1957

The predictive value of a capacity-achievement comparison in the fourth grade to identify "over-achievers" and "under-achievers" in the sixth grade.

Colgan, Margaret C

Boston University

http://hdl.handle.net/2144/13195

Boston University
BOSTON UNIVERSITY
SCHOOL OF EDUCATION

Thesis

THE PREDICTIVE VALUE OF A CAPACITY-ACHIEVEMENT
COMPARISON IN THE FOURTH GRADE TO IDENTIFY "OVER-ACHIEVERS"
AND "UNDER-ACHIEVERS" IN THE SIXTH GRADE

In Partial Fulfillment
of the Requirements for the Degree
Master of Education
1957

Submitted by
Margaret C. Colgan
(B. Ed., R. I., College of Education, 1951)
First Reader: James F. Baker, Associate Professor of Education
Second Reader: W. Linwood Chase, Dean of the School of Education
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>THE PROBLEM AND DEFINITIONS OF TERMS USED</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>The Problem</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Statement of the Problem</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Source of the Problem</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Justification of the Study</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Definitions of Terms Used</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>&quot;Over-achievers&quot;</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>&quot;Under-achievers&quot;</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Summary</td>
<td>3</td>
</tr>
<tr>
<td>II.</td>
<td>REVIEW OF RESEARCH</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>The Achievement Quotient</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Definition of the A. Q.</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Negative Correlation between I.Q. and A. Q.</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Reliability of the Accomplishment Quotient</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Prescott's Technique</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Guides for This Technique</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Description of Technique</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Summary</td>
<td>14</td>
</tr>
<tr>
<td>III.</td>
<td>PROCEDURES</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Selection of Pupils for Study</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Tests and Time of Testing</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>California Short-Ferm Test of Mental Maturity</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Diagnostic Profile</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Reliability</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Metropolitan Achievement Test</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Standardization</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Reliability</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Treatment of Data</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Correlations</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Deviation Indices</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Bivariate Distributions</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Mental Age-Achievement Age Comparisons</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Identification of &quot;Over&quot; &amp; &quot;Under-Achievers&quot;</td>
<td>23</td>
</tr>
<tr>
<td>CHAPTER</td>
<td>PAGE</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>Comparison of Consistency of Achievement—Ability Deviations</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Summary</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>IV. INTERPRETATION OF DATA</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Capacity—Achievement Comparison</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Comparison of Mental Ages and Average Achievement Ages</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Comparison of Mental Ages and Achievement Ages in Selected Subtests</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Correlations Between Mental Ages and Achievement Ages</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Bivariate Distributions</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Deviation Indices: Mental &amp; Achievement Ages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Achievement, Grade Four</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Average Achievement, Grade Six</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Reading, Grade Four</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Reading, Grade Six</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Vocabulary, Grade Four</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Vocabulary, Grade Six</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Arithmetic Fundamentals, Grade Four</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Arithmetic Fundamentals, Grade Six</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Arithmetic Problems, Grade Four</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>Arithmetic Problems, Grade Six</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>Summary</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>V. SUMMARY AND CONCLUSIONS</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Restatement of the Problem</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Summary</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Conclusions</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>Limitations of Study</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>Recommendations for Further Research</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>APPENDIX</td>
<td>57</td>
<td></td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>TABLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Studies Showing the Negative Correlations Between Intelligence Quotients and Accomplishment Quotients</td>
<td>9</td>
</tr>
<tr>
<td>II. The Coefficients of Reliability and Standard Error of Measurement Expressed in Months of Mental Ages for Grades 1-2 and 4-6</td>
<td>18</td>
</tr>
<tr>
<td>III. Corrected Split-Half Reliability Coefficients, Standard Deviations, and Standard Errors of Measurement for Metropolitan Achievement Test; Form R</td>
<td>20</td>
</tr>
<tr>
<td>IV. Mean and Standard Deviation of the Mental Ages, Average Achievement Ages in Months for Forty-Two Pupils in Grades Four and Six</td>
<td>26</td>
</tr>
<tr>
<td>V. Mean and Standard Deviation of the Mental Ages and Achievement Ages in Months of Selected Subtests for Grades Four and Six</td>
<td>27</td>
</tr>
<tr>
<td>VI. Coefficients of Correlation Between the Mental Ages and the Average Achievement Ages and Between the Mental Ages and the Achievement Ages in Selected Subtests for Grades Four and Six</td>
<td>28</td>
</tr>
<tr>
<td>VII. Number of &quot;Over-achievers&quot; and &quot;Under-achievers&quot; in Average Achievement and in Selected Subtests of the Achievement Measure in Grades Four and Six</td>
<td>48</td>
</tr>
</tbody>
</table>
# List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Bivariate Distribution of California DINA's and Metropolitan DIAA's for Forty-Two Fourth Grade Pupils</td>
<td>30</td>
</tr>
<tr>
<td>2.</td>
<td>Bivariate Distribution of California DINA's and Metropolitan DIAA's for Forty-Two Sixth Grade Pupils</td>
<td>31</td>
</tr>
<tr>
<td>3.</td>
<td>Bivariate Distribution of California DINA's and Metropolitan DIA's for Forty-Two Fourth Grade Pupils</td>
<td>34</td>
</tr>
<tr>
<td>4.</td>
<td>Bivariate Distribution of California DINA's and Metropolitan DIA's for Forty-Two Sixth Grade Pupils</td>
<td>35</td>
</tr>
<tr>
<td>5.</td>
<td>Bivariate Distribution of California DINA's and Metropolitan DIA's for Forty-Two Fourth Grade Pupils</td>
<td>38</td>
</tr>
<tr>
<td>6.</td>
<td>Bivariate Distribution of California DINA's and Metropolitan DIA's for Forty-Two Sixth Grade Pupils</td>
<td>39</td>
</tr>
<tr>
<td>7.</td>
<td>Bivariate Distribution of California DINA's and Metropolitan DIAF's for Forty-Two Fourth Grade Pupils</td>
<td>42</td>
</tr>
<tr>
<td>8.</td>
<td>Bivariate Distribution of California DINA's and Metropolitan DIAF's for Forty-Two Sixth Grade Pupils</td>
<td>43</td>
</tr>
<tr>
<td>FIGURE</td>
<td>PAGE</td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>9. Bivariate Distribution of California DIMA's and Metropolitan DIAP's for Forty-Two Fourth Grade Pupils</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>10. Bivariate Distribution of California DIMA's and Metropolitan DIAP's for Forty-Two Sixth Grade Pupils</td>
<td>46</td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS USED

Capacity achievement comparisons are made to identify the pupils who are achieving above or below their capacity to achieve. Teachers, in making these comparisons in a primary grade, often ask: "Will the pupils who are labeled as "over-achievers" or "under-achievers" in the primary grades remain in the same category throughout the elementary grades?"

1. THE PROBLEM

Statement of the Problem. It was the purpose of this study to determine to what extent prediction of over-achievement or under-achievement in an upper grade of an elementary school is possible from a capacity-achievement comparison in a lower grade. This involved two major steps: The first was concerned with capacity-achievement comparisons of the same pupils in a primary grade and in an upper elementary grade to identify the "over-achievers" and "under-achievers" in both grades. The second step included a comparison of the consistency of ability-achievement deviations in selected subtests in both grades.

Source of the Problem. Intelligence tests are administered in the fall term of the third grade and the
sixth grade. Metropolitan Achievement Tests are given every year in the fall term to all pupils in grades four through six. Since the time of testing in capacity and achievement for grades four and six was relatively close, the present sixth grade group was chosen for this study. Records of intelligence test scores and achievement test scores and achievement test scores were available for forty-two of this group in the fourth grade and the sixth grade.

Justification of the Study. The prediction of "over-achievers" and "under-achievers" in the sixth grade from a capacity-achievement comparison in the fourth grade would provide the basis for more expert guidance by affording the teacher the opportunity:

1. To analyze the pupils who were over-achieving or under-achieving to determine the reasons for the deviations;

2. To stimulate and direct the training of those pupils of high native ability who were not accomplishing what might be expected of them in light of their superior intelligence;

3. To recommend acceleration or an enriched program for those pupils of superior intelligence who were achieving beyond their mental ability;

4. To provide the necessary remedial measures for the pupils who were under-achieving because of deficiency in the skill subjects;

5. To ease the pressure on the pupils who were accomplishing beyond what one is justified in expecting of them in light of their mental capacity.
2. DEFINITIONS OF TERMS USED

"Over-achievers". Pupils whose achievement is significantly higher than their capacity to achieve on the basis of an ability rating.

"Under-achievers". Pupils whose achievement is significantly lower than their capacity to achieve on the basis of an ability rating.

3. SUMMARY

These capacity-achievement comparisons were made to determine the possibility of predicting at the fourth grade level the "over-achievers" and "under-achievers" in the sixth grade. The same group of forty-two pupils in grades four and six were the subjects of this study. This prediction would provide the basis for more expert guidance by the teacher in the fourth grade.
CHAPTER II
REVIEW OF RESEARCH

The need for an adequate means of comparing capacity to achieve, as determined by an intelligence test with actual achievement, as determined by an achievement test has been recognized by educators for many years. Prescott states:

The history of the mental measurement movement might be said, with little exaggeration, to be the history of a search for an adequate means of comparing a capacity measure with some measure of achievement.¹

Some of the better-known techniques mentioned by McCrory² for capacity-achievement comparisons are: Monroe and Buckingham's achievement quotient; Fransen's accomplishment quotient; Pintner's difference index; Torgerson's efficiency quotient and Symond's index of studiousness and effort. Prescott,³ recently, in a doctoral dissertation, developed an improved method of comparing capacity with

³Prescott, op. cit., p. 143.
achievement. The achievement or accomplishment quotient, which has received more publicity and wider acceptance than any of the other measures, and Prescott's improved technique will be discussed in this chapter.

1. THE ACHIEVEMENT QUOTIENT

The value of the achievement quotient or accomplishment quotient, which are synonymous terms and abbreviated A. Q. as an educational concept, has been the subject of much controversy since it was introduced in 1920. It was first advocated by Monroe and Buckingham and later by Franzen as a means of combining the results of capacity and achievement tests into a measure of educational achievement relative to the child's capacity.⁴ Beeson and Tope refer to the A. Q. as "the fairest and most valuable measure of the efficiency of both teacher and pupil, which has yet been devised."⁵ Stebbins and Pechstein claim that, "From the viewpoint of the teacher, the A. Q. is the only quotient which takes into account the material with which she is working."⁶ Toops and


Symonds express the concern of educators when they state:

The need in education for a measure of accomplishment, effort, motivation, attitude, dynamic effort of educational environment—call it what you will—is so great that it seems quite possible the accomplishment quotient procedure may be accepted uncritically by educators.7

Definition of the A. Q. The A. Q. may be defined as "the degree to which a pupil's actual progress has attained its potential progress by the best possible measures of both,"8 or, "as a simple method of comparing a pupil's achievement with his mental age (learning capacity)."9

The A. Q. is the ratio of the educational quotient to the intelligence quotient. Since chronological age is a common factor to both quotients, the A. Q. may be also considered as a ratio of educational age to mental age and is expressed symbolically in the form:10

\[
A. Q = \frac{E. Q.}{I. Q.} = \frac{C. A.}{M. A.} = \frac{E. A.}{M. A.}
\]


An I. Q. of one hundred indicates achievement commensurate with a pupil's capacity, or that he has achieved exactly as well as other pupils of his mental age. In discussing this, Greene and Jorgensen claim:

In theory an accomplishment quotient of more than 100 is an impossibility, since it is maintained that a pupil cannot be expected to develop a special skill higher than his general mental ability. The probabilities are that, when such quotients exceed 100, the reason may be traced to the unreliability of the tests themselves.\(^{12}\)

On the other hand, an A. Q. of less than one hundred means that the pupil is not working up to capacity, or, as Monroe and Buckingham point out, "If a pupil's achievement is .75 we have evidence that he has achieved only seventy-five per cent as much as the average of the pupils of his mental age."\(^{13}\)

Negative Correlations Between I. Q. and A. Q. The first disadvantage of the A. Q. technique was the negative correlations reported by investigators. Franzen reports a coefficient of \(-.61\) between I. Q. and A. Q. in a study of two hundred children in Garden City. After intensive training, motivation, and proper grade placement, a coeffi-

\(^{11}\)Wagner and Hause, loc. cit.


\(^{13}\)Monroe and Buckingham, loc. cit.
cient of $-0.49$ was found. The conclusion, according to Wilson, was that,

The tendency of low accomplishment quotients to be associated with high intelligence quotients and high accomplishment quotients to be associated with low intelligence quotients seemed stubbornly to resist remedial measures.\footnote{14William R. Wilson, "The Misleading Accomplishment Quotient," \textit{Journal of Educational Research}, 17:1, January, 1928.}

Similar studies made by other investigators are reported in Table I.
### TABLE I
CORRELATIONS BETWEEN I.Q. AND A.Q.

<table>
<thead>
<tr>
<th>Investigator</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Murdock(^{15})</td>
<td>-.45 &amp; -.73</td>
</tr>
<tr>
<td>McPhail(^{16})</td>
<td>-.50</td>
</tr>
<tr>
<td>Pumphoe(^{17})</td>
<td>-.39 &amp; -.59</td>
</tr>
<tr>
<td>Odell(^{18})</td>
<td>-.42 &amp; -.58</td>
</tr>
<tr>
<td>Wilson(^{19})</td>
<td>-.38</td>
</tr>
</tbody>
</table>

The results in the table above verify the opinions of critical writers in the field in regard to the negative correlations obtained by the application of this method of comparing intelligence and achievement.

---


\(^{19}\)Wilson, *op. cit.*., pp. 1-10.
From his experiment, McPhail concludes:

... superior children are not working up to their capacity as well as do normal children and that the less gifted children exceed both these groups in this respect by doing just what one is justified in expecting of them.20

The high accomplishment quotients obtained by slow pupils is due to the special attention given by the teacher. The bright children are capable of doing the grade work with little effort and have no incentive to do any better. To alter this situation Torgerson suggested that children be classified according to mental age and that the methods of instruction be readjusted to fit the needs of each group.21 In this way, each child would be placed on a higher plane of efficiency.

Pintner and Marshall share Torgerson's viewpoint when they say, "... a combination of mental and achievement tests will equalize the pressure and stimulate both groups to work to their respective capacities."22

Reliability of The Accomplishment Quotient. The low reliability, reported by writers, is listed as another weakness of the accomplishment quotient. This is due to the low reliability of the tests used and to the statistical fact that quo-

20McPhail, op. cit., 586.


patients derived from tests that are unreliable cannot be reliable.23

McCrorry cites studies by Symonds, Poponoe, and Odell in which the reliability coefficients obtained varied from .39-58.24 In his study, the average reliability of six accomplishment quotients derived from various combinations of the Terman Group Test of Mental Ability and the Stanford Achievement Test was .66.

In a later study, Wagner and Hause report a coefficient of correlation of .38 .046 between two sets of paired scores.25 The conclusions of these two investigators was that the accomplishment quotient had little reliability26 and that it should be used cautiously, if at all, in the field of individual diagnosis until more reliable tests are available.27

2. PRESCOTT'S TECHNIQUE

An improved method of comparing capacity to achieve and actual achievement based on a regression technique was developed by Prescott.28 The procedure employed the Pintner General Ability Test, Verbal Series, as the capacity measure and the Metropolitan Achievement Tests for grade 4,5-8,5 as the achieve-
ment measure. Although the author realized that the validity and reliability of the tests were basic problems he felt that this consideration was outside the scope of his study.

Guides For This Technique. Prescott set up the following guides for the development of this technique:

1. Comparison of capacity and achievement should be restricted to specific areas of achievement where, at least a reasonable amount of continuity of instruction exists from one level (age or grade) to another. A composite achievement measure, that is, an achievement score obtained by totaling or averaging achievement scores from a number of achievement tests, is meaningless under most circumstances.

2. The system of comparison must take into account the unreliabilities of whatever capacity and achievement measures are employed.

3. The computation of quotients obtained by dividing an achievement measure by a capacity measure should not constitute the method of comparison.

4. The derived test score units must be equally variable from age (or grade) level to age (or grade) level.

5. The derived test score units must be equally variable from the capacity measure to the several achievement measures.

6. The derived test score units of the capacity and achievement measures being compared must be relatively independent of the developmental curves through the mean scores of successive groups (age or grade) while reflecting accurately changes in the growth pattern of individual pupils.

7. Extrapolated values should be avoided.

8. The system should make allowances for the exposure differential.

9. Allowance must be made for differences in community level of achievement due to the opera-
tion of specific factors, such as curriculum
differences, differences in methods, differences
in length of school year, and differences in pro-
motion policies.

10. Allowance must be made for the regres-
sion effect of a first score upon a second due
to the imperfect correlation between the two
measures.29

Description of Technique. In making capacity-achievement
comparisons, the first step consists of setting up comparable
test score units separately for each measure after the data
has been collected. The next step is concerned with the com-
parison of actual achievement with expected achievement. The
directions for these steps are:

To set up comparable test score units that are
equally variable from level to level (grade or
age) and from the capacity to the achievement
measures, the progression of both the mean scores
and standard deviations of scores is determined
for each of the measures separately. The develop-
mental lines for the means provide the basis for
determining the amount by which an individual de-
viates from the norm at his particular level. A
correction for the unequal variability of test
scores is determined by dividing an arbitrarily
established standard deviation of 15 by the stan-
dard deviation of the test scores at each level.
The deviation of any score from the norm multi-
plied by this ratio added to, or subtracted from,
100 results in a new deviation-type score that is
constant regardless of grade or age. This proce-
dure is applied independently to the capacity
measure and the several achievement measures,
thereby canceling out differences in the shapes
of the developmental lines for the means. Thus
it is possible to make direct comparisons of the
capacity and achievement measures.

29 Prescott, ibid., pp. 51-52.
Expected achievement scores are obtained by computing the coefficient of correlation between the capacity and achievement measure and determining the regression of achievement on capacity. This makes it possible to compare a pupil's actual achievement in each of several subject matter areas and the achievement that can be expected of him in light of his capacity to achieve.30

As Prescott points out, the ninth criterion is not met adequately.31 The norms used were national norms which makes this procedure applicable if the capacity and achievement means and standard deviations for the group do not depart radically from the norm group.

Prescott made the following statement in regard to this procedure: "Although it does not meet all criteria perfectly, any substantial gain over current capacity-achievement comparisons must be considered worthwhile."32

3. SUMMARY

In a search for an acceptable means of comparing capacity and achievement many different measures have been proposed. Of these, the accomplishment quotient has received more publicity than any of the others. Many writers have criticized this procedure and either suggested other methods

30 Prescott, ibid., pp. 52-53.
31 Prescott, ibid., p. 92.
32 Prescott, ibid., p. 52.
or endeavored to revise the original procedure. Recently, Prescott developed an improved technique in an attempt to eliminate or minimize some of the disadvantages of the previous measures.
CHAPTER III

PROCEDURES

Selection of Pupils for Study. Forty-two pupils in the sixth grade, for whom scores of intelligence tests and achievement tests were available in grades four and six, were selected for this study.

Tests and Time of Testing. The California Short-Form Test of Mental Maturity, Primary (1950 S-Form), was administered to this group when they were in the third grade and the Elementary (1950 S-Form) of the same test was given in the sixth grade approximately one month after the achievement test was given. These tests were used as the capacity measure. For the achievement measure, the scores of the Metropolitan Achievement Tests were recorded. The Elementary Battery, Form U, had been used in the fourth grade and the Intermediate Battery, Partial, Form S, in the sixth grade.

1. CALIFORNIA SHORT-FORM TEST OF MENTAL MATURITY

The California Short-Form Test, a part of a parent test, The California Test of Mental Maturity, is available in five levels: pre-primary, primary, elementary, intermediate, and advanced. The Short-Form has been developed to
secure as valid a measure of mental maturity as can be se-
cured by a one period test. In describing this test, the
authors say:

Selections from the parent test provide sub-
tests which measure both language and non-language
mental maturity and four of the major factors in-
volved in intelligence or mental capacity, namely:
spatial relations, logical reasoning, numerical
reasoning, and verbal concepts which are useful
in the thinking process.¹

This test yields three mental ages (language, non-
language, and total), and three I. Q.'s (language, non-
language, and total).²

The Diagnostic Profile. A feature of this test
which is pointed out by the authors is the diagnostic pro-
file which appears on the back of each test booklet. It
summarizes the major factors measured by the test and iden-
tifies the strengths and weaknesses of pupils. They may be
used by the teacher as the basis for guiding educational
activities.³

Reliability. Reliability coefficients of the Cali-
ifornia Short-Form Test of Mental Maturity were computed by
the split-halves method and corrected by the Spearman-Brown
Formula. The following table shows the coefficients and

¹Manual for Administering the California Short-Form
Test of Mental Maturity (1950 S-Form), California Test Bureau,
Los Angeles, California, 1950, p. 2.

²Loc. cit.

³Ibid., p. 6.
standard error of measurement expressed in months of mental age for grades two and three and grades four to six.  

TABLE II

THE COEFFICIENTS OF RELIABILITY AND STANDARD ERROR OF MEASUREMENTS EXPRESSED IN MONTHS OF MENTAL AGES FOR GRADES 2-3 AND 4-6

<table>
<thead>
<tr>
<th>Tests</th>
<th>Grades 2-3</th>
<th>Grades 4-6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Reliability</td>
<td>S.E.M.</td>
</tr>
<tr>
<td>Total Mental Factors</td>
<td>.921</td>
<td>3.9</td>
</tr>
<tr>
<td>Language Factors</td>
<td>.882</td>
<td>4.8</td>
</tr>
<tr>
<td>Non-language Factors</td>
<td>.902</td>
<td>4.4</td>
</tr>
<tr>
<td>Spatial Relationships</td>
<td>.865</td>
<td>5.1</td>
</tr>
<tr>
<td>Logical Reasoning</td>
<td>.874</td>
<td>4.9</td>
</tr>
<tr>
<td>Numerical Reasoning</td>
<td>.842</td>
<td>5.5</td>
</tr>
<tr>
<td>Verbal Concepts</td>
<td>.820</td>
<td>5.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of cases</th>
<th>700</th>
<th>1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.D.(M.A. in MO.)</td>
<td>14</td>
<td>16</td>
</tr>
</tbody>
</table>

2. METROPOLITAN ACHIEVEMENT TESTS

The Metropolitan Achievement Tests, covering the skills in grades one through nine, are divided into five batteries: Primary I, Primary II, Elementary, Intermediate, and Advanced. There are several forms of each battery, similar in content and organization and equal in difficulty. The Elementary Battery is recommended for grades three and four and the Intermediate Battery in grades five, six, and beginning seventh. Both of these batteries include sub-

tests in reading comprehension, vocabulary, arithmetic funda-
mentals, arithmetic problems, language, and spelling.4

Standardization. National norms were based on a
twenty-five per cent random sample in each classroom tested.
More than 500,000 tests were administered in every state in
the country.

Freedom from selection within the norm popula-
tion was insured by the wide range of communities
included from a geographic point of view, by the
wide variety of administrative units—large cities,
small cities, town, villages, and rural areas—and
by the fact that all pupils in at least three grades
in each community were tested.5

The authors state, "The existence of a variety of
norms based on an adequate population is one of the most
essential characteristics of a well-standardized test."6
There are several norms provided in the Metropolitan Achieve-
ment Tests as modal age norms, traditional age equivalents,
grade equivalents and percentile norms. One of the common
uses of the age equivalent is to "Compare the performance
of a child in a specific subject area with his mental age
as obtained from a standard intelligence test."7

4Gertrude Mildred, Manual for Interpreting Metro-
politan Achievement Tests, (New York: World Book Company,
1948), p. 5.
5Ibid., p. 8.
6Ibid., p. 34.
7Ibid., p. 37.
Reliability. The following table gives the split-half reliability coefficients corrected by the Spearman-Brown Formula for the Elementary and Intermediate Batteries.

<table>
<thead>
<tr>
<th>Battery</th>
<th>Gr.</th>
<th>N</th>
<th>Test</th>
<th>Reliability</th>
<th>Standard Deviation</th>
<th>S. E. Meas.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary</td>
<td>3</td>
<td>374</td>
<td>Reading</td>
<td>.959</td>
<td>19.1</td>
<td>4.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vocabulary</td>
<td>.927</td>
<td>20.5</td>
<td>5.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Arith.Fund.</td>
<td>.946</td>
<td>9.5</td>
<td>2.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Problems</td>
<td>.871</td>
<td>11.2</td>
<td>4.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lang.Usage</td>
<td>.925</td>
<td>20.3</td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Spelling</td>
<td>.934</td>
<td>18.0</td>
<td>4.9</td>
</tr>
<tr>
<td>Intermediate</td>
<td>5</td>
<td>350</td>
<td>Reading</td>
<td>.954</td>
<td>21.0</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vocabulary</td>
<td>.926</td>
<td>21.7</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Arith.Fund.</td>
<td>.914</td>
<td>20.1</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Problems</td>
<td>.879</td>
<td>18.5</td>
<td>6.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>English</td>
<td>.904</td>
<td>21.2</td>
<td>6.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Spelling</td>
<td>.933</td>
<td>19.6</td>
<td>5.3</td>
</tr>
</tbody>
</table>

3Adapted from Table II, p. 9.
3. TREATMENT OF DATA

The scores of the two forms of the intelligence tests were expressed in terms of mental ages. Reference was made to the tables in the Binet Manual to project the mental ages to the time of the achievement testing in both grades. Achievement ages in the subtests were found in the table of norms in the Key and Directions for Scoring the Elementary and Intermediate forms of the Metropolitan Achievement Tests. The average achievement age was found for each pupil in grade four and grade six. These results are listed for the forty-two children in both grades in the Appendix.

Correlations. The coefficients of correlation were computed between the mental ages and the average achievement ages and between the mental ages and the achievement ages in selected subtests of the achievement measure. The Pearson Product Moment Formula, which follows, was used:

\[ r = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sigma_x \sigma_y} \]

---

9Greene and Jorgensen, op. cit., 193-198.
Deviation Indices. Prescott\textsuperscript{10} lists the setting up of comparable test score units for the capacity measure and the achievement measures, as the first step in a capacity-achievement comparison. This was done by converting the mean and the standard deviation scores of each variable to an assigned mean of one hundred and a standard deviation of ten. These new scores were termed deviation indices.

Bivariate Distributions. The deviation indices for the mental ages, average achievement ages, and the achievement ages in selected subtests were plotted in the form of bivariate distributions. The slope of the regression line was determined by connecting the points set at plus and minus one standard deviation from the assigned mean of one hundred for both variables. The following formula for finding the standard error of estimate was employed:

$$
\sigma_y \sqrt{1 - r_{xy}^2}
$$

$\sigma_y$ is the standard deviation of the mental ages and $r_{xy}$ the correlation between the mental ages and the achievement ages. Parallel bands of significance were drawn at plus and minus one standard error of estimate from the line of regression.

Mental Age-Achievement Age Comparisons. The capacity-achievement comparisons were made for the same pupils in
grade four and grade six using Prescott's regression technique as the statistical measure.\textsuperscript{11}

\textbf{Identification of "Over-achievers" and "Under-achievers".}
The pupils above the upper parallel band of significance, whose actual achievement was significantly lower than their capacity to achieve were identified as "under-achievers". Those pupils below the lower parallel band who were achieving beyond what might normally be expected of them in light of their capacity to achieve were identified as "over-achievers".

\textbf{Comparison of Consistency of Achievement-Ability Deviations.} A comparison was made of the consistency of achievement-ability deviations in average achievement and in selected subtests of the achievement measure. The object of these comparisons was to determine whether or not the pupils who were achieving above or below their capacity in the fourth grade were in the same categories in the sixth grade.

\textbf{4. SUMMARY}

The scores of two forms of the California Short-Form Test of Mental Maturity (1950 S-Form) and two batteries of the Metropolitan Achievement Test were the data for these capacity-achievement comparisons. Prescott's regression technique was the statistical measure employed for the comparison.

\textsuperscript{11} Prescott, \textit{op. cit.}, pp. 50-54.
parisons. The following steps were taken in the study:

1. Each pupil was identified by a number on tables containing the mental ages and achievement ages in grades four and six.

2. The mean and standard deviation of the capacity and achievement measures were found and Pearson Product Moment correlations were computed between mental ages and average achievement ages in selected subtests.

3. Mental ages and achievement ages were transformed into deviation indices and plotted in the form of bivariate distributions for both grades.

4. The slope of the line of regression was determined and parallel bands of significance were drawn at plus and minus one standard error of estimate from this line.

5. "Over-achievers" and "under-achievers" were identified in both grades.

6. Comparisons were made of the consistency of capacity-achievement deviations in selected subtests.
CHAPTER IV

INTERPRETATION OF DATA

This study, as has been stated before, includes:

1. A comparison of the mental ages and the average achievement ages of the same group of forty-two children in grades four and six;

2. A comparison of the mental ages and the achievement ages in selected subtests of the achievement measure;

3. The identification of "over-achievers" and "under-achievers" in both grades; and

4. A comparison of the consistency of achievement-ability deviation in selected subtests.

1. CAPACITY-ACHIEVEMENT COMPARISON

Comparison of Mental Ages and Average Achievement Ages. Table IV shows the mean and the standard deviation of the mental ages and the average achievement ages in months for forty-two children in grades four and six.
### TABLE IV

**MEAN AND STANDARD DEVIATION OF THE MENTAL AGES AND THE AVERAGE ACHIEVEMENT AGES IN MONTHS FOR FORTY-TWO PUPILS IN GRADES FOUR AND SIX**

<table>
<thead>
<tr>
<th>Grade</th>
<th>California M</th>
<th>SD</th>
<th>Metropolitan M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four</td>
<td>105.6</td>
<td>13.13</td>
<td>109.28</td>
<td>4.74</td>
</tr>
<tr>
<td>Six</td>
<td>134.95</td>
<td>13.85</td>
<td>135.2</td>
<td>9.85</td>
</tr>
</tbody>
</table>

*The California Short-Form Test of Mental Maturity, Form 3, Primary and Elementary, were used as the capacity measure.

**The Metropolitan Achievement Test, Partial Elementary U, in the fourth grade and Partial Intermediate S, in the sixth grade were used for the achievement measure.

NOTE: Samples of the tests used will be found in the Appendix.

The mean of the average achievement ages was higher than the mean of the mental ages for these pupils in the fourth grade indicating that they were, as a group, achieving a little beyond their capacity to achieve. The difference of less than one point between the mental ages and the average achievement ages in the sixth grade would indicate that they were achieving as well as could be expected of them in light of their mental ages.

Comparison of Mental Ages and Achievement Ages in Selected Subtests. The mean and standard deviation for the
mental ages and the achievement ages in selected subtests of the Metropolitan Achievement Test are reported in Table V.

**TABLE V**

MEAN AND STANDARD DEVIATION OF THE MENTAL AND ACHIEVEMENT AGES, EXPRESSED IN MONTHS, OF SELECTED SUBTEST OF THE ACHIEVEMENT TEST FOR GRADES FOUR AND SIX

<table>
<thead>
<tr>
<th>California</th>
<th>Metropolitan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade</td>
<td>Subtest</td>
</tr>
<tr>
<td>4</td>
<td>Reading</td>
</tr>
<tr>
<td></td>
<td>Vocabulary</td>
</tr>
<tr>
<td></td>
<td>Fund.</td>
</tr>
<tr>
<td></td>
<td>Arith. Prob.</td>
</tr>
<tr>
<td>6</td>
<td>Reading</td>
</tr>
<tr>
<td></td>
<td>Vocabulary</td>
</tr>
<tr>
<td></td>
<td>Fund.</td>
</tr>
<tr>
<td></td>
<td>Arith. Prob.</td>
</tr>
</tbody>
</table>

In the fourth grade this group was achieving slightly beyond their capacity to achieve in reading, while the mean for vocabulary was relatively close to the mean of the mental ages. Their achievement in arithmetic fundamentals and problems, however, was significantly higher than might normally be expected of pupils of their mental ages.

The results in the sixth grade show that these pupils were not working up to their capacity level in either reading comprehension or vocabulary. Their achievement in arithmetic
fundamentals and problems, as was noted in the fourth grade, was higher than their capacity to achieve.

Correlations Between Mental Ages and Achievement Ages.
The coefficient of correlation between the mental ages and average achievement ages and between the mental ages and achievement ages in selected subtests are reported in Table VI.

**TABLE VI**

**COEFFICIENT OF CORRELATION BETWEEN THE MENTAL AGES AND THE AVERAGE ACHIEVEMENT AGES AND BETWEEN THE MENTAL AGES AND THE ACHIEVEMENT AGES IN SELECTED SUBTESTS FOR GRADES FOUR AND SIX**

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Grade 4</th>
<th>Grade 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( r )</td>
<td>( r )</td>
</tr>
<tr>
<td>Aver. Ach.</td>
<td>.18</td>
<td>.74</td>
</tr>
<tr>
<td>Reading</td>
<td>.00</td>
<td>.66</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>.24</td>
<td>.71</td>
</tr>
<tr>
<td>Arith. Fund.</td>
<td>.42</td>
<td>.56</td>
</tr>
<tr>
<td>Arith. Prob.</td>
<td>.60</td>
<td>.67</td>
</tr>
</tbody>
</table>

The coefficient of correlation between the mental ages and the average achievement ages was much higher for this group in the sixth grade than the coefficient found between the same two variables in the fourth grade. The correlation between these two measures in the sixth grade is more consistent with the correlations between the mental ages and the achievement ages in the subtests.

The lowest correlation coefficient, .00, was noted between the mental ages and reading comprehension in the
fourth grade while the highest, .60, was found between the 
mental ages and the achievement ages in arithmetic problems. 
In the sixth grade there was more consistency between the 
variables with the lowest coefficient, .56, between the 
mental ages and the achievement ages in fundamentals and 
the highest, .71, between the mental ages and the achieve-
ment ages in vocabulary.

Bivariate Distributions. Bivariate distributions of 
the California Capacity Indices and the Metropolitan Indices 
for mental ages and achievement ages in selected subtests 
were plotted for grades four and six. After the slope of 
the line of regression was determined, parallel bands of sig-
nificance were drawn at plus and minus one standard error of 
estimate. The pupils falling beyond the upper band were not 
achieving up to their capacity level and were identified as 
"over-achievers". Those below the lower band were achieving 
more than would be expected of them in light of their measured 
capacity and, therefore, were identified as "under-achievers".

On the sixth grade charts those encircled in red are 
the "over-achievers" and "under-achievers" in the sixth grade 
who were over-achieving or under-achieving in the fourth 
grade. Figures 1-10 are bivariate distributions of the de-
viation indices of the mental ages and achievement ages and 
appear on the following pages.
Fig. 1 Bivariate Distribution of California DLs and Metropolitan DLs for Forty-Two Pupils in Grade Four
Figure 2: Bilanates Distribution of California D, MA, and Metropolitan D's
for Forty-two Pupils in Grade Six
Distribution of \( \text{DIM}_A\)'s and \( \text{DIA}_A\)'s for Grade Four.

Figure 1 is a bivariate distribution of the deviation indices of the mental ages and the average achievement ages for the fourth grade. The coefficient of correlation between the capacity measure and the achievement measure was .18. Parallel bands of significance were drawn one standard error of estimate (12.88) above and below the line of regression. There were, according to this chart, fifteen pupils achieving beyond their capacity to achieve and nineteen who were not achieving as well as they should.

Distribution of \( \text{DIM}_A\)'s and \( \text{DIA}_A\)'s for Grade Six. The bivariate distribution of deviation indices for the mental ages and the average achievement ages for the sixth grade are shown in Figure 2. The coefficient of correlation of .74 between the two variables indicates much more consistency between capacity and achievement than was noted in the coefficient of .18 between the same two variables in the fourth grade. There were eight pupils below the lower band of significance, drawn at plus and minus one standard error of estimate (9.28) from the line of regression. The average achievement of these pupils was greater than their capacity to achieve. The six who fell outside the upper band were not achieving what might normally be expected of them.

Consistency of Achievement-Ability Deviation in Average Achievement. There were, as indicated in Figure 1, fifteen "over-achievers" and nineteen "under-achievers" in this
group in grade four. Less than one-half of this number were ever-achieving when they were in the sixth grade. Of the nineteen "under-achievers" less than one-third were listed as under-achieving in grade six. The identification of over and under achievers at the fourth grade level cannot be assumed to be a strong indication that they will fall into the same category in the sixth grade.
Fig. 3: Bivariate Distribution of California DLr's and Metropolitan DLr's for Forty-two Pupils in Grade Four.
Eight Bivariate Distribution of California D_{w} and Metropolitan D_{R_{S}} for forty-two pupils in Grade Six.
Distribution of DI\textsubscript{MA}'s and DIR's for Grade Four. Figure 3 shows the bivariate distribution of the deviation indices for the mental ages and the achievement ages in reading for grade four. The coefficient of correlation between the two variables was .00, the lowest found in this study. There were eight pupils below the line which was drawn one standard error of estimate (13.15) from the regression line, thus indicating that they were achieving beyond their capacity to read. Thirteen pupils were above the upper parallel line which indicated that they were not achieving what might be expected of them in view of their mental ages.

Distribution of DI\textsubscript{MA}'s and DIR's for Grade Six. The bivariate distribution of the deviation indices of the mental ages and the achievement ages in reading for these pupils in the sixth grade are shown in Figure 4. The coefficient of correlation of .66 between the two variables was considerably higher than the coefficient of correlation between the same two variables in the fourth grade. There were four pupils above and the same number below the bands of significance drawn one standard error of estimate (10.38) above and below the regression line.

Consistency of Achievement-Ability Deviation in Reading. There were, according to these diagrams, eight "over-achievers" in the fourth grade and four in the sixth grade. Two of the four pupils who were achieving beyond
their capacity to read in the sixth grade were also identified as "over-achievers" in the fourth grade. Three of the four "under-achievers" in the sixth grade were achieving significantly below their capacity to read in the fourth grade.
Fig. 5 Bivariate Distribution of California Div. 5 and Metropolitan Div. 5 for Forty-two Pupils in Grade Four
Fig. 6. Bivariate distribution of California DL$_{m}$ and Metropolitan DL$_{u}$ for forty-two pupils in Grade Six.
Distribution of DI\$MA’s and DI\$V’s for Grade Four. Bivariate distributions of deviation indices of mental ages and achievement ages in vocabulary for the fourth grade are shown in Figure 5. The coefficient of correlation between the capacity measure and the achievement measure was considerably higher than the coefficient of .00 between the mental ages and the achievement ages in reading. The bands of significance were drawn one standard error (12.75) above and below the line of regression. This chart indicates that there were twelve pupils achieving more than would be expected of them in view of their mental ages and eleven whose achievement was below their capacity to achieve in vocabulary.

Distribution of DI\$MA’s and DI\$V’s for Grade Six. Figure 6 shows the bivariate distribution of deviation indices of mental ages and achievement ages in vocabulary for the sixth grade. The coefficient between the two measures was .71, the highest found in this study between the mental ages and achievement ages in the subtests. Parallel bands drawn at plus and minus one standard error of estimate (9.69) from the line of regression indicate that there were four of this group over-achieving. Six pupils were not achieving what might normally be expected of them.

Consistency of Achievement-Ability Deviation in Vocabulary. A comparison of the diagrams for grade four and grade six shows that there were twelve "over-achievers" in vocabulary in the fourth grade and four in the sixth grade.
Of the twelve who were working beyond their capacity in the fourth grade only two were identified as over-achieving in the sixth grade. There were eleven "under-achievers" in the fourth grade and six in the sixth grade. One of this group of eleven was listed in the group of "under-achievers" in grade six.
Fig. 7 Bivariate Distribution of California DL_{MRS} and Metropolitan DL_{AFS} for forty-two pupils in Grade Four
Fig. 8 Bivariate Distribution of California $D_{off}$ and Metropolitan $D_{off}$ for Forty-two Pupils in Grade Six
Distribution of DI\text{MA}_4^g$ and DI\text{AF}_4^g$ for Grade Four. The deviation indices for the mental ages and the achievement ages for the fourth grade in fundamentals were plotted in a bivariate distribution in Figure 7. The coefficient of correlation of \( .42 \) indicates a little more consistency between capacity and achievement in fundamentals than between capacity and reading in vocabulary. There were twelve pupils above and the same number below the lines drawn at plus and minus one standard error (11.63) from the line of regression. The twelve below the lower band were achieving significantly above their expected level while those above the upper band were doing less than might be expected of them.

Distribution of DI\text{MA}_6^g$ and DI\text{AF}_6^g$ for Grade Six. Figure 8 is a bivariate distribution of the deviation indices for the mental ages and achievement ages in fundamentals for grade six. The correlation coefficient between the two variables was \( .56 \). Bands of significance were drawn one standard error of estimate (11.35) above and below the line of regression.

Consistency of Achievement-Ability Deviation in Fundamentals. A comparison of Figures 7 and 8 shows that there were twelve pupils in the fourth grade who were over-achieving. Three of these were identified as "over-achievers" in the sixth grade. Of the twelve "under-achievers" in the fourth grade, only one was listed in the same category in the sixth grade.
Fig. 9 Bivariate Distribution of California DL and Metropolitan DL for Forty-two Pupils in Grade Four
Figure Bivariate Distribution of California DLprop and Metropolitan DLprop for Forty-two Pupils in Grade Six
Distribution of DIAMA's and DIAP's for Grade Four. The coefficient of correlation between the mental ages and the achievement ages in arithmetic problems for the fourth grade, as shown in the bivariate distributions of deviation indices in Figure 9, was .60. The parallel lines, drawn plus and minus one standard error of estimate (10.52) from the regression line, show ten pupils achieving above their mental ages. There were ten pupils whose achievement in problems was below their capacity to achieve.

Distribution of DIAMA's and DIAP's for Grade Six. Figure 10 shows the bivariate distribution of deviation indices for the mental ages and for the achievement ages in problems for the sixth grade. The coefficient of correlation between the two variables was .56, which was consistent with the coefficient of correlation between capacity and achievement in problems in the fourth grade. There were seven over-achieving as determined by the parallel band of significance, drawn one standard error of estimate (10.24) above the line of regression. Nine pupils were below the lower parallel line indicating that they were not achieving at their expected level.

Consistency of Achievement-Ability Deviation in Problems. Figures 9 and 10 identify eleven pupils in the fourth grade and seven pupils in the sixth grade as "over-achievers". Of these seven, only one was in the same category in grade four. There were ten "under-achievers" in this group in the fourth grade and nine in grade six. Three of those who were not
working up to capacity in the sixth grade were not achieving what might be expected of them in the fourth grade.

2. SUMMARY

The comparison of mental ages and achievement ages for the same children in the fourth grade and the sixth grade indicated there were more pupils achieving above and below their capacity to achieve in the fourth grade than in the sixth grade. Table VII gives the number of "over-achievers" and "under-achievers" in grades four and six.

**TABLE VII**

**NUMBER OF "OVER-ACHIEVERS" AND "UNDER-ACHIEVERS" IN AVERAGE ACHIEVEMENT AND IN SELECTED SUB-TESTS OF THE ACHIEVEMENT MEASURE IN GRADES FOUR AND SIX**

<table>
<thead>
<tr>
<th></th>
<th>Grade 4</th>
<th>Grade 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Over</td>
<td>Under</td>
</tr>
<tr>
<td>Av. Ach.</td>
<td>15</td>
<td>19</td>
</tr>
<tr>
<td>Reading</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>Arith. Fund.</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Arith. Prob.</td>
<td>11</td>
<td>10</td>
</tr>
</tbody>
</table>

Table VII shows that the number of pupils who were over-achieving and under-achieving in the fourth grade was significantly larger than in the sixth grade in average achievement, vocabulary, and arithmetic problems. In reading there were twice as many pupils achieving beyond their capacity in the fourth grade as there were in the sixth grade.
The number who were not achieving up to their capacity in reading in grade four was more than three times the number found in grade six. There was a little more consistency in the number over-achieving or under-achieving in arithmetic fundamentals in both grades.
CHAPTER V

SUMMARY AND CONCLUSIONS

1. RESTATEMENT OF THE PROBLEM

Capacity-achievement comparisons were made of the same group of forty-two children in the fourth grade and the sixth grade to identify the "over-achievers" and "under-achievers" in both grades. A comparison was made of the consistency of capacity-achievement deviations in selected subtests of the achievement measure to determine the possibility of predicting at the fourth grade level the "over-achievers" and "under-achievers" in the sixth grade.

2. SUMMARY

Research has shown that the accomplishment quotient has been the most widely used of the different procedures proposed for comparing capacity and achievement. An improved method which was developed by Prescott was the technique used in this study.

Two forms of the California Short-Form Test of Mental Maturity, (1950 S-Form), constituted the capacity measure and two forms of the Metropolitan Achievement Tests, the achievement measure. Coefficients of correlation were computed between these two variables by the Pearson Product Moment Formula.
Mental ages and achievement ages were transformed into deviation indices and plotted in the form of bivariate distributions for both grades. The line of regression was determined and bands of significance were drawn to identify the pupils who were achieving above or below their capacity to achieve.

Comparisons were made of the consistency of the capacity-achievement deviations in average achievement and in selected subtests to determine the number of "over-achievers" and "under-achievers" who were still over-achieving or under-achieving in the sixth grade.

The correlations between mental ages and achievement ages in selected subtests were low in the fourth grade, particularly in reading comprehension and vocabulary. In the sixth grade the correlations between the two variables was more in agreement with results of studies made by previous investigators.

More pupils were achieving above and below their capacity when these pupils were in the fourth grade than when they were in the sixth grade. These large numbers would warrant further analysis. Guidance and remedial measures should be recommended for the extreme cases if there is no reason to doubt the scores of the intelligence test. In the sixth grade, the achievement of this group is more consistent with their measured capacity.
3. CONCLUSIONS

It is evident from the results of this study that there is no proof that the pupils who were achieving above or below their capacity in the fourth grade will be found in the same category in the sixth grade. There are, according to Hildreth, many factors which influence a child's success in school. Some of these which might be investigated are: poor home conditions, physical handicaps, inadequate language background, long absence from school, lack of interest, poor attitude towards school, and emotional instability. Any one of these might affect a child's performance in school.

4. LIMITATIONS OF STUDY

The number of cases in this study was small. This technique should be applied to a larger group to be considered valid.

5. RECOMMENDATIONS FOR FURTHER RESEARCH

The following recommendations are made for further research:

1. An analysis of the "over-achievers" and "under-achievers" should be made to determine the reasons for these deviations;

2. Capacity-achievement comparisons should be made using a different intelligence test with

Hildreth, op. cit., p. 70.
the Metropolitan Achievement Test or a different achievement test with the California Short-Form Test of Mental Maturity (1950 S-Form);

3. This same study should be made for a school system;

4. A further analysis of these pupils who are over-achieving or under-achieving should be made to determine the validity of the capacity scores;

5. A study of this kind could be made using a modal age group;

6. The study habits of the "over-achievers" and "under-achievers" should be investigated to determine their effect on achievement.
BIBLIOGRAPHY
BIBLIOGRAPHY


Manual for Administering California Short-Form Test of Mental Maturity, Primary, 1950 S-Form, California Test Bureau, Los Angeles, California, 1950.

Manual for Administering California Short-Form Test of Mental Maturity, Elementary, 1950 S-Form, California Test Bureau, Los Angeles, California, 1950.


<table>
<thead>
<tr>
<th>No.</th>
<th>CA</th>
<th>MA</th>
<th>DIMA</th>
<th>AA</th>
<th>DI AA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10-2</td>
<td>89</td>
<td>87</td>
<td>105</td>
<td>*91</td>
</tr>
<tr>
<td>2</td>
<td>9-3</td>
<td>97</td>
<td>93</td>
<td>105</td>
<td>*91</td>
</tr>
<tr>
<td>3</td>
<td>9-4</td>
<td>82</td>
<td>82</td>
<td>110</td>
<td>102</td>
</tr>
<tr>
<td>4</td>
<td>10-3</td>
<td>100</td>
<td>96</td>
<td>105</td>
<td>*91</td>
</tr>
<tr>
<td>5</td>
<td>10-4</td>
<td>102</td>
<td>97</td>
<td>107</td>
<td>*95</td>
</tr>
<tr>
<td>6</td>
<td>9-7</td>
<td>98</td>
<td>93</td>
<td>107</td>
<td>95</td>
</tr>
<tr>
<td>7</td>
<td>9-4</td>
<td>109</td>
<td>103</td>
<td>110</td>
<td>102</td>
</tr>
<tr>
<td>8</td>
<td>10-11</td>
<td>128</td>
<td>117</td>
<td>110</td>
<td>**102</td>
</tr>
<tr>
<td>9</td>
<td>9-3</td>
<td>116</td>
<td>108</td>
<td>116</td>
<td>**114</td>
</tr>
<tr>
<td>10</td>
<td>9-4</td>
<td>111</td>
<td>104</td>
<td>111</td>
<td>104</td>
</tr>
<tr>
<td>11</td>
<td>9-5</td>
<td>111</td>
<td>104</td>
<td>109</td>
<td>100</td>
</tr>
<tr>
<td>12</td>
<td>9-6</td>
<td>103</td>
<td>98</td>
<td>104</td>
<td>**89</td>
</tr>
<tr>
<td>13</td>
<td>10-3</td>
<td>120</td>
<td>112</td>
<td>107</td>
<td>**95</td>
</tr>
<tr>
<td>14</td>
<td>10-9</td>
<td>97</td>
<td>93</td>
<td>101</td>
<td>**82</td>
</tr>
<tr>
<td>15</td>
<td>9-11</td>
<td>99</td>
<td>95</td>
<td>105</td>
<td>**91</td>
</tr>
<tr>
<td>16</td>
<td>10-5</td>
<td>111</td>
<td>104</td>
<td>106</td>
<td>**93</td>
</tr>
<tr>
<td>17</td>
<td>9-9</td>
<td>107</td>
<td>101</td>
<td>105</td>
<td>**91</td>
</tr>
<tr>
<td>18</td>
<td>9-5</td>
<td>112</td>
<td>105</td>
<td>112</td>
<td>*106</td>
</tr>
<tr>
<td>19</td>
<td>8-11</td>
<td>121</td>
<td>112</td>
<td>108</td>
<td>**97</td>
</tr>
<tr>
<td>20</td>
<td>9-1</td>
<td>126</td>
<td>116</td>
<td>120</td>
<td>*123</td>
</tr>
<tr>
<td>21</td>
<td>8-6</td>
<td>143</td>
<td>128</td>
<td>113</td>
<td>108</td>
</tr>
<tr>
<td>22</td>
<td>9-5</td>
<td>105</td>
<td>100</td>
<td>110</td>
<td>102</td>
</tr>
<tr>
<td>23</td>
<td>10-6</td>
<td>97</td>
<td>93</td>
<td>111</td>
<td>*104</td>
</tr>
<tr>
<td>24</td>
<td>9-8</td>
<td>94</td>
<td>90</td>
<td>102</td>
<td>**85</td>
</tr>
<tr>
<td>25</td>
<td>8-10</td>
<td>115</td>
<td>107</td>
<td>110</td>
<td>102</td>
</tr>
<tr>
<td>26</td>
<td>9-11</td>
<td>106</td>
<td>100</td>
<td>109</td>
<td>100</td>
</tr>
<tr>
<td>27</td>
<td>10-1</td>
<td>103</td>
<td>98</td>
<td>111</td>
<td>*104</td>
</tr>
<tr>
<td>28</td>
<td>9-3</td>
<td>89</td>
<td>87</td>
<td>122</td>
<td>*127</td>
</tr>
<tr>
<td>29</td>
<td>8-10</td>
<td>106</td>
<td>100</td>
<td>120</td>
<td>*123</td>
</tr>
<tr>
<td>30</td>
<td>8-10</td>
<td>85</td>
<td>84</td>
<td>113</td>
<td>*108</td>
</tr>
<tr>
<td>31</td>
<td>10-1</td>
<td>93</td>
<td>90</td>
<td>104</td>
<td>**89</td>
</tr>
<tr>
<td>32</td>
<td>11-0</td>
<td>92</td>
<td>89</td>
<td>105</td>
<td>**91</td>
</tr>
<tr>
<td>33</td>
<td>9-4</td>
<td>132</td>
<td>120</td>
<td>106</td>
<td>**93</td>
</tr>
<tr>
<td>34</td>
<td>9-5</td>
<td>99</td>
<td>95</td>
<td>115</td>
<td>*112</td>
</tr>
<tr>
<td>35</td>
<td>9-6</td>
<td>90</td>
<td>87</td>
<td>105</td>
<td>**91</td>
</tr>
<tr>
<td>36</td>
<td>9-2</td>
<td>119</td>
<td>110</td>
<td>114</td>
<td>*110</td>
</tr>
<tr>
<td>37</td>
<td>9-1</td>
<td>112</td>
<td>105</td>
<td>104</td>
<td>**89</td>
</tr>
<tr>
<td>38</td>
<td>9-11</td>
<td>85</td>
<td>84</td>
<td>109</td>
<td>*100</td>
</tr>
<tr>
<td>39</td>
<td>8-9</td>
<td>112</td>
<td>105</td>
<td>113</td>
<td>*108</td>
</tr>
<tr>
<td>40</td>
<td>9-1</td>
<td>107</td>
<td>102</td>
<td>103</td>
<td>**87</td>
</tr>
<tr>
<td>41</td>
<td>8-11</td>
<td>108</td>
<td>102</td>
<td>113</td>
<td>*108</td>
</tr>
<tr>
<td>42</td>
<td>8-11</td>
<td>101</td>
<td>96</td>
<td>112</td>
<td>*106</td>
</tr>
</tbody>
</table>

*Over-achievers
**Under-achievers
<table>
<thead>
<tr>
<th>No.</th>
<th>CA</th>
<th>MA</th>
<th>DIMA</th>
<th>AA</th>
<th>DIAAA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12-2</td>
<td>122</td>
<td>91</td>
<td>126</td>
<td>91</td>
</tr>
<tr>
<td>2</td>
<td>11-3</td>
<td>107</td>
<td>83</td>
<td>122</td>
<td>86</td>
</tr>
<tr>
<td>3</td>
<td>11-4</td>
<td>143</td>
<td>106</td>
<td>145</td>
<td>*112</td>
</tr>
<tr>
<td>4</td>
<td>12-3</td>
<td>140</td>
<td>104</td>
<td>131</td>
<td>96</td>
</tr>
<tr>
<td>5</td>
<td>12-4</td>
<td>134</td>
<td>99</td>
<td>133</td>
<td>98</td>
</tr>
<tr>
<td>6</td>
<td>11-7</td>
<td>136</td>
<td>101</td>
<td>145</td>
<td>*112</td>
</tr>
<tr>
<td>7</td>
<td>11-4</td>
<td>127</td>
<td>94</td>
<td>136</td>
<td>101</td>
</tr>
<tr>
<td>8</td>
<td>12-11</td>
<td>139</td>
<td>103</td>
<td>127</td>
<td>**92</td>
</tr>
<tr>
<td>9</td>
<td>11-3</td>
<td>136</td>
<td>101</td>
<td>145</td>
<td>*112</td>
</tr>
<tr>
<td>10</td>
<td>11-4</td>
<td>129</td>
<td>96</td>
<td>134</td>
<td>99</td>
</tr>
<tr>
<td>11</td>
<td>11-5</td>
<td>152</td>
<td>112</td>
<td>139</td>
<td>104</td>
</tr>
<tr>
<td>12</td>
<td>11-6</td>
<td>121</td>
<td>90</td>
<td>131</td>
<td>96</td>
</tr>
<tr>
<td>13</td>
<td>12-3</td>
<td>134</td>
<td>99</td>
<td>137</td>
<td>102</td>
</tr>
<tr>
<td>14</td>
<td>12-9</td>
<td>110</td>
<td>82</td>
<td>127</td>
<td>92</td>
</tr>
<tr>
<td>15</td>
<td>11-11</td>
<td>121</td>
<td>90</td>
<td>130</td>
<td>95</td>
</tr>
<tr>
<td>16</td>
<td>12-5</td>
<td>144</td>
<td>107</td>
<td>136</td>
<td>101</td>
</tr>
<tr>
<td>17</td>
<td>11-9</td>
<td>122</td>
<td>91</td>
<td>131</td>
<td>96</td>
</tr>
<tr>
<td>18</td>
<td>11-5</td>
<td>152</td>
<td>112</td>
<td>136</td>
<td>110</td>
</tr>
<tr>
<td>19</td>
<td>10-11</td>
<td>140</td>
<td>104</td>
<td>136</td>
<td>101</td>
</tr>
<tr>
<td>20</td>
<td>11-1</td>
<td>161</td>
<td>119</td>
<td>149</td>
<td>116</td>
</tr>
<tr>
<td>21</td>
<td>10-8</td>
<td>151</td>
<td>112</td>
<td>143</td>
<td>108</td>
</tr>
<tr>
<td>22</td>
<td>11-7</td>
<td>148</td>
<td>109</td>
<td>136</td>
<td>101</td>
</tr>
<tr>
<td>23</td>
<td>12-6</td>
<td>130</td>
<td>98</td>
<td>121</td>
<td>**85</td>
</tr>
<tr>
<td>24</td>
<td>11-8</td>
<td>122</td>
<td>91</td>
<td>122</td>
<td>**86</td>
</tr>
<tr>
<td>25</td>
<td>10-10</td>
<td>135</td>
<td>100</td>
<td>134</td>
<td>99</td>
</tr>
<tr>
<td>26</td>
<td>11-11</td>
<td>121</td>
<td>90</td>
<td>133</td>
<td>98</td>
</tr>
<tr>
<td>27</td>
<td>12-1</td>
<td>127</td>
<td>94</td>
<td>134</td>
<td>99</td>
</tr>
<tr>
<td>28</td>
<td>11-3</td>
<td>163</td>
<td>120</td>
<td>156</td>
<td>*123</td>
</tr>
<tr>
<td>29</td>
<td>10-10</td>
<td>160</td>
<td>118</td>
<td>160</td>
<td>*128</td>
</tr>
<tr>
<td>30</td>
<td>10-10</td>
<td>133</td>
<td>99</td>
<td>145</td>
<td>*112</td>
</tr>
<tr>
<td>31</td>
<td>12-1</td>
<td>116</td>
<td>86</td>
<td>125</td>
<td>90</td>
</tr>
<tr>
<td>32</td>
<td>13-9</td>
<td>121</td>
<td>90</td>
<td>114</td>
<td>**77</td>
</tr>
<tr>
<td>33</td>
<td>11-4</td>
<td>114</td>
<td>109</td>
<td>141</td>
<td>106</td>
</tr>
<tr>
<td>34</td>
<td>12-5</td>
<td>138</td>
<td>102</td>
<td>134</td>
<td>99</td>
</tr>
<tr>
<td>35</td>
<td>11-6</td>
<td>135</td>
<td>100</td>
<td>124</td>
<td>**86</td>
</tr>
<tr>
<td>36</td>
<td>11-2</td>
<td>153</td>
<td>113</td>
<td>149</td>
<td>**116</td>
</tr>
<tr>
<td>37</td>
<td>11-1</td>
<td>130</td>
<td>96</td>
<td>125</td>
<td>**90</td>
</tr>
<tr>
<td>38</td>
<td>11-11</td>
<td>106</td>
<td>61</td>
<td>127</td>
<td>*92</td>
</tr>
<tr>
<td>39</td>
<td>10-9</td>
<td>146</td>
<td>108</td>
<td>140</td>
<td>105</td>
</tr>
<tr>
<td>40</td>
<td>11-1</td>
<td>122</td>
<td>91</td>
<td>125</td>
<td>90</td>
</tr>
<tr>
<td>41</td>
<td>10-11</td>
<td>141</td>
<td>104</td>
<td>138</td>
<td>103</td>
</tr>
<tr>
<td>42</td>
<td>10-11</td>
<td>140</td>
<td>104</td>
<td>143</td>
<td>108</td>
</tr>
</tbody>
</table>

*Over-achievers
**Under-achievers
<table>
<thead>
<tr>
<th>No.</th>
<th>R</th>
<th>DIR</th>
<th>V</th>
<th>DIV</th>
<th>AF</th>
<th>DIAP</th>
<th>AP</th>
<th>DIAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>102</td>
<td>93</td>
<td>102</td>
<td>94</td>
<td>103</td>
<td>**83</td>
<td>111</td>
<td>94</td>
</tr>
<tr>
<td>2</td>
<td>102</td>
<td>93</td>
<td>110</td>
<td>*107</td>
<td>109</td>
<td>95</td>
<td>103</td>
<td>**83</td>
</tr>
<tr>
<td>3</td>
<td>102</td>
<td>93</td>
<td>105</td>
<td>**99</td>
<td>113</td>
<td>*103</td>
<td>124</td>
<td>*110</td>
</tr>
<tr>
<td>4</td>
<td>100</td>
<td>**90</td>
<td>102</td>
<td>94</td>
<td>109</td>
<td>95</td>
<td>120</td>
<td>*105</td>
</tr>
<tr>
<td>5</td>
<td>100</td>
<td>**90</td>
<td>99</td>
<td>**89</td>
<td>119</td>
<td>*115</td>
<td>122</td>
<td>*108</td>
</tr>
<tr>
<td>6</td>
<td>103</td>
<td>95</td>
<td>105</td>
<td>99</td>
<td>107</td>
<td>**91</td>
<td>108</td>
<td>90</td>
</tr>
<tr>
<td>7</td>
<td>108</td>
<td>103</td>
<td>110</td>
<td>*107</td>
<td>113</td>
<td>103</td>
<td>114</td>
<td>98</td>
</tr>
<tr>
<td>8</td>
<td>105</td>
<td>**98</td>
<td>103</td>
<td>**96</td>
<td>113</td>
<td>103</td>
<td>116</td>
<td>**100</td>
</tr>
<tr>
<td>9</td>
<td>108</td>
<td>103</td>
<td>115</td>
<td>113</td>
<td>119</td>
<td>*115</td>
<td>129</td>
<td>*117</td>
</tr>
<tr>
<td>10</td>
<td>102</td>
<td>**93</td>
<td>103</td>
<td>96</td>
<td>113</td>
<td>103</td>
<td>124</td>
<td>*110</td>
</tr>
<tr>
<td>11</td>
<td>103</td>
<td>**95</td>
<td>104</td>
<td>97</td>
<td>107</td>
<td>**91</td>
<td>114</td>
<td>98</td>
</tr>
<tr>
<td>12</td>
<td>101</td>
<td>**91</td>
<td>98</td>
<td>**88</td>
<td>107</td>
<td>**91</td>
<td>120</td>
<td>105</td>
</tr>
<tr>
<td>13</td>
<td>100</td>
<td>**90</td>
<td>99</td>
<td>**89</td>
<td>126</td>
<td>*128</td>
<td>118</td>
<td>103</td>
</tr>
<tr>
<td>14</td>
<td>101</td>
<td>91</td>
<td>98</td>
<td>**88</td>
<td>105</td>
<td>**87</td>
<td>103</td>
<td>**83</td>
</tr>
<tr>
<td>15</td>
<td>104</td>
<td>96</td>
<td>98</td>
<td>**88</td>
<td>111</td>
<td>99</td>
<td>120</td>
<td>*105</td>
</tr>
<tr>
<td>16</td>
<td>103</td>
<td>**95</td>
<td>103</td>
<td>96</td>
<td>113</td>
<td>103</td>
<td>108</td>
<td>**90</td>
</tr>
<tr>
<td>17</td>
<td>103</td>
<td>95</td>
<td>105</td>
<td>99</td>
<td>105</td>
<td>**87</td>
<td>106</td>
<td>**87</td>
</tr>
<tr>
<td>18</td>
<td>105</td>
<td>98</td>
<td>110</td>
<td>107</td>
<td>116</td>
<td>*109</td>
<td>114</td>
<td>*98</td>
</tr>
<tr>
<td>19</td>
<td>108</td>
<td>103</td>
<td>104</td>
<td>**97</td>
<td>105</td>
<td>**87</td>
<td>116</td>
<td>**100</td>
</tr>
<tr>
<td>20</td>
<td>121</td>
<td>*124</td>
<td>127</td>
<td>*134</td>
<td>113</td>
<td>103</td>
<td>122</td>
<td>108</td>
</tr>
<tr>
<td>21</td>
<td>105</td>
<td>**98</td>
<td>111</td>
<td>108</td>
<td>120</td>
<td>116</td>
<td>131</td>
<td>119</td>
</tr>
<tr>
<td>22</td>
<td>108</td>
<td>103</td>
<td>106</td>
<td>100</td>
<td>113</td>
<td>103</td>
<td>120</td>
<td>105</td>
</tr>
<tr>
<td>23</td>
<td>113</td>
<td>*111</td>
<td>109</td>
<td>*105</td>
<td>113</td>
<td>*103</td>
<td>116</td>
<td>**100</td>
</tr>
<tr>
<td>24</td>
<td>103</td>
<td>95</td>
<td>98</td>
<td>**88</td>
<td>111</td>
<td>99</td>
<td>103</td>
<td>83</td>
</tr>
<tr>
<td>25</td>
<td>108</td>
<td>103</td>
<td>110</td>
<td>107</td>
<td>113</td>
<td>103</td>
<td>116</td>
<td>100</td>
</tr>
<tr>
<td>26</td>
<td>108</td>
<td>103</td>
<td>108</td>
<td>103</td>
<td>107</td>
<td>**91</td>
<td>116</td>
<td>100</td>
</tr>
<tr>
<td>27</td>
<td>108</td>
<td>103</td>
<td>109</td>
<td>*105</td>
<td>109</td>
<td>95</td>
<td>114</td>
<td>98</td>
</tr>
<tr>
<td>28</td>
<td>122</td>
<td>*125</td>
<td>118</td>
<td>*119</td>
<td>109</td>
<td>95</td>
<td>108</td>
<td>90</td>
</tr>
<tr>
<td>29</td>
<td>122</td>
<td>*125</td>
<td>118</td>
<td>*119</td>
<td>120</td>
<td>*116</td>
<td>131</td>
<td>*119</td>
</tr>
<tr>
<td>30</td>
<td>119</td>
<td>*120</td>
<td>110</td>
<td>*107</td>
<td>113</td>
<td>*103</td>
<td>103</td>
<td>**83</td>
</tr>
<tr>
<td>31</td>
<td>100</td>
<td>90</td>
<td>105</td>
<td>99</td>
<td>109</td>
<td>95</td>
<td>108</td>
<td>90</td>
</tr>
<tr>
<td>32</td>
<td>106</td>
<td>100</td>
<td>102</td>
<td>94</td>
<td>109</td>
<td>95</td>
<td>106</td>
<td>**87</td>
</tr>
<tr>
<td>33</td>
<td>105</td>
<td>**98</td>
<td>106</td>
<td>**100</td>
<td>111</td>
<td>**90</td>
<td>114</td>
<td>**98</td>
</tr>
<tr>
<td>34</td>
<td>108</td>
<td>103</td>
<td>101</td>
<td>92</td>
<td>113</td>
<td>*103</td>
<td>122</td>
<td>**108</td>
</tr>
<tr>
<td>35</td>
<td>108</td>
<td>*103</td>
<td>105</td>
<td>99</td>
<td>113</td>
<td>*103</td>
<td>108</td>
<td>90</td>
</tr>
<tr>
<td>36</td>
<td>113</td>
<td>111</td>
<td>116</td>
<td>*116</td>
<td>123</td>
<td>*122</td>
<td>122</td>
<td>108</td>
</tr>
<tr>
<td>37</td>
<td>100</td>
<td>**90</td>
<td>101</td>
<td>**92</td>
<td>109</td>
<td>**95</td>
<td>116</td>
<td>100</td>
</tr>
<tr>
<td>38</td>
<td>108</td>
<td>*103</td>
<td>108</td>
<td>*107</td>
<td>105</td>
<td>**87</td>
<td>108</td>
<td>90</td>
</tr>
<tr>
<td>39</td>
<td>108</td>
<td>103</td>
<td>110</td>
<td>107</td>
<td>123</td>
<td>*122</td>
<td>131</td>
<td>*119</td>
</tr>
<tr>
<td>40</td>
<td>100</td>
<td>**90</td>
<td>99</td>
<td>**89</td>
<td>109</td>
<td>**95</td>
<td>116</td>
<td>100</td>
</tr>
<tr>
<td>41</td>
<td>102</td>
<td>**93</td>
<td>103</td>
<td>96</td>
<td>113</td>
<td>103</td>
<td>126</td>
<td>*113</td>
</tr>
<tr>
<td>42</td>
<td>117</td>
<td>*117</td>
<td>110</td>
<td>*107</td>
<td>113</td>
<td>103</td>
<td>111</td>
<td>94</td>
</tr>
</tbody>
</table>

*Over-achievers
**Under-achievers
<table>
<thead>
<tr>
<th>No.</th>
<th>R</th>
<th>DIR</th>
<th>V</th>
<th>DIV</th>
<th>AF</th>
<th>DI_{AF}</th>
<th>AP</th>
<th>DI_{AP}</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>116</td>
<td>90</td>
<td>120</td>
<td>92</td>
<td>137</td>
<td>96</td>
<td>125</td>
<td>88</td>
</tr>
<tr>
<td>2</td>
<td>121</td>
<td>*94</td>
<td>126</td>
<td>*96</td>
<td>127</td>
<td>*117</td>
<td>159</td>
<td>111</td>
</tr>
<tr>
<td>3</td>
<td>131</td>
<td>101</td>
<td>149</td>
<td>103</td>
<td>152</td>
<td>*117</td>
<td>159</td>
<td>113</td>
</tr>
<tr>
<td>4</td>
<td>122</td>
<td>95</td>
<td>130</td>
<td>99</td>
<td>142</td>
<td>103</td>
<td>144</td>
<td>101</td>
</tr>
<tr>
<td>5</td>
<td>122</td>
<td>95</td>
<td>132</td>
<td>101</td>
<td>143</td>
<td>104</td>
<td>151</td>
<td>106</td>
</tr>
<tr>
<td>6</td>
<td>137</td>
<td>106</td>
<td>134</td>
<td>102</td>
<td>148</td>
<td>*111</td>
<td>157</td>
<td>*111</td>
</tr>
<tr>
<td>7</td>
<td>125</td>
<td>97</td>
<td>126</td>
<td>96</td>
<td>136</td>
<td>95</td>
<td>151</td>
<td>*106</td>
</tr>
<tr>
<td>8</td>
<td>118</td>
<td>**92</td>
<td>120</td>
<td>**92</td>
<td>126</td>
<td>**81</td>
<td>132</td>
<td>**91</td>
</tr>
<tr>
<td>9</td>
<td>137</td>
<td>106</td>
<td>134</td>
<td>*117</td>
<td>148</td>
<td>*111</td>
<td>159</td>
<td>*113</td>
</tr>
<tr>
<td>10</td>
<td>124</td>
<td>96</td>
<td>138</td>
<td>*105</td>
<td>147</td>
<td>*110</td>
<td>136</td>
<td>94</td>
</tr>
<tr>
<td>11</td>
<td>124</td>
<td>**96</td>
<td>136</td>
<td>104</td>
<td>143</td>
<td>104</td>
<td>140</td>
<td>**98</td>
</tr>
<tr>
<td>12</td>
<td>127</td>
<td>98</td>
<td>130</td>
<td>99</td>
<td>127</td>
<td>**82</td>
<td>146</td>
<td>*102</td>
</tr>
<tr>
<td>13</td>
<td>128</td>
<td>97</td>
<td>132</td>
<td>101</td>
<td>149</td>
<td>**113</td>
<td>154</td>
<td>*119</td>
</tr>
<tr>
<td>14</td>
<td>114</td>
<td>89</td>
<td>118</td>
<td>90</td>
<td>141</td>
<td>*102</td>
<td>142</td>
<td>*99</td>
</tr>
<tr>
<td>15</td>
<td>125</td>
<td>97</td>
<td>126</td>
<td>96</td>
<td>143</td>
<td>*104</td>
<td>142</td>
<td>99</td>
</tr>
<tr>
<td>16</td>
<td>119</td>
<td>**92</td>
<td>127</td>
<td>**97</td>
<td>147</td>
<td>110</td>
<td>162</td>
<td>115</td>
</tr>
<tr>
<td>17</td>
<td>129</td>
<td>100</td>
<td>117</td>
<td>89</td>
<td>138</td>
<td>98</td>
<td>134</td>
<td>93</td>
</tr>
<tr>
<td>18</td>
<td>136</td>
<td>105</td>
<td>147</td>
<td>112</td>
<td>138</td>
<td>**98</td>
<td>157</td>
<td>111</td>
</tr>
<tr>
<td>19</td>
<td>132</td>
<td>102</td>
<td>132</td>
<td>101</td>
<td>147</td>
<td>*110</td>
<td>138</td>
<td>96</td>
</tr>
<tr>
<td>20</td>
<td>139</td>
<td>**108</td>
<td>157</td>
<td>120</td>
<td>136</td>
<td>**95</td>
<td>157</td>
<td>111</td>
</tr>
<tr>
<td>21</td>
<td>134</td>
<td>104</td>
<td>134</td>
<td>**102</td>
<td>153</td>
<td>*118</td>
<td>174</td>
<td>*125</td>
</tr>
<tr>
<td>22</td>
<td>130</td>
<td>101</td>
<td>132</td>
<td>101</td>
<td>142</td>
<td>103</td>
<td>151</td>
<td>106</td>
</tr>
<tr>
<td>23</td>
<td>119</td>
<td>92</td>
<td>109</td>
<td>83</td>
<td>126</td>
<td>**81</td>
<td>125</td>
<td>**86</td>
</tr>
<tr>
<td>24</td>
<td>121</td>
<td>94</td>
<td>120</td>
<td>92</td>
<td>129</td>
<td>**85</td>
<td>116</td>
<td>**78</td>
</tr>
<tr>
<td>25</td>
<td>132</td>
<td>102</td>
<td>124</td>
<td>93</td>
<td>138</td>
<td>98</td>
<td>138</td>
<td>96</td>
</tr>
<tr>
<td>26</td>
<td>123</td>
<td>95</td>
<td>127</td>
<td>97</td>
<td>137</td>
<td>96</td>
<td>134</td>
<td>93</td>
</tr>
<tr>
<td>27</td>
<td>124</td>
<td>96</td>
<td>127</td>
<td>97</td>
<td>142</td>
<td>*103</td>
<td>134</td>
<td>93</td>
</tr>
<tr>
<td>28</td>
<td>168</td>
<td>129</td>
<td>157</td>
<td>120</td>
<td>145</td>
<td>107</td>
<td>149</td>
<td>**105</td>
</tr>
<tr>
<td>29</td>
<td>175</td>
<td>*135</td>
<td>170</td>
<td>*129</td>
<td>150</td>
<td>115</td>
<td>169</td>
<td>121</td>
</tr>
<tr>
<td>30</td>
<td>142</td>
<td>110</td>
<td>136</td>
<td>104</td>
<td>142</td>
<td>103</td>
<td>142</td>
<td>99</td>
</tr>
<tr>
<td>31</td>
<td>127</td>
<td>*98</td>
<td>120</td>
<td>92</td>
<td>132</td>
<td>89</td>
<td>132</td>
<td>92</td>
</tr>
<tr>
<td>32</td>
<td>104</td>
<td>81</td>
<td>113</td>
<td>86</td>
<td>122</td>
<td>**75</td>
<td>125</td>
<td>86</td>
</tr>
<tr>
<td>33</td>
<td>135</td>
<td>104</td>
<td>144</td>
<td>110</td>
<td>144</td>
<td>106</td>
<td>132</td>
<td>**91</td>
</tr>
<tr>
<td>34</td>
<td>135</td>
<td>104</td>
<td>124</td>
<td>95</td>
<td>139</td>
<td>99</td>
<td>144</td>
<td>101</td>
</tr>
<tr>
<td>35</td>
<td>121</td>
<td>94</td>
<td>115</td>
<td>**88</td>
<td>137</td>
<td>96</td>
<td>132</td>
<td>91</td>
</tr>
<tr>
<td>36</td>
<td>141</td>
<td>109</td>
<td>154</td>
<td>117</td>
<td>143</td>
<td>104</td>
<td>157</td>
<td>111</td>
</tr>
<tr>
<td>37</td>
<td>116</td>
<td>90</td>
<td>123</td>
<td>94</td>
<td>140</td>
<td>100</td>
<td>136</td>
<td>94</td>
</tr>
<tr>
<td>38</td>
<td>116</td>
<td>90</td>
<td>118</td>
<td>90</td>
<td>139</td>
<td>*99</td>
<td>132</td>
<td>91</td>
</tr>
<tr>
<td>39</td>
<td>141</td>
<td>109</td>
<td>136</td>
<td>104</td>
<td>144</td>
<td>**86</td>
<td>138</td>
<td>**96</td>
</tr>
<tr>
<td>40</td>
<td>121</td>
<td>94</td>
<td>118</td>
<td>90</td>
<td>138</td>
<td>98</td>
<td>140</td>
<td>98</td>
</tr>
<tr>
<td>41</td>
<td>124</td>
<td>96</td>
<td>124</td>
<td>**95</td>
<td>138</td>
<td>98</td>
<td>157</td>
<td>111</td>
</tr>
<tr>
<td>42</td>
<td>145</td>
<td>112</td>
<td>144</td>
<td>110</td>
<td>141</td>
<td>102</td>
<td>140</td>
<td>98</td>
</tr>
</tbody>
</table>

*Over-achievers
**Under-achievers
TO BOYS AND GIRLS:

This test booklet has some games you will like. They will show how well you can think. Do as many of them as you can.

DO NOT TURN THIS PAGE UNTIL TOLD TO DO SO.
TEST 1.

A
B

1
2
3

4
5
6

7
8
9

10

Test 1 Score
(number right)
<table>
<thead>
<tr>
<th>E</th>
<th>F</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Pants" /></td>
<td><img src="image2.png" alt="Vest" /></td>
<td><img src="image3.png" alt="Jacket" /></td>
<td><img src="image4.png" alt="Fan" /></td>
<td><img src="image5.png" alt="Bicycle" /></td>
<td><img src="image6.png" alt="Kite" /></td>
<td><img src="image7.png" alt="Airplane" /></td>
</tr>
<tr>
<td><img src="image8.png" alt="Mower" /></td>
<td><img src="image9.png" alt="Lawnmower" /></td>
<td><img src="image10.png" alt="Apple" /></td>
<td><img src="image11.png" alt="Milk" /></td>
<td><img src="image12.png" alt="Moon" /></td>
<td><img src="image13.png" alt="Boat" /></td>
<td><img src="image14.png" alt="Bicycle" /></td>
</tr>
<tr>
<td><img src="image15.png" alt="Chair" /></td>
<td><img src="image16.png" alt="Cabinet" /></td>
<td><img src="image17.png" alt="Glove" /></td>
<td><img src="image18.png" alt="Table" /></td>
<td><img src="image19.png" alt="Bird" /></td>
<td><img src="image20.png" alt="Mosquito" /></td>
<td><img src="image21.png" alt="Bug" /></td>
</tr>
<tr>
<td><img src="image22.png" alt="Violin" /></td>
<td><img src="image23.png" alt="Drum" /></td>
<td><img src="image24.png" alt="Carrot" /></td>
<td><img src="image25.png" alt="Zebra" /></td>
<td><img src="image26.png" alt="Trumpet" /></td>
<td><img src="image27.png" alt="Food" /></td>
<td><img src="image28.png" alt="Plate" /></td>
</tr>
<tr>
<td><img src="image29.png" alt="Moon" /></td>
<td><img src="image30.png" alt="Lamp" /></td>
<td><img src="image31.png" alt="Barrel" /></td>
<td><img src="image32.png" alt="Lightbulb" /></td>
<td><img src="image33.png" alt="Scissors" /></td>
<td><img src="image34.png" alt="Frog" /></td>
<td><img src="image35.png" alt="Bird" /></td>
</tr>
<tr>
<td><img src="image36.png" alt="Umbrella" /></td>
<td><img src="image37.png" alt="Tent" /></td>
<td><img src="image38.png" alt="Bag" /></td>
<td><img src="image39.png" alt="Basket" /></td>
<td><img src="image40.png" alt="Clock" /></td>
<td><img src="image41.png" alt="Car" /></td>
<td><img src="image42.png" alt="Traffic Light" /></td>
</tr>
<tr>
<td><img src="image43.png" alt="Monkey" /></td>
<td><img src="image44.png" alt="Teapot" /></td>
<td><img src="image45.png" alt="Broom" /></td>
<td><img src="image46.png" alt="Hat" /></td>
<td><img src="image47.png" alt="Refrigerator" /></td>
<td><img src="image48.png" alt="Sun" /></td>
<td><img src="image49.png" alt="Apple" /></td>
</tr>
</tbody>
</table>

Test 3 Score:
(number right) ________________________________
<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>N</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>dog</td>
<td>cow</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>bird</td>
<td>fish</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>cat</td>
<td>horse</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>deer</td>
<td>snake</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>zebra</td>
<td>mouse</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>rabbit</td>
<td>sheep</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>flower</td>
<td>bee</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>rose</td>
<td>ant</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>leaf</td>
<td>sailboat</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>log</td>
<td>tent</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>swan</td>
<td>turtle</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>chair</td>
<td>cow</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>book</td>
<td>woman</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>apple</td>
<td>beetle</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>whale</td>
<td>whale</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>turtle</td>
<td>turtle</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>stairs</td>
<td>stairs</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>chair</td>
<td>chair</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>house</td>
<td>house</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>man</td>
<td>woman</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>woman</td>
<td>man</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>tree</td>
<td>man</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>umbrella</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>octagon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>hexagon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>hourglass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>umbrella</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>umbrella</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Test 7 Score**

(number right)..............................

Page 9

SFP-50
**California Short-Form Test of Mental Maturity**

**Primary Grades 1-2-3 '50 S-form**

Devised by E. T. Sullivan, W. W. Clark, and E. W. Tiegs

---

**Name**

Last: [ ]  
First: [ ]  
Middle: [ ]  
Grade: [ ]

**School**

City: [ ]

**Date of Test**

Month: [ ]  
Day: [ ]  
Year: [ ]

**Examiner**

[ ]

Pupil's Age: [ ]

**Date of Birth**

Month: [ ]  
Day: [ ]  
Year: [ ]

---

**DIAGNOSTIC PROFILE**

<table>
<thead>
<tr>
<th>Mental Age</th>
<th>Yr.</th>
<th>48</th>
<th>60</th>
<th>72</th>
<th>84</th>
<th>96</th>
<th>108</th>
<th>120</th>
<th>132</th>
<th>144</th>
<th>156</th>
<th>168</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>1. Sensing Right and Left</td>
<td>10''</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Manipulation of Areas</td>
<td>12''</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL (1+2)</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Similarities</td>
<td>12''</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Inference</td>
<td>12</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL (3+4)</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Number Series</td>
<td>12''</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Numerical Quantity</td>
<td>12</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL (5+6)</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. TOTAL VERBAL CONCEPTS</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL MENTAL FACTORS - 98**

**LANGUAGE FACTORS - 52**

**NON-LANGUAGE FACTORS - 46**

**CHRONOLOGICAL AGE**

Average Grade Placement Equivalent

<table>
<thead>
<tr>
<th>KGN. TRANS.</th>
<th>1.0</th>
<th>2.0</th>
<th>3.0</th>
<th>4.0</th>
<th>5.0</th>
<th>6.0</th>
<th>7.0</th>
<th>8.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>2.0</td>
<td>3.0</td>
<td>4.0</td>
<td>5.0</td>
<td>6.0</td>
<td>7.0</td>
<td>8.0</td>
<td></td>
</tr>
</tbody>
</table>

**INTELL. GRADe PLACEMENT**

<table>
<thead>
<tr>
<th>Mental Age</th>
<th>Yr.</th>
<th>48</th>
<th>60</th>
<th>72</th>
<th>84</th>
<th>96</th>
<th>108</th>
<th>120</th>
<th>132</th>
<th>144</th>
<th>156</th>
<th>168</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>4.0</td>
<td>5.0</td>
<td>6.0</td>
<td>7.0</td>
<td>8.0</td>
<td>9.0</td>
<td>10.0</td>
<td>11.0</td>
<td>12.0</td>
<td>13.0</td>
<td>14.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**SUMMARY OF DATA**

<table>
<thead>
<tr>
<th>TOTAL MENTAL FACTORS</th>
<th>LANGUAGE FACTORS</th>
<th>NON-LANGUAGE FACTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SCORES**

MA divided by CA equals I.Q.

**INTELLIGENCE GRADE PLACEMENTS**

---

*Non-language Tests*

---

**PUBLISHED BY CALIFORNIA TEST BUREAU - 5215 HOLLYWOOD BOULEVARD - LOS ANGELES 28, CALIFORNIA**

**BRANCH OFFICES:** MADISON, WISC.; NEW CUMBERLAND, PA.--COPYRIGHT 1930-1950 BY CALIFORNIA TEST BUREAU--PRINTED IN U. S.
INSTRUCTIONS TO PUPILS:

This is a test of mental maturity. In taking it you will show how well you understand relationships and what you do when you face new problems. No one is expected to do the whole test correctly, but you should answer as many items as you can. Work as fast as you can without making mistakes.

DO NOT WRITE OR MARK ON THIS TEST BOOKLET UNLESS TOLD TO DO SO BY THE EXAMINER.
**DIRECTIONS:** Mark as you are told the letter, R, for each right hand or foot; mark the letter, L, for each left hand or foot.

<table>
<thead>
<tr>
<th>Samples A and B</th>
<th>Correct Test Booklet Marks</th>
<th>Correct Answer Sheet Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Hand A" /></td>
<td><img src="image2" alt="Hand A" /></td>
<td><img src="image3" alt="Hand A" /></td>
</tr>
<tr>
<td><img src="image4" alt="Hand B" /></td>
<td><img src="image5" alt="Hand B" /></td>
<td><img src="image6" alt="Hand B" /></td>
</tr>
</tbody>
</table>

**TEST 1**

1. ![Hand 1](image7)
2. ![Hand 2](image8)
3. ![Hand 3](image9)
4. ![Hand 4](image10)
5. ![Hand 5](image11)

6. ![Hand 6](image12)
7. ![Hand 7](image13)
8. ![Hand 8](image14)
9. ![Hand 9](image15)
10. ![Hand 10](image16)

11. ![Hand 11](image17)
12. ![Hand 12](image18)
13. ![Hand 13](image19)
14. ![Hand 14](image20)
15. ![Hand 15](image21)

16. ![Foot 16](image22)
17. ![Foot 17](image23)
18. ![Foot 18](image24)
19. ![Foot 19](image25)
20. ![Foot 20](image26)

**Stop** NOW WAIT FOR FURTHER INSTRUCTIONS

Test 1 Score
(number right)..................................
DIRECTIONS: In each row find the drawing that is a different view of the first drawing. Mark its number as you are told.

TEST 2

STOP
NOW WAIT FOR
FURTHER INSTRUCTIONS

Test 2 Score
(number right).................................
### DIRECTIONS:
The first three pictures in each row are alike in some way. Decide how they are alike, and then find the one picture among the four to the right of the dotted line that is most like them and mark its number.

<table>
<thead>
<tr>
<th>Test 3</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>![Image 21]</td>
<td>![Image 22]</td>
<td>![Image 23]</td>
<td>![Image 24]</td>
</tr>
<tr>
<td>41</td>
<td>![Image 25]</td>
<td>![Image 26]</td>
<td>![Image 27]</td>
<td>![Image 28]</td>
</tr>
<tr>
<td>42</td>
<td>![Image 29]</td>
<td>![Image 30]</td>
<td>![Image 31]</td>
<td>![Image 32]</td>
</tr>
</tbody>
</table>

STOP

Test 3 Score (number right) ........................................

Page 4

SFE-50
DIRECTIONS: Read each group of statements below and the conclusions which follow. Then mark as you are told the number of each answer you have decided is correct.

TEST 4

51. All four-footed creatures are animals.
   All horses are four-footed.
   Therefore
   1 Creatures other than horses can walk
      2 All horses can walk
      3 All horses are animals

52. Either the sun moves around the earth or the earth moves around the sun.
   But the sun does not move around the earth.
   Therefore
   1 The earth moves around the moon
      2 The earth moves around the sun
      3 The sun is larger than the earth

53. Jack runs faster than Harry.
    Bert runs faster than Harry.
    Which is the slowest of the three?
    1 Bert
    2 Jack
    3 Harry

54. Jane is taller than Helen.
    Helen is taller than Barbara.
    Which is the tallest: Jane, Helen, or Barbara?
    1 Helen
    2 Jane
    3 Barbara

55. All mammals are vertebrates.
    The cow is a mammal.
    Therefore
    1 Some vertebrates live on land
       2 Some mammals live in water
       3 The cow is a vertebrate

56. A is either B or C.
    A is not C.
    Therefore
    1 A is not B
       2 A is B
       3 C is B

57. Either your cousin is older than you, or the same age, or younger.
    But your cousin is not older, nor is he younger.
    Therefore
    1 Your cousin is younger than you
       2 Your cousin is older than you
       3 Your cousin is the same age as you

GO RIGHT ON TO THE NEXT PAGE
58. All circles are round figures.  
A certain figure is not round.  
Therefore  
1 It is not a circle  
2 It is oval  
3 It is either a square or a triangle  

59. All metals except mercury are solids.  
Gold is a metal.  
Therefore  
1 Gold is valuable  
2 Gold is a solid  
3 Metals are usually heavy  

60. Some fishes fly.  
No birds are fishes.  
Therefore  
1 All creatures that fly are fishes or birds  
2 No fishes resemble birds  
3 Creatures other than birds can fly  

61. Three boys are up on a ladder.  
Tom is farther up the ladder than Paul.  
Jim is farther up than Tom.  
Which boy is in the middle position on the ladder?  
1 Tom  
2 Paul  
3 Jim  

62. George Washington was a skillful general.  
George Washington was President of the United States.  
Therefore  
1 Skillful generals make good presidents  
2 One President of the United States was a skillful general  
3 Good presidents make skillful generals  

63. A is situated to the east of B.  
B is situated to the east of C.  
Therefore  
1 C is situated close to A  
2 A is situated to the east of C  
3 C is nearer to A than to B  

64. He is either honest or dishonest.  
But he is not dishonest.  
Therefore  
1 He is desirable for a position  
2 He comes from honest people  
3 He is honest  

65. A is equal to B.  
B is equal to C.  
Therefore  
1 B is larger than C  
2 A is equal to C  
3 A is equal to B plus C  

STOP  
NOW WAIT FOR FURTHER INSTRUCTIONS
DIRECTIONS: In each row of numbers below, there is one that does not belong. Find the number that should be omitted from each row among the answer numbers on the right, and mark its letter as you are told.

TEST 5.

F. 2 4 6 8 9 10 12 14

(66). 5 10 15 20 22 25 30

(67). 18 15 13 12 9 6 3

(68). 2 5 8 10 11 14 17

(69). 1 2 4 8 14 16 32

(70). 27 9 3 1 0 ⅙

(71). 3 4 7 8 10 11 12 15

(72). 3 9 27 76 81 243

(73). 25 24 22 19 18 16 13 12 9 10 7

(74). 1 2 4 7 11 15 16 22 29 37

(75). 12.5 11.4 10.3 9.8 9.2 8.1 7.0

Test 5 Score (number right) ........................................

Page 7
SFE-50

STOP
NOW WAIT FOR FURTHER INSTRUCTIONS
DIRECTIONS: Work these problems on a sheet of scratch paper. Mark as you are told the letter of each correct answer.

TEST 6

G. There are 5 birds in a tree and 3 birds on a fence. How many birds are there in both places?  
   a 2  
   b 8  
   c 15  
   d 7  

76. Tom has 5 marbles. Bob has 4 marbles. Bill has 3 marbles. How many marbles do all three boys have?  
   a 1  
   b 2  
   c 12  
   d 60  

77. Tickets to a show cost 10 cents. Jim bought 2 tickets. How much did he pay for them?  
   a 20¢  
   b 2¢  
   c 12¢  
   d 8¢  

78. Ben earns 4 dollars each week helping his father after school. He has earned 16 dollars. How many weeks has he been working?  
   a 20  
   b 64  
   c $4  
   d 4  

79. Seventy girl scouts were divided into 5 groups of equal size. How many girls were there in each group?  
   a 15  
   b 14  
   c 20  
   d 3  

80. How many marbles can you buy for 25 cents at the rate of 3 for 5 cents?  
   a 15  
   b 75  
   c 33  
   d 40  

81. Two boys bought watermelons and sold slices of them at a ball game. They had 50 cents in the cash box to start with. They sold 40 slices of melon at 5 cents a slice. How much should they have in the cash box at the end of the day?  
   a $2.00  
   b 80¢  
   c $3.00  
   d $2.50  

82. Balls which usually sold for 65 cents were sold for a short time for 25 cents less. Frank bought a ball at the lower price and gave the clerk 50 cents. How much change should he get back?  
   a 25¢  
   b 20¢  
   c 10¢  
   d 5¢  

GO RIGHT ON TO THE NEXT PAGE
83. At Camp No. 9 it took 10 boy scouts 3 days to set up camp. Camp No. 12, which is the same size, must be set up in one day. How many boys will be needed to do the work?

a 3
b 30
c 27
d 13

84. George lives one-fourth of a mile from school. He goes home at noon for lunch. How far does he walk each day going to and from school?

a \(\frac{1}{4}\) mi.
b 1 mi.
c \(\frac{3}{4}\) mi.
d \(\frac{1}{2}\) mi.

85. A newsboy delivered papers to 30 customers for a month. At the end of the month he collected $15.00. How much did each customer pay?

a 50¢
b $2.00
c 5¢
d $5.00

86. There are 20 girls in the Sunday School class. Each week each girl gives 5 cents to go toward a fund for needy families. How much will all the girls give in 5 weeks?

a $1.00
b 25¢
c $5.00
d $7.50

87. Richard saw an air rifle advertised for $21.00 at one-third off for cash. How much money will he need to buy it?

a $14.00
b $7.00
c $18.00
d $9.00

88. How much will your mother have to pay for the cleaning of a rug 9 ft. wide and 12 ft. long at the rate of 20 cents a square foot?

a $8.40
b $1.08
c $4.20
d $21.60

89. In a field meet, 20 events were listed for the day. Pupils from your school won 60 per cent of the events. How many events did you lose?

a 4
b 3
c 8
d 12

90. A swimming pool is 60 ft. long and 30 ft. wide. The water in the pool is 4 ft. deep on the average. How long will it take to fill the pool if the water runs in at the rate of 90 cubic feet a minute?

a 80 min.
b 5 min.
c 26 min.
d 45 min.
DIRECTIONS: Mark as you are told the number of the word that means the same or about the same as the first word.

TEST 7

1. blossom
2. tree
3. flower
4. garden

5. journey
1. state
2. travel
3. end
4. fair

6. law
1. rule
2. power
3. able
4. help

7. always
1. larger
2. forever
3. know
4. apart

8. almost
1. rarely
2. never
3. now
4. nearly

9. alarm
1. blame
2. signal
3. address
4. comfort

10. damage
1. manage
2. collect
3. injure
4. recover

11. announce
1. keep
2. publish
3. reform
4. destroy

12. improve
1. make
2. better
3. satisfy
4. admit

13. difficult
1. different
2. pleasant
3. hard
4. task

14. despair
1. mind
2. time
3. past
4. hopelessness

15. consent
1. occur
2. offer
3. oppose
4. agree

16. portion
1. collect
2. part
3. make
4. refer

17. amuse
1. afford
2. gift
3. game
4. please

18. lack
1. use
2. want
3. admit
4. apart

19. cease
1. consent
2. concert
3. stop
4. strain

20. disguise
1. reveal
2. declare
3. show
4. mask

21. distinct
1. success
2. clear
3. interest
4. noticed

22. sincere
1. satisfactory
2. genuine
3. hopeful
4. noble

23. lofty
1. tone
2. high
3. example
4. toil

24. extend
1. refuse
2. remain
3. lengthen
4. revert

25. condemn
1. false
2. blame
3. oppose
4. alarm

26. humble
1. secure
2. dwelling
3. lowly
4. proud

27. expert
1. average
2. master
3. business
4. student

28. apply
1. piece
2. use
3. correct
4. mean
# METROPOLITAN ACHIEVEMENT TESTS

**ELEMENTARY BATTERY: FORM U**

By Richard D. Allen, Ph.D.  
Harold H. Bixler, Ph.D.  
William L. Connor, M.A.  
Frederick B. Graham, Pd.D.  
and Gertrude H. Hildreth, Ph.D.

<table>
<thead>
<tr>
<th>Name</th>
<th>Boy</th>
<th>Girl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School</td>
<td></td>
<td></td>
</tr>
<tr>
<td>City</td>
<td></td>
<td></td>
</tr>
<tr>
<td>County</td>
<td></td>
<td></td>
</tr>
<tr>
<td>State</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test</th>
<th>Standard Score</th>
<th>Grade Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Read.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Vocab.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avg. Reading</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Avg. Arith.</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>5. Lang. Usage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Ach't</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

*Do not include when figuring average achievement.

<table>
<thead>
<tr>
<th>Year</th>
<th>Month</th>
<th>Day</th>
<th>Date of Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>Month</td>
<td>Day</td>
<td>Date of Birth</td>
</tr>
</tbody>
</table>

Age ....... yrs. ....... mos.

This test is copyrighted. The reproduction of any part of it by mimeograph, hectograph, or in any other way, whether the reproductions are sold or furnished free for use, is a violation of the copyright law.

Published by World Book Company, Yonkers-on-Hudson, New York, and Chicago, Illinois. Copyright 1949 by World Book Company. Copyright in Great Britain. All rights reserved.

Printed in U.S.A. MAT: ELEM: D-4
TEST 1. READING: PART I

a. The cow gives
   eggs  silk  mush  milk

I can see a little mouse coming out of his hole. He is very hungry. He wants something to eat. But he must run fast or the cat will catch him.

1. The mouse wants
   the cat  a ball  food  a house

2. He must run away from the
   food  house  lady  cat

John found a big pumpkin in the field. It was just the right size for a jack-o'-lantern. With his knife he cut out eyes, a nose, and a big mouth with teeth. At night he put a candle inside, lighted it, and put the jack-o'-lantern in the window.

3. The carving was done by
   Bill  John  Fred  Ted

4. The jack-o'-lantern was made from a
   lamp  ball  candle  pumpkin

5. In making it the boy used a
   window  nose  knife  stick

Bess is our baby calf. One day she ran away from her mother. The farmer saw her. He told his son, Bill, to run after the little calf. Bill caught Bess in the meadow.

6. The calf is called
   Dolly  Bill  Mother  Bess

7. The calf was caught by
   Bill  Bess  the farmer  the cow

Every Friday we go to the farmers' market. The farmers come in their trucks. They bring in their vegetables. They sell them to the people. We said, "Farmer, what do you sell?" "I sell beans and corn and cabbage," said the farmer.

8. At the market, we saw the dog clowns farmers horses

9. The people buy the soap beans bread meat

10. The farmers ride to market in trains wagons carts trucks

11. We spoke to a farmer groceryman truck driver gardener

The children brought two white rats to school. One of the rats was given milk to drink every day. The other rat got no milk. At the end of two months the children weighed the rats. The one that drank milk was much heavier than the other rat.

12. This story is about feeding children feeding rats milking cows catching rats

13. Giving rats milk every day makes them smaller faster weaker larger

We saw a model Indian village at the museum. One Indian was burning out a log to make a canoe. Another one was pounding corn to make into meal. One man was building a hut of sticks and bark. Some Indians were climbing rocks to store food and supplies in the caves.

14. The boat was made by pounding corn cutting some bark grinding wood burning out a log

15. One house was made of bricks and mud boards and nails bark and sticks sticks and stones

16. Food was kept in caves in a log on rocks in the bark houses

17. The story is about the museum the Indian chief
a country village an Indian village

The trained seals we see on the stage or in the movies are not seals at all, but sea lions. These animals come from the Pacific Ocean off the lower California coast. From there the seals are shipped to Tonawanda, New York, to go to school. It is said that wild animals can be trained but seldom tamed. Sea lions must be tamed first, then trained. The training is a long job, sometimes requiring years of patient effort. This long period of training is rewarded in the end, for a trained seal never forgets a lesson after he has learned it.

18. Many trained seals go to school in California New York the Pacific Ocean the Atlantic Ocean

19. This story is about sea lions Hudson seals wild lions whales

20. The trained seal has a good memory reward ship stage

In order to keep birds around, it is well to provide shelves and shelters where they may procure food in winter. Birds will take food from a shelf just outside a window. During a snowstorm, they will hide under a shed that is open on one side, preferably toward the south. Such a place makes a good feeding ground when the earth is covered with snow. If the birds are in danger from cats, the front of the shed should be covered with poultry netting of two-inch mesh. This allows the birds to get in but keeps the cats out.

21. An enemy from which birds need protection is the cow mouse cat dog

22. Birds need most help in the spring winter fall summer

23. One can attract birds in winter by providing nests screens snow sheds

24. It is best to have the shelter open toward the ground south frost snow

Go right on to the next page.
To make vegetable soup, you must first get together all the things you need—the vegetables, some meat, broth, water, butter, and seasoning. After the vegetables are cleaned and cut in small pieces, they are added to the broth and cooked. When the vegetables are soft, the soup should be seasoned, and then it is ready to serve.

25. These directions are for making
   salad soup seasoning butter

26. Before the vegetables are cut up, they should be
   washed cooked seasoned served

27. In addition to vegetables the cook needs some
   butter soup milk eggs

28. The seasoning is put in after serving
   after cleaning before cooking is begun last of all

Rafts were the earliest means of water travel. They can be made of anything that will float. In the olden days Indians in Canada made rafts of reeds which grew along the rivers. Logs tied together with vines were used on smooth water, but could not be used in rapids. Airplanes which fly over oceans carry rubber boats which resemble rafts. Such rafts take up a very small amount of space when rolled up, but in case of accident they can be blown up and then will be large enough to carry three or four men.

29. The earliest means of water travel was by
   canoe raft steamboat rowboat

30. Airplanes carry boats made of
   reeds logs cloth rubber

31. Many years ago Indians in Canada made rafts of
   reeds boards cloth rubber

Go right on to the next page.
The two Wright brothers read every book and article they could find on the theory of flying. They studied the movements of hawks and other great birds as these birds soared high up in the air. After months of study and hard work they built a plane which they thought would fly. The frame was made chiefly of wood and cloth and weighed, with one brother in it, only 750 pounds. At Kitty hawk, North Carolina, in 1903, they gave the new plane a trial, with one brother as pilot. It rose from the ground and flew through the air for several seconds. This was the first time that a motor-driven, heavier-than-air machine carried a man through the air.

32. Before building a plane, the Wright brothers studied the movements of fish birds trees bees

33. The frame of the first plane was made of wood and cloth silk wood and steel paper

34. The first plane, when unoccupied, weighed about 7500 lb. 1900 lb. 600 lb. 1000 lb.

35. At the first trial the plane flew for several hours seconds minutes days

Thousands of years ago people began to make bowls and jars of clay. Many of the cups from which we drink today are made of clay. That’s why dishes are called earthenware. But before earthenware dishes are ready to be used the clay has to be glazed and fired. Not until this is done are the clay dishes ready to hold liquids.

36. Earthenware is made of liquids clay glaze fire

37. An earthenware cup will leak unless it has been colored fixed filled fired

38. Pottery making is an art that is recent cold ancient forgotten

In making a web the garden spider first spins the radiating lines that run out from the center of the web like spokes of a wheel. These lines are made of dry thread which will not stretch. In the center of the web is a part called the hub. This is a thickly woven mesh or network made of the same kind of thread. The lines running round and round the hub are made of sticky thread and tangle the feet of the careless fly. Running from the hub to the outer edge is a space left without sticky thread. This gives the spider a path by which he can go from one side of his web to the other.

39. The center of a spider's web is called the

nests, hive, hub, spokes

40. The lines running round and round the web are

sticky, thickly woven, dry, spun first

41. When the spider crosses his web, he walks on lines which are

circular, sticky, wide, dry

For the purpose of loading and unloading ships, piers of wood or stone, called "wharves," are built from the shore of a harbor out into the water. Even a large vessel can be fastened firmly, or moored, to such a wharf, and trucks or railway cars can run out on it close to the sides of the vessel. Then derricks on the decks of the ship can lift freight from the cars or trucks and lower it through trap doors into the hold.

42. Another word for "moored" is

unloaded, wharf, fastened, truck

43. The device used for hoisting is the

derrick, hold, wharf, truck

44. Freight is moved from the wharves into ships by

trucks, men, derricks, tugboats

STOP!
PART II

SAMPLE. Dick, Tom, and Fred are brothers. The names ( ) of Dick's brothers are ( ) and ( ) ................. ( )

45-46. Mary's mother gave her some pet chickens. Every morning, Mary gives her ( ) grain to eat and water to ( ) ................. ( )

47-48. Most people think that hard coal is better than soft coal for use in the home furnace. Hard ( ) burns slowly and without much smoke, but ( ) coal produces much smoke and soot, and the pieces may melt and run together.

49. Arithmetic is the study of numbers. Boys and girls should study their ( ) carefully because of its ( ) many uses through life.

50-51. If bedroom windows are opened wide on cold winter nights, the doors should be ( ) so that the other parts of the house will not get too ( ) ................. ( )

52-53. Southeastern Brazil is sometimes called the "Land of Coffee." About two thirds of the ( ) of the ( ) world is raised there. The warm climate and plentiful rainfall of ( ) make it favorable for the growth of the ( ) coffee tree.

54-56. Even the dogs take tests these days. Dog shows now include obedience tests. Dogs are judged on their ability to respond quickly to orders to run, stop, walk, etc. These tests may seem simple, but in one year only 14 out of 64 dogs earned certificates. ( ) There are schools now where your ( ) can be educated so that he can pass his ( ) well. In the dog world it is becoming fashionable to attend ( ) ................. ( )

57-60. The need for counting large numbers of things was not felt until man began to keep herds and flocks. The shepherd needed to count his ( ) every day to see that none was missing. He soon learned to ( ) them in groups of five or ten. He did this by using his fingers. Some used toe ( ) as well as ( ) counting. ................. ( )
61-62. Loadstone, or natural magnet, is a kind of iron ore found in many iron mines. No one knows who first made this natural magnet. A magnet attracts itself iron and some other metals. Magnets have been found which can lift forty times their own weight. How ever, a loadstone which lifts more than ten times its weight is rare.

63-65. When Columbus discovered the New World, corn was growing extensively on both new continents. He first saw corn in Cuba. Not long afterward other explorers told of the growing of corn by the Indians in New England. These explorers were quick to see the value of this new crop and took some of the seed corn back to Europe. From it was sent to many regions of the earth...

66-68. With the aid of the radio beam, air travel in America has become a safer means of travel. There are times when planes run into fog which the weatherman or the pilot did not know about when the flight was planned. But no matter how black the night or how dense the fog, the can follow his beam straight to the right...

69-71. It was a very queer street, all twisted and crooked, more like a country road than a city street, but the people in it were even stranger. Dick was not so surprised at what the women wore; but to see the dressed in doublet and hose was too much. He began to laugh, but when he saw that he also was wearing a doublet and it no longer seemed so...

72-74. People need plenty of water for cleanliness and health and even for life itself. The water we drink should be pure, as well as plentiful, for some diseases may be spread by the use of unclean water. A large city may secure a supply of pure water in one of two ways. It may pipe its water from a pure supply far from the, or, if no such supply can be found, the water can be by the use of certain chemicals...

STOP!
### TEST 2. VOCABULARY

<table>
<thead>
<tr>
<th>Word</th>
<th>Word</th>
<th>Word</th>
<th>Word</th>
<th>Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>kitten</td>
<td>wear</td>
<td>cat</td>
<td>girl</td>
<td>chair</td>
</tr>
<tr>
<td>jump</td>
<td>down</td>
<td>ride</td>
<td>leap</td>
<td>see</td>
</tr>
<tr>
<td>run</td>
<td>stay</td>
<td>ask</td>
<td>race</td>
<td>fun</td>
</tr>
</tbody>
</table>

| 1. home | come | house | yard | horse | live |
| 2. sea | wash | ocean | roar | drink | beach |
| 3. meat | knife | plate | good | food | train |
| 4. pig | wood | animal | dog | bag | pin |
| 5. start | begin | stout | end | brief | sky |
| 6. daughter | boy | girl | father | carpenter | brother |
| 7. chair | table | seat | room | floor | legs |
| 8. walk | sing | laugh | stop | step | stand |
| 9. near | close | far | clear | back | time |
| 10. heat | light | wet | dry | cool | warmth |
| 11. queer | strange | people | title | mirth | quick |
| 12. banana | handkerchief | band | vegetable | fruit | ribbon |
| 13. order | command | allow | smell | give | carry |
| 14. dark | dim | light | day | fair | arrow |
| 15. clever | dull | clean | better | small | smart |
| 16. delight | please | place | trouble | free | sunshine |
| 17. frosty | fresh | cold | misty | hot | hairy |
| 18. harm | heat | help | storm | hurt | fear |
| 19. captive | prisoner | war | jail | robber | poison |
| 20. bench | grapes | seat | desk | bough | couch |
| 21. tremble | shake | fall | travel | run | tear |
| 22. patch | dig | throw | tear | mend | catch |
| 23. gasoline | pump | car | lamp | water | fuel |
| 24. shelter | storm | desert | shock | protection | attack |
| 25. hollow | below | pillow | full | heavy | empty |

[10] Go right on to the next page.
26. forever  never  yesterday  always  everywhere  now
27. shout  kill  close  shock  brief  cry
28. distant  unpleasant  clear  far  alone  near
29. surround  perplex  yield  review  open  encircle
30. principal  chief  original  amount  rule  private
31. have  fold  gave  hold  lose  hive
32. pantry  guard  closet  attic  cellar  plant
33. harvest  moon  crop  feast  player  farmer
34. reply  complain  demand  fill  answer  question
35. about  around  above  after  again  what
36. branch  tree  bush  limb  bud  blossom
37. describe  write  ask  tell  reduce  wish
38. announce  deny  attach  disturb  weigh  proclaim
39. join  rejoice  connect  travel  note  part
40. couch  desk  rug  wagon  porch  bed
41. notify  observe  police  injure  inform  look
42. agree  take  disturb  collect  consent  extend
43. match  fashion  lead  equal  change  time
44. argue  sickness  agree  decide  discuss  arrange
45. plain  solid  plot  clear  calm  real
46. wretched  weary  ugly  mean  miserable  tired
47. field  filled  lot  ball  daisy  park
48. interrupt  blow  hint  translate  break  tremble
49. particular  practical  expensive  clean  special  piece
50. ever  never  soon  always  even  else

STOP!
TEST 3. ARITHMETIC FUNDAMENTALS

Add

\[
\begin{array}{cccccccc}
5 & 6 & 7 & 4 & 2 & 9 & 9 & 8 \\
+8 & +2 & +9 & +2 & +7 & +9 & +5 & +7 \\
\end{array}
\]

\[
\begin{array}{cccccccc}
20 & 30 & 26 & 9 & 75 & 87 \\
+50 & +46 & +3 & +42 & +36 & +56 \\
\end{array}
\]

Subtract

\[
\begin{array}{cccccccc}
5 & 9 & 7 & 9 & 11 & 15 & 14 & 14 \\
-1 & -2 & -5 & -7 & -5 & -6 & -9 & -8 \\
\end{array}
\]

\[
\begin{array}{cccccccc}
28 & 29 & 48 & 56 & 86 & 172 \\
-13 & -7 & -8 & -48 & -19 & -95 \\
\end{array}
\]

Multiply

\[
\begin{array}{cccccccc}
3 & 5 & 9 & 8 & 2 & 9 & 6 & 9 \\
\times8 & \times4 & \times5 & \times4 & \times8 & \times1 & \times5 & \times2 \\
\end{array}
\]

\[
\begin{array}{cccccccc}
35 & 70 & 67 & $5.18 & 857 & 68 \\
\times3 & \times7 & \times5 & \times4 & \times6 & \times90 \\
\end{array}
\]

Divide

One half of 12 is \_

\[
6 \div 3 = \_
\]

\[
\begin{array}{cccccccc}
3)9 & 1)8 & 2)10 & 1)3 & 2)8 & 3)18 \\
\end{array}
\]

Go right on to the next page.
Divide

5)45
7)42
6)48
8)72
9)63

7)52
2)82
6)79
5)375
4)804

7)833
6)14.25
32)96

Add

73
19
45
677
10
$9.48

69
12
654
308
.20

72
31
501
7
6.69

16
97
458
576
7.22

Subtract

387
445
544
8000
$30.00

- 54
- 369
- 396
- 348
- 29.72

[ 13 ] Go right on to the next page.
Subtract
\[
\begin{array}{ccc}
\frac{2}{3} & 8 & 5\frac{4}{7} \\
-\frac{1}{3} & -\frac{1}{2} & -3\frac{1}{7}
\end{array}
\]

Multiply
\[
\begin{array}{cccc}
74 \times 23 & 908 \times 54 & 477 \times 82 & 476 \times 805 & 559 \times 795
\end{array}
\]

Find
\[
\frac{1}{6} \text{ of } 48 = \quad \frac{3}{4} \text{ of } 20 = \quad \frac{5}{6} \text{ of } 36 =
\]

Divide
\[
\begin{array}{ccc}
48)301 & 67)8742 & 69)3365
\end{array}
\]

STOP!
TEST 4. ARITHMETIC PROBLEMS

1. I bought a bottle of milk for 8 cents, an apple for 5 cents, and some candy for 4 cents. All the things together cost how much?

2. I have 6 cents and want a pencil which costs 10 cents. I need how many more cents to buy the pencil?

3. My sister has 8 kittens. She is going to give me half of them. How many shall I have?

4. We had 12 puppies and gave away 4. We had how many puppies left?

5. 4 children are coming to my party. I am going to give each one of them 2 apples. I must get how many apples for all of them?

6. I need 5 eggs to make a cake. How many eggs do I need to make 6 times as many cakes?

7. My father gave me 45 cents. I spent 10 cents for a candy bar and 10 cents for a ride on the car. How many cents did I have left?

8. A train went 53 miles the first hour and 65 miles the second hour. How far did it go in 2 hours?
9. Our class had $1.85. We spent 95 cents for a picnic we gave. How much money did we have left?

10. There are 15 children in our class and each one drinks 5 bottles of milk a week. How many bottles are needed for all the children each week?

11. The first week our lunchroom was open we sold 103 quarts of milk. The second week we sold 113 quarts. How many more quarts did we sell the second week than the first week?

12. The manager of a store has three helpers. He pays each of them $15.75 a week. How much does he pay them all together?

13. A farmer is going to plant 380 trees. He has already planted 125 of the trees. How many more has he still to plant?

14. If we average 35 miles an hour on our auto trip, how far can we go in 9 hours?

15. My uncle gathered 288 baskets of cherries. He put the baskets into 4 crates. How many were in each crate?

Go right on to the next page.
16. Tickets to our play are 15 cents each. If 20 persons buy tickets, how much money shall we take in?

\[ \$ \]

17. I bought 8 apples at 4 cents each and gave the clerk half a dollar. How much change did I get back?

\[ \$ \]

18. Ruth has 366 candles. How many boxes will she need if she puts 6 candles in a box?

\[ \text{boxes} \]

19. At the grocery store Mary bought a pound of cheese for 28 cents, six apples for 18 cents, and a loaf of bread for 12 cents. How much change should she get from the dollar bill she gave the storekeeper?

\[ \$ \]

20. Louise has an allowance of 60¢ a week. Her mother expects her to save \( \frac{1}{3} \) of it. How much must Louise save a week?

\[ \$ \]

21. The 37 pupils in our class went on a picnic. It cost 46 cents for each pupil. How much did it cost for the entire class?

\[ \$ \]

22. If Jane bought a dress for \$5.44, how much change should she receive from a 10-dollar bill?

\[ \$ \]
23. If oranges sell at 4 for 10¢, how much would 1 dozen cost?  

24. Last summer Walter picked 552 quarts of berries. His father shipped them in crates. If each crate held 24 quarts, how many crates did he use?  

25. Dan earned $78.00 working 4 weeks during February. How much did he earn a week?

STOP!
TEST 5. LANGUAGE USAGE

a. My brother ______ he would hurry.
b. I want a piece _______ bread.
c. She _______ it coming to my party.

1. The girl was crying because she had hurt _______ self.
2. If my mother will let me, I should like to _______ to the show with you.
3. Both of these hats ________ mine.
4. Yesterday I ______ some elephants at the circus.
5. Last month my aunt ______ me a dollar for my birthday.
6. My sister and ________ wish to go with you. Please take us both.
7. "Will you please do the dishes for me?"
   "I _______ them half an hour ago."
8. The boys ______ playing marbles when it started to rain.
9. Of the three dresses, Mary liked the red one ________.
10. Bob bought too much candy. Now, he has hardly ______ money left.
11. Ann said to the little boy, "I ______ down in this chair."
   He could see that _______ were only two boys in the room.

Paul, you _______ late to school every day last week.
14. If a new player had not arrived, the boys would __________ lost the game.

15. Fido was lost. He __________ nowhere to be seen.

16. That is the man __________ knocked at the door.

17. The two boys disappeared. I wonder where they have __________

18. Instead of knocking at the door, I __________ the bell.

19. She gave the cat some milk, which it __________ immediately.

20. Miss Waters is my new teacher. She will __________ me arithmetic.

21. Every girl brought __________ own lunch.

22. Father, __________ I have a dime?

23. Mary is older __________ Jane.

24. There __________ any books left in the closet.

25. Please __________ the window a little higher.

26. His eyeglasses were __________ when he fell.

27. Ruth said, "I do not sew as well as Helen does, but I can __________ faster than ___________."

28. "Do you take the same trip every year?"
   "Yes, we have __________ this trip every July for years."

29. I like to __________ down on the couch.

30. Dan has been ill, but by tomorrow he will feel __________ enough to return to school.

31. Betty and I washed dishes after supper. My father gave both her and __________ a dime for helping.
32. Neither of the two boys \_ to go on errands.

33. Yesterday a crate of eggs \_ left there.

34. Robert was \_ to be leader by the boys.

35. My mother has just \_ a note to Mrs. Clark.

36. Please take the books \_ the next room.

37. My brother \_ like to cut wood when the ax is dull.

38. Neither Jack \_ Tom is very strong.

STOP!
TEST 6. SPELLING

1. ___________________________

2. ___________________________

3. ___________________________

4. ___________________________

5. ___________________________

6. ___________________________

7. ___________________________

8. ___________________________

9. ___________________________

10. ___________________________

11. ___________________________

12. ___________________________

13. ___________________________

14. ___________________________

15. ___________________________

16. ___________________________

17. ___________________________

18. ___________________________

19. ___________________________

20. ___________________________

21. ___________________________

22. ___________________________

23. ___________________________

24. ___________________________

25. ___________________________

26. ___________________________

27. ___________________________

28. ___________________________

29. ___________________________

30. ___________________________
31. __________________________  36. __________________________
32. __________________________  37. __________________________
33. __________________________  38. __________________________
34. __________________________  39. __________________________
35. __________________________  40. __________________________

No. right. .... Stand. score. .... Gr. equiv. .... Age equiv.
<table>
<thead>
<tr>
<th>Test 1</th>
<th>Test 2</th>
<th>Test 3</th>
<th>Test 4</th>
<th>Test 5</th>
<th>Test 6</th>
<th>AVE</th>
<th>ACH'T.</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-3</td>
<td>12-2</td>
<td>12-1</td>
<td>12-0</td>
<td>11-11</td>
<td>11-10</td>
<td>11-9</td>
<td>11-8</td>
</tr>
<tr>
<td>12-4</td>
<td>12-3</td>
<td>12-2</td>
<td>12-1</td>
<td>12-0</td>
<td>11-1</td>
<td>11-0</td>
<td>10-1</td>
</tr>
<tr>
<td>12-5</td>
<td>12-4</td>
<td>12-3</td>
<td>12-2</td>
<td>12-1</td>
<td>12-0</td>
<td>11-9</td>
<td>11-8</td>
</tr>
<tr>
<td>12-6</td>
<td>12-5</td>
<td>12-4</td>
<td>12-3</td>
<td>12-2</td>
<td>12-1</td>
<td>12-0</td>
<td>11-9</td>
</tr>
<tr>
<td>12-7</td>
<td>12-6</td>
<td>12-5</td>
<td>12-4</td>
<td>12-3</td>
<td>12-2</td>
<td>12-1</td>
<td>12-0</td>
</tr>
<tr>
<td>12-8</td>
<td>12-7</td>
<td>12-6</td>
<td>12-5</td>
<td>12-4</td>
<td>12-3</td>
<td>12-2</td>
<td>12-1</td>
</tr>
<tr>
<td>12-9</td>
<td>12-8</td>
<td>12-7</td>
<td>12-6</td>
<td>12-5</td>
<td>12-4</td>
<td>12-3</td>
<td>12-2</td>
</tr>
<tr>
<td>12-10</td>
<td>12-9</td>
<td>12-8</td>
<td>12-7</td>
<td>12-6</td>
<td>12-5</td>
<td>12-4</td>
<td>12-3</td>
</tr>
</tbody>
</table>

* These two scales are independent. Only one should be used at one time.

In plotting this chart, put an X in the box above the scale which is to be used.

† An additional scale is provided here in order to make it possible to plot the chart in terms of norms other than those of age or grade.

The Profile Chart is designed to furnish a graphic picture of the achievement of an individual pupil as revealed by his test scores. In plotting the equivalents (grade, age, or other type), open the test booklet and lay it flat so that both the title page and the Profile Chart are in view. Plot the equivalent of each test score on the proper stave and join these points to make the profile.
# METROPOLITAN ACHIEVEMENT TESTS

## INTERMEDIATE BATTERY — PARTIAL: FORM S

**By Richard D. Allen, Ph.D.**  
**Harold H. Bixler, Ph.D.**  
**William L. Connor, M.A.**  
**And Frederick B. Graham, Pd.M.**

<table>
<thead>
<tr>
<th>Test</th>
<th>Standard Score</th>
<th>Grade Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Vocabulary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Reading</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>3. Arithmetic Fundamentals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Arithmetic Problems</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>Average Arithmetic</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>5. English</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I. Language Usage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. Punct. and Cap.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total English</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Spelling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Achievement</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Do not include when figuring average achievement.

---

Name: ...................................  Boy  ...  Girl ...
Teacher: .................................  Grade ....  School: ..........................
City: .................................  County: .............................  State: ..........................

**Year**  
**Month**  
**Day**  
**Date of Testing**

**Year**  
**Month**  
**Day**  
**Date of Birth**

Age  ... yrs.  ... mos.

---

This test is copyrighted. The reproduction of any part of it by mimeograph, hectograph, or in any other way, whether the reproductions are sold or furnished free for use, is a violation of the copyright law.

Published by World Book Company, Yonkers-on-Hudson, New York, and Chicago, Illinois  
Copyright 1947 by World Book Company. Copyright in Great Britain. All rights reserved
**Test 1. Reading**

_DIRECTIONS._ In each paragraph a blank line means that a word has been left out. Read each paragraph. Then think of the word that should be in each blank. Write the word in the parentheses at the side of the page. You should get the answer from the paragraph itself.

**Sample.** Dick, Tom, and Fred are brothers. The names (__________) of Dick’s brothers are (a) and (b) . . . . (__________)  

1. The girls went to the store to buy some grapes. They took the (__) to school to make jelly . . . . . . . . . . . (__________) 1 .  

2. Spelling is an important school subject. Every child should learn to (__) correctly . . . . . . . . . . . (__________) 2 .  

3–5. Tea was known to be used as a drink in China as early as the 6th century but was not (__) by the (__________) until about the 17th century. It was introduced into (__) by a Dutch traveler who learned about (__________) it in China. Millions of people in all parts of the world use (__) daily . . . . . . . . . . . (__________) 5 .  

6–7. The crocodile bird, also called the Egyptian plover, rides on the crocodile’s back, where he finds and eats insects. He even enters the mouth of the (__) to (__________) catch flies. The crocodile recognizes the plover as a friend and would not (__) him . . . . . . . . . . . (__________) 7 .  

8–10. If you are a good reader, your eyes move (__________) across the page regularly, seldom going back for a second look at what you have (__) already. A poor (__) on the other hand, needs to (__) back many times . . . . (__________) 10 .  

11–15. Centuries ago in Madagascar a chief, who wished to count his army, used a plan which developed into a simple decimal system. As each of the (__) marched past the chief a pebble was dropped in a pile on the ground. When there were ten pebbles in the (__) one was taken out and set aside. The remaining (__) were picked up and used over again. When this had been done ten times the chief knew that ten times ten or (__) soldiers had passed by. In this way the chief (__) all the men in his army . . . . . . . . . . . (__________) 15 .  

16–20. Over two hundred years ago Benjamin Franklin started the first circulating library. He produced the books and hired a librarian to help take care of the (__) . Thus was America started on a habit of (__) that has lasted ever since. Recently the bookmobile has been introduced to assist those country people who live too far from the (__) to take advantage of these city libraries. The (__) is a truck which travels from house to (__) . This library is truly a (__________) circulating library.
21-24. There are clocks now that are self-winding. They are wound by changes in temperature. If the temperature changes one degree, this stores up enough power to drive the clock for four days. Since the temperature is always constant, there is little chance that the clock will run down.

25-28. The largest cacao-producing region in the world is in the lowlands of West Africa. Cacao trees must have a hot and moist climate such as this region offers. This hot and moist climate, however, is not healthy for the white man so that natives do most of the work. Cacao often grows on small plantations. To start a new plantation, most of the trees of the forest have to be cleared away. After the cacao trees are planted it takes four or five years before the first crop can be gathered and at least ten years to get a full crop. These trees produce beans which are used in the making of cocoa and chocolate.

29-33. For centuries the English have appreciated the advantages of speedy transportation, as the British Empire is spread out over the whole earth. The Empire was built up largely in the days when sailing vessels were the only means of crossing the oceans. At that time, it took months to make a long journey across an ocean. Later, steamships cut the journey to weeks. In 1938 it required six weeks for the usual steamship to carry passengers and freight from England to Australia, but in this same year it took only a week and a half for commercial airplanes to fly the same distance.

34-41. A journey that started in India almost two thousand years ago may be ending soon. This is the journey of the gypsies who first left their origin, before the Christian era. They have been wandering ever since, making a living largely by horse trading. For many centuries the horse-drawn gypsy wagon was their means of getting from one place to another and also their home in stormy weather. Then came the automobile, and horse trading was no longer a practical way of making a living. Many gypsies bought automobiles and continued to travel from place to place, but gasoline does not grow by the wayside as grass does; it must be paid for. There were fewer and fewer ways for the gypsies to make a living on the open road. More and more of the gypsies have now settled down in the towns and cities and have become part of the mixed population of these places.
The little flat where Pierre and Marie Curie lived was notably lacking in comfort. However, they refused furniture offered by Pierre’s father, because Marie hadn’t the time to clean it. The bareness was relieved only by books, two chairs, and a white wooden table. On the table were scientific books, a bunch of flowers, an oil lamp, and that was all. Before these two chairs, neither of which was for him, the most daring visitor could only flee. The idea of choosing between family and the scientific career did not even cross Marie’s mind. She kept house, washed the baby, and put pans on the stove, but she also kept on working in a miserable old shed, working toward the most important discovery of modern science, the discovery of radium.

42. Who offered furniture to Pierre and Marie? .......(________________________________________) 42
43. Why couldn’t Marie clean the furniture offered? ...(______________________________________) 43
44. In what place did Marie do her scientific work? .......(______________________________________) 44
45. What did Marie and Pierre use for light? ..........(_______________________________________) 45
46. The discovery of what material is said to be the most important of modern science? .......(______________________________________) 49

One of the most picturesque “Way Down East” harbors is Corea, Maine. This little village is an active lobster-fishing center. The harbor is lined around with huts and houses of the fishing folk, and lobster pots are piled everywhere. A few yards back, a single road winds around the harbor, so that every house has its own approach by land and sea. Views of tiny inlets combine the beautiful and picturesque, and many pretty flower gardens bloom with special brilliance beside the changing tide.

47. For what industry is Corea known? .....................(______________________________________) 47
48. How many roads wind around the harbor? .......(________________________________________) 48
49. By what two ways can the homes of the fisher folk be reached? ................(__________________________) 49
50. Where are the lobster pots piled? .................(__________________________________________) 50
51. What is there in the scene which shows the villagers want their town to be beautiful? .......(______________________________________) 51
52. Write in the answer space the letter which appears in front of the best title for this paragraph —
   a. The Fishing Industry in Maine    b. Pretty Flower Gardens
   c. The Harbor of Corea    d. Lobster Fishing .............(________) 52

[ 4 ] (Go right on to the next page.)
In 1871 a young student doctor in the Montreal General Hospital walked back and forth, back and forth, in his room. He was much worried about his future. He feared that he was not going to be able to become the successful doctor that he wanted so much to be. Without giving much thought to what he was doing, he picked up a book which was lying on the table and read a few words. These are the words he read, "Our main business is not to see what lies dimly at a distance but to do what lies clearly at hand." This so impressed the doctor that he stopped his worried pacing and settled down to work on the next day's examination. The young man was William Osler. He became one of the world's greatest doctors and medical teachers. Osler lived to be seventy years of age and late in his life he said, "The load of tomorrow added to that of today makes the strongest falter." From this we know that he never forgot the lesson he learned as a young man.

53. What did the young student hope to become? ( )
54. In what city was Osler when he learned the lesson which made his life a success? ( )
55. What was the young doctor worried about? ( )
56. After the incident what did Osler stop doing? ( )
57. For what task of the next day did he begin to prepare? ( )

The hive of the honeybee is like a human city. It is governed by strict laws which all the bees obey without question. Every bee has his specialized job to do. Some make the wax from which the honeycomb is built. Others build the honeycomb with its variety of cells. Others act as policemen and will not allow a strange bee to enter the hive, while still others keep the hive clean.

58. To what is the honeybee hive compared? ( )
59. What occupation is named which also is to be found in a human city? ( )
60. By what are all the bees said to be governed? ( )
61. How many different jobs are mentioned? ( )
62. What word tells us that not all cells in the hive are alike? ( )
63. Write in the answer space the letter which appears in front of the best title for this paragraph —
   a. Honeybees at Work  b. How Honey Is Made
   c. Community Life of the Honeybee
   d. How Honeybees Make a Living ( )

STOP!
TEST 2. VOCABULARY

DIRECTIONS. In the parentheses after each question write the number of the word that makes the sentence most nearly true.

SAMPLE. Big means the same as — 1 bad 2 pretty 3 large 4 tiny ( )

1. To hate means to — 1 admire 2 harry 3 frighten 4 dislike ( )
2. To be strong is to be — 1 selfish 2 strange 3 proud 4 powerful ( )
3. Everywhere means — 1 someplace 2 elsewhere 3 there 4 all places ( )
4. Down means — 1 up 2 below 3 from 4 out ............. ( )
5. A prize is a — 1 contest 2 party 3 story 4 reward .... ( )
6. Faint means — 1 noisy 2 plain 3 weak 4 quick ........ ( )
7. Weather refers to — 1 climate 2 calendar 3 doubt 4 seashore ( )
8. Single refers to — 1 many 2 all 3 both 4 one .......... ( )
9. To be mistaken is to be — 1 quiet 2 mixed 3 dim 4 wrong ( )
10. Distant means — 1 unpleasant 2 clear 3 far 4 alone .... ( )
11. A coast is a — 1 shore 2 bottom 3 steamer 4 dock .... ( )
12. A level country has — 1 hills 2 mountains 3 plains 4 valleys ( )
13. To tease is to — 1 rip 2 fight 3 annoy 4 drink ........ ( )
14. To compare is to — 1 criticize 2 flatter 3 comfort 4 match ( )
15. To lead means to — 1 guide 2 weigh 3 measure 4 drive ( )
16. An island is a form of — 1 desert 2 wood 3 land 4 water ( )
17. A comrade is — 1 a walk 2 a rival 3 an enemy 4 a companion ( )
18. To happen is to — 1 arrange 2 trust 3 occur 4 believe .. ( )
19. To select is to — 1 vote 2 run 3 name 4 choose ........ ( )
20. A supply is a — 1 need 2 help 3 prayer 4 quantity .... ( )
21. A question is a — 1 adventure 2 inquiry 3 argument 4 answer ( )
22. To live means to — 1 like 2 dwell 3 play 4 wake ....... ( )
23. To ignore means to — 1 overlook 2 know 3 kindle 4 imagine ( )
24. To defend means to — 1 overcome 2 guard 3 wait 4 attack ( )
25. To match is to — 1 fashion 2 lead 3 equal 4 change ... ( )
26. It seems means it — 1 sews 2 attempts 3 appears 4 shines( )
27. To desert means to — 1 cling 2 place 3 search 4 abandon ( )
28. Indeed means — 1 inasmuch 2 really 3 never 4 amen .. ( )

(Go right on to the next page.)
29. To threaten means to — 1 increase 2 storm 3 menace 4 throw ( )
30. To direct means to — 1 command 2 improve 3 straighten 4 erect ( )
31. I want means I — 1 have 2 would 3 require 4 thank . . . ( )
32. To retire means to — 1 reduce 2 dress 3 retain 4 withdraw ( )
33. To depend is to — 1 deepen 2 need 3 rely 4 help . . . . ( )
34. To guide is to — 1 defend 2 watch 3 supply 4 lead . . . . ( )
35. To distrust is to — 1 confide 2 believe 3 upset 4 doubt ( )
36. Often means — 1 rarely 2 now 3 seldom 4 frequently . . . ( )
37. To conceal is to — 1 forget 2 concede 3 find 4 hide . . . . ( )
38. I encourage means I — 1 amuse 2 attempt 3 surround 4 urge ( )
39. About means — 1 over 2 far 3 near 4 above . . . . . . . . . ( )
40. Curious means — 1 anxious 2 calm 3 inquisitive 4 angry ( )
41. An appeal is a — 1 presence 2 request 3 sound 4 paring ( )
42. To be envious is to be — 1 joyful 2 greedy 3 jealous 4 constant ( )
43. To suit means to — 1 wear 2 fit 3 clothe 4 soil . . . . . . ( )
44. Circumstance means — 1 circle 2 circuit 3 wealth 4 event ( )
45. Abundant means — 1 insufficient 2 abusive 3 plentiful 4 absolute ( )
46. Devotion means — 1 hope 2 affection 3 suffrage 4 ambition ( )
47. To address is to — 1 greet 2 clothe 3 call 4 write . . . . . . ( )
48. To indicate means to — 1 hint 2 signify 3 charge 4 dent . . . ( )
49. To hearten is to — 1 live 2 heed 3 cheer 4 hope . . . . . . ( )
50. To repent means to — 1 sin 2 regret 3 return 4 restore ( )
51. Until means — 1 later than 2 during 3 up to 4 now . . . . ( )
52. Leisure means — 1 ease 2 sport 3 work 4 contentment . . . ( )
53. Courteous means — 1 original 2 cowardly 3 civil 4 impudent ( )
54. Dispatched means — 1 spread 2 sewed 3 scorned 4 sent ( )
55. She argues means she — 1 complains 2 fights 3 disputes 4 repeats ( )

STOP!
**TEST 3. ARITHMETIC FUNDAMENTALS**

**Directions.** Work each example and write the answer in the box near it. If you have to copy your answer, be sure to copy it correctly. Reduce all improper fractions to mixed numbers, and all fractions to lowest terms.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Add</td>
<td>9 [\frac{3}{4}]</td>
<td></td>
</tr>
<tr>
<td>2. Add</td>
<td>0 [\frac{9}{3}]</td>
<td></td>
</tr>
<tr>
<td>3. Add</td>
<td>26 [\frac{7}{3}]</td>
<td></td>
</tr>
<tr>
<td>4. Add</td>
<td>9 [\frac{0}{4}] 3 0 7 6 7 5 8</td>
<td></td>
</tr>
<tr>
<td>5. Add</td>
<td>29699 88687 99899 87739 42478</td>
<td></td>
</tr>
<tr>
<td>6. Subtract</td>
<td>9 [\frac{3}{2}]</td>
<td></td>
</tr>
<tr>
<td>7. Subtract</td>
<td>15 [\frac{9}{3}]</td>
<td></td>
</tr>
<tr>
<td>8. Subtract</td>
<td>79 [\frac{31}{3}]</td>
<td></td>
</tr>
<tr>
<td>9. Subtract</td>
<td>909 [\frac{240}{3}]</td>
<td></td>
</tr>
<tr>
<td>10. Subtract</td>
<td>76381 1 464762</td>
<td></td>
</tr>
<tr>
<td>11. Multiply</td>
<td>2 [\frac{9}{3}]</td>
<td></td>
</tr>
<tr>
<td>12. Multiply</td>
<td>221 [\frac{4}{3}]</td>
<td></td>
</tr>
<tr>
<td>13. Multiply</td>
<td>254 [\frac{8}{3}]</td>
<td></td>
</tr>
<tr>
<td>14. Multiply</td>
<td>508 [\frac{906}{3}]</td>
<td></td>
</tr>
<tr>
<td>15. Multiply</td>
<td>5978 [\frac{87}{3}]</td>
<td></td>
</tr>
<tr>
<td>16. 28 ÷ 4 =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>4 [\frac{37}{3}]</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>3 [\frac{693}{3}]</td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>9 [\frac{7821}{3}]</td>
<td></td>
</tr>
</tbody>
</table>

(Go right on to the next page.)
20. \[ 41 \) \( 451 \]

21. \[ 58 \) \( 46815 \]

22. \( \frac{2}{8} = \frac{\_}{\_} \)

23. \( \frac{1}{6} + \frac{1}{6} = \)

24. Add \( \frac{1}{5} \)

25. Add \( \frac{1}{10} \)

26. Add \( \frac{3}{2} \)

27. Subtract \( \frac{1}{3} \)

28. Subtract \( \frac{1}{6} \)

29. Subtract \( \frac{3}{4} \)

30. Subtract \( \frac{3}{12} \)

31. Subtract \( \frac{5}{12} \)

32. \( \frac{1}{3} \text{ of } 129 = \)

33. \( \frac{7}{8} \times \frac{5}{7} = \)

34. \( 9 \times \frac{3}{3} = \)

(Go right on to the next page.)
35. $10 \times 2\frac{2}{5} \times 1\frac{7}{8} =$  

36. $4 \div 2 \frac{2}{5} =$  

37. $\frac{3}{4} \div \frac{3}{16} =$  

38. $\frac{2}{3} \div 8 =$  

39. $2\frac{3}{5} \div 1\frac{1}{5} =$  

40. Add  
   350  
   6224  
   47055  
   325042  
   963  
   4002  

41. $86 - 3.71 =$  

42. $1000 \times .33 =$  

43. $.23 \times 65.2 =$  

The graph below shows the attendance record of a class of 40 pupils for a week.

44. How many pupils were present on the day when the attendance record was best?  

45. How many more pupils were present on the last day than on the first?
53. The distance from A to B on above drawing is \( \frac{3}{8} \) in. According to the given scale what is distance in miles?

54. 40% of 45 =

55. 6% of 200 =

56. 12\(\frac{1}{2}\)% of 32 =

STOP!
TEST 4. ARITHMETIC PROBLEMS

DIRECTIONS. Work each problem and write the answer in the box after the problem. Do your work in the margin at the right of the page.

1. Four boys went fishing. Sam caught 7 fish, Dan 5, Paul 4, and Mark 8. How many fish did the boys catch? .............

2. Alice said that she had 22 words right and 8 words wrong in her spelling test. How many words were in the test? ...........

3. We had 38 red balls on the beach last summer, but this year we had only 29. How many balls were lost? ...........

4. One stormy day there were 207 pupils present in our school. There should have been 267. How many were absent? ......

5. If we average 25 miles an hour on our auto trip, how far can we go in 9 hours? ......... mi.

6. On our motor trip we used 45 gallons of gasoline. If we paid 21¢ a gallon, how much did the gasoline cost? ............. $

7. At our picnic there will be 256 fifth-grade pupils. Each bus holds 32 pupils. How many busses do we need? ...........

8. If May spends $1.37 for groceries, how much change should she get from a 10-dollar bill? ............. $

9. There are 56 pages in our speller. Our teacher said $ of them are review pages. How many review pages are there? .........

10. Mr. Hill works 6 days a week and earns $37.50 a week. How much is that a day? ............. $

11. Last summer Walter picked 552 quarts of berries. His father shipped them in crates. If each crate held 24 quarts, how many crates did he use? .............

[ 12 ] (Go right on to the next page)
12. Apples are selling 4 for 10¢. How much should I pay for 2 dozen?.............. 10¢

13. Mr. Gray has been in Canada two years. How many weeks has he been gone?..... wk.

14. Mrs. Rose bought a 1 2/3-yard piece of linen and a 2 1/2-yard piece. How much linen did she buy in all?............... yd.

15. Dan gets 30¢ an hour for delivering papers. Yesterday he worked from 6:00 A.M. to 7:30 A.M. How much did he earn?..............

16. Tom picked 24 boxes of cherries. He said he would give a fourth of them to his brother and a fourth to a neighbor and keep the rest. How many boxes will he keep?..................

17. John bought an old bicycle for $12. He spent $2.50 for repairs. He sold it for $18. How much did he gain?..............

18. Our Scout troop started a hike from Groton to Madison, 10.3 miles away. At noon Billy saw a sign that showed we had gone 7.7 miles. How far had we still to go?.....

19. Mrs. Green bought shoes for Tom and his brother at $4.89 a pair, sweaters at $2.98 each, and caps for 78¢ each. How much did the new outfits for two boys cost?.......

20. Our principal told us that the bill for our 75 history books was $43.50. What did one book cost?..................

21. Don spends 30¢ each week for the movies. How much money does he spend in a year?

22. Milk sells at 16¢ a quart. We need 6 gallons for our church supper. How much will the milk cost?..........................

23. Amy bought 3 1/4 yards of ribbon. She used 2 5/8 yards for a dress. How much did she have left for a hair ribbon?............... yd.

24. Nellie practices her music lessons 3 3/4 hour every day. How many hours of practicing does she do in 7 days?.............. hr.
25. If eggs are 48¢ a dozen, how much did the 2 eggs I ate today cost? ..

26. A freight agent was unloading boxes. The hand truck weighed $35\frac{1}{2}$ lb. On the scales one box and the hand truck weighed $84\frac{1}{2}$ lb. What was the weight of the box?

27. Joan bought 8 yards of ribbon. She used $1\frac{3}{4}$ yards for her hair and $2\frac{5}{8}$ yards for her dress. How much did she have left?

28. The gas bills for our family for the first six months were: $3.20, 2.75, 3.00, 2.65, 2.50, and 2.25. What was the average cost per month for our family?

29. The candy-store man pays $1.50 for a 5-pound box of candy and sells it for 10¢ a 4-ounce bag. How much does he make on a 5-pound box?

30. Bob worked $4\frac{1}{2}$ hours on Monday, $3\frac{3}{4}$ hours on Tuesday, and 4 hours on Thursday. At 40¢ an hour, how much did he earn?

31. If 4 bars of chocolate are to be divided among 5 boys, what part of a bar should each boy get?

32. How many pieces, $\frac{7}{8}$ yard in length, could you cut from $3\frac{1}{2}$ yards of linen?

33. Joe planted 35 five-cent tomato plants. He gathered 120 lb. of tomatoes and sold them for 6¢ a pound. How much did he make?

STOP!
TEST 5. ENGLISH: PART I - LANGUAGE USAGE

DIRECTIONS. In each sentence one word is left out for each blank line. Think of the one word that should be written on the blank line to make the sentence correct and sensible. Write the word in the parentheses after the sentence. Read the whole sentence before you write the word. (Sometimes the first letter of the word you are to use is given.) Read the sentence again after you have written the word, to be sure that it is correct and sensible.

SAMPLES. John says he d—like to lose a game. 
Mary hasn’t — more paper left for her lessons.

1. Jack’s mother won’t l—him play with us. (l)  
2. Ted hurt —self, very badly when he fell from his bicycle. ( )  
3. Ben c—to school late this morning. (c)  
4. There is hardly — fruit left in the bowl. ( )  
5. Yesterday Carol d—her homework before supper. (d)  
6. Because we were good, Bob and — were allowed to go. ( )  
7. I always did like to ride on th—kind of boat. (th)  
8. Here is the book — you lent me last week. ( )  
9. He s—in the most comfortable chair. (s)  
10. Although we sat in the last row, we s—the actors clearly because we used opera glasses. (s)  
11. My dog is clever. He can learn any trick I try to —him. ( )  
12. She gave the tramp milk, which he dr—immediately. (dr)  
13. Of the three pretty sisters, Peggy is the pr—. (pr)  
14. We wished to go to the movies, but we a—going because we haven’t enough money. (a)  
15. “Did Mother go shopping, Jane?”  
“No, she has — to visit Aunt Ellen.” ( )  
16. When Mary fell, she h—her leg a great deal. (h)  
17. He could see that th—were only two boys in the room. (th)  
18. “Does he always take the same train?”  
“Yes, he has t—the same train every day for two years.” (t)  
19. We can go skating, because the water in the lake is fr—. (fr)
20. There \( w \)-hardly any food on hand when they arrived. (\( w \))
21. Mr. Smith, one of the children — gone to look for the teacher. (\( w \))
22. The ring wasn’t — where to be found. It was lost. (\( w \))
23. Fred is just beginning, but Jenny — ten minutes ago. (\( b \))
24. The books are Helen’s, but the ones on that table are mine. (\( Th \))
25. Please — her with you to the play. (\( thr \))
26. If you hadn’t — that plate, it wouldn’t have broken. (\( thr \))
27. The committee — made up of three boys. (\( w \))
28. We have — a hundred miles by auto this morning. (\( dr \))
29. “I am — on the bed, but I am not asleep,” said Mary. (\( l \))
30. Stanley did well the card tricks that Dick — him. (\( thr \))
31. With — was Sally playing when you saw her yesterday? (\( w \))
32. Bill — his hat into the air. (\( thr \))
33. “Did you eat the cheese?”
   “No, I have — only the crackers.” (\( w \))
34. Billy is 8 years old, but he hasn’t — been to school. (\( w \))
35. The boys in my class are much taller than —. (\( w \))
36. We got the boat — Mr. Jones, who kindly lent it to us. (\( wr \))
37. I haven’t — her for a week, because I broke my arm. (\( wr \))
38. Did you say wanted to see me? (\( W \))
39. The bottle would have — if it had been full. (\( s \))
40. We had to walk very — in order to get there on time. (\( qu \))
41. I recognized John as soon as he came — the room. (\( i \))
42. There was a gradual — in the temperature during the morning. (\( r \))
43. We were all very good, but she gave only Mary and — candy. Mine tasted very good. (\( w \))
44. Do Jim’s parents object to — playing football? (\( h \))
45. The man at — you are looking is my uncle. (\( w \))

STOP!
PART II — PUNCTUATION AND CAPITALIZATION

DIRECTIONS. In each of the following sentences put in the capital letters and the commas, periods, and other punctuation marks that have been left out. Do not change any punctuation that is already in any sentence. The punctuation has been put in correctly in the sample given below.

SAMPLE. Where was the ball? It was on the chair.

On Monday we shall see a movie

The children go to a camp in Vermont in July.

while they were waiting patiently for supper Sam got together wood paper and dried leaves for the fire.

Where is my book you put it away this morning.

We don't go to the seashore in the summer.

Bob was reading the book which the teacher had asked him to read he likes to read books.

Why has the book been returned to the library

That is Ted's game will you please give it to him?

The paper is too thick we need thin paper.

The book is torn if mother sees it she will be angry.

Mrs Green is Carol's aunt.

Mother said, Ned you must put your toy away now.

Is that so who would have expected Dick to win the prize?

Newark New Jersey is a large city.

The studies I like best are these literature, music, and languages.

STOP!

No. right. Stand. score. Gr. equiv. Age equiv. [ 17 ]
### Test 6. Spelling

<table>
<thead>
<tr>
<th>No.</th>
<th>Spellings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td></td>
</tr>
<tr>
<td>31.</td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td></td>
</tr>
<tr>
<td>33.</td>
<td></td>
</tr>
<tr>
<td>34.</td>
<td></td>
</tr>
<tr>
<td>35.</td>
<td></td>
</tr>
<tr>
<td>36.</td>
<td></td>
</tr>
<tr>
<td>37.</td>
<td></td>
</tr>
<tr>
<td>38.</td>
<td></td>
</tr>
<tr>
<td>39.</td>
<td></td>
</tr>
<tr>
<td>40.</td>
<td></td>
</tr>
<tr>
<td>41.</td>
<td></td>
</tr>
<tr>
<td>42.</td>
<td></td>
</tr>
<tr>
<td>43.</td>
<td></td>
</tr>
<tr>
<td>44.</td>
<td></td>
</tr>
<tr>
<td>45.</td>
<td></td>
</tr>
<tr>
<td>46.</td>
<td></td>
</tr>
<tr>
<td>47.</td>
<td></td>
</tr>
<tr>
<td>48.</td>
<td></td>
</tr>
<tr>
<td>49.</td>
<td></td>
</tr>
<tr>
<td>50.</td>
<td></td>
</tr>
</tbody>
</table>

No. right........ Stand. score........... Gr. equiv.............. Age equiv..............
**INDIVIDUAL PROFILE CHART**

**Metropolitan Achievement Tests: Intermediate Battery — Partial**

<table>
<thead>
<tr>
<th>Test 1</th>
<th>Test 2</th>
<th>Test 3</th>
<th>Test 4</th>
<th>Test 5</th>
<th>Test 6</th>
<th>AVE. AC'H'T</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-10.0</td>
</tr>
<tr>
<td>14.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-9.5</td>
</tr>
<tr>
<td>14.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-9.0</td>
</tr>
<tr>
<td>14.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-8.5</td>
</tr>
<tr>
<td>14.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-8.0</td>
</tr>
<tr>
<td>14.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-7.5</td>
</tr>
<tr>
<td>14.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-7.0</td>
</tr>
<tr>
<td>14.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-6.5</td>
</tr>
<tr>
<td>13.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-6.0</td>
</tr>
<tr>
<td>13.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-5.5</td>
</tr>
<tr>
<td>13.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-5.0</td>
</tr>
<tr>
<td>13.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-4.5</td>
</tr>
<tr>
<td>13.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-4.0</td>
</tr>
<tr>
<td>13.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-3.5</td>
</tr>
<tr>
<td>13.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-3.0</td>
</tr>
<tr>
<td>13.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-2.5</td>
</tr>
<tr>
<td>13.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-2.0</td>
</tr>
<tr>
<td>13.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-1.5</td>
</tr>
<tr>
<td>12.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-1.0</td>
</tr>
<tr>
<td>12.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.5</td>
</tr>
<tr>
<td>12.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>12.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.5</td>
</tr>
<tr>
<td>12.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>12.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.5</td>
</tr>
<tr>
<td>12.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.0</td>
</tr>
<tr>
<td>12.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.5</td>
</tr>
<tr>
<td>12.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.0</td>
</tr>
</tbody>
</table>

* These two scales are independent. Only one should be used at one time.

In plotting this chart, put an X in the box above the scale which is to be used.

† An additional scale is provided here in order to make it possible to plot the chart in terms of norms other than those of age or grade.

The Profile Chart is designed to furnish a graphic picture of the achievement of an individual pupil as revealed by his test scores. In plotting the equivalents (grade, age, or other type), open the test booklet and lay it flat so that both the title page and the Profile Chart are in view. Plot the equivalent of each test score on the proper stave and join these points to make the profile.