	89-90	45	90	62-65	15-20	77-85	256-265	73	
99	99	74	—	—	—	89	61	—	76	254-255	72	
98	98	73	—	88	44	—	60	14	74-75	251-253	71	
98	98	—	—	87	—	44	59	—	73	248-250	70	
97	97	72	14	86	—	—	58	—	71-72	245-247	69	
96	96	—	—	43	—	87	57	13	70	243-244	68	
95	95	71	—	85	—	86	56	—	69	240-242	67	
95	95	—	—	84	—	43	55	—	67-68	236-239	66	
93	93	70	—	—	42	—	54	12	66	234-235	65	
92	92	—	—	83	—	—	84	53	—	231-233	64	
90	90	69	13	82	—	42	83	52	11	228-230	63	
88	88	—	—	41	—	—	82	51	—	226-227	62	
86	86	68	—	81	—	—	—	10	61	224-225	61	
84	84	—	—	80	40	41	81	50	—	220-223	60	
82	82	67	12	79	—	—	80	49	9	58	217-219	59
80	79	66	—	78	39	—	79	48	—	214-216	58	
76	76	—	—	77	38	40	78	47	—	55-56	210-213	57
73	73	65	—	76	—	—	77	46	8	54	207-209	56
70	70	64	—	75	37	—	76	45	—	53	203-206	55
66	66	63	11	73-74	—	39	75	44	—	51-52	199-202	54
60	62	62	—	72	36	—	74	43	7	50	196-198	53
60	58	61	—	71	35	38	73	42	—	49	193-195	52
54	60	—	70	—	—	72	41	—	—	48	190-192	51
50	50	59	10	68-69	34	37	70-71	—	6	47	185-189	50
46	58	—	67	33	36	68-69	40	—	46	181-184	49	
42	57	—	66	32	34-35	66-67	39	—	45	176-180	48	
40	38	56	9	65	31	33	63-65	38	—	43-44	171-175	47
34	55	—	63-64	30	31-32	61-62	37	—	42	166-170	46	
30	30	54	—	62	29	30	58-60	36	5	41	161-165	45
27	53	8	61	28	28-29	56-57	35	—	40	157-160	44	
24	52	—	59-60	—	27	54-55	34	—	39	152-156	43	
21	51	—	58	27	25-26	52-53	33	—	38	148-151	42	
20	18	50	7	57	26	24	49-51	—	37	143-147	41	
16	49	—	55-56	25	22-23	47-48	32	4	36	138-142	40	
14	48	—	54	24	21	44-46	31	—	35	133-137	39	
12	47	6	53	23	19-20	42-43	30	—	34	129-132	38	
10	10	46	—	51-52	22	18	39-41	29	—	33	123-128	37
8	45	—	50	21	16-17	37-38	28	—	32	119-122	36	
7	44	5	49	20	15	35-36	27	—	31	114-118	35	
5	43	—	47-48	—	14	33-34	26	3	30	109-113	34	
5	4	42	—	46	19	12-13	31-32	—	29	105-108	33	
4	41	4	45	18	11	28-30	25	—	28	101-104	32	
3	40	—	43-44	17	10	26-27	24	—	27	96-100	31	
2	2	39	—	42	16	9	24-25	23	—	26	92-95	30
2	2	38	—	41	15	8	22-23	22	2	24-25	87-91	29
1	1	37	3	40	14	7	20-21	21	—	23	81-86	28
1	1	36	12	39	1-13	1-6	1-19	1-20	1	1-22	1-80	27

Wave 1
Q101

TABLE 23
PERCENTILE RANKS — STANDARD SCORES — STANINES
1963 NORMS — HIGH 2

%ILE INTER- VAL	%ILE RANK	RAW SCORE							STAN- DARD SCORE	STA- NINE
		RV	RC	TR	AR	AF	TA	ME		
99	—	—	—	—	—	—	—	—	1820	264-265
98	75	—	90	45	—	—	—	—	—	263
95	—	—	—	—	—	—	—	—	—	72
90	74	—	89	44	—	—	—	—	17	262
88	73	—	—	—	—	—	—	—	—	71
80	—	—	—	—	43	—	—	65	—	70
71	72	15	87	—	—	45	88	—	81	69
71	—	—	—	42	—	—	—	64	—	68
71	—	—	—	—	—	—	89	—	—	67
70	70	14	84	—	—	43	—	62	—	66
70	—	—	—	—	—	—	86	59	—	65
69	69	—	82	40	42	—	—	63	14	64
60	69	—	—	85	41	—	85	58	—	63
60	70	12	77	37	39	—	84	57	—	62
50	68	13	80	—	—	81	52	—	77	69
50	67	—	79	39	41	80	51	10	67	68
46	66	—	78	38	40	78.79	50	—	66	67
40	65	12	77	37	39	76.77	49	—	64	66
36	64	—	76	36	37.38	74.75	48	9	57	65
30	63	11	74	35	35	72.73	47	—	56	63
30	62	—	73	34	34	67.69	45	8	53	62
20	61	—	71.72	33	32.33	65.66	44	—	51	61
20	60	10	70	32	31	63.64	43	—	54.55	60
20	59	—	69	31	30	61.62	42	—	51	59
10	58	—	67.68	—	29	59.60	41	7	49.50	58
10	57	9	66	30	28	57.58	40	—	47	57
10	56	—	65	29	26.27	55.56	39	—	46	56
5	55	—	63.64	28	25	53.54	38	—	44.45	55
5	54	8	62	27	24	51.52	37	6	43	54
5	53	—	61	26	23	49.50	36	—	42	53
2	52	—	59.60	—	21.22	47.48	35	—	41	52
2	48	6	54	22	16	37.38	31	—	36	51
1	47	—	53	21	14.15	34.36	30	—	35	50
1	46	—	51.52	20	13	32.33	23	—	33.34	49
1	45	1.5	1.50	1.19	1.12	1.31	1.28	1.4	1.32	48

ANTICIPATED ACHIEVEMENT GRADE PLACEMENTS FOR GRADE 1

TABLE 24

INTELLECTUAL STATUS INDEX

INTELLECTUAL STATUS INDEX

GRADES 2.0 - 2.3 - 2.4

TABLE 25

INTELLECTUAL STATUS INDEX	ANTICIPATED ACHIEVEMENT GRADE PLACEMENTS FOR GRADE 2											
	RV	RC	TR	AR	AF	TA	TR	RC	RV	ME	SP	TB
140	3.5	3.4	3.5	3.5	3.5	3.7	3.4	3.6	3.7	3.9	4.3	3.8
139	3.6	3.4	3.5	3.5	3.5	3.7	3.4	3.6	3.7	3.9	4.2	3.6
138	3.6	3.4	3.4	3.4	3.5	3.6	3.4	3.6	3.7	3.8	4.2	3.6
137	3.5	3.4	3.4	3.4	3.5	3.7	3.4	3.6	3.7	3.8	4.1	3.7
136	3.5	3.4	3.3	3.3	3.4	3.5	3.4	3.5	3.6	3.7	4.1	3.7
135	3.4	3.3	3.3	3.3	3.4	3.5	3.4	3.5	3.6	3.7	4.0	3.6
134	3.4	3.2	3.2	3.2	3.2	3.4	3.4	3.5	3.6	3.7	4.0	3.5
133	3.3	3.2	3.2	3.2	3.2	3.4	3.4	3.5	3.6	3.7	3.9	3.4
132	3.2	3.1	3.1	3.1	3.1	3.3	3.4	3.5	3.6	3.7	3.9	3.3
131	3.1	3.0	3.0	3.0	3.1	3.2	3.4	3.5	3.6	3.7	3.9	3.2
130	3.0	2.9	2.9	2.9	3.0	3.1	3.1	3.2	3.2	3.3	3.4	3.1
129	2.9	2.8	2.8	2.8	2.9	2.9	2.9	2.9	2.9	3.0	3.1	3.1
128	2.8	2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.8	2.9	3.0	2.9
127	2.7	2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.8	2.9	3.0	2.8
126	2.6	2.6	2.6	2.6	2.7	2.7	2.7	2.7	2.7	2.8	2.9	2.7
125	2.5	2.5	2.5	2.5	2.6	2.6	2.6	2.6	2.6	2.7	2.8	2.6
124	2.5	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.6	2.7	2.5
123	2.4	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.5	2.6	2.4
122	2.4	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.5	2.6	2.3
121	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.2
120	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.1
119	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.0
118	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.4	1.9
117	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.4	1.8
116	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.4	1.7
115	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.3	1.6
114	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.3	1.5
113	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.3	1.4
112	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.3	1.3
111	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.3	1.2
110	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.3	1.1
109	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.3	1.0
108	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.3	0.9
107	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.3	0.8
106	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.3	0.7
105	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.3	0.6
104	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.3	0.5
103	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.3	0.4
102	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.3	0.3
101	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.3	0.2

INTELLECTUAL STATUS INDEX	ANTICIPATED ACHIEVEMENT GRADE PLACEMENTS FOR GRADE 2											
	RV	RC	TR	AR	AF	TA	RC	TR	ME	SP	TL	TB
140	4.1	4.0	4.2	4.2	4.6	4.1	3.9	4.3	4.5	4.9	4.4	A2
139	4.1	4.0	4.0	4.2	4.4	4.1	3.7	4.1	4.5	4.9	4.4	A2
138	4.0	3.9	3.9	4.0	4.0	4.1	3.7	4.0	4.4	4.8	4.3	A2
137	4.0	3.9	3.9	4.0	4.0	4.1	3.7	4.0	4.4	4.8	4.3	A2
136	4.0	3.9	3.9	4.0	4.0	4.1	3.6	4.0	4.4	4.8	4.3	A2
135	3.9	3.8	3.8	3.8	3.8	3.9	3.6	3.9	4.3	4.7	4.2	A1
134	3.9	3.8	3.8	3.8	3.8	3.9	3.6	3.9	4.1	4.5	4.0	A0
133	3.9	3.7	3.7	3.8	3.8	3.9	3.6	3.9	4.1	4.5	4.0	A0
132	3.8	3.7	3.7	3.8	3.8	3.9	3.7	3.8	4.0	4.4	4.1	A1
131	3.7	3.7	3.7	3.8	3.8	3.9	3.7	3.8	4.0	4.4	4.0	A0
130	3.7	3.6	3.6	3.7	3.7	3.8	3.6	3.7	3.9	4.0	4.0	A0
129	3.7	3.6	3.6	3.7	3.7	3.8	3.6	3.7	3.9	4.0	4.0	A0
128	3.6	3.5	3.5	3.6	3.6	3.7	3.5	3.6	3.8	3.9	3.9	A0
127	3.6	3.5	3.5	3.6	3.6	3.7	3.5	3.6	3.8	3.9	3.9	A0
126	3.6	3.5	3.5	3.6	3.6	3.7	3.5	3.6	3.8	3.9	3.9	A0
125	3.5	3.4	3.4	3.5	3.5	3.6	3.4	3.5	3.7	3.8	3.8	A0
124	3.4	3.3	3.3	3.4	3.4	3.5	3.3	3.4	3.6	3.7	3.7	A0
123	3.4	3.3	3.3	3.4	3.4	3.5	3.3	3.4	3.6	3.7	3.7	A0
122	3.3	3.2	3.2	3.3	3.3	3.4	3.2	3.3	3.5	3.6	3.6	A0
121	3.4	3.3	3.3	3.4	3.4	3.5	3.3	3.4	3.6	3.7	3.7	A0
120	3.4	3.3	3.3	3.4	3.4	3.5	3.3	3.4	3.6	3.7	3.7	A0
119	3.3	3.2	3.2	3.3	3.3	3.4	3.2	3.3	3.5	3.6	3.6	A0
118	3.3	3.2	3.2	3.3	3.3	3.4	3.2	3.3	3.5	3.6	3.6	A0
117	3.2	3.2	3.2	3.3	3.3	3.4	3.2	3.3	3.5	3.6	3.6	A0
116	3.2	3.1	3.1	3.2	3.2	3.3	3.1	3.2	3.4	3.5	3.5	A0
115	3.2	3.1	3.1	3.2	3.2	3.3	3.1	3.2	3.4	3.5	3.5	A0
114	3.1	3.1	3.1	3.2	3.2	3.3	3.1	3.2	3.4	3.5	3.5	A0
113	3.1	3.1	3.1	3.2	3.2	3.3	3.1	3.2	3.4	3.5	3.5	A0
112	3.0	3.0	3.0	3.1	3.1	3.2	3.0	3.1	3.3	3.4	3.4	A0
111	3.1	3.1	3.1	3.2	3.2	3.3	3.1	3.2	3.4	3.5	3.5	A0
110	3.0	3.0	3.0	3.0	3.0	3.1	3.0	3.0	3.3	3.4	3.4	A0
109	2.9	2.9	2.9	3.0	3.0	3.1	2.9	3.0	3.2	3.3	3.3	A0
108	2.9	2.8	2.8	2.9	2.9	3.0	2.8	2.9	3.1	3.2	3.2	A0
107	2.8	2.8	2.8	2.9	2.9	3.0	2.8	2.9	3.1	3.2	3.2	A0
106	2.9	2.8	2.8	2.9	2.9	3.0	2.8	2.9	3.1	3.2	3.2	A0
105	2.8	2.7	2.7	2.8	2.8	2.9	2.7	2.8	2.9	3.0	3.0	A0
104	2.7	2.7	2.7	2.7	2.7	2.8	2.7	2.7	2.8	2.9	2.9	A0
103	2.7	2.7	2.7	2.7	2.7	2.8	2.7	2.7	2.8	2.9	2.9	A0
102	2.7	2.7	2.7	2.7	2.7	2.8	2.7	2.7	2.8	2.9	2.9	A0
101	2.6	2.6	2.6	2.7	2.7	2.8	2.6	2.6	2.7	2.8	2.9	A0

GRADES 2.5 - 2.6 - 2.7

TABLE 26

ANTICIPATED ACHIEVEMENT GRADE PLACEMENTS FOR GRADE 2

ANTICIPATED ACHIEVEMENT GRADE PLACEMENTS FOR GRADE 2