A Comparative Study of Pupils from Rural and Urban Grades in the Freshman Year of High Schools in Sumner County, Kansas.

by

John A. Jeffries, Jr.
A. B., Fairmount College, 1911

Submitted to the Department of

Education

and the Faculty of the Graduate School of the University of Kansas in partial fulfillment of the requirements for the degree of

M.A.

Approved by:

J. W. Twente
Instructor in Charge.

Raymond A. Schwegler
Head or Chairman of Department

Date Aug. 1926.

Acknowledgments

The writer wishes to express his sincere thanks and appreciation to Dean Raymond A. Schwegler and Dr. J. W. Twente of the University of Kansas for their many helpful suggestions, and to the following superintendents of Sumner county for their interest in the subject and assistance in collecting the data for this study: Superintendent A. D. Zook, Wellington; Superintendent J. H. Pendleton, Caldwell; Superintendent J. A. Steele, South Haven; Superintendent R. E. Snow, Belle Plaine; Superintendent Jesse C. Smith, Mulvane; Superintendent John W. Wengler, Oxford; Superintendent C. L. Kimel, Conway Springs; Superintendent H. H. Baker, Milton; Superintendent G. G. Maxfield, Milan.

TABLE OF CONTENTS

	Page
Index to Tables and Graphs	2
I Introduction	4
II Historical Sketch of Studies Using Similar Methods	6
III The Problem	14
IV Securing and Discussing the Data	16
a. Method of securing data	16
b. Representativeness of the two groups	18
c. Number taking the Tests	19
d. Pairing	20
e. Methods of Comparison	21
f. Tables used	29
V Summary and Conclusion	55
VI Bibliography	56
Appendix	

INDEX TO TABLES AND GRAPHS

Page

Table 1. Number from each group taking Stanford Achievement and National Intelligence Tests, by towns 26

Table 2. Number from each group taking both the Stanford Achievement and the National Intelligence Tests, by towns 27

Table 3. Frequency distribution of the 161 pairs of scores, on the basis of Mental Text scores and age. 28

Frequency Distribution of Scores Made by Each Group on the Stanford Achievement Tests in --

Table 4. Reading: Paragraph Meaning 29

Table 5. Reading: Sentence Meaning 30

Table 6. Reading: Word Meaning 31

Table 7. Reading: Total Score 32

Table 8. Arithmetic Computation 33

Table 9. Arithmetic Reasoning 34

Table 10. Arithmetic: Total Score 35

Table 11. Nature Study and Science 36

Table 12. History and Literature 37

Table 13. Language Usage 38

Table 14. Spelling: Dictation Exercises 39

Table 15. Composite Scores 40

Table 16. Physical data showing the number included under each head also, the per cent 53

INDEX
(continued)

		Page
Graph 1.	Mean made by each group and the number of points that each mean is below normal	43
Graph 2.	Number of months in Educational Age that the urban group is below the norm.	44
Graph 3.	Number of months in Educational Age that the rural group is below the norm.	45
Graph 4.	Number of months in Educational Age that the two groups differ.	46
Graph 5.	Limits of the True Difference between each set of means.	47
Graph 6.	Showing how far the Zero Difference is below the True Difference in sigma terms.	48
Graph 7.	Percentile graph for each group in the National Intelligence tests.	50

Chapter I

A comparative study of the pupils from the rural grade schools and from the urban grade schools in the freshman year of the high schools of Sumner county, Kansas, made by comparing the data obtained from the three following sources: (a) Stanford Achievement Test, (b) National Intelligence Tests, (c) A limited physical test.

There is an increasing desire on the part of high school principals and teachers to know more about the product that the grade schools are turning into the high schools, both from a mental and from an achievement point of view. There also seems to be a nation among high school principals and teachers that the pupils coming from the rural grades are not as well prepared to do high school work as are those pupils coming from the urban grades.

Not only has the high school faculty a right to know the abilities of these two groups, but it must have this information, if it is to deal with these new groups of pupils in an intelligent manner. Again, the increasing numbers that are coming into the high schools from both the rural schools and urban schools, make it highly important that the high school principals and teachers measure their pupils with the best instruments that the educational field has provided in order to know what

to expect from these pupils and in what way the high school can be of most benefit to them. Moreover, several of the high school principals of Sumner county have been planning to make a study of this nature, each in his own high school. Both the high school principals and superintendents have shown their interest in this study by cooperating in every way possible.

Chapter II

A number of studies have been made in different parts of the United States which have had as their purpose, a comparison of rural and urban pupils. The studies have approached the subject from many different angles, and the results have varied widely in different sections of the nation. After studying the results from these different investigations, it would be presumptuous for anyone to say what the results would be for any locality without actually making the test.

1. Norman Frost made a comparative study of country and town schools, by comparing the achievement in each group on the basis of age. He used the ages 10, 11, 12, 13. His conclusions are, that for these four years studied, the rural schools of Madison county, Kentucky, are consistently lower than the schools of Louisville, Kentucky; Patterson, New Jersey; and St. Paul, Minnesota. Tests were given in Language, arithmetic, and reading.

2. The results which Mr. Frost obtained compare quite favorably with the results of a study made by E. A. Taylor with the Courtis

. . . . . .

1. (1)* Norman Frost, "A Comparative Study of Achievement in Rural and Town Schools." Teachers College Contribution to Education, No. III.

2. (2) Journal of Educational Psychology, Vol. V:461-66.

* Numbers in parenthesis refer to the number of the reference as it will be found in the Bibliography.

Arithmetic, the same test that Mr. Frost used, in the rural schools of a county in Illinois. He compared his results with the scores of 7,008 children, mostly from cities, published by Dr. Courtis in The Elementary School Teacher. A comparison shows that the rural schools are consistently below the city schools. The pupils of the rural eighth grade were two grades below the city eighth grade.

2. The Ohio Survey Commission reports that the median score on 97, 8th grade composition papers from Delaware City, as measured by the Hillegas Scale, was 5.21. As contrasted with this they found that the median score for 118, 8th grade compositions from the country was 3.78. This same report shows results from the Ayers Scale in Handwriting for 1,379 pupils in 176 rural schools in 21 counties in Ohio; 214 pupils in the upper grades in the rural schools of Delaware county; and from 312 pupils in the three upper grades in the city schools of Delaware, also a small city in Iowa based on a report of I. King and H. Johnson (Journal of Educational Psychology, III:514-520). In the small Iowa city, 98 per cent of the 8th grade papers scored over 50 on the Ayers Scale; 77.8 per cent of like papers from Ohio rural schools; 73.5 per cent from Delaware rural schools and 91.3 per cent from the Delaware City schools made scores of over 50. This report shows greater uniformity among the city schools

. . . . . .

1. (3) S. A. Courtis, Elementary School Journal, (XII:133 ff)

2. (4) Ohio Survey Commission Report, 1914, Page 133 ff.

than between the rural and city schools.

1. In a study made in Travis county, Texas, where the Courtis Standard Research Test in Arithmetic, Series B, and the Starch Arithmetic Scale A, were used, the eighth grade stood 8 per cent lower than the corresponding grades of Boston and Detroit.

2. In an unpublished survey of the Haldane school, a table on page 30 gives a comparison of median achievements in English composition by grades for Hillegas Scale, Nassau County Extension, with grade medians for the schools of Mobile county, Alabama, and for the city of Mobile. In every grade reported the median for the city schools is higher than for the country schools.

The Virginia Public School Commission gives comparative results from the country and city schools for the following tests: Thorndike Reading Scale A 2; Virginia Reading Test Sigma 8; Virginia General Examination Test I; Ayers Spelling Scale; Starch Scale for Measuring Handwriting; Woody Arithmetic Scale; Series B;

. . . . . .

1. (5) A Study of Rural Schools in Travis County, Bulletin of the University of Texas, Dec., 1916.

2. (6) Survey of Haldane School, Cold Springs, New York. 1917.

1. Nassau County Supplement to the Hilegas Scale for the Measuring of English Composition. 5,000 of the 16,000 children tested were in the rural schools, grades 3 to 7.

Results: One-room rural schools averaged one year older than the children in the four-room rural schools and one and one-half years older than the children in city schools.

2. Richard Zeidler, using the Courtis Standard Tests, made a study of the rural and village schools of Santa Clara County, California. The results of his tests were as follows: The one-room schools did better than the two-room schools; the three-room rural schools did better than either the one- or two-room schools; or the village schools with four or more teachers. The village schools fall below all three types of rural schools. Each type of school in the county falls below the median for twenty small city schools of the Middle West.

3. Charles Harlin scored the handwriting of 359 pupils in 21 rural schools in Pennsylvania, by the Ayers Scale on Handwriting. He found no material difference when compared with Freeman's average for 56 cities. When these pupils were given the Ayers Spelling Test, the country pupils were uniformly lower than the city

. . . . . .

1. (7) The Survey and Report of the Virginia Public School Educational Commission, Published 1919.
2. (8) Elementary School Journal XVI:551
3. (9) Educational Administration and Supervision, Vol. II:560-73.

averages, and when results from the Ayers Arithmetic Test are compared with the Courtis Standard, the pupils in the rural grades rank approximately two grades below the pupils of the city schools.

1. M. E. Haggerty reports the results of an Arithmetic test covering five counties in Indiana, as follows: "These data point to the conclusion that the district schools are more efficient in procuring achievement in the function measured than the graded (city) schools.

2. E. H. Taylor, using the Courtis Arithmetic Test, found that the rural pupils ranked about two school grades below the pupils of the same grades of the city schools.

3. A comparison of the standings in all subjects of the eighth grade pupils in the rural schools with those of pupils of the same grade in the city schools in the New Jersey State Final Examination for graduation, shows that the rural pupils rank lower in all subjects than do city pupils.

. . . . . .

1. (10) M. E. Haggerty, Studies in Arithmetic, Indiana University Studies, No. 32 (Sept., 1916)
2. (11) E. H. Taylor, Arithmetic Ability of Rural School Children, Journal of Educational Psychology, March, 1914.
3. (12) Educational Bulletin, Vol. I, No. 3, 1914, Trenton, N. J.

1. E. J. Ashbaugh found that Iowa rural children compare favorably with Iowa city children in handwriting, both as to speed and quality.
2. W. W. Theisen reports the results for a study made of 36,564 children in Wisconsin, of whom 15,835 were in rural schools. He summarizes as follows: "Judged by the Ayers Standards, rural children in Wisconsin do not spell well. They average not less than ten points below the standard in every grade." This is not conspicuously poorer or better than the pupils in the cities and villages of Wisconsin. The results from 141 rural schools in 28 counties on the Thorndike Handwriting Scale, show that the rural schools, on the whole, make the best showing of Wisconsin schools in handwriting.
3. In a report made from giving the Courtis Standard Reading Test No. 2, to 6,056 rural pupils in 547 schools in 82 counties of Missouri, it was found that the children in all of the grades were below the standard set by Courtis. The Kansas City Scale for Measuring Handwriting shows the seventh and eighth in the school below the accepted standard. According to the Courtis Standard Research Test in

. . . . . .

1. (13) Handwriting of Iowa School Children. University of Iowa Bulletin, No. 15, Iowa City, Iowa.
2. (14) A Report on the Use of Some Standard Tests, Wisconsin State Department of Public Instruction, Bulletin No. 1, Page 22.
3. (15) 69th Report of Public Schools of State of Missouri, June 30, 1918.

Arithmetic, Series B, the sixth, seventh, and eighth grades are not up to standard. These schools are also below according to the Ayers Spelling Scale.

1. John M. Foote concludes, after giving the Ayers Scales in Spelling and Handwriting in the country schools of Louisiana, that the pupils in the large cities are slightly superior, but show no great difference.

2. Cyrus D. Mead concludes that the rural children of Plumas county, California are just about of the average ability of city children over the same county when judged by the Ayers Spelling List.

3. John E. Worthington concluded, after making a study of writing, spelling, arithmetic, reasoning, geography, and reading in the rural and town schools of Lake county, Indiana, that the results of the tests given indicate that the work of the rural schools is more efficient than that of the town schools.

. . . . . .

1. (16) "Report on Spelling and Handwriting in County Schools, Louisiana", State Dept. of Education, Bulletin, No. 1, June, 1918.

2. (17) "Spelling Ability of Plumas County Children", California State Board of Education, Supplement of California Blue Bulletin, December, 1919.

3. (18) John E. Worthington, "A Comparative Study of the Attainments of Eighth Grade Pupils in the Rural and in the Town Schools of Lake County, Indiana, University of Chicago, 1918. (Thesis.)

1. In the report of the New York Survey we find this conclusion as to rural schools: the results tend to show, "that the small rural schools do work inferior to the large (four-room) rural schools and that the latter seldom reach the standard norm. The small schools lag behind about a full year."

2. In the survey of the Gentry County public schools, Bert W. Loomis reports that the rural schools were below the town schools in all subjects tested. The rural schools average almost one year below the Standard.

3. Fred D. Cram concludes from the survey of rural schools in Iowa, that rural children are mentally as bright as town children, but in achievement they are consistently below the town children.

After reading the reports of those who have compared rural and town pupils in different parts of the United States, one is convinced that the only way to determine what the results will be in any particular locality is to make the study and find out.

. . . . . .

1. (19) Report on Rural Schools, New York Survey, Ithica, New York, 1922, Page 154-170.
2. (20) "Survey of Gentry County Public Schools," State Teachers College Bulletin, Marysville, Missouri, 1922.
3. (21) "Tests and Measurements in the Rural Schools," National Educational Proceedings, 1921.

Chapter III

The purpose of this thesis is to make a comparative study of the pupils who have completed the eighth grade in the rural schools and the pupils who have completed the eighth grade in the town schools, at the time they enter the high schools -- ninth grade -- of Sumner county, Kansas. This is to be done by comparing the data received from the two Standard Tests mentioned below and a limited physical study.

In order to answer this thesis, it will be necessary to answer these two questions:

(a) In what respects, as shown by these data, are the two groups alike?

(b) In what respects, as shown by these data, do the two groups differ and to what extent do they differ?

The National Intelligence Tests, Scale B, Form 1, was used in testing mental ability and the Stanford Achievement Test, Advanced Examination, Form A, was used as a test of Achievement. For the physical data, a record was made of the following points: height, weight, vision, hearing, teeth, and throat. These data were obtained from the records made by the school nurses who examined the children during the first semester, fall of 1925. Copies of the Standard Tests used and the form on which the physical data were recorded are found in the Appendix.

In this study, the expression "high school" will refer to those high schools which include the twelfth grade in their organization. There are four towns in the county that have the ninth and tenth grades only in their high school. These schools are not included in this study. The expressions "rural schools" and "rural grades" will be used to refer to those grade schools in the county with less than three teachers in the grade organization -- the first eight grades. The expressions "urban schools" and "urban grades" will be used to designate those schools in the county having three or more teachers in their grade organization. In Sumner county, it happens that no school outside of an incorporated town has three or more teachers in its grade organization. Pupils who did their eighth grade work in an urban school are classed with the urban group. Pupils who did their eighth grade work in a rural school are classed with the rural group.

Chapter IV

During the summer of 1925 the author obtained the consent of each high school principal and of each city superintendent, in the towns where the tests were to be given, to get the data used for this study. Most of them were anxious for the study to be made, offering to assist in every way possible. The two Standard Tests were in the hands of the writer by September 15. The actual work of testing was not started, however, until September 21, two weeks having been allowed for all of the high schools of the county to complete their enrollment. The Stanford Achievement Test was given the week of September 21 to 25. The National Intelligence Tests were given the week of September 28 to October 2.

The Tests were given in each high school under the supervision of the high school principal or superintendent of city schools. The writer met with the one in each school who was to give the Tests there and explained all of the details of giving the Tests. Also, a manual of directions was left with each administrator who was to supervise the giving of the Tests. The writer was fortunate in having in each town, men in charge of the Tests, who were both interested in the study and had had more or less experience in handling Standard Tests.

In four high schools the scoring was done in the school where the Tests were given and under the direction of the one giving the Tests. In order to check against errors, all papers were rescored by the writer. The Tests from the other six schools were scored by the writer.

The Tests were given to the freshman class in each of the ten high schools of Sumner County, Kansas. These high schools are located in the following towns: Wellington, Caldwell, South Haven, Mulvane, Conway Springs, Belle Plaine, Argonia, Oxford, Milton and Milan. The total enrollments in these high schools range from 500 to 50 in the order named above.

How This Study Differs From Other Studies

This study differs from other studies of the same subject in that the Tests were given to both groups, in each school, under the same condition, at the same time, and by the same person. Most of the studies on this subject have been made from data obtained from Tests given to the two groups under different conditions. While it would seem that the method used for giving the Tests used in this thesis ought to be the basis of a more accurate comparison, there is no proof that such is the case.

Representativeness of the Two Groups

In May, 1925, there were 235 who finished the eighth grade in the rural schools of Sumner county. In September, 1925, 205 took one or both Tests given by the author, as shown by Table I, column 3. This is 87.2 per cent of the number who completed the eighth grade in May. The number completing the rural schools in the county was obtained from the records in the office of the county superintendent of Sumner county. From these same county records and from the records in the offices of the city superintendents, we found that there were 313 who finished the eighth grade in the urban schools of Sumner county, in May, 1925. In September, 1925, 274 took one or both Tests, as shown by Table I, column 4. This is 87.5 per cent of the number who completed the eighth grade in May, 1925. From this it would seem that we are justified in making the statement that the freshmen from the rural schools come as nearly representing the

entire number who completed the eighth grade as do the freshmen from the urban schools. If this be true, we do not have a more selective group with the one than with the other. It would also seem that the results obtained from comparing the two groups should be relatively the same as they would have been, had the study been made with these pupils while they were in the eighth grade.

Number Taking One or Both Tests

In these ten high schools there were 496 who took one or both tests. There were 17 who took the Achievement Test but did not take the Intelligence Tests. There were 25 who took the Intelligence Tests but did not take the Achievement Test. The failure to take both Tests was due to absence from school. Table 1, page 24, shows the name of each town and the number from each group taking the Stanford Achievement Test and the number from eabh group taking the National Intelligence Tests. Twenty-one of Wellin gton's pupils and four of Caldwell's pupils who took the National Intelligence Tests did not take the Stanford Achievement Test. Wellington had two, Caldwell three, South Haven three, Mulvane three, Belle Plaine three, Oxford two, Conway Springs one, who took the Stanford Achievement Test but did not take the National Intelligence Tests. From this we see that those who did not take both Tests

came mainly from the larger schools of the county.

Table 2, page 25, gives the name of each town and the number of each group taking both Tests. There were 256 from the urban group and 198 from the rural group. Stated in terms of per cent of the total number who took both Tests, 57 per cent were urban pupils and 43 per cent were rural pupils. This is practically the same per cent as the number from each group taking one or both Tests who can be classified as urban and rural -- see Table I, columns 3 and 4. The per cent is, urban -- 57.2, rural -- 42.8.

Method of Pairing

It seems to the author that the best method of comparing the two groups as to achievement is to eliminate, as nearly as possible, the factors of intelligence and age. This was done by pairing the two groups on the basis of intelligence and age. In no case did the intelligence scores for each pair differ by more than four points on the National Intelligence Test score. In but few cases did the ages differ by more than four months.

This process of pairing produced 161 pairs which we were able to compare as to achievement, intelligence and age being as nearly equal as possible. The average difference in age was .26 of a month. The results of pairing are shown in Table 3, page 26.

It will be noted that Q_3 and Q_1 vary by .2 and .3 of one unit respectively, but the medians are the same.

Using these 161 pairs, comparison in achievement is made for each of the nine tests, the total scores in Reading and Arithmetic, and also, the composite score for the entire Test. This makes a total of twelve sets of scores shown in tables which are numbered 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15. Pages 29 to 40, inclusive.

Tables of Comparison Explained

Tables numbered 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 show the results of these comparisons. A detailed explanation of Table 4 will make the interpretation of these twelve tables clear. In this table which shows the results of the Paragraph Meaning scores, the mean for the urban group is 78.88 while that of the rural group is 75.08 "diff of av." shows the difference between these two means. σ^{-1} is used to refer to the standard deviation of the distribution, e. g. σ for the urban group is 3.02 and σ for the rural group is 2.97. σ_{av} -- read standard error for the average -- is obtained from the formula $\sigma_{av} = \frac{\sigma_{dis}}{\sqrt{N}}$

. . . . . .

1. (22) "Statistics in Psychology and Education" Henry E. Garrett, Page 121.
2. (23) See (22) above, Page 121.

Its function is to show the limits within which the true average of the distribution would lie. For example, in the urban group the chances are 997 in 1000 that the true average will lie within the limits 78.88 $\pm$ 3σ or 78.88 $\pm$ 3 x .237, or between 79.591 and 78.169. The limits of the true average for each group are not shown since it is the amount of difference between the two means in each test and the reliability of this difference that we are concerned with in this study. Another reason for not showing the limits of the true average for each distribution is that, under the explanation of the reliability of the difference (σ_{diff}) it will be seen how much above zero the true difference would lie.

As stated above, "diff of av." shows the amount by which the means or averages of the two groups differ. In the case of the means in Table 4, the difference of the average is 3.80. How reliable is this difference? Or, stated another way, what are the chances that there will always be a difference in favor of the urban group, if the tests were repeated? These questions can be answered by finding the reliability of the difference, written σ_{diff}. It is obtained from the formula $\sigma_{diff} = \sqrt{\sigma_{av_1}^2 + \sigma_{av_2}^2}$. σ_{av_1} means σ_{av}

. . . . . .

1. (24) See (22) above, Page 129 ff.
2. (25) See (22) above, Page 123 ff.

of the urban group and σ_{av_2} means $\sigma_{av.}$ of the rural group. In Table 4, $\sigma_{diff} = .333$. The chances are 997 in 1000 that the true differences between the averages of the two groups lies within the limits, diff. of av. $\pm$ 3 σ_{diff}. In Table 4 it is 3.80 $\pm$ 3 x .333, or between 4.799 and 2.801. Again, we can be almost certain that the difference between the means of the two groups will never be less than 2.801 which is the lowest limit of the true difference. Graph 5, Page 45, illustrates the above points. The red bar shows the number of units between zero difference and the lowest limits of the true difference for each of the twelve comparisons. In no case does this lowest limit reach zero. Its distance above zero varies from .438 in the Arithmetic Reasoning Test, to 19.9 in the Total Score, column 12. Stated in sigma terms, the range is from 1.7σ to 52.4 σ. The top of the blue bar and the top of the red bar mark the upper and lower limits respectively, of the true difference for each set of the means for each of the twelve sets of scores in the Achievement Test. The distance between these two limits indicates the number of units. In each case this distance represents 6 σ_{diff}.

If we will now divide the mean difference by the σ_{diff}, we shall find how far the zero difference lies below the mean in σ terms. Referring again to Table 4 and column 1, in graph 6, $\frac{3.80}{.333} = 11.4\ \sigma$.

. . . . . .

1. (26) see (22) above, page 130.
2. (27) see (22) above, page 133.

Since 3 σ indicates complete reliability. Graph 6 shows how far the zero difference lies below the mean difference in σ terms for each of the twelve sets of scores. This graph shows that the difference varied from 4.7 σ in the Arithmetic Reasoning Test, to 55.4 σ in the Total Score, column 12. Again, this graph expresses in σ terms, the distance from the top of the red bar in Graph 5, to the zero line plus three sigma.

E. A. Indicates the difference in the means of the two groups in terms of Educational Age as shown by norms set up for the Stanford Achievement Test. In Table 4, it will be noted that this difference is ten months in favor of the urban group. The results in all of the Tests, excepting the Tests in Arithmetic, shown in Tables 8, 9, 10, are in favor of the urban group. In Tables 8, 9, 10, the results show that the rural children do better work in Arithmetic, both as to Computation and Reasoning, than do the urban children. Graph 4, brings out this fact more clearly. This graph shows the number of months of Educational Age that the two groups differ for each of the twelve sets of scores. The letter at the top of the bar indicates whether the difference is in favor of the urban or the rural group. This difference ranges from one month in the Arithmetic Reasoning Test, column 6, to eleven months in the Reading Total score, column 4.

The scores of the several tests have been weighted by the authors of the Test so that they will give a composite score

as shown in Table 15, and column 12 in Graphs 1, 2, 3, 4, 5, 6. The weighting has been done in this manner: the number of correct answers in the Paragraph Meaning test is multiplied by two; the number of problems correct in Arithmetic Computation and the number of correct answers in Arithmetic Reasoning are multiplied by four; in both Nature Study and Science and History and Literature the number of correct answers, divided by two, is subtracted from the number of correct answers; in Spelling-Dictation Exercise -- the number correct is multiplied by two.

TABLE I. NUMBER FROM EACH GROUP TAKING THE STANFORD ACHIEVEMENT TEST AND THE NUMBER TAKING THE NATIONAL INTELLIGENCE TESTS BY TOWNS

Name of Town	Stanford Achievement Test		National Intelligence Tests	
	Rural	Urban	Rural	Urban
Wellington	63	98	69	111
Caldwell	21	61	22	61
South Haven	47	17	47	14
Mulvane	14	22	14	19
Belle Plaine	17	20	17	17
Oxford	12	17	12	15
Argonia	10	10	10	10
Conway Springs	6	14	6	13
Milan	6	7	6	7
Milton	2	7	2	7
Total	198	273	205	274

TABLE 2. NAME OF EACH TOWN AND THE NUMBER FROM EACH GROUP TAKING BOTH THE STANFORD ACHIEVEMENT TEST AND THE NATIONAL INTELLIGENCE TESTS.

NAME OF TOWN	URBAN	RURAL
Wellington	94	63
Caldwell	58	21
South Haven	14	47
Mulvane	19	14
Belle Plaine	17	16
Oxford	15	12
Argonia	10	10
Conway Springs	13	6
Milan	7	6
Milton	7	2
Total	256	198
Percent of total	57	43

TABLE 3. FREQUENCY DISTRIBUTION SHOWING THE ARRANGEMENT OF THE 161 PAIRS OF SCORES, ON THE BASIS OF MENTAL TEST SCORES, ~~AND AGE~~, WHICH ARE TO BE COMPARED AS TO ACHIEVEMENT.

National Intelligence Test Scores	Urban Group	Rural Group
165-169	1	1
160-164	2	2
155-159	7	7
150-154	7	7
145-149	15	14
140-144	14	15
135-139	17	18
130-134	22	21
125-129	20	20
120-124	14	15
115-119	13	11
110-114	12	13
105-109	8	8
100-104	5	4
95-99	3	4
90-94	1	1
	N = 161	N = 161
	Q_3 = 142.1	Q_3 = 141.9
	M = 131	M = 131
	Q_1 = 119.3	Q_1 = 119.6

TABLE 4. FREQUENCY DISTRIBUTION OF SCORES MADE BY EACH GROUP ON THE STANFORD ACHIEVEMENT TEST IN READING: PARAGRAPH MEANING

Paragraph Meaning Score	Urban	Rural
103-106	2	1
99-102	1	2
95-98	10	2
91-94	15	5
87-90	13	8
83-86	21	23
79-82	23	16
75-78	19	31
71-74	17	18
67-71	12	20
63-66	10	10
59-62	9	5
55-58	3	8
51-54	5	5
47-50	1	3
43-46		3
39-42		1
	N = 161	N = 161

Urban Group

Mean = 78.88

σ = 3.02

σ_{av} = .237

Rural Group

σ = 2.97

Mean = 75.08

σ_{Av} = .234

---

diff. of av. = 3.80

σ_{diff} = .333

true difference between 4.799 and 2.801

$\frac{3.80}{.333}$ = 11.4 σ

E. A. is 10 months in favor of Urban

TABLE 5. FREQUENCY DISTRIBUTION OF SCORES MADE BY EACH GROUP ON THE STANFORD ACHIEVEMENT TEST IN READING: SENTENCE MEANING

Sentence Meaning Score	Urban	Rural
80-83	1	
76-79	5	2
72-75	5	7
68-71	18	8
64-67	21	12
60-63	21	24
56-59	15	13
52-55	17	15
48-51	17	21
44-47	15	18
40-43	8	12
36-39	6	12
32-35	6	6
28-31	4	2
24-27		3
20-23	1	3
16-19		2
12-15	1	
8-11		1
	N = 161	N = 161

Urban Group

Mean = 55.42

σ = 3.01

σ_{av} = .273

Rural Group

Mean = 52.00

σ = 3.37

σ_{av} = .265

difference of av. = 3.42

σ_{diff} = .38

true difference between 4.56 and 2.28

$\frac{3.42}{.38} = 9\ \sigma$

E. A. is 10 months in favor of Urban

TABLE 6. FREQUENCY DISTRIBUTION OF SCORES MADE BY EACH GROUP ON THE STANFORD ACHIEVEMENT TEST IN READING: WORD MEANING

Word Meaning Score	Urban	Rural
80-83	3	2
76-79	9	1
72-75	12-	6
68-71	11	14
64-67	12-14	14
60-63	20	17
56-59	20	18
52-55	20	22
48-51	17	31
44-47	17	18
40-43	11	12
36-39	3	6
32-35	3	
28-31	1	
24-27	1	
20-23	0	
16-19	0	
12-15	1	
	N = 161	N = 161

Urban Group

Mean = 57.50

σ = 3.075

σ_{av} = .242

Rural Group

Mean = 55.81

σ = 1.575

σ_{av} = .124

diff. of av. = 1.69

σ_{diff} = .272

true difference between

2.706 & .574

$\frac{1.69}{.272}$ = 6.2 σ

E. A. is 6 months in favor of Urban

TABLE 7. FREQUENCY DISTRIBUTION OF SCORES MADE BY EACH GROUP ON THE STANFORD ACHIEVEMENT TEST IN READING: TOTAL SCORE

Total Reading Score	Rural	Urban
252-259	1	
244-251	1	6
236-243	2	10
228-235	8	11
220-227	5	9
212-219	10	13
204-211	17	10
196-203	10	13
188-195	13	20
180-187	17	9
172-179	12	17
164-171	17	13
156-163	13	7
148-155	11	7
140-147	9	7
132-139	6	4
124-131	4	4
116-123	2	1
108-115	1	
100-107	1	
92-99	1	
	N = 161	N = 161

Urban Group

Mean = 192.45

$\sigma \pm 3.672$

$\sigma_{Av} = .288$

Rural Group

Mean = 181.32

$\sigma \pm 3.93$

$\sigma_{av} = .307$

diff. of av. = 11.13

$\sigma_{diff} = .428$

true difference between 12.414 & 9.846

$\frac{11.13}{.428} = 26\ \sigma$

E. A. is 11 months in favor of Urban

TABLE 8. FREQUENCY DISTRIBUTION OF SCORES MADE BY EACH GROUP ON THE STANFORD ACHIEVEMENT TEST IN ARITHMETIC: COMPUTATION

Computation Score	Urban	Rural
170-177	2	1
162-169	5	4
154-161	6	6
146-153	12	20
138-145	14	17
130-137	28	20
122-129	22	33
114-121	15	22
106-113	17	10
98-105	17	14
90-97	14	9
82-89	3	3
74-81	4	1
66-73	2	
	N = 161	N = 161

Urban Group

Mean = 123.22

$\sigma \pm 2.77$

$\sigma_{av} = .218$

Rural Group

Mean = 127.19

$\sigma \pm 2.41$

$\sigma_{av} = .190$

diff. of av. = 3.97

$\sigma_{diff} = .289$

true difference between 4.837 & 3,103

$\frac{3.97}{.289} = 13.7\ \sigma$

E. A. is 6 months in favor of Rural

TABLE 9. FREQUENCY DISTRIBUTION OF SCORES MADE BY EACH GROUP ON THE STANFORD ACHIEVEMENT TEST IN ARITHMETIC: REASONING

Reasoning Score	Urban	Rural
140-147	1	2
132-139	2	1
124-131	6	5
116-123	16	12
108-115	14	13
100-107	25	31
92-99	23	31
84-91	21	20
76-83	21	24
68075	20	13
60-67	8	4
52-59	2	2
44-51	1	2
36-43	1	1
	N = 161	N = 161

Urban Group

Mean = 94.16

σ = 2.42

σ_{av} = .190

Rural Group

Mean = 95.36

σ = 2.14

σ_{av} = .168

diff. of av. 1.20

σ_{diff} = .254

true difference between 1.962 & .438

$\frac{1.20}{.254}$ = 4.7 σ

E. A. is one month in favor of Rural

TABLE 10. FREQUENCY DISTRIBUTION OF SCORES MADE BY EACH GROUP ON THE STANFORD ACHIEVEMENT TEST IN ARITHMETIC: TOTAL SCORE

Total Arithmetic Score	Urban	Rural
312-323		1
300-311	1	
288-299	4	2
276-287	6	8
264-275	12	6
252-263	8	17
240-251	11	12
228-239	21	25
216-227	22	23
204-215	13	20
192-203	13	17
180-191	20	17
168-179	15	5
156-167	6	4
144-155	5	2
132-143		1
120-131	1	
108-119	3	1
	N = 161	N = 161

Urban Group

Mean = 216.19

σ = 3.30

σ_{av} = .260

Rural Group

Mean = 222.596

σ = 2.52

σ_{av} = .199

---

diff. of av. = 6.41

σ_{diff} = .328

true difference between 7.394 & 5.426

$\frac{6.41}{.328}$ = 19.5 σ

E. A. is 5 months in favor of Rural

TABLE 11. FREQUENCY DISTRIBUTION OF SCORES MADE BY EACH GROUP ON THE STANFORD ACHIEVEMENT TEST IN NATURE STUDY AND SCIENCE

Nature Study and Science Score	Urban	Rural
91-95	1	
86-90	4	3
81-85	12	4
76-80	22	17
71-75	25	24
66-70	18	20
61-65	24	29
56-60	14	19
51-55	19	14
46-50	4	12
41-45	9	4
36-40	5	5
31-35	4	3
26-30		1
	N = 161	N = 161

Urban Group

Mean = 65.33

σ = 2.68

σ_{av} = .211

Rural Group

Mean = 62.60

σ = 2.28

σ_{av} = .180

---

diff. of av. = 2.73

σ_{diff} = .277

true difference between 3.561 & 1.899

$\frac{2.73}{.277}$ = 9.8 σ

E. A. is 3 months in favor of Urban

TABLE 12. FREQUENCY DISTRIBUTION OF SCORES MADE BY EACH GROUP ON THE STANFORD ACHIEVEMENT TEST IN HISTORY AND LITERATURE

History and Literature Score	Urban	Rural
80-85	5	3
74-79	8	4
68-73	16	6
62-67	13	14
56-61	19	12
50-55	17	28
44-49	33	24
38-43	17	19
32-37	13	17
26-31	9	15
20-25	9	10
14-19	1	4
8-13	1	3
2-7		2
	N = 161	N = 161

Urban Group

Mean = 50.84

σ = 2.69

σ_{av} = .212

Rural Group

Mean = 45.74

σ = 2.70

σ_{av} = .213

---

diff. of av. 5.10

σ_{diff} = .301

true difference between 6.003 & 4.197

$\frac{5.10}{.301}$ = 16.9 σ

E. A. is 6 months in favor of Urban

TABLE 13. FREQUENCY DISTRIBUTION OF SCORES MADE BY EACH GROUP ON THE STANFORD ACHIEVEMENT TEST IN LANGUAGE USAGE

Language Usage Score	Urban	Rural
55-58	1	
51-54	4	3
47-50	8	4
43-46	18	11
39-42	16	18
35-38	22	18
31-34	29	19
27-30	24	29
23-26	15	19
19-22	10	15
15-18	8	14
11-14	4	6
7-10		2
3-6	1	3
0-2	1	
	N = 161	N = 161

Urban Group

Mean = 33.37

σ = 2.52

σ_{av} = .198

Rural Group

Mean = 30.16

σ = 2.59

σ_{av} = .204

diff. of av. = 3.21

σ_{diff} = .284

true difference between 4.062 & 2.358

$\frac{3.21}{.284}$ = 11.3 σ

E. A. is 9 months in favor of Urban

TABLE 14. FREQUENCY DISTRIBUTION OF SCORES MADE BY EACH GROUP ON THE STANFORD ACHIEVEMENT TEST IN SPELLING: DICTATION EXERCISE

Spelling Score	Urban	Rural
202-209	6	5
194-201	9	1
186-193	11	6
178-185	9	14
170-177	18	12
162-169	18	27
154-161	19	18
146-153	13	15
138-145	14	16
130-137	12	18
122-129	7	11
114-121	9	11
106-113	10	5
98-105	6	2
	N = 161	N = 161

Urban Group

Mean = 155.72

σ = 3.47

σ_{av} = .273

Rural Group

Mean = 153.44

σ = 2.97

σ av = .234

---

diff. of av. = 2.28

σ_{diff} = .360

true difference of av.2is between 3.28 & 1.20

$\frac{2.28}{.360}$ = 6.3 σ

E. A. is 3 months in favor of Urban

TABLE 15. FREQUENCY DISTRIBUTION OF COMPOSITE SCORES MADE BY EACH GROUP ON THE STANFORD ACHIEVEMENT TEST

Composite Score	Urban	Rural
970-999	1	
940-969	2	2
910-939	1	2
880-909	7	3
850-879	7	6
820-849	10	1
790-819	10	14
760-789	14	15
730-759	16	18
700-729	19	16
670-699	14	20
640-669	22	17
610-639	11	15
580-609	9	14
550-579	5	10
520-549	7	3
490-519	4	3
460-489	2	3
430-459	0	0
400-429		1
	N = 161	N = 161

Urban Group

Mean = 713.32

σ = 3.538

σ_{av} = .279

Rural Group

Mean = 692.27

σ = 3.275

σ_{av} = .258

---

diff. of av. = 21.05

σ_{diff} = .380

true difference of av. is between 22.19 & 19.9

$\frac{21.05}{.380}$ = 55.4 σ

E. A. is 4 months in favor of Urban Group

MEANING OF GRAPHS 1, 2, 3

Graph 1 shows the mean score made by each group in each test. From this graph it can be seen by how much one group surpasses the other for each test and by how much both groups fail to reach the norm set for pupils at the beginning of the ninth grade. Neither group reaches the norm set for any of the nine tests. The urban group surpasses the rural group in all tests excepting Arithmetic. The urban group falls lowest in Arithmetic Computation, while the rural group made its lowest score in Language Usage.

Graph 2, Page 42, shows the number of months in Educational Age that the urban group falls below the norm set by the Stanford Achievement Test for pupils entering the ninth grade. Column 5, which represents test 4 in Graph 1 shows that it misses the norm farthest -- 19 months -- in Arithmetic Computation and column 8, which represents test 6 in Graph 1, shows that it comes closest to the norm -- four months -- in Nature Study and Science.

Graph 3, shows the number of months in Educational Age that the rural group falls below the norm set by the Stanford Achievement Test for pupils entering the ninth grade. Column 10, which represents the rural group's score in Test 8, Graph 1, shows that it misses the norm farthest in this test. Column 6, which represents

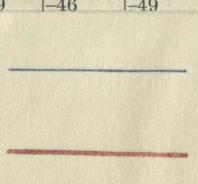
the rural group's score in Test 5, Arithmetic Reasoning, shows it came closest to the norm in this test. A comparison of Graphs 2 and 3, shows that the rural group is farther from the norm in all tests, excepting Arithmetic Computation, Arithmetic Reasoning, and Arithmetic Total, than the urban group.

GRAPH I

THE MEAN MADE BY EACH GROUP IN EACH TEST ALSO THE NUMBER OF POINTS THAT EACH MEAN IS BELOW THE NORM SET FOR THE STANFORD ACHIEVEMENT TEST

EDUCATIONAL PROFILE CHART: ADVANCED EXAMINATION

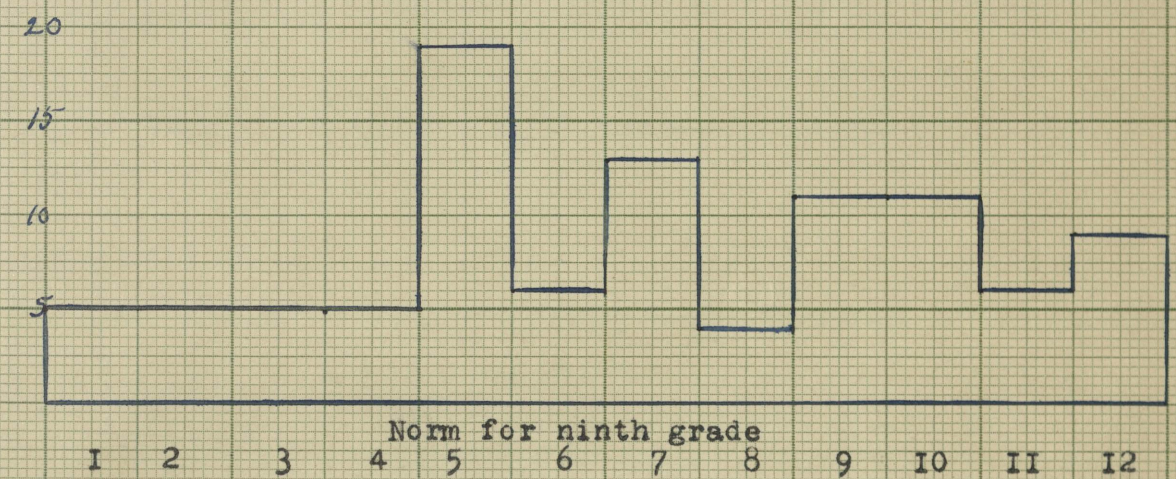
Test 1, Parag. Mean.	Test 2, Sent. Mean.	Test 3, Word Mean.	Read. total	Test 4, Arith. Comp.	Test 5, Arith. Reas.	Arith. total	Test 6, Na. St. & Sci.	Test 7, Hist. & Lit.	Test 8, Lang. Usage	Test 9, Dictation	Total Score	Educational Age	Chronological Age	Grade*
-102	**-75**	**-82**	**-259**	**-179**	**-132**	**-311**	**-86**	**-84**	**-54**	**-206**	**-100**	**-18-6**		
-102	-75	-81	-258	-175	-132	-307	-85	-83	-53	-204	- 99	-18-4		
-101	-74	-80	-255	-171	-131	-302	-85	-83	-53	-202	- 98	-18-1		
-101	-74	-79	-254	-166	-131	-297	-84	-83	-52	-200	- 97	-17-11		
-101	-73	-79	-253	-161	-130	-291	-84	-83	-51	-198	- 96	-17-8		
-101	**-73**	**-78**	**-252**	**-157**	**-130**	**-287**	**-83**	**-83**	**-50**	**-195**	**- 95**	**-17-6**		
-100	-72	-78	-250	-152	-130	-282	-82	-82	-50	-194	- 94	-17-4		
-100	-72	-77	-249	-148	-129	-277	-82	-82	-49	-191	- 93	-17-2		
- 99	-71	-76	-246	-147	-127	-274	-81	-81	-48	-190	- 92	-17-1		
- 98	-70	-75	-243	-147	-124	-271	-80	-80	-47	-189	- 91	-16-11		
- 96	**-70**	**-74**	**-240**	**-146**	**-122**	**-268**	**-80**	**-78**	**-47**	**-187**	**- 90**	**-16-9**		
- 95	-69	-73	-237	-146	-119	-265	-79	-77	-46	-186	- 89	-16-8		
- 94	-68	-73	-235	-145	-117	-262	-78	-75	-45	-185	- 88	-16-6		
- 92	-67	-72	-231	-145	-114	-259	-78	-74	**-45**	-183	- 87	-16-5		
- 90	-67	-71	-228	-145	-112	-257	-77	-72	-44	-182	- 86	-16-3		
- 89	**-66**	**-70**	**-225**	**-144**	**-110**	**-254**	**-77**	**-70**	**-43**	**-181**	**- 85**	**-16-2**		
- 88	-65	-69	-222	-144	-107	-251	-76	-69	-43	-179	- 84	-16-1		
- 87	-65	-68	-220	-143	-105	-248	-75	-67	-42	-178	- 83	-15-11		
- 86	-64	-67	-217	-142	-104	-246	-74	-66	-41	-176	- 82	-15-10		-10.0
- 85	-63	-66	-214	-141	-103	-244	-73	-65	-40	-174	- 81	-15-9		- 9.8
- 84	**-62**	**-65**	**-211**	**-140**	**-102**	**-242**	**-72**	**-63**	**-40**	**-172**	**- 80**	**-15-7**	-Adult	**- 9.7**
- 83	-61	-64	-208	-139	-101	-240	-71	-62	-39	-170	- 79	-15-6	-17-9	- 9.5
- 83	-60	-63	-206	-138	-100	-238	-69	-61	-38	-168	- 78	-15-4	-16-9	- 9.3
- 82	-59	-62	-203	-137	- 99	-236	-68	-60	-38	-165	- 77	-15-2	-16-2	- 9.2
- 81	-58	-61	-200	-136	- 98	-234	-67	-59	-37	-163	- 76	-15-1	-15-9	- 9.0
- 81	**-57**	**-60**	**-198**	**-134**	**- 97**	**-231**	**-66**	**-58**	**-36**	**-161**	**- 75**	**-14-11**	-15-4	**- 8.9**
- 80	-56	-59	-195	-133	- 96	-229	-65	-56	-36	-159	- 74	-14-9	-15-0	- 8.8
- 79	-55	-58	-192	-132	- 95	-227	-64	-55	-35	-157	- 73	-14-8**	-14-9	- 8.6
- 78	-54	-58	-190	-131	- 93	-224	-63	-54	-34	-155	- 72	-14-6	-14-6	- 8.5
- 77	-54	-57	-188	-129	- 92	-221	-62	-52	-34	-153	- 71	-14-4	-14-4	- 8.4
- 77	**-53**	**-56**	**-186**	**-128**	**- 91**	**-219**	**-61**	**-51**	**-36**	**-150**	**- 70**	**-14-2**	**-14-2**	**- 8.2**
- 76	-53	-56	-185	-127	- 89	-216	-60	-49	-32	-148	- 69	-14-0	-14-0	- 8.1
- 75	-52	-55	-182	-125	- 87	-212	-60	-48	-32	-146	- 68	-13-10	-13-10	- 8.0
- 74	-52	-54	-180	-124	- 86	-210	-59	-46	-31	-144	- 67	-13-8	-13-8	- 7.9
- 74	-51	-54	-179	-123	- 84	-207	-58	-44	-31	-141	- 66	-13-6	-13-6	- 7.7
- 73	**-51**	**-53**	**-177**	**-121**	**- 83**	**-204**	**-57**	**-43**	**-30**	**-139**	**- 65**	**-13-5**	**-13-5**	**- 7.6**
- 72	-50	-53	-175	-120	- 81	-201	-56	-42	-29	-137	- 64	-13-3	-13-3	- 7.5
- 71	-50	-52	-173	-119	- 80	-199	-55	-40	-29	-134	- 63	-13-2	-13-2	- 7.4
- 71	-49	-51	-171	-118	- 78	-196	-54	-39	-28	-132	- 62	-13-0	-13-0	- 7.3
- 70	-48	-51	-169	-117	- 77	-194	-52	-38	-28	-129	- 61	-12-11	-12-11	- 7.2
- 70	**-47**	**-50**	**-167**	**-117**	**- 75**	**-192**	**-51**	**-37**	**-27**	**-126**	**- 60**	**-12-9**	**-12-9**	**- 7.1**
- 69	-46	-49	-164	-116	- 73	-189	-50	-36	-27	-124	- 59	-12-8	-12-8	- 7.0



GRAPH 2

THE NUMBER OF MONTHS IN EDUCATIONAL AGE THAT THE URBAN GROUP IS BELOW THE NORMS SET BY THE STANFORD ACHIEVEMENT TEST FOR PUPILS ENTERING THE NINTH GRADE

Each small square on the left margin equals .5 of one month in Educational Age



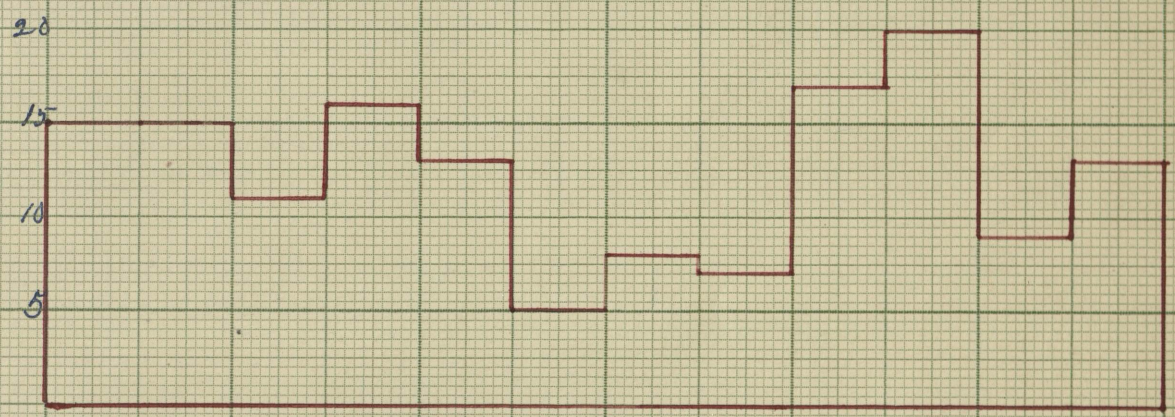
(Read this graph; The urban group is five months of Educational Age below the norm set by the Stanford Achievement Test, in test one, for pupils entering the ninth grade, etc.)

GRAPH 3

Months of E. C. Nelson Mason

SHOWING THE NUMBER OF MONTHS IN EDUCATIONAL AGE THAT THE RURAL GROUP IS BELOW THE NORM SET BY THE STANFORD ACHIEVEMENT TEST FOR PUPILS ENTERING THE NINTH GRADE

Each small square on the left margin equals .5 of one month in Educational Age



Norm for ninth grade

I 2 3 4 5 6 7 8 9 10 11 12

ParagSent Word Read ArithArithArithNa.St Hist LangDictaTotal
Mean Mean MeanTotal Comp ReasTotal & & Usage tionScore
Sci, Lit.

(Read this graph; The rural group is fifteen months of Educational Age below the norm set by the Stanford Achievement Test for pupils entering the ninth grade, in test one, etc.)

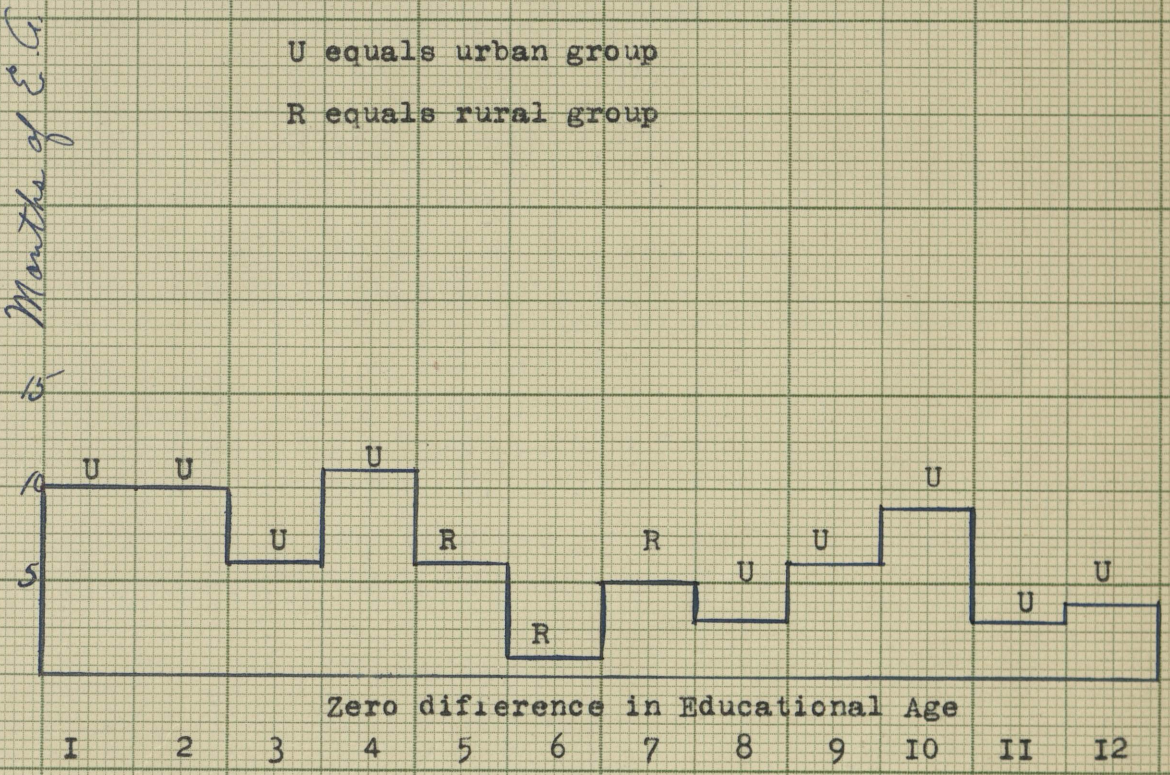
GRAPH 4

. NUMBER OF MONTHS IN EDUCATIONAL AGE THAT THE TWO GROUPS DIFFER FOR EACH OF THE STANFORD ACHIEVEMENT TESTS

Each small square on the left margin equals .5 of one month in Educational Age

U equals urban group

R equals rural group



(Read this graph; The urban group surpasses the rural group, in test one, by ten months in Educational Age, etc.)

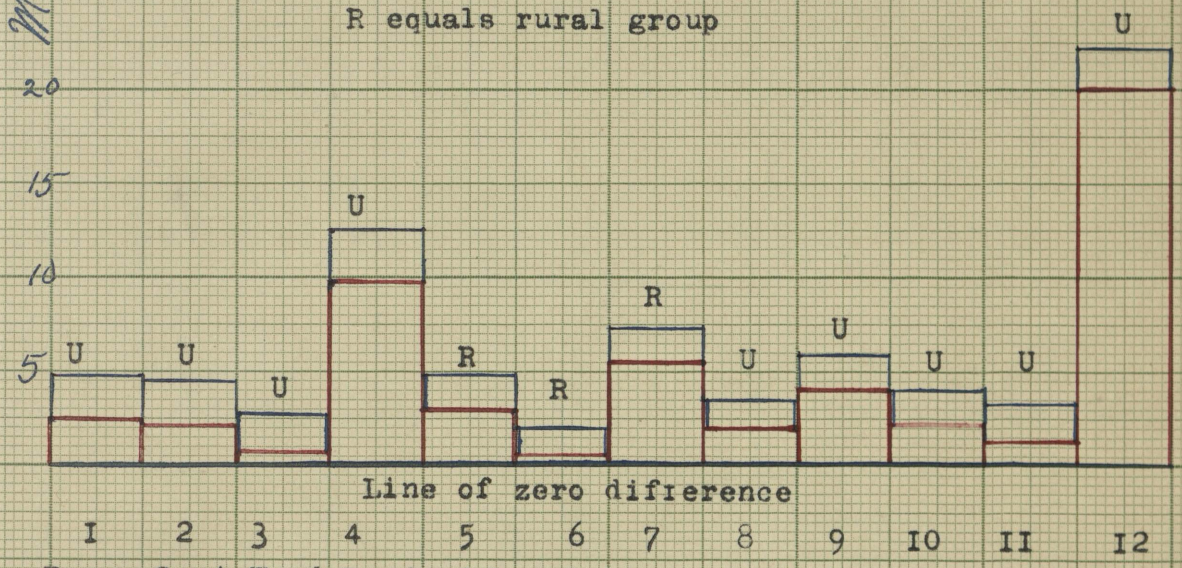
GRAPH 5

SHOWING THE LIMITS OF THE TRUE DIFFERENCE BETWEEN EACH SET OF MEANS. ALSO, THE DISTANCE OF THE LOWEST LIMIT OF THE TRUE MEAN ABOVE THE ZERO DIFFERENCE

Each small square on the left margin equals .5 of one mean unit

U equals urban group

R equals rural group



(Read this graph; In test one the upper and lower limits of the true difference between the mean of the urban group and themean of the rural group are marked by the blue bar and by the red bar respectively, e.g. between 4.799 and 2.801 units above zero. (U) indicates that the difference is in favor of the urban group, etc.)

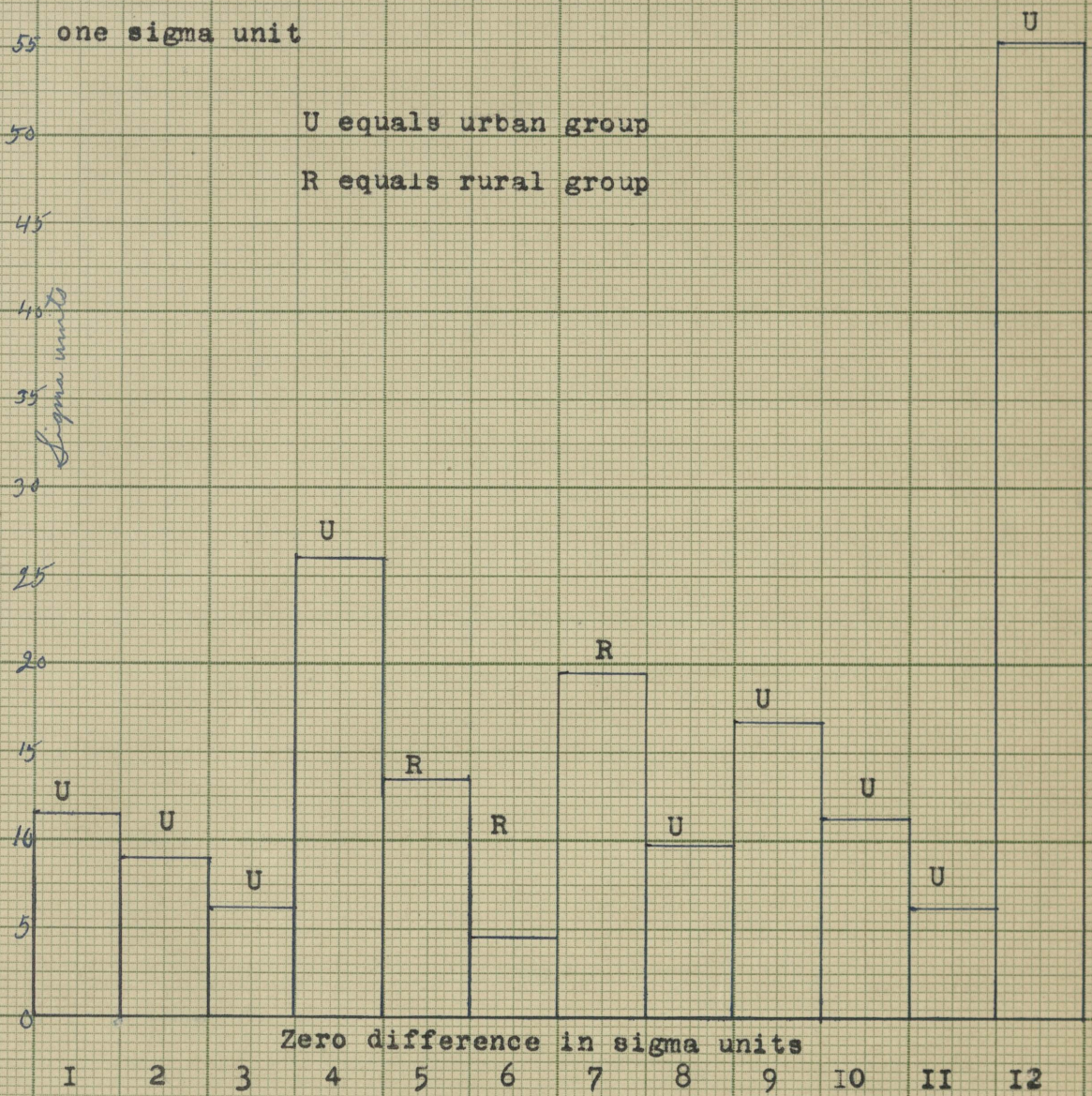
GRAPH 6

SHOWING HOW FAR THE ZERO DIFFERENCE IS BELOW THE MEAN DIFFERENCE IN SIGMA TERMS

Each small square on the left margin equals .5 of one sigma unit

U equals urban group

R equals rural group



(Read this graph; In test one, the zero difference is II.4 sigma terms below the mean difference of the urban group and the rural group. The difference is in favor of the urban group, etc.)

Graph 7

This is a percentile graph of each of the two groups in the National Intelligence Tests. It is shown by this graph that the median intelligence for the entire group of urban pupils is higher than the median for the entire group of rural pupils.

The median score in intelligence for the urban group, as shown in Graph 7, is 133. The median score in intelligence for the rural group, as shown by Graph 7 is 129. A score[1] of 133 in the National Intelligence Tests equals a Mental Age of 15 years and six months. A score of 129 equals a Mental Age of fourteen years and four months. The difference between the Mental Ages of the two groups shows that the urban group is one year and four months ahead of the rural group. The average chronological age for the urban group is 14 years, and 10 months while the average chronological age for the rural group is 15 years and 4 months. The Mental Age of the urban group is 8 months above its average Chronological Age. The Mental Age of the rural group is one year below its average Chronological Age.

. . . . . .

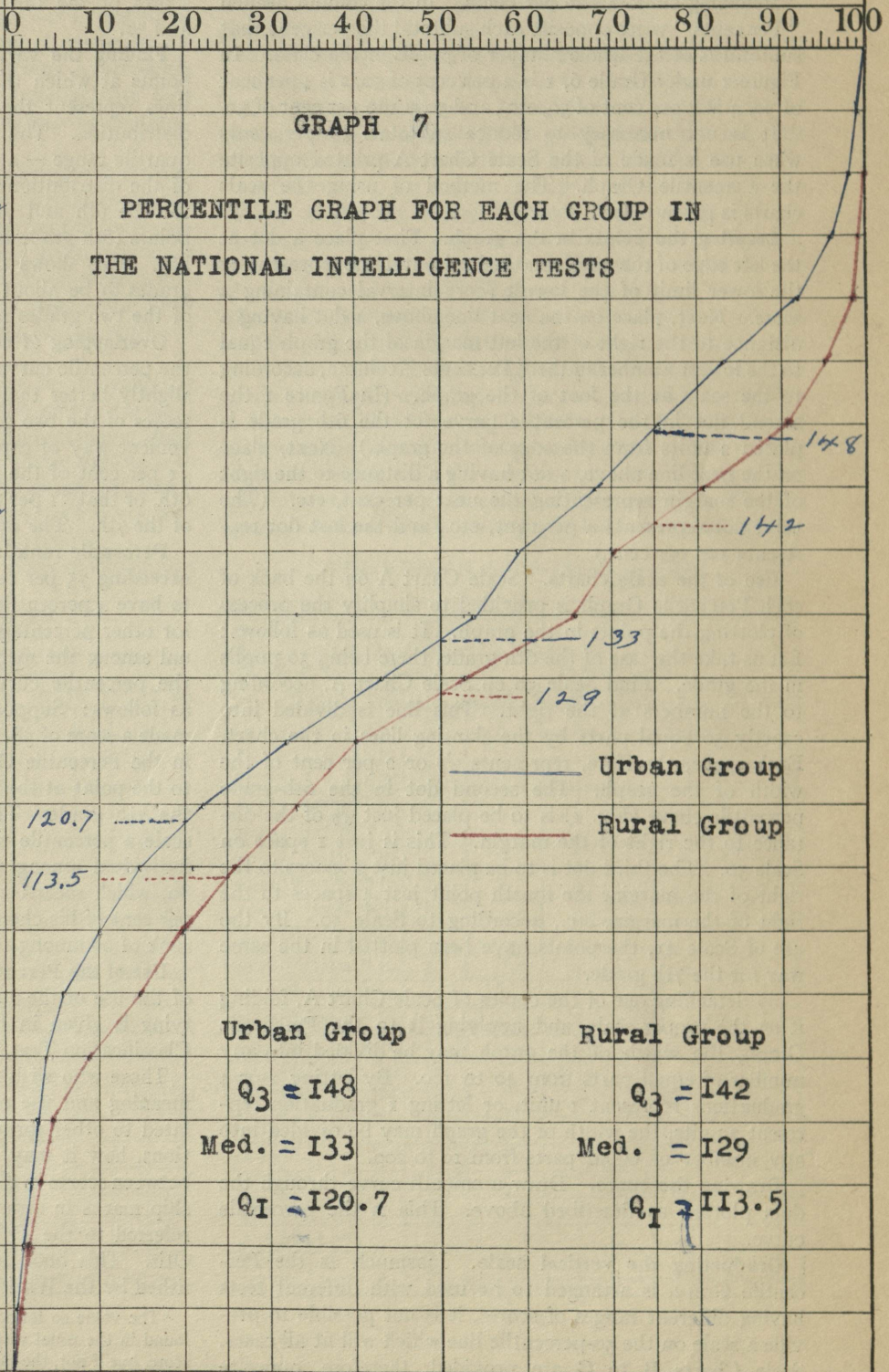
1. (28) National Intelligence Tests, Manual of Directions, Supplement 3, Table 3.

UNIVERSAL PERCENTILE GRAPH

Grade or Class	
Number	
Date of Exam.	
Form Used	
Examination	
School or College	
Examiner	

Percentile Graph

Score	Tallying	Sub-totals	Per cents	Tallying	Sub-totals	Per cents
179 175				1	274	100
174 170				2	273	99
169 165	1	205	100	8	271	98
164 160	3	204	99	11	263	96
159 155	7	201	98	24	252	92
154 150	7	194	95	19	228	83
149 145	19	187	91	23	209	76
144 140	14	168	81	25	186	68
139 135	17	154	70	23	161	59
134 130	27	137	66	22	138	54
129 125	27	110	53	28	119	43
124 120	15	83	40	29	88	32
119 115	13	68	33	18	59	22
114 110	13	55	26	14	41	15
109 105	11	42	20	11	27	10
104 100	12	31	15	4	16	6
99 95	8	19	9	5	12	4
94 90	5	11	5	2	7	3
89 85	3	6	3	2	5	2
84 80	1	3	1.5	2	3	1
79 75	2	2	1	1	1	.4
Class Medians						



Finding the subtotals. Begin at the bottom of the column of frequencies and place in the square to the right of each frequency the sum of the frequencies up to and including that frequency. In the subtotal column under 6th grade (Fig. 1) there is 1 score in the first interval, a subtotal of 2 to and including the second interval, a subtotal of 4 to and including the third interval, etc., and 50 to and including the last interval. This last "subtotal" (50) should equal the number of pupils in the class, as entered at the top of the column.

Reducing subtotals to per cents. In the column headed "Per cents" write opposite each subtotal the per cent that subtotal is of the whole number of pupils in the class. In Figure 1 under Grade 6, 1 is 2 per cent of 50, 2 is 4 per cent of 50, 4 is 8 per cent of 50, etc., and 50 is 100 per cent of 50.

It is not necessary to reduce subtotals to per cents when use is made of the Scale Chart A printed opposite the Percentile Graph. The method of using the scale charts is given below.

Locating the points in the graph. First place a dot at the left edge of the graph on the horizontal line representing the lower limit of the lowest score interval containing a score. Next, place on the next line above, a dot having a distance to the right of the left margin of the graph equal to the lowest number in the "Per cents" column, according to the scale at the foot of the graph. (In Figure 1 the second dot in the percentile curve for the 6th grade is placed 2 units from the edge of the graph.) Next, place on the next line above, a dot having a distance to the right of the margin representing the next per cent, etc. (The third dot represents 4 per cent, etc., and the last dot represents 100 per cent.)

Use of the scale charts. Scale Chart A on the back of each Percentile Graph is provided to simplify the process of plotting the points in the graph. It is used as follows: Let us take the case of the 6th grade, there being 50 pupils in the grade. Find Scale 50 on Scale Chart A, according to the numbers at the right. This line is divided into exactly 50 equal parts by the slanting lines in the chart. Each space, therefore, represents $\frac{1}{50}$ or 2 per cent of the width of the graph. The second dot in the 6th-grade percentile curve (Fig. 1) is to be placed just $\frac{1}{50}$ of the distance to the right of the margin. This is just 1 space on Scale 50. The third dot is to be placed just 2 spaces to the right of the margin, the fourth point just 4 spaces to the right of the margin, etc., according to Scale 50. By the use of Scale 41, the points have been plotted in the same way for the 7th grade.

By detaching one of the copies of Scale Chart A, folding it on the proper scale, and applying it to the Percentile Graph, the width of the graph may be divided into any number of equal parts from 40 to 100. By letting 2 or 4 graduations represent 1 unit, or letting 1 graduation represent 2 units, the width of the graph may be divided into any number of equal parts from 10 to 200.

Drawing the curve. Draw a smooth curve through the dots plotted as described above. This is the percentile curve.

Graduating the vertical scale. Inasmuch as the Percentile Graph is arranged to be used with different tests having different ranges of scores, it is not possible to provide a scale on the 50-percentile line which will fit all cases. Scale Charts B to G are provided, therefore, opposite Scale Chart A for graduating the spaces between horizontal lines to scales corresponding to groupings of 1, 2, 3, 4, 5, and 10 units to the interval. By applying the appropriate one of these scales to the Percentile Graph, the score represented by the point at which a percentile curve cuts the 50-percentile line, or any other percentile line, can be read to the nearest unit. To graduate the vertical scale of the Percentile Graph to correspond to a grouping in intervals of 5 units, as in Figure 1, use Scale Chart F; when intervals of 3 units are used, as in Figure 2, use Scale Chart D; etc.

Finding the median score of a class. The point where the percentile curve cuts the 50-percentile line represents the median score of the group.[1] In Figure 1 the median scores of the 6th and 7th grades are, respectively, 45 and 50.

Finding the variability of the scores of a class. The points at which the curve cuts the 25- and 75-percentile lines represent the lower and upper quartile scores of a distribution. The interval between these is the interquartile range — a very convenient measure of the scatter of the distributions. In Figure 1 the interquartile ranges for the 6th and 7th grades are, respectively, 14 and 13 points (6th grade from 38 to 52, and 7th grade from 43 to 56). This shows the variability of the scores of the two grades to be about equal. The variabilities of the scores of the two grades in Figure 2 differ considerably.

Overlapping of classes. It will be seen by a glance at the percentile curves in Figure 1 that the 7th grade is only slightly better than the 6th and that the distributions of scores of the two grades overlap very markedly. A convenient way of expressing this overlapping is to say that 31 per cent of the 7th grade fall below the median of the 6th, or that 31 per cent of the 6th grade exceed the median of the 7th. The overlapping is less marked in Figure 2.

Percentile rank in class. If an individual makes a score exceeding 75 per cent of the scores of his class, he is said to have a percentile rank of 75 in his class; and the same for other percentages. The percentile rank of any individual among the members of his class may be found from the percentile curve representing the scores of his class as follows: Suppose an individual in the 7th grade has made a score of 58. Find the point 58 on the vertical scale in the Percentile Graph and move the pencil horizontally to the point at the same height on the percentile curve for the 7th grade. This point represents on the horizontal scale a percentile rank of 80. The percentile rank of the individual among the members of his class is, therefore, 80, which means that his score exceeds the scores of 80 per cent of his class. A score of 58 represents a percentile rank of 90 among the members of the 6th grade.

Use of the Percentile Graph in regrading. A description of the use of the Percentile Graph in regrading and classifying is given in the Manual of Directions for the Otis Classification Test,[2] page 49.

Those who wish a more thorough understanding of the meaning and use of the Percentile Graph — how it is related to other forms of graphic representation of distributions, how it may be used in finding the correspondence between scores in different tests, between scores and scholarship marks in order that these may be averaged, etc., are referred to the *Primer of Statistical Method* by Arthur S. Otis. This book is now in preparation and will be published by the World Book Company.

[1] The value so found may not be exactly the same as the median found in the usual way by counting to the middle paper in order of score, but if not, the median score found by means of the curve is considered to represent the distribution better and to be in that sense more nearly accurate.

[2] Published by World Book Company, Yonkers-on-Hudson, New York.

UNIVERSAL PERCENTILE GRAPH

By ARTHUR S. OTIS

DIRECTIONS

Purpose. In order to compare the score of a pupil in a test with the scores of the class as a whole or to compare two or more classes, the most effective way is to draw a percentile curve for each grade or class on a Percentile Graph. The Universal Percentile Graph is designed for use with any test. The method of drawing a percentile curve is given in full below. One not familiar with percentile curves will appreciate their significance after studying the directions for drawing them.

A percentile curve shows at a glance not only the median score of a class but also the range and variability of the scores. It shows at a glance just what per cent of the scores of the class is exceeded by the score of any given individual and just what per cent of the class attains or exceeds any given score. Two or more curves on the same graph show very vividly the amount of overlapping of the scores of different classes.

General procedure. The steps taken in drawing the percentile curve are: (1) distributing the scores, (2) finding the subtotals — number of cases to and including those in each interval of score, (3) reducing these subtotals to per cents of the number of cases in the group, (4) locating points in the graph representing these per cents, and (5) drawing a smooth curve through these points.

Provision is made for distributing the scores of two groups of individuals on one Percentile Graph sheet, and from these distributions two percentile curves may be drawn. The scores of additional groups may be distributed on other Percentile Graph sheets, or any sheet of paper, and as many curves drawn on one graph as may be conveniently distinguished.

The blank spaces at the top of the sheet should be filled as shown in the sample Percentile Graphs (Figs. 1 and 2).

Distributing the scores. First, choose a suitable interval of score (number of units to be grouped into one interval) so that the distribution will not be too long for the graph or so short as to be unduly cramped. Next, enter in the column at the left headed "Score" the intervals of score chosen, such as 0–4, 5–9, 10–14, etc., as shown in Figure 1, or 0–2, 3–5, 6–8, etc., as shown in Figure 2. Next, in one of the columns headed "Tallying," distribute the scores of a grade by putting a short mark for the score of each individual opposite the interval of score within which the score falls. For example, Figure 1 shows that in the 6th grade two pupils made scores between 65 and 69 in the Otis Achievement Test,[1] two pupils made scores between 60 and 64, five made scores between 55 and 59, etc. The number of tallies, which tells the number of scores falling within any interval of score, is called a "frequency." The frequency of scores of 6th-grade pupils between 50 and 54 is 8.

[1] This is Part I of the Otis Classification Test.

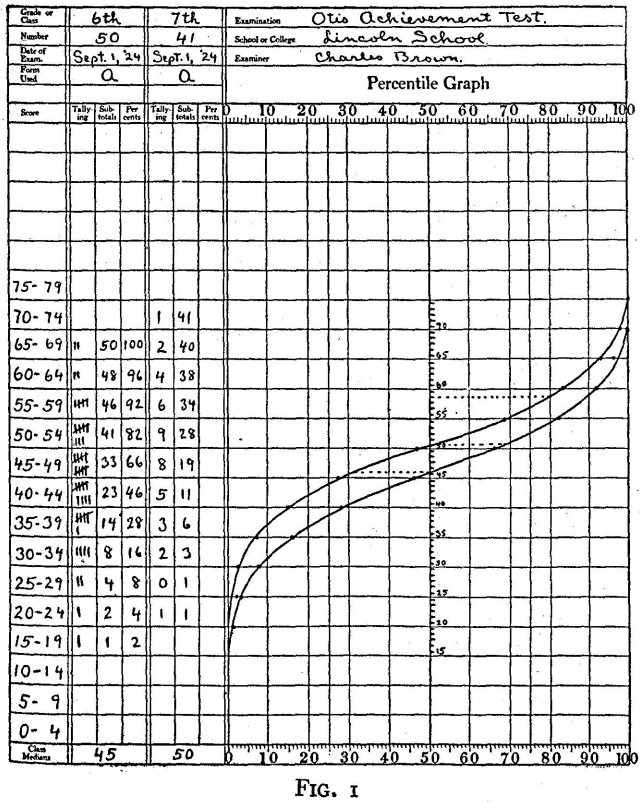


FIG. 1

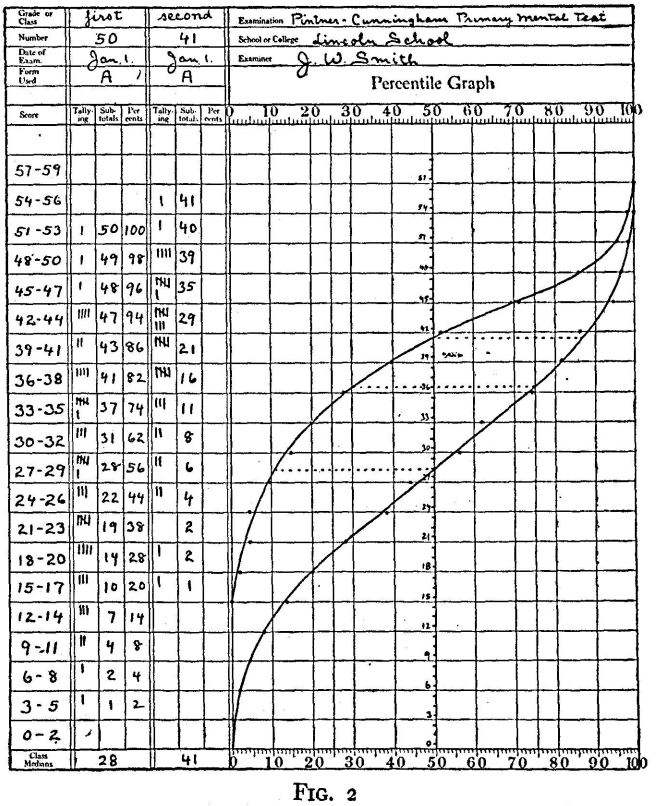
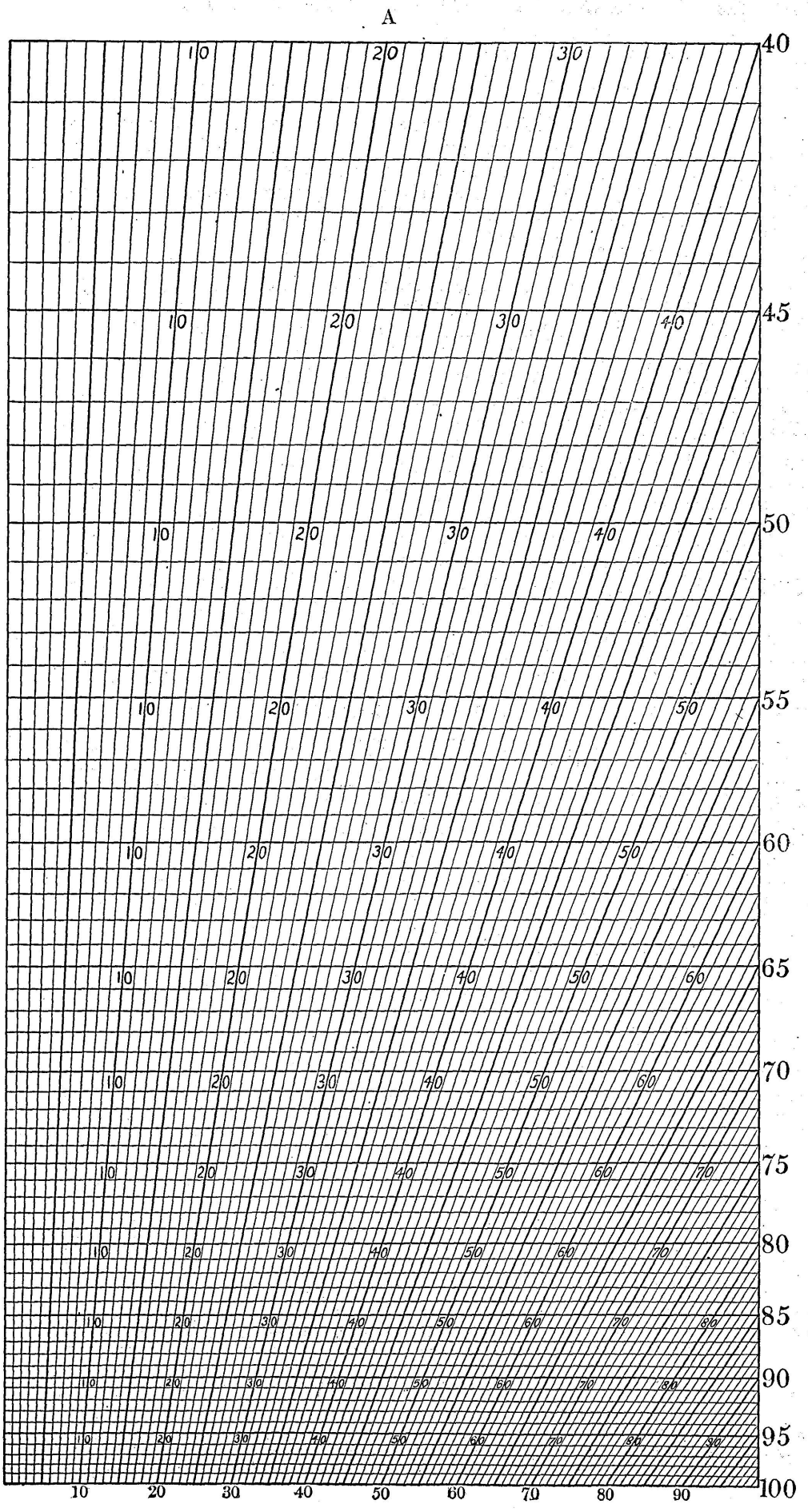


FIG. 2

Published by World Book Company, Yonkers-on-Hudson, New York, and 2126 Prairie Avenue, Chicago
Copyright 1924 by World Book Company. Copyright in Great Britain. *All rights reserved.* OUPG-1

PRINTED IN U.S.A.

SCALE CHARTS



B

3	3
2	2
1	1
0	0

C

6-7	6
4-5	4
2-3	2
0-1	0

D

9-11	9
6-8	6
3-5	3
0-2	0

E

12-15	12
8-11	8
4-7	4
0-3	0

F

15-19	15
10-14	10
5-9	5
0-4	0

G

30-39	30
20-29	20
10-19	10
0-9	0

TABLE 16

This table shows the results of the data obtained from the reports of the school nurses. Not all of the high schools in Sumner county had their pupils inspected, but we were able to get the data for 310 pupils who were examined. This number included 208 from the urban group and 102 from the rural group.

The numbers in the first two columns show the number of pupils reported under each head for each of the two groups. Columns 3 and 4, show these results in terms of per cent for each group. Columns 5 and 6, show the difference in per cent for each item in columns 3 and 4, the difference in per cent being placed in the column having the higher per cent in columns 3 and 4. A closer inspection of columns 5 and 6, will reveal the fact that the per cent of each group which is normal in weight, vision, hearing, and teeth is practically the same. But the difference in per cent of pupils normal in tonsils, adenoidal growth, and thyroid and lymph glands is quite marked. It is also interesting to note from columns 3 and 4, that more than half -- 58.3 per cent of the urban and 52.9 per cent of the rural -- of each group are below normal in weight. While 19.5 per cent of the urban group and 15.6 per cent of the rural group are reported as having defective vision, only 8.1 per cent of the urban group and 7.8 per cent of the rural group are reported as wearing glasses. 41.3 per cent of the urban group and 42.7 per cent of the

rural group have defective teeth. Practically the same per cent of each group has infected tonsils, urban 29.8 per cent and rural 28.4 per cent. About one-fifth of the pupils of each group has had its tonsils removed, about one-eighth has had its adenoids removed. There is a much larger per cent of enlarged thyroid and lymph glands among the pupils of the urban group than among the pupils of the rural group, 19.2 per cent to 6.8 per cent.

TABLE 16. PHYSICAL DATA SHOWING THE NUMBER INCLUDED UNDER EACH HEAD FOR EACH OF THE TWO GROUPS ALSO, THE PER CENT FOR EACH GROUP AND THE DIFFERENCE IN PER CENT

	No. for Each Group		Per Cent for Each Group		Group Having Highest Per Cent	
Weight	Urban	rural	urban	rural	urban	rural
normal	34	12	12.4	11.8	.6	
Overweight	61	36	29.3	35.3		6.0
underweight	113	54	58.3	52.9	5.4	
Vision						
normal	150	86	80.5	84.4		3.9
astigmatism	14	7	6.7	6.8		.1
hypermetropia	12	2	5.7	1.9	3.8	
myopia	3	1	1.4	1.0	.4	
eyes different	12	6	5.7	5.9		.2
Wears Glasses						
yes	17	8	8.1	7.8	.3	
no	191	94	91.9	92.2		.3
Hearing						
normal	192	95	92.3	93.3		1.0
defect slight	7	2	3.4	1.9	1.5	
defect marked	3	2	1.4	1.9		.5
ears differ	6	3	2.9	2.9	0	0

TABLE 16 (continued)

	urban	rural	urban	rural	urban	rural
Teeth						
no cavaties	122	58	58.7	57.3	1.4	
cavaties	86	44	41.3	42.7		1.4
Tonsils						
normal	55	13	26.5	12.8	13.7	
large for age	45	37	21.6	36.3		14.7
infected	62	29	29.8	28.4	1.4	
removed	46	23	22.1	22.5		.4
Adenoidal Growth						
none	150	61	72.1	59.9	12.2	
slight	24	21	11.5	21.5		10.0
marked	7	4	3.4	3.9		.5
removed	27	15	13	14.7		1.7
Enlarged Glands						
(thryoid & lymph)	40	7	19.2	6.8	12.4	

CHAPTER V

SUMMARY AND CONCLUSIONS

From the data presented in Chapter IV, the following answers to the questions raised in Chapter III can be made:

A. The two groups are alike,

a. Both the urban and the rural groups are below the norm set by the Stanford Achievement Test for pupils entering the ninth grade.

b. As shown by the physical data, the two groups are closely alike in weight, vision, hearing, and teeth.

B. The two groups differ,

a. The Mental Age for the urban group is one year and two months higher than it is for the rural group.

b. The urban group is ahead of the rural group in all of the sets of scores in achievement, excepting those in Arithmetic. In the sets of scores in which the urban group surpasses, the range is from 11 months in the Reading Total scores Graph 4, to 3 months in both Nature Study and Science, and Dictation. In the Arithmetic scores the rural group surpasses the urban group from 6 months in Arithmetic Computation to one month in Arithmetic Reasoning. In each group of scores compared in the Stanford Achievement Test, the Reliability of the Difference was more than 3 sigmas.

c. 13.7 per cent more of the pupils of the urban group has normal tonsils and 12.2 per cent more of the pupils of this group is without adenoids than among the pupils of the rural group. 12.4

per cent more of the pupils of the rural group is without enlarged thyroid and lymph glands than of the pupils of the urban group.

CHAPTER VI

BIBLIOGRAPHY

1. Norman Frost, "A Comparative Study of Achievement in Rural and Town Schools." Teachers College Contribution to Education, No. III.
2. Journal of Educational Psychology, Vol. V:461-466.
3. Dr. Courtis, Elementary School Journal, Vol. XII:133ff.
4. Ohio Survey Commission Report, 1914, Page 133 ff.
5. "A Study of Rural Schools in Travis County." Bulletin of the University of Texas, December, 1917.
6. "Survey of Haldane School." Cold Springs, New York, 1917.
7. The Survey and Report of the Virginia Public School Educational Commission, Published 1919.
8. Elementary School Journal, Vol. XVI:551.
9. Educational Administration and Supervision, Vol. II:560-573.
10. M. E. Haggerty, "Studies in Arithmetic." Indiana University Studies, No. 32, September, 1916.
11. E. H. Taylor, "Arithmetic Ability of Rural School Children." Journal of Educational Psychology, March, 1914.
12. Educational Bulletin, Vol. No. 3, 1914, Trenton, New Jersey.
13. "Handwriting of Iowa School Children." University of Iowa Bulletin, No. 15, Iowa City, Iowa.
14. "A Report on the Use of Some Standard Tests." Wisconsin State Department of Public Instruction, Bulletin No. 1, Page 22.
15. 69th Report of Public School of the State of Missouri, June 30, 1918.

16. "Report of Spelling and Handwriting in County Schools." Louisiana State Department of Education. Bulletin No. 1, June, 1918.

17. "Spelling Ability of Plumas County Children." California State Board of Education, Supplement of California Blue Bulletin, December, 1919.

18. John E. Wrothington, "A Comparative Study of the Attainments of Eighth Grade Pupils in the Rural and in the Town Schools of Lake County, Indiana." University of Chicago, 1918. (Thesis)

19. "Report on Rural Schools," New York Survey, Ithaca, New York, 1922, page 154-170.

20. "Survey of Gentry County Public Schools ." State Teachers College Bulletin, Marysville, Missouri, 1922.

21. "Tests and Measurements in the Rural Schools," National Educational Proceedings, 1921.

22, 23, 24, 25, 26, 27. Statistics in Psychology and Education, Henry E. Garrett. Page 118-148.

28. National Intelligence Tests, Manual of Directions, Supplement 3, Table 3.

APPENDIX

PHYSICAL DATA

Date . . . . . .

1. Name of High School . . . . . .

2. Pupil . . . . . .
last name first name middle name

3. Age . . . . . Sex . . . . . .
years months

4. Height, inches . . . . . Weight, pounds . . . . . .

5. Pounds overweight . . . . . Pounds underweight . . . . . .

Underscore the term that applies

R L R L R. L R L

6. Vision - normal, Astigmatism, hypermetropis, myopia

7. Does the pupil wear glasses? Yes. No.

R L R L

8. Hearing - normal, degree of defect slight, marked.

9. Teeth - no cavaties, cavaties.

10. Tonsils - normal, large for age, infected, removed.

11. Adenoidal Growth - none, slight, marked, removed.

12. Enlarged Glands - thyroid, lymph.

NATIONAL INTELLIGENCE TESTS

SCALE B – FORM 1

Prepared under the auspices of the National Research Council by M. E. Haggerty, L. M. Terman, E. L. Thorndike, G. M. Whipple, and R. M. Yerkes

Name ..... Grade ..... Boy or girl .....
First name Last name

Date of birth ..... Age .....
Month Day Year Years Months

Birthplace of parents ..... Race .....
Father Mother

Name of teacher .....

Name of school .....

Name of city .....

Date of examination .....

Test	Rights	Method	Score
1		× 2 =	
2		=	
3		− (Wrongs) =	
4		=	
5		− (Wrongs) =	
Total		Sum	

If you completed the eighth grade in a town school, answer these questions; Name of school....., Name of town.....
If you completed the eighth grade in a country school, answer these questions; Name of school..... ..., Number of school district....., County in which school is located.....

Exercise 1

Do this work in arithmetic as quickly as you can without making mistakes. Try each example as you come to it. Look carefully at each one to see what you are to do.

Begin here

(1) Add

$$\begin{array}{r} 4 \\ 2 \\ \hline \end{array}$$

(2) Multiply

$4 \times 5 =$

(3) Add

$$\begin{array}{r} 32 \\ 25 \\ 19 \\ \hline \end{array}$$

(4) Subtract

$$\begin{array}{r} 13 \\ 5 \\ \hline \end{array}$$

(5) Divide

$11 \div 3 =$

(6) Multiply

$$\begin{array}{r} 5073 \\ 9 \\ \hline \end{array}$$

(7) Divide

$37\overline{)14282}$

(8) Subtract

$\frac{6}{7} - \frac{4}{5} =$

(9) Divide

$\frac{3}{4} \div 5 =$

(10) Multiply

$$\begin{array}{r} 358\frac{1}{3} \\ 26 \\ \hline \end{array}$$

Test 1

Do this work in arithmetic as quickly as you can without making mistakes. Try each example as you come to it. Look carefully at each one to see what you are to do.

Begin here

(1) Add

1
5

(2) Multiply

$2 \times 3 =$

(3) Subtract

5
2

(4) Divide

$2\overline{)8}$

(5) Add

19
3

(6) Multiply

26
3

(7) Add

24
27
15

(8) Subtract

16
7

(9) Divide

$13 \div 4 =$

(10) Multiply

6084
7

(11) Subtract

37344
14853

(12) Divide

$380 \div 7 =$

(13) Add

\$ 80.41
1.00
10.20
.04
203.00
3022.02

(14) Divide

$48\overline{)1536}$

(15) Subtract

$126.16 - 23.88 =$

(16) Add

$\frac{5}{6} + 1\frac{3}{12} =$

(17) Divide

$\frac{2}{3} \div 4 =$

(18) Multiply

$249\frac{3}{4}$
25

(19) Add

1 hr. 35 min.
47 min.
2 hr. 10 min.

(20)

$12\frac{1}{2}\%$ of 160 =

(21) Multiply

63 lb. 8 oz.
6

(22) Subtract

$8.3 - 3.00072 =$

Exercise 2

SAMPLES { Sheep eat mostly nuts grass fruits bread
The number of cents in a dime is 2 5 10 25

In each sentence draw a line under the one word that makes the sentence true.

Begin here

1	The number of days in a week is 5 6 7 12	1
2	The kitten is the young of the dog cat lion sheep	2
3	The day before Thursday is Wednesday Tuesday Friday Monday	3
4	Cheese comes from butter plants eggs milk	4
5	Leather comes from cotton wool skins bark	5
6	An animal that moves very slowly is the snail squirrel rabbit deer	6
7	The elm is a kind of bush flower vine tree	7
8	Soap is made from sugars fats pears lemons	8
9	Easter comes in fall winter spring summer	9
10	Figs grow on a bush stalk tree vine	10
11	America was discovered by Drake Hudson Columbus Raleigh	11
12	Glass is made of sand gravel clay mica	12
13	The highest price per pound is usually paid for flour sugar coffee salt	13
14	Pearls are obtained from mines elephants reefs oysters	14
15	The tadpole is the young of the fish frog lizard crayfish	15
16	Cypress is a kind of machine food fabric tree	16

Test 2

In each sentence draw a line under the one word that makes the sentence true, as shown in the samples.

SAMPLES
Sheep eat mostly nuts grass fruits bread
The number of cents in a dime is 2 5 10 25

Begin here

1 The day before Sunday is Friday Monday Saturday Thursday 1
2 Ripe strawberries are black green blue red 2
3 Raisins are dried cranberries currants gooseberries grapes 3
4 The axle is a part of a bed ax chair wagon 4
5 Most spiders spin webs to catch birds fish flies snakes 5

6 A net is used in playing croquet football golf tennis 6
7 The buffalo looks most like a cow deer sheep wolf 7
8 New Year's Day is April 1 December 1 January 1 July 1 8
9 "Hiawatha" was written by Cooper Longfellow Poe Whittier 9
10 A country that fought on Germany's side was Greece Holland Roumania Turkey 10

11 Diamonds are obtained from mines oysters reefs whales 11
12 An animal with a painful sting is the cricket hornet locust salamander 12
13 The month before October is August December November September 13
14 A guitar is played with bow fingers mouth sticks 14
15 The highest price per bushel is usually paid for corn oats turnips wheat ... 15

16 The incubator is useful in raising cattle chickens corn cotton 16
17 Boston is in Connecticut Maine Massachusetts Rhode Island 17
18 A state famous for oranges is Alabama California Louisiana Texas 18
19 The number of weeks in a month is about 2 4 6 8 19
20 Cambric is a cloth color dance food 20

21 A duet is sung by one two four six 21
22 The Arabian is a kind of cow goat horse sheep 22
23 Sirloin is a cut of beef mutton pork veal 23
24 Massachusetts was settled by the Huguenots Moors Pilgrims Quakers ... 24
25 A canteen is a kind of cannon cup flask musket 25

26 Of parsnips we eat the flower leaf root stem 26
27 Turquoise is usually blue green red yellow 27
28 A peck is a fourth of a barrel bushel gallon keg 28
29 Turpentine comes from hides ore petroleum trees 29
30 A man known for his strength was Abel David Samson Solomon 30

31 A lake that touches Ohio is Erie Huron Ontario Superior 31
32 James A. Garfield was a poet inventor president writer 32
33 The loom is used for carding sewing spinning weaving 33
34 Among Robin Hood's men was Allan Breck Natty Bumpo Galahad Friar Tuck 34
35 General Lee surrendered at Appomattox in 1812 1886 1865 1832 35

36 One of the first locomotives was made by Fulton Morse Stephenson Whitney 36
37 The aorta is a blood vessel bone muscle nerve 37
38 "The Secret Garden" tells about Colin Joan of Arc Rebecca William Tell 38
39 The humerus is a bone gland muscle nerve 39
40 A meter is nearest in length to the inch foot yard rod 40

Exercise 3

SAMPLES
- Can cows eat? ..... Yes No
- Do stones swim? ..... Yes No

Read each question and draw a line under the right answer.

Begin here

1	Do flowers bloom?	Yes	No
2	Are apples good to eat?	Yes	No
3	Are some houses built of stone?	Yes	No
4	Is the sky ever gray?	Yes	No
5	Has our flag green stars?	Yes	No
6	Do trees ever grow on moist land?	Yes	No
7	Are newspapers printed in churches?	Yes	No
8	Is stealing a proper pastime?	Yes	No
9	Are steeples commonly found in barrels?	Yes	No
10	Is furniture usually visible?	Yes	No
11	Is a memorable publication often trivial?	Yes	No
12	Is a dromedary a curious implement?	Yes	No
13	May a reprimand cause poignant distress?	Yes	No
14	Are veracious statements frequently inconsistent?	Yes	No
15	Can acrimonious criticism be censorious?	Yes	No

Test 3

Draw a line under the right answer to each question. Do as many as you can.

SAMPLES { Can cows eat?..... Yes No
Do stones swim?..... Yes No

Begin here
1 Have you a name?..... Yes No
2 Do apples have seeds?..... Yes No
3 Are all birds blue?..... Yes No
4 Are books useful?..... Yes No
5 Is it always morning?..... Yes No

6 Do bears have legs?..... Yes No
7 Do daisies bloom in meadows?..... Yes No
8 Does ice make water warmer?..... Yes No
9 Does a dollar have eyes?..... Yes No
10 Is red a color?..... Yes No

11 Are shawls made of brass?..... Yes No
12 Do children like pain?..... Yes No
13 Are handkerchiefs ever found useful?..... Yes No
14 Are avenues found in large cities?..... Yes No
15 Is a fish ever covered with scales?..... Yes No

16 Do some kitchens have cupboards?..... Yes No
17 Can you carry water in a sieve?..... Yes No
18 Do "herring" and "hereditary" mean the same? Yes No
19 Do ducks like corn?..... Yes No
20 Are accurate reports ever worth while?..... Yes No

21 Is medicine ever purchased by a physician?..... Yes No
22 Should a sentinel be trustworthy?..... Yes No
23 Do we desire serious trouble?..... Yes No
24 Do builders construct bridges?..... Yes No
25 Does money necessarily bring happiness?..... Yes No

26 Would you trust people who have malicious designs?..... Yes No
27 Is it an outrage to insult a well-behaved tourist?..... Yes No
28 Are chandeliers found inside stately mansions?..... Yes No
29 Is a traitor one who never betrays confidence?..... Yes No
30 Can all teachers ascertain with correctness the chemical properties of food?..... Yes No

31 Are measurements used in astronomy?..... Yes No
32 Does a conscientious commander mourn the loss of his men?.. Yes No
33 Are "synthesis" and "analysis" synonyms?..... Yes No
34 Do disastrous consequences sometimes succeed defiance of authority?..... Yes No
35 Does manual labor always terminate in cerebral hemorrhages? Yes No

36 Is alliteration a form of pentameter?..... Yes No
37 Is a penurious man averse to a policy of hoarding money?..... Yes No
38 Do those evincing modesty and virtue behave in an indecorous manner?..... Yes No
39 Is the cessation of belligerency ever desirable?..... Yes No
40 Is a natatorium a place for swimming?..... Yes No

Exercise 4

SAMPLES

shoe — foot	———	hat — coat	nose see head
sky — blue	———	grass — grows	summer green tall
bird — sing	———	dog — tail	bark walk kennel
bird — fly	———	dog — tail	bark walk kennel
dress — cloth	———	hat — head	wear band straw

Read carefully the first three words in each line. Then read the last four and draw a line under the right one.

Begin here

1	baby — cries	———	cat — mews hole little dog	1
2	dog — hair	———	fish — cat water scales pole	2
3	chew — teeth	———	smell — sweet strong odor nose	3
4	book — paper	———	dress — worn cloth fruit tree	4
5	sailor — ship	———	preacher — pray church preach read..	5
6	go — come	———	sell — leave papers money buy	6
7	ball — hand	———	football — play game field foot	7
8	paddle — canoe	———	sail — ocean boat wind steam	8
9	city — houses	———	forest — trees dark country birds	9
10	hat — brim	———	house — high sun porch chair	10
11	reward — hero	———	punish — God whip pain traitor.....	11
12	100 — 90	———	10 — 6 7 8 9.....	12

Test 4

Read carefully the first three words in each line. Then read the last four and draw a line under the right one.

SAMPLES	shoe — foot	———	hat — coat nose see head
	sky — blue	———	grass — grows summer green tall
	bird — sing	———	dog — tail bark walk kennel
	bird — fly	———	dog — tail bark walk kennel
	dress — cloth	———	hat — head wear band straw

Begin here

1	finger — hand	———	toe — box foot doll coat	1
2	cannon — shoots	———	bell — rings door metal maid	2
3	sweet — sugar	———	sour — sweet cake vinegar man	3
4	handle — hammer	———	knob — key room shut door	4
5	suitcase — clothing	———	purse — purchase money string stolen	5
6	Wednesday — day	———	July — August hot month year	6
7	clothes — man	———	fur — dress warm soft animal	7
8	razor — beard	———	saw — cloth tool wood sharp	8
9	feather — float	———	rock — ages hill sink break	9
10	packing — pack	———	lifting — lifter lift lifted lifts	10
11	pan — tin	———	table — chair wood legs dishes	11
12	strength — boldness	———	weakness — woman run cry timidity	12
13	fish — salmon	———	bird — robin sing nest bushes	13
14	violin — bow	———	drum — loud parade stick march	14
15	man — Adam	———	woman — girl Eve dress female	15
16	12 — 36	———	8 — 24 88 16 48	16
17	above — below	———	top — spin bottom surface side	17
18	second — minute	———	minute — time week day hour	18
19	June — May	———	August — July March October November	19
20	establish — begin	———	abolish — end slavery wrong abolition	20
21	food — costly	———	air — breathe gas free oxygen	21
22	success — joy	———	failure — sadness luck fail work	22
23	quarrel — enemy	———	agree — friend disagree agreeable foe	23
24	hinge — door	———	joint — bone fasten stiff open	24
25	devil — angel	———	bad — mean disobedient defamed good	25
26	dead — lifeless	———	danger — peril accident wreck run	26
27	floor — ceiling	———	ground — earth sky dirt grass	27
28	water — fish	———	air — nose man blame breathe	28
29	snake — adder	———	dog — black bark cat spaniel	29
30	person — crowd	———	one — all many few large	30
31	$\frac{5}{2}$ — 10	———	1 — 2 4 6 8	31
32	almost — entirely	———	rarely — ever often never seldom	32

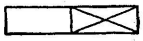
Exercise 5

If the two things in a pair are the same, write **S** on the dotted line between them. If they are different, write **D** on the dotted line between them. Do each one as you come to it.

Begin here 273 273

3861 3854

Roland R. C. ..... Rollan R. C.

 .....

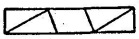
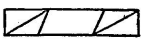
2579 2397

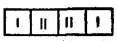
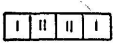
38657 38657

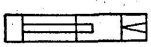
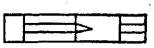
926745 926145

Rapen J. D. ..... Rapon J. O.

Palteser F. ..... Palteser F.

 ..... 

 ..... 

 ..... 

468225 468235

920379 923079

5218861 5218861

3238734 3328734

21059876 21059876

Singleton O. J. ..... Singleton O. J.

Siegel P. D. ..... Seigel P. D.

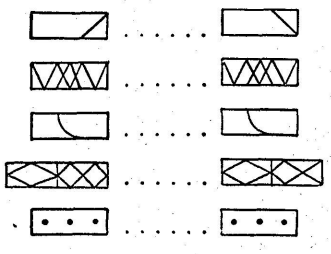
Richards W. E. ..... Richards W. E.

Test 5

If the two things in a pair are the same, write S. If they are different, write D. Do each one as you come to it.

Begin here 561 560
493 493
5172 5172
9432 9342
19037 19037

Capline J. F. ..... Caplein J. F.
Carlson B. O. ..... Carlson B. O.
Abbott J. V. ..... Abbett J. V.
Barnum O. L. ..... Barman O. L.
Beakes E. W. ..... Beakes E. W.



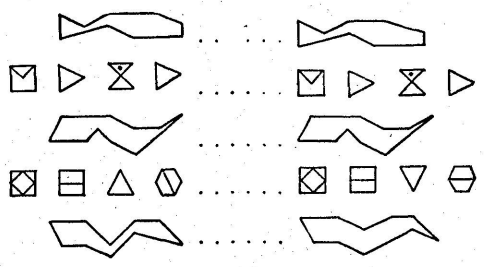
70090 71090
276431 267431
5307251 5307257
23544636 23445636
57216472 57216472

Basler A. H. ..... Basler A. H.
Aspinwall G. ..... Aspinwald G.
Armand J. P. ..... Armand J. P.
Castleman F. ..... Castleman F.
Barsk C. P. ..... Barks C. P.

☞ Go to the other column at the top of the page and do as many as you can.

40246586 40246586
875012534 975012534
388132902 388123902
742138694 742138694
8566607362 8656607362

3371089340 3371089344
2986751243 2986751243
7649266315 7649366215
5144667210 5144667210
4046169289 4046169289



Anderson L. B. ..... Andersen L. B.
Johnson G. W. ..... Johston G. W.
Reynolds F. J. ..... Reynolds F. J.
Saunders D. E. ..... Saunders D. E.
Whittaker S. P. ..... Whithaker S. P.

280587204 380587204
479124079 479124079
7949623615 7949623615
3652881365 3562881365
9655834821 9655834821

Stanford Achievement Test

By Truman L. Kelley, Giles M. Ruch, and Lewis M. Terman

ADVANCED EXAMINATION: FORM A

FOR GRADES 4–8

Name.....Grade.....Boy or girl.....

Age.....When is your next birthday?.....How old will you be then?.....

Name of school.....Date.....

Test	Score	Subject Scores	Age Equivalents (Subject Ages)
1. Reading: Paragraph Meaning			
2. Reading: Sentence Meaning			
3. Reading: Word Meaning			
Total Reading Score			
4. Arithmetic: Computation			
5. Arithmetic: Reasoning			
Total Arithmetic Score			
6. Nature Study and Science			
7. History and Literature			
8. Language Usage			
9. Dictation Exercise			
Composite Score (Sum of Subject Scores ÷ 10)			
Educational Age			

Note. This page may be torn off and filed as a record.

Published by World Book Company, Yonkers-on-Hudson, New York, and 2126 Prairie Avenue, Chicago
Copyright 1922 by World Book Company. Copyright in Great Britain. *All rights reserved.*
SAT : ADV. A–10

PRINTED IN U.S.A.

To the Examiner: Do not administer this test without first reading carefully the Manual of Directions. The Manual must be ordered extra.

EDUCATIONAL PROFILE CHART: ADVANCED EXAMINATION

Test 1, Parag. Mean.	Test 2, Sent. Mean.	Test 3, Word Mean.	Read. total	Test 4, Arith. Comp.	Test 5, Arith. Reas.	Arith. total	Test 6, Na. St. & Sci.	Test 7, Hist. & Lit.	Test 8, Lang. Usage	Test 9, Dicta-tion	Total Score	Educa-tional Age	Chrono-logical Age	Grade*
-102	**-75**	**-82**	**-259**	**-179**	**-132**	**-311**	**-86**	**-84**	**-54**	**-206**	**-100**	**-18-6**		
-102	-75	-81	-258	-175	-132	-307	-85	-83	-53	-204	- 99	-18-4		
-101	-74	-80	-255	-171	-131	-302	-85	-83	-53	-202	- 98	-18-1		
-101	-74	-79	-254	-166	-131	-297	-84	-83	-52	-200	- 97	-17-11		
-101	-73	-79	-253	-161	-130	-291	-84	-83	-51	-198	- 96	-17-8		
-101	**-73**	**-78**	**-252**	**-157**	**-130**	**-287**	**-83**	**-83**	**-50**	**-195**	**- 95**	**-17-6**		
-100	-72	-78	-250	-152	-130	-282	-82	-82	-50	-194	- 94	-17-4		
-100	-72	-77	-249	-148	-129	-277	-82	-82	-49	-191	- 93	-17-2		
- 99	-71	-76	-246	-147	-127	-274	-81	-81	-48	-190	- 92	-17-1		
- 98	-70	-75	-243	-147	-124	-271	-80	-80	-47	-189	- 91	-16-11		
- 96	**-70**	**-74**	**-240**	**-146**	**-122**	**-268**	**-80**	**-78**	**-47**	**-187**	**- 90**	**-16-9**		
- 95	-69	-73	-237	-146	-119	-265	-79	-77	-46	-186	- 89	-16-8		
- 94	-68	-73	-235	-145	-117	-262	-78	-75	-45	-185	- 88	-16-6		
- 92	-67	-72	-231	-145	-114	-259	-78	-74	**-45**	-183	- 87	-16-5		
- 90	-67	-71	-228	-145	-112	-257	-77	-72	-44	-182	- 86	-16-3		
- 89	**-66**	**-70**	**-225**	**-144**	**-110**	**-254**	**-77**	**-70**	**-43**	**-181**	**- 85**	**-16-2**		
- 88	-65	-69	-222	-144	-107	-251	-76	-69	-43	-179	- 84	-16-1		
- 87	-65	-68	-220	-143	-105	-248	-75	-67	-42	-178	- 83	-15-11		
- 86	-64	-67	-217	-142	-104	-246	-74	-66	-41	-176	- 82	-15-10		-10.0
- 85	-63	-66	-214	-141	-103	-244	-73	-65	-40	-174	- 81	-15-9		- 9.8
- 84	**-62**	**-65**	**-211**	**-140**	**-102**	**-242**	**-72**	**-63**	**-40**	**-172**	**- 80**	**-15-7**	-Adult	**- 9.7**
- 83	-61	-64	-208	-139	-101	-240	-71	-62	-39	-170	- 79	-15-6	-17-9	- 9.5
- 83	-60	-63	-206	-138	-100	-238	-69	-61	-38	-168	- 78	-15-4	-16-9	- 9.3
- 82	-59	-62	-203	-137	- 99	-236	-68	-60	-38	-165	- 77	-15-2	-16-2	- 9.2
- 81	-58	-61	-200	-136	- 98	-234	-67	-59	-37	-163	- 76	-15-1	-15-9	- 9.0
- 81	**-57**	**-60**	**-198**	**-134**	**- 97**	**-231**	**-66**	**-58**	**-36**	**-161**	**- 75**	**-14-11**	-15-4	**- 8.9**
- 80	-56	-59	-195	-133	- 96	-229	-65	-56	-36	-159	- 74	-14-9	**-15-0**	- 8.8
- 79	-55	-58	-192	-132	- 95	-227	-64	-55	-35	-157	- 73	-14-8**	-14-9	- 8.6
- 78	-54	-58	-190	-131	- 93	-224	-63	-54	-34	-155	- 72	-14-6	-14-6	- 8.5
- 77	-54	-57	-188	-129	- 92	-221	-62	-52	-34	-153	- 71	-14-4	-14-4	- 8.4
- 77	**-53**	**-56**	**-186**	**-128**	**- 91**	**-219**	**-61**	**-51**	**-33**	**-150**	**- 70**	**-14-2**	**-14-2**	**- 8.2**
- 76	-53	-56	-185	-127	- 89	-216	-60	-49	-32	-148	- 69	-14-0	-14-0	- 8.1
- 75	-52	-55	-182	-125	- 87	-212	-60	-48	-32	-146	- 68	-13-10	-13-10	- 8.0
- 74	-52	-54	-180	-124	- 86	-210	-59	-46	-31	-144	- 67	-13-8	-13-8	- 7.9
- 74	-51	-54	-179	-123	- 84	-207	-58	-44	-31	-141	- 66	-13-6	-13-6	- 7.7
- 73	**-51**	**-53**	**-177**	**-121**	**- 83**	**-204**	**-57**	**-43**	**-30**	**-139**	**- 65**	**-13-5**	**-13-5**	**- 7.6**
- 72	-50	-53	-175	-120	- 81	-201	-56	-42	-29	-137	- 64	-13-3	-13-3	- 7.5
- 71	-50	-52	-173	-119	- 80	-199	-55	-40	-29	-134	- 63	-13-2	-13-2	- 7.4
- 71	-49	-51	-171	-118	- 78	-196	-54	-39	-28	-132	- 62	-13-0	-13-0	- 7.3
- 70	-48	-51	-169	-117	- 77	-194	-52	-38	-28	-129	- 61	-12-11	-12-11	- 7.2
- 70	**-47**	**-50**	**-167**	**-117**	**- 75**	**-192**	**-51**	**-37**	**-27**	**-126**	**- 60**	**-12-9**	**-12-9**	**- 7.1**
- 69	-46	-49	-164	-116	- 73	-189	-50	-36	-27	-124	- 59	-12-8	-12-8	- 7.0
- 68	-45	-49	-162	-115	- 72	-187	-49	-35	-26	-121	- 58	-12-7	-12-7	- 6.8
- 67	-45	-48	-160	-114	- 70	-184	-48	-34	-25	-119	- 57	-12-6	-12-6	- 6.7
- 67	-44	-47	-158	-113	- 68	-181	-47	-33	-25	-116	- 56	-12-5	-12-5	- 6.6
- 66	**-43**	**-46**	**-155**	**-112**	**- 67**	**-179**	**-46**	**-31**	**-24**	**-114**	**- 55**	**-12-4**	**-12-4**	**- 6.5**
- 65	-43	-46	-154	-110	- 66	-176	-44	-30	-24	-112	- 54	-12-2	-12-2	- 6.4
- 64	-42	-45	-151	-109	- 65	-174	-43	-29	-23	-110	- 53	-12-1	-12-1	- 6.3
- 64	-41	-44	-149	-107	- 63	-170	-42	-28	-23	-108	- 52	-12-0	-12-0	- 6.2
- 63	-40	-44	-147	-105	- 62	-167	-40	-27	-22	-107	- 51	-11-11	-11-11	- 6.1
- 62	**-39**	**-43**	**-144**	**-103**	**- 61**	**-164**	**-39**	**-26**	**-22**	**-105**	**- 50**	**-11-10**	**-11-10**	**- 6.0**
- 61	-38	-42	-141	-102	- 60	-162	-38	-25	-21	-103	- 49	-11-9	-11-9	- 5.9
- 60	-38	-41	-139	-100	- 59	-159	-36	-24	-21	-101	- 48	-11-8	-11-8	- 5.8
- 59	-37	-41	-137	- 98	- 58	-156	-35	-23	-20	- 99	- 47	-11-7	-11-7	- 5.7
- 58	-37	-40	-135	- 96	- 56	-152	-34	-22	-20	- 97	- 46	-11-6	-11-6	- 5.7
- 57	**-36**	**-39**	**-132**	**- 95**	**- 55**	**-150**	**-33**	**-21**	**-19**	**- 95**	**- 45**	**-11-5**	**-11-5**	**- 5.6**
- 56	-35	-38	-129	- 93	- 54	-147	-32	-20	-19	- 93	- 44	-11-4	-11-4	- 5.5
- 55	-35	-37	-127	- 91	- 52	-143	-31	-20	-18	- 91	- 43	-11-3	-11-3	- 5.4
- 55	-34	-36	-125	- 89	- 51	-140	-30	-19	-17	- 89	- 42	-11-2	-11-2	- 5.3
- 54	-33	-35	-122	- 87	- 50	-137	-29	-18	-17	- 87	- 41	-11-1	-11-1	- 5.2
- 53	**-33**	**-34**	**-120**	**- 86**	**- 48**	**-134**	**-28**	**-17**	**-16**	**- 85**	**- 40**	**-11-0**	**-11-0**	**- 5.1**
- 52	-32	-33	-117	- 84	- 47	-131	-27	-16	-16	- 83	- 39	-10-11	-10-11	- 5.0
- 51	-31	-32	-114	- 82	- 46	-128	-26	-16	-15	- 81	- 38	-10-10	-10-10	- 4.9
- 50	-30	-32	-112	- 80	- 44	-124	-25	-15	-15	- 79	- 37	-10-9	-10-9	- 4.9
- 49	-30	-31	-110	- 78	- 43	-121	-24	-14	-14	- 77	- 36	-10-9	-10-9	- 4.8
- 48	**-29**	**-30**	**-107**	**- 76**	**- 42**	**-118**	**-23**	**-13**	**-14**	**- 75**	**- 35**	**-10-8**	**-10-8**	**- 4.7**
- 47	-29	-29	-105	- 74	- 41	-115	-22	-12	-13	- 73	- 34	-10-7	-10-7	- 4.6
- 46	-28	-28	-102	- 73	- 39	-112	-21	-12	-12	- 71	- 33	-10-6	-10-6	- 4.5
- 45	-27	-27	- 99	- 71	- 38	-109	-20	-11	-12	- 69	- 32	-10-5	-10-5	- 4.4
- 43	-26	-26	- 95	- 70	- 38	-108	-18	-10	-11	- 68	- 31	-10-4	-10-4	- 4.4
- 42	**-25**	**-25**	**- 92**	**- 68**	**- 37**	**-105**	**-17**	**-10**	**-10**	**- 66**	**- 30**	**-10-2**	**-10-2**	**- 4.3**
- 40	-24	-24	- 88	- 66	- 36	-102	-16	- 9	-10	- 65	- 29	-10-1	-10-1	- 4.2
- 39	-23	-23	- 85	- 65	- 35	-100	-15	- 8	- 9	- 63	- 28	-10-0	-10-0	- 4.1
- 38	-22	-22	- 82	- 63	- 34	- 97	-13	- 8	- 8	- 62	- 27	- 9-11	- 9-11	- 4.0
- 36	-21	-21	- 78	- 62	- 33	- 95	-12	- 7	- 8	- 60	- 26	- 9-10	- 9-10	- 4.0
- 35	**-20**	**-20**	**- 75**	**- 60**	**- 32**	**- 92**	**-11**	**- 6**	**- 7**	**- 59**	**- 25**	**- 9-8**	**- 9-8**	**- 3.9**
- 34	-19	-19	- 72	- 59	- 31	- 90	- 9	- 5	- 7	- 57	- 24	- 9-7	- 9-7	- 3.8
- 32	-18	-18	- 68	- 57	- 30	- 87	- 8	- 5	- 6	- 56	- 23	- 9-6	- 9-6	- 3.7
- 31	-17	-17	- 65	- 56	- 30	- 86	- 6	- 4	- 5	- 54	- 22	- 9-5	- 9-5	- 3.6
- 30	-16	-16	- 62	- 54	- 29	- 83	- 5	- 3	- 4	- 53	- 21	- 9-4	- 9-4	- 3.5
- 28	**-15**	**-15**	**- 58**	**- 53**	**- 27**	**- 80**	**- 4**	**- 3**	**- 4**	**- 51**	**- 20**	**- 9-2**	**- 9-2**	**- 3.4**
- 27	-14	-14	- 55	- 50	- 26	- 76	- 4	- 3	- 3	- 49	- 19	- 9-1	- 9-1	- 3.4
- 25	-14	-13	- 52	- 47	- 25	- 72	- 3	- 2	- 3	- 48	- 18	- 9-0	- 9-0	- 3.3
- 24	-13	-12	- 49	- 45	- 23	- 68	- 3	- 2	- 2	- 46	- 17	- 8-11	- 8-11	- 3.2
- 22	-13	-12	- 47	- 42	- 22	- 64	- 2	- 1	- 2	- 44	- 16	- 8-10	- 8-10	- 3.1
- 21	**-12**	**-11**	**- 44**	**- 40**	**- 20**	**- 60**	**- 2**	**- 1**	**- 1**	**- 42**	**- 15**	**- 8-9**	**- 8-9**	**- 3.1**

* Grade defined as in Table 5, Manual of Directions, Revised.
** Educational ages below this point are extrapolated values.
For explanation of vertical bars see Manual of Directions, Revised.

TEST 1. READING: PARAGRAPH MEANING

Sample: Dick and Tom were playing ball in the field. Dick was throwing the ball and..... was trying to catch it.

Write JUST ONE WORD on each dotted line.

---

1 Fanny has a little red hen. Every day the hen goes to her nest and lays an egg for Fanny to eat. Then she makes a funny noise to tell Fanny to come and get the.....

2 A kitten can climb a tree, but a dog cannot. This is very lucky for Nellie's kitten. Every time Joe's big dog comes along the kitten climbs a tree and the..... cannot follow.

3 Anna had never seen a squirrel in her life, although she had always wanted to very much. One day when she was playing under a tree she heard a funny little noise over her head. She looked up, and what do you think she saw? Up there in the..... was the very thing she had always wanted to see, a .....

4 John and Joe played one day till they were very hungry; so John went into the house and asked his mother for something to ..... When he came out again he had a big apple for himself and another for .....

5 One day when Jane was sweeping she found a dime on the floor under the bed. They could not find out whose dime it was, so Jane's mother gave it to her. Now, every time Jane ..... the floor she looks carefully under the bed for another.....

6 Helen and Kate pulled their sled through the deep snow to the top of the hill and soon were coasting swiftly down again. They did this over and over. The ..... was so deep that they found it hard work to drag the ..... to the top.

7 Once a black raven wanted to have white feathers like a swan. The raven saw that the swan lived in the water, and thought it was the water that made the swan's feathers so white. So the ..... decided to wash his feathers every day to see if it would not make them .....

8 Birds' eggs are almost as different from each other as are the birds themselves. The robin lays four or five blue eggs. The dove lays two white eggs. The sparrow lays six or eight speckled eggs. If we should find a nest with four blue eggs in it, we could be pretty sure that it was the nest of a ..... rather than of a ..... or dove.

9 Once there lived on a mountain near a village an immense giant whose cruelty kept the people of the village in great terror. However, there was one person in the village who was not afraid of the giant. This was a young soldier who carried a magic sword that a fairy had given him. Once when the ..... came down from the ..... the soldier attacked him with his magic ..... and killed him.

10 Once a hen was so foolish as to go to a fox and ask him to look after her chicks while she went to the barnyard to find some worms for her chicks. The fox was of course quite willing. The hen was gone a long time. When she finally returned, she found that the fox had eaten all her chicks. Since then no ..... has employed a ..... as a nurse.

Turn the page and go right on.

TEST 1, CONTINUED

11 When the bear appeared near the hut, Walter was alone. His father had driven to the village, that morning, several miles away. Fortunately he had left his gun hanging on the wall loaded and ready for service. Walter was excited, but he did not hesitate. Quickly seizing the ..... he ..... the .....

12 In a certain village a ton of coal costs just as much as a cord of wood, but it produces twice as much heat. Therefore the poor families in this village should be advised to burn ..... rather than .....

13 "Come on," called Joe, "let's go for a swim down by Jones' Point, where the river is deep." "No," said Pete, "let's swim down by Duggan's, where the water is warmer." "It isn't because the water is warm that you want to go to ....., but because you can't swim," said .....

14 Richard and Miss Cabot quickly found their way alone to the house of Mr. Smith on Craven Street. Miss Cabot left Richard in the carriage, walked quickly to the door, and sending up her card by the servant, requested to see Mr. Smith. The ..... soon returned and begged her to come in. As soon as she had done so, Miss Cabot introduced herself to Mr. ..... and begged him to come out and talk with ....., who was waiting outside in the carriage.

15 Joe made up a game which he called "Jac-alack." One person called Jack must climb a tree and hang by his arms from a low bough. The others stand behind him and say in unison, "Alas, alack, he fell on his back," and while they are saying it, one of them hits Jack with a bean bag. If Jack can see or guess who did it, he may drop down, and the guilty person takes his place. Otherwise he has to ..... there for another turn and sing out, "Alas, alack, another whack." It is quite a game and Jack must have strong .....

16 It is well established that the bee, which is commonly supposed to be so industrious, really works only two or three hours a day. The man who works eight or ten hours a day is therefore far more ..... than the .....

17 Boys and girls know my name. And mothers and fathers, too. Big folks love me. You do, too. The first letters in the first four sentences of this paragraph spell my name; so write it here.....

18 Energy is a measure of the fullness of life and is indispensable for genius. No energy at all is death. Idiots are feeble and listless. Nearly all the leaders of mankind have been noted for their remarkable .....

19 Deciduous trees lose their leaves in winter, while evergreens, as their name implies, do not. Therefore, in forests composed of ..... trees the ground is less shaded in winter than is the case in forests whose trees are .....

20 Some historians believe that the spread of anti-slavery feeling among the people of the North previous to the Civil War was due less to the moral issue involved than to the fact that they recognized the system of ..... as a menace to the industrial system of free labor.

Go right on to next page.

TEST 1, CONTINUED

21 If I were writing about the rich, I should be inclined to divide them, according to their attitude toward life, into workers and parasites. The motto of the worker is, " I owe the world a life," and the motto of the ..... is, " The ..... owes me a living."

22 Caution, when not present in excess, is a desirable trait. Often it saves one from disappointment or failure. Occasionally, however, one finds a person so extremely ..... that his will is paralyzed and he is totally unable to set about any new undertaking. Too much ..... is indeed often ..... than too little.

23 A whale is not a fish, even though it does live in water. A fish has no lungs, is cold-blooded, and absorbs oxygen from the water through its gills; but a whale is warm-blooded and has a genuine set of lungs. In consequence, in bodily structure the ..... is ..... like a shark, which is a true fish, than it is like a horse.

24 The brook on our farm has many whims. It ripples over bright and shiny rocks, and falls into a placid little pool so clear that I can see the pebbles on the bottom and can see myself down there, too. As I look straight down, it is hard to tell whether what I see is my nose or a ....., but as I move a little, that which I see stands still, so I know it is not .... Farther on the brook forgets the placid pool and tumbles over roots and rocks. It does, indeed, have many .....

25 To pant for recognition, to yearn to impress one's personality upon one's fellow-men, is the essence of ambition. The ambitious person may think that he merely thirsts to " do something " or " be somebody," but really what he craves is to figure potently in the minds of others, to be greatly loved, admired, or feared. To reap a success which no one ..... does not satisfy the yearnings of the ..... individual.

26 Washington was a very silent man. Of no man in the world's history do we have so few sayings of a personal kind. As for talking about himself, that was something in which he almost never indulged. Yet it would be a great error to interpret his ..... as an indication that he was in any sense cold or unfeeling.

27 As a rule, it is more economical to remember things by associating them clearly and vigorously than by going through many repetitions of them. Thus, a clear understanding of the causes for the Democratic victory in the national election in 1916 will be ..... effective in remembering the fact than a dozen ..... of the statement " Woodrow Wilson was elected in 1916."

28 Fundamentally, education depends upon the capacity of a person to profit by past experiences. Past situations modify present and future adjustments. Education in its broadest sense means acquiring experiences that serve to ..... existing inherited or acquired tendencies of behavior.

29 "Naïve" and " unsophisticated " are frequently confused. The former suggests a type of behavior which is artless, spontaneous, and free from the restraints of custom. The latter implies fully as great lack of knowledge of social usage, and, in addition, conduct which is primitive and perchance inelegant. Thus, the ..... youth was the first to enter the car, and his ..... little sister warmly kissed him in the presence of the king. We may also say that a country boy is ..... with respect to city life and customs.

Test 1. Number right ..... × 2 = *Score* .....

TEST 2. READING: SENTENCE MEANING

Samples: Can dogs bark? ..... Yes No
Does a cat have six legs? ..... Yes No

Read each question and draw a line under the right answer.

1 Is milk white? ..... Yes No 1
2 Do we sleep in beds? ..... Yes No 2
3 Is the day as dark as night? ..... Yes No 3
4 Is green a color? ..... Yes No 4
5 Is smoke always yellow? ..... Yes No 5

6 Do men and women dress just alike? .. Yes No 6
7 Do ships sail on the sea? ..... Yes No 7
8 Are all chimneys made of brass? ..... Yes No 8
9 Are rocks hard? ..... Yes No 9
10 Is everybody as huge as a giant? ..... Yes No 10

11 Do pupils always have excellent memories? ..... Yes No 11
12 Are brooms used to sweep bedrooms? ..... Yes No 12
13 Are machines ever useful? ..... Yes No 13
14 Are sugar and salt sold in stores? ..... Yes No 14
15 Are geese generally clad in bonnets? ..... Yes No 15

16 Do lambs roar? ..... Yes No 16
17 Does crime always bring happiness? ..... Yes No 17
18 Does justice sometimes seem cruel? ..... Yes No 18
19 Could one cradle hold eighty infants? ..... Yes No 19
20 Is a beetle very different from a mole? ..... Yes No 20

21 Does the friendship of a cheerful person make us unhappy? .. Yes No 21
22 Is a dime less than a nickel? ..... Yes No 22
23 Is the guilty thief always located? ..... Yes No 23
24 Is it ever important to hurry? ..... Yes No 24
25 Might a prisoner feel sorrow at the ruin he has caused? ..... Yes No 25

26 Are all antique benches made of bamboo? ..... Yes No 26
27 Are battleships dedicated to warfare? ..... Yes No 27
28 Can we discern things clearly in a dense fog? ..... Yes No 28
29 Might a person suffer confusion during an examination? ..... Yes No 29
30 Are marmalade and gruel made of milkweed? ..... Yes No 30

31 Could delicious chocolate be served at a festival? ..... Yes No 31
32 Do all university professors give instruction in science? ..... Yes No 32
33 Does it take courage to perform a very dangerous task? ..... Yes No 33
34 Should one always be censured for playing a flute by the fireplace? ..... Yes No 34
35 Are homely people always loathed and disliked? ..... Yes No 35

36 Is it deemed delightful to suffer a bloody defeat? ..... Yes No 36
37 Would a man be fortunate if he could flee from a famine? ..... Yes No 37
38 May careful observation be of considerable help in decreasing mistakes? .. Yes No 38
39 Does speaking with brevity necessarily mean that one is peevish? ..... Yes No 39
40 Are chimes ever played in a cathedral? ..... Yes No 40

Go right on to next page.

TEST 2, CONTINUED

41 Do repeated interruptions sometimes exasperate us? ..... Yes No 41
42 Should thieves be encouraged by giving them magnificent rewards? ..... Yes No 42
43 Are locusts and gnats generally believed to enjoy immortality? ..... Yes No 43
44 Might an accidental outbreak cause anxiety? ..... Yes No 44
45 May shortages often be prevented by foresight? ..... Yes No 45

46 Is an annual appeal made once a week? ..... Yes No 46
47 May occasional opposition awaken us to greater endeavor? ..... Yes No 47
48 Is every earl destined to become a genius or a conqueror? ..... Yes No 48
49 Might a person show unfeigned enjoyment of a symphony? ..... Yes No 49
50 Are we irresistibly led to confide in every near-by idler? ..... Yes No 50

51 Do any considerable percentage of motorists use headlights? ..... Yes No 51
52 Does an auctioneer boost prices with earnestness? ..... Yes No 52
53 Is it advisable to use dynamite as a lubricant? ..... Yes No 53
54 Is a person in a frenzy likely to make wild gestures? ..... Yes No 54
55 Should the captain of a yacht consider the weather forecast? ..... Yes No 55

56 Would it take a considerable income to provide a sumptuous wardrobe? .. Yes No 56
57 Is it disgraceful to teach a defenseless person decimals? ..... Yes No 57
58 Is the idea of burial usually attractive? ..... Yes No 58
59 May allies make exertion to enter into a federation? ..... Yes No 59
60 Should enthusiastic homage make a man indignant? ..... Yes No 60

61 Could the imperious actions of a lordly person become notorious? ..... Yes No 61
62 Is all adventurous activity to be deplored? ..... Yes No 62
63 Should a person be advised to sacrifice a good opportunity? ..... Yes No 63
64 Is a harmonious alliance sometimes expedient? ..... Yes No 64
65 Could an eloquent lawmaker do anything heinous? ..... Yes No 65

66 Is boric acid a chemical made of graphite? ..... Yes No 66
67 Are all festivities characterized by extravagance? ..... Yes No 67
68 May imposition upon others become habitual? ..... Yes No 68
69 Is a scarecrow a kind of inoffensive imitation? ..... Yes No 69
70 Does bliss always befall desperate people? ..... Yes No 70

71 Could congressional action cause the people to be dissatisfied? ..... Yes No 71
72 May seeing a person drunk decrease one's admiration for him? ..... Yes No 72
73 Could an inexperienced person be jovial and fascinating? ..... Yes No 73
74 Is one often assaulted by a boon companion? ..... Yes No 74
75 Ought accursed liars to be suppressed? ..... Yes No 75

76 Might an involuntary impulse impel one to be malicious? ..... Yes No 76
77 Is one necessarily inhospitable who dislikes an obnoxious guest? ..... Yes No 77
78 Does extreme audacity sometimes make us stand aghast? ..... Yes No 78
79 Is humanity subject to joyous emotions? ..... Yes No 79
80 Might a hysterical person, given to rashness be intolerable? ..... Yes No 80

Number right .....
Number wrong .....
Test 2. Score (subtract) .....

TEST 3. READING: WORD MEANING

Samples: Bread is something to catch drink <u>eat</u> throw wear
A robin is a <u>bird</u> cat dog girl horse

In each sentence draw a line under the word that makes the sentence true.

---

1 March is the name of a day food month week year 1
2 A fat person is always bad blue cold heavy little 2
3 A thing that is perfect is always close early hard little right 3
4 A farmer often raises bears corn gold paper pictures 4
5 Cotton is cool dark heavy soft sweet 5

6 A husband is sometimes a father flower mother sister town 6
7 A path is a place to eat dress die live walk 7
8 A maiden is a bird boy girl king plant 8
9 A lion is blue fine hot strong sweet 9
10 Islands are land ships soldiers time water 10

11 The ocean is fire land paper water wood 11
12 Rice is a battle beast bell cloud grain 12
13 A dove is a bird boat fish horse sheep 13
14 To be silent is to be heard loud quick still wild 14
15 Olives are to burn drink eat ride wear 15

16 To crush is to break escape guard hold plant 16
17 Rapid means long much quick small soft 17
18 A moment means color form money time place 18
19 To stitch is to reward sew starve suggest tempt 19
20 A question is something we answer build eat grow kill 20

21 Harbors are for churches cows gardens horses ships 21
22 To polish is to bribe brighten smite thrive traverse 22
23 To pronounce is to sail show speak stand watch 23
24 A physician is a child doctor master noise valley 24
25 A customer is a person who buys draws fishes hunts sells 25

26 To wander is to improve locate roam situate wail 26
27 To be sober is to be funny grave happy noisy wild 27
28 An orphan is one who has no clothing education hair parents teeth ... 28
29 To be active is to be hospitable humorous ignoble indolent sprightly .. 29
30 To be wretched is to be proud silent swift unhappy valuable 30

31 Independence means blame custom freedom mercy virtue 31
32 Agriculture refers to authority appearance defense farming mystery 32
33 To inquire is to appear ask rest sleep watch 33
34 A tavern is a companion funeral parcel park hotel 34
35 To be saucy is to be affectionate agreeable devoted dignified rude ... 35

36 An argument is a discussion gully gymnasium penance perjury 36
37 Jealous means affectionate appeased benevolent envious sympathetic 37
38 Meek means gaudy gentle mean strength tight 38
39 Gorgeous means frisky gigantic hereditary magnificent malicious 39
40 A barge is a kind of animal boat castle fruit vegetable 40

Go right on to next page.

TEST 3, CONTINUED

41 Situation refers to noise number place pleasure time 41
42 To plan is to banish bestow design betray defeat 42
43 Behavior refers to position conduct progress revenge temper 43
44 A vagabond is a kite lantern nightingale tramp scholar 44
45 Ambition means aspiration frivolity loitering remorse slothfulness 45

46 A sluggard is ambitious considerate divine earnest lazy 46
47 Victorious means baffled frustrated triumphant unstable vagrant 47
48 To mingle is to mislead blend sanction screech scurry 48
49 To heed is to escape fancy hurry notice prove 49
50 Dignified means lonely monstrous prominent spiritual stately 50

51 An opponent is a delicacy antagonist detective diplomat hostess 51
52 To prophesy is to assess bemoan cancel disclaim foretell 52
53 Imperial affairs concern cities garments kingdoms machines patterns. 53
54 To massacre is to investigate lament manifest misunderstand slaughter. 54
55 To be prompt is to be formal frightful hospitable punctual purified ... 55

56 Listless means indifferent loathsome malicious merciless presumptuous. 56
57 To lament is to flatter humor injure lend mourn 57
58 A prologue is a kind of introduction knell prohibition sermon tempest. 58
59 Lifeless means inanimate indefinite infamous undecided untidy 59
60 An impression is a century compass copy globe pasture 60

61 Crafty means accurate proficient slavish submissive wily 61
62 Liberality means promotion robbery reproof scandal generosity 62
63 Jubilant means abrupt abject confused triumphant doleful 63
64 A bulwark is a hospital hotel protection punishment purchase 64
65 A legacy is an inheritance inscription levy receptacle regulation 65

66 Maintenance means contention continuance corruption cowardice resource. 66
67 To meditate is to escort gossip ponder transgress withhold 67
68 Covetous means avaricious bountiful gaudy gray-headed harassed 68
69 Minimum means the largest least most newest oldest 69
70 To chastise is to promise publish punish purchase trifle 70

71 A sequel is something that excels follows interrupts precedes yields. 71
72 Ceaseless means boisterous diminished discontented ended incessant. 72
73 Emphatic means forcible frantic incurable pernicious reluctant 73
74 To subvert means to overturn shorten sling sojourn spurn 74
75 To be infamous is to be doubtful polished shameful sorrowful valuable. 75

76 To be languid is to be courteous domestic doubtful spiritless jolly 76
77 An associate is an adversary ally antagonist emigrant ensign 77
78 To be vigilant means to be aloof betrothed betwixt lawless watchful. 78
79 Decisive means conclusive dazzled genuine profane prudent 79
80 A scullion is a grasshopper gymnasium haycock hedgehog servant 80

81 Usury has to do with chivalry fiction homage loans manufactures 81
82 Perspective has to do with drawing expenses mining religion warfare. 82
83 An insurrection is a fugitive rebellion publication punishment hermit. 83
84 A reprobate is one who is very cowardly ugly wealthy wicked youthful. 84
85 Candid means illegitimate impeccable imperious incisive ingenuous .. 85

Test 3. Score .....

TEST 4. ARITHMETIC: COMPUTATION

Get the answers to these examples as quickly as you can without making mistakes. Look carefully at each example to see what you are to do.

Begin here.

(1)

$3 + 2 =$

(2)

$3 + 4 =$

(3)

Add

$$\begin{array}{r} 2 \\ 5 \\ \hline \end{array}$$

(4)

Add

$$\begin{array}{r} 7 \\ 4 \\ \hline \end{array}$$

(5)

Add

$$\begin{array}{r} 1\,3 \\ 2 \\ \hline \end{array}$$

(6)

Add

$$\begin{array}{r} 1\,7 \\ 2 \\ \hline \end{array}$$

(7)

Subtract

$$\begin{array}{r} 4 \\ 2 \\ \hline \end{array}$$

(8)

Subtract

$$\begin{array}{r} 7 \\ 4 \\ \hline \end{array}$$

(9)

$2 \times 3 =$

(10)

Add

$$\begin{array}{r} 1\,6 \\ 5\,3 \\ 3\,2 \\ \hline \end{array}$$

(11)

Subtract

$$\begin{array}{r} 1\,6 \\ 5 \\ \hline \end{array}$$

(12)

Subtract

$$\begin{array}{r} 9\,6 \\ 2\,5 \\ \hline \end{array}$$

(13)

Subtract

$$\begin{array}{r} 1\,3 \\ 5 \\ \hline \end{array}$$

(14)

Subtract

$$\begin{array}{r} 7\,6\,5 \\ 3\,2\,7 \\ \hline \end{array}$$

(15)

Multiply

$$\begin{array}{r} 2\,6 \\ 2 \\ \hline \end{array}$$

(16)

Multiply

$$\begin{array}{r} 2\,5\,3 \\ 6 \\ \hline \end{array}$$

(17)

Divide

$2\overline{)6}$

(18)

Divide

$4\overline{)8}$

(19)

Add

$$\begin{array}{r} 6\,8\,4\,8\,7\,6\,5\,4\,2 \\ 7\,9\,1\,6\,5\,4\,2\,2\,0 \\ 5\,8\,7\,3\,3\,9\,3\,6\,4 \\ \hline \end{array}$$

(20)

$6 \div 3 =$

(21)

Add

$$\begin{array}{r} 2\,4 \\ 1\,2\,\frac{4}{5} \\ \hline \end{array}$$

(22)

Multiply

$$\begin{array}{r} 6\,3\,8\,9 \\ 7 \\ \hline \end{array}$$

(23)

Multiply

$$\begin{array}{r} 4\,6\,7\,9 \\ 6\,8 \\ \hline \end{array}$$

(24)

$2\overline{)15.8}$

(25)

$2\frac{7}{8} - 1 =$

Go right on to next page.

TEST 4, CONTINUED

(26) $\frac{1}{4}$ of 8 2 8 =

(27) $9\frac{3}{5} - 4\frac{1}{5}$ =

(28) Subtract

7 9

$1\ 6\frac{3}{8}$

(29) $\frac{1}{7} \times 2$ =

(30) $.45\overline{)27.90}$

(31) $3\frac{6}{7} \div 1\frac{1}{2}$ =

(32) Multiply

9 . 7 2

2 1 . 9

(33) Multiply

$6\ 9\ 7\frac{1}{2}$

1 8

(34) $\frac{27}{28} \div \frac{6}{7}$ =

(35) .40 + .00044 + 4400 + .04 =

(36) $48.76 - 4\frac{9}{10}$ =

(37) $\frac{1}{2} + \frac{3}{4} + \frac{1}{6} + \frac{2}{3} + \frac{7}{8}$ =

(38) 7.34 + $2\frac{1}{4}$ + 89.2 + $4\frac{3}{4}$ =

(39) $3\frac{1}{4} \times 5\frac{1}{2} \times 3\frac{1}{2}$ =

(40) $1\frac{3}{4}$ + 25.2 + $4\frac{1}{5}$ + 48.961 =

(41) $\sqrt{45369}$ =

(42) $(4)^3$ =

(43) Subtract

8 yd. 1 ft. 3 in.

6 yd. 3 ft. 9 in.

(44) Add

5 yr. 9 mo.

6 yr. 7 mo.

8 yr. 2 mo.

(45) 67 . 36 ÷ $\frac{2}{3}$ =

(46) Multiply

4 gals. 3 qts. 1 pt.

4

(47) Express as a decimal to three places

$\frac{29}{64}$ =

Test 4. Number right ..... × 4 = *Score* .....

TEST 5. ARITHMETIC: REASONING

Find all the answers as quickly as you can.
Write the answers on the dotted lines.
Use the blank sheets of paper to figure on.

Begin here.

1 How many are 3 eggs and 2 eggs? *Answer*.....
2 Mary is 7 years old. How old will she be in 3 years? *Answer*.....
3 A hen had 9 chicks and 3 of them died. How many were left? *Answer*.....
4 Milk costs 8 cents a pint and the milkman is going to raise the price 2 cents. What will it then cost? *Answer*.....
5 If you buy a pencil for 4 cents and pay for it with a dime, how much change should you get? *Answer*.....

6 How many dimes are there in a dollar? *Answer*.....
7 How many eggs are there in 7 nests if each nest has 3 eggs? *Answer*.....
8 How many cents will 8 oranges cost at 3 cents each? *Answer*.....
9 David earned \$3.50 in June, \$2.25 in July, and \$1.50 in August. How much did he earn in all? *Answer*.....
10 Frank bought 3 two-cent postage stamps and 13 one-cent stamps. How much did he pay for all? *Answer*.....

11 Five girls buy a present costing 25 cents. How many cents does each pay? *Answer*.....
12 If a train goes 60 miles in three hours, how far does it go in one hour? *Answer*.....
13 John has saved \$3.75. How many dollars more does he need to buy a pony which costs \$45.75? *Answer*.....
14 A man pays the street-car fare for himself and two friends. If the fare is 7¢, how much change should he receive from a half dollar? *Answer*.....
15 A train which was due at 2 P.M. was $3\frac{1}{2}$ hours late. When did it arrive? *Answer*.....

16 What is the cost of 10 oranges at 2 for 5 cents? *Answer*.....
17 Edward has \$1.67 in the bank and takes out 2 quarters, a dime, and a cent. How much does he have left in the bank? *Answer*.....
18 What is the cost of a $4\frac{3}{4}$-pound roast at 40 cents a pound? *Answer*.....
19 A boy saved 5 cents a day for two weeks, and 10 cents a day for the next four weeks. How much money does he then have? *Answer*.....
20 A gallon is equal to 231 cubic inches. How many gallons are there in a tank $6 \times 7 \times 11$ inches? *Answer*.....

21 The tax rate in an Eastern city has varied as follows: 1910, 21¢ on each \$100; 1911, 17¢ on each \$100; 1912, 27¢ on each \$100; 1913, 26¢ on each \$100; 1914, 34¢ on each \$100; 1915, 33¢ on each \$100. The highest rate was how many times as great as the lowest? *Answer*.....

Go right on to next page.

TEST 5, CONTINUED

22 Henry was marked 87 in geography the first month, 91 the second, and 93 the third month. What was his average grade? *Answer*.....

23 If the butcher's scales read one ounce too much on each weighing, how much is a customer overcharged on a pound of steak at 48¢ a pound? *Answer*.....

24 At $1.00 a bushel for potatoes and $30.00 a car for freight, how much will a 400-bushel carload of potatoes cost? *Answer*.....

25 Tom has just 4 weeks' vacation and wishes to spend it in a city which it takes two days to reach by train. How many days can he spend in the city? *Answer*.....

26 If a fence rail is 10 feet long, how many rails will it take to reach a mile? *Answer*.....

27 Sound travels about 1100 ft. a second. If you see the flash of a cannon and 12 seconds later the sound reaches you, how far away is the cannon? *Answer*.....

28 A man had $5000, from which he received 6 per cent income each year. In addition he earned $1500 in business. What was his total income for the year? *Answer*.....

29 Frank and George buy 300 marbles for 50 cents. Frank pays 35 cents and George 15 cents. How many marbles should George receive? *Answer*.....

30 If a watch gains 20 seconds in 24 hours, what fraction of a minute will it gain between noon and 6 P.M.? *Answer*.....

31 The heights of 4 boys in a class are 5 feet 10 inches, 5 feet 9 inches, 5 feet 7 inches, and 5 feet 6 inches. What is the average height? *Answer*.....

32 An article which formerly sold at 12 cents was raised to 18 cents. What per cent was the price advanced? *Answer*.....

33 A broker charges $25 commission on every sale plus 5 per cent on all over $200. What would be his commission on a $500 sale? *Answer*.....

34 If 72 per cent of potatoes is water, how many pounds of solid material are there in a ton of potatoes? *Answer*.....

35 A man invested $1000 in each of 3 different bonds. The first paid 8 per cent dividend and the second 6 per cent, but on the third he lost $5 on each hundred dollars invested. What was his net yearly gain on the three investments? *Answer*.....

36 If the circumference of a circle is 12.5664 feet, what is its diameter? *Answer*.....

37 The regular price of a certain piece of linen is $4 per yard. A remnant $1\frac{1}{4}$ yards long is offered at $2.50. What per cent reduction is made? *Answer*.....

38 A man six feet tall casts a shadow 8 feet long at 9 A.M. A telephone pole casts a shadow 100 feet long at the same time. How high is the pole? *Answer*.....

39 It costs 43 cents to send a 10-pound parcel post package from New Orleans to Dallas. What will it cost to send an 8-pound package if the cost is 3 cents more on the first pound than on additional pounds? *Answer*.....

40 If the hour hand of a clock is 3 inches long and the minute hand is 4 inches long, how far apart are the tips of the two hands at 9 A.M.? *Answer*.....

Test 5. Number right ..... × 4 = *Score* .....

TEST 6. NATURE STUDY AND SCIENCE

Samples: The number of cents in a dollar is 200 100 300
Our rain comes from the clouds moon stars
Draw a line under the word that makes the sentence true.

Begin here.

1 Thanksgiving comes in July January November 1
2 The earth is shaped most like a baseball football pear 2
3 A sweet-smelling flower is the daisy poppy rose 3
4 The month before July is May June August 4
5 The axle is a part of an ax typewriter wagon 5

6 Alfalfa is a kind of corn fruit hay 6
7 Bacon comes from the cow hog sheep 7
8 An animal that builds dams is the alligator beaver turtle 8
9 Raisins are dried currants gooseberries grapes 9
10 London is in England Scotland Wales 10

11 The dahlia is a kind of animal flower fruit 11
12 The tractor is used in farming mining racing 12
13 Tarts are a kind of drink pastry vegetable 13
14 Planes are used chiefly by barbers blacksmiths carpenters 14
15 Rubber is obtained from animals oil trees 15

16 The antelope is a kind of deer rabbit wolf 16
17 The number of quarts in a gallon is 2 4 6 17
18 A telescope makes things look larger prettier smaller 18
19 Chop suey is a dish of the Chinese Indians Mexicans 19
20 A flower that grows from a bulb is the lily marigold poppy 20

21 The compass is used chiefly by sailors surgeons tailors 21
22 Serge is a kind of cloth drink wood 22
23 The article costing the least is coat gloves overcoat 23
24 The anvil is used by blacksmiths carpenters printers 24
25 A food requiring many eggs is "angel food" bread marmalade 25

26 Rye is most like beans corn wheat 26
27 The cotton gin was invented by Arkwright Watt Whitney 27
28 Beets are used for making catsup sugar jellies 28
29 The earth moves completely around the sun in about 7 days 30 days 365 days 29
30 The most gold is produced in Alaska New York Tennessee 30

31 The lungs take from the air carbon dioxide nitrogen oxygen 31
32 The tadpole is the young of the fish frog lizard 32
33 Most of our anthracite coal comes from Alabama Colorado Pennsylvania 33
34 Molasses is obtained from grapes honey sugar cane 34
35 A great clothing-manufacturing state is Massachusetts Oregon Texas 35

36 A food rich in fats is butter eggs tapioca 36
37 An important meat-packing city is Chicago New Orleans Seattle 37
38 Lard comes from butter cattle hogs 38
39 A food containing considerable oil is rice potatoes walnuts 39
40 Linen is made from cotton flax hemp 40

41 The United States exports coffee cotton tea 41
42 A tree that will grow from cuttings is the oak pine willow 42
43 Organdie is a kind of cloth marmalade musical instrument 43
44 The common house fly often lays its eggs in leaves manure water 44
45 The greatest sugar-exporting country is Brazil Cuba Mexico 45

Go right on to next page.

TEST 6, CONTINUED

46 The Leghorn is a kind of **cow fowl goat** 46
47 The panther is most like the **cat dog wolf** 47
48 Electric lights were invented by **Edison Marconi Volta** 48
49 The most wool is produced in **Australia France Holland** 49
50 Calcutta is a city in **China Egypt India** 50
51 Tapioca is chiefly **fat starch sugar** 51
52 The largest state in the Union is **California New York Texas** 52
53 The freezing point on the Centigrade thermometer is **0° 32° 100°** 53
54 The tooth's enamel is broken down by **acids carbon dioxide starches** 54
55 Air and gasoline are mixed in the **accelerator carburetor gear-case** 55
56 A crop which enriches the soil is **clover potatoes tobacco** 56
57 Distance above sea level is known as **altitude latitude longitude** 57
58 The house fly spreads **bubonic plague typhoid yellow fever** 58
59 A very important product of Minneapolis is **automobiles flour meat** 59
60 A food that has much the same food substance as rice is **beans peas potatoes** 60
61 A gross equals **64 144 500** 61
62 Milk testers were devised by **Babcock Bell Edison** 62
63 The coarsest of these threads is No. **40 60 80** 63
64 The differential is a part of an **auto bicycle typewriter** 64
65 The largest planet is **Jupiter Neptune Saturn** 65
66 A plant that can be grafted is the **apple tree lily potato** 66
67 The normal temperature of the human body is about **60° 98° 112°** 67
68 Alcohol is made from **gasoline grains oils** 68
69 An avalanche causes destruction by **burning sliding spouting** 69
70 Most automobiles are manufactured in **Michigan New York Iowa** 70
71 The Nile is in **Africa Asia Europe** 71
72 A country that imports nearly half its food is **England France Germany** 72
73 Bronchitis resembles most **dyspepsia headaches sore throat** 73
74 A common ingredient of matches is **calcium iodine phosphorus** 74
75 A body that shines by reflected light is the **moon North Star sun** 75
76 Monsoons are a kind of **plain plateau storm** 76
77 The days are longest in **March July October** 77
78 The largest amount of corn is shipped from **Denver Omaha Pittsburgh** 78
79 Tokyo is a city of **China India Japan** 79
80 A place for storing weapons is called an **abattoir arsenal cafeteria** 80
81 A plant that thrives best in dry places is the **lichen lily mushroom** 81
82 The dictaphone is a kind of **multigraph phonograph typewriter** 82
83 The Wyandotte is a kind of **fowl sheep watermelon** 83
84 Linotypes are used in **printing surveying weaving** 84
85 An eight-sided figure is called an **octagon scholium trapezium** 85
86 "Pi" is equal to **.7854 3.1416 .6666** 86
87 Croquettes are a kind of **food ornament weapon** 87
88 A botanist is one who studies **animals minerals plants** 88
89 The technical name for hard coal is **anthracite bituminous lignite** 89
90 Air brakes are used on **automobiles balloons trains** 90
91 Deltas tend to grow **larger smaller wetter** 91
92 The Angora is a kind of **chicken goat sheep** 92
93 One of the lightest-known metals is **aluminum tin zinc** 93
94 The most expensive of these rugs is **Axminster Brussels Oriental** 94
95 Fondant is a kind of **candy meat salad** 95

Number right .....

Number wrong ..... ÷ 2 = ...

Test 6. Score (subtract) .....

TEST 7. HISTORY AND LITERATURE

Draw a line under the word that makes the sentence true.

1 An elf is a kind of **animal brownie dragon** 1
2 "The Glass Slipper" reminds us of **Ali Baba Cinderella Goldilocks** 2
3 The first President of the United States was **Adams Jefferson Washington** ... 3
4 The shepherd boy who became king was **David Saul Solomon** 4
5 Columbus made his first voyage to America in **1492 1620 1776** 5

6 The highest officer of a city is the **alderman chief of police mayor** 6
7 Apollo was the god of **rivers the sun wind** 7
8 A battle of the Revolution was **Bull Run Bunker Hill Tippecanoe** 8
9 The god of mischief was **Asgard Loki Mimir** 9
10 Mount Olympus is located in **Greece Italy Washington** 10

11 Hiawatha was written by **Bryant Longfellow Whittier** 11
12 The Declaration of Independence was signed in **1776 1781 1789** 12
13 A name made famous by Longfellow is **Matthew Arnold Admiral Dewey Paul Revere** .. 13
14 Kings are supposed to rule for **4 years 8 years life** 14
15 "The Children's Hour" was written by **Longfellow Riley Stevenson** 15

16 The Quakers came from **England France Holland** 16
17 Ulysses captured Troy by hiding in a **forest load of hay wooden horse** 17
18 The country which helped America in the Revolution was **England France Germany** .. 18
19 Goliath was slain by **David Joseph Samson** 19
20 Thor lost his **armor chariot hammer** 20

21 "Uncle Tom's Cabin" was written by **Alger Sewell Stowe** 21
22 Louisiana was purchased by **Jefferson Madison Polk** 22
23 Peter Pan is the name of a **boy dog man** 23
24 The slaves were freed by **Jefferson Lincoln Washington** 24
25 The first white man to see the Pacific was **Balboa Cabot Vespucci** 25

26 The United States was allied in the Great War with **Bulgaria France Turkey** .. 26
27 "Treasure Island" tells about **Long John Micawber Uncas** 27
28 Madame Curie is noted for the discovery of **platinum radium pyrite** 28
29 "The Star-Spangled Banner" was written by **Alcott Burns Key** 29
30 The earliest of these inventions was **railroad stagecoach steamboat** 30

31 Foreigners can obtain the right to vote by **habeas corpus naturalization purchase** .. 31
32 "The Legend of Sleepy Hollow" tells about **Ichabod Crane Hiawatha Pinocchio** .. 32
33 Robert E. Lee surrendered to **Grant Sheridan Sherman** 33
34 New York was settled by the **Dutch English French** 34
35 Minnehaha means **falling leaves laughing waters whispering pines** 35

36 The most important qualification for a voter is **generosity intelligence wealth** .. 36
37 The king who let the cakes burn was **Alfred Arthur William** 37
38 Inability to pay debts is called **bankruptcy embezzlement vagrancy** 38
39 The messenger of the gods was called **Mercury Perseus Vulcan** 39
40 Virginia was settled by the **English French Spanish** 40

41 "Oliver Twist" was written by **Dickens Scott Thackeray** 41
42 Roger Williams was a **colonizer judge merchant** 42
43 Valley Forge relates to the **Civil War Revolution War of 1812** 43
44 Sherlock Holmes was a **detective sailor thief** 44
45 A man who betrayed his country was **Arnold Cornwallis Lee** 45

Go right on to next page.

TEST 7, CONTINUED

46 The number of United States Senators from each state is 1 2 4 46
47 "The Man Without a Country" was written by Cooper Hawthorne Hale ... 47
48 A general in the Civil War was Lincoln Sherman Washington 48
49 The name "Old Ironsides" refers to a man mountain ship 49
50 A President who was assassinated was Garfield Roosevelt Taylor 50
51 The British Prime Minister in 1918 was Lloyd George Balfour Asquith 51
52 The Red Cross was founded by Clara Barton Jenny Lind Rockefeller 52
53 Legal authority over a dead man's estate is given to an administrator judge jury .. 53
54 Barbara Frietchie sympathized with the English South Union 54
55 Grover Cleveland was a general an inventor a President 55
56 The crime which brings the greatest punishment is larceny manslaughter murder .. 56
57 The chief cause of the Mexican War was disputed territory immigration slavery .. 57
58 The stork reminds us of Holland Italy Scotland 58
59 Cornwallis surrendered at Appomattox Bunker Hill Yorktown 59
60 "Treasure Island" was written by Alger Defoe Stevenson 60
61 The "spoils system" refers to farming political offices tariff 61
62 Jesus was betrayed by Herod Judas Pilate 62
63 Louisiana was purchased from the French Indians Spanish 63
64 The son of Abraham was Isaac Moses Solomon 64
65 Lewis and Clark explored The Great Lakes The Mississippi Valley The Northwest .. 65
66 The number of men in the Light Brigade was 600 500 400 66
67 The War of 1812 was fought against England Mexico Spain 67
68 Among the allies of Germany was Belgium Bulgaria Roumania 68
69 One of Robin Hood's men was Ivanhoe Lancelot Little John 69
70 Each state has the power to coin money declare war establish schools 70
71 A great Scotch poet was Burns Chaucer Milton 71
72 The general who surrendered at Yorktown was Burgoyne Cornwallis Lafayette .. 72
73 A gnome is a kind of dwarf giant priest 73
74 "Treasure Island" tells about Black Dog Fagin Miss Hazy 74
75 The vessel which overcame the Merrimac was the Monitor Old Ironsides Wasp .. 75
76 A man known for his strength was Abel David Samson 76
77 One who lives in the poorhouse is legally a bankrupt delinquent pauper 77
78 "A Tale of Two Cities" tells of the American Revolution Civil War French Revolution .. 78
79 Ivanhoe is a character from Dickens Scott Wordsworth 79
80 Circe changed the men of Odysseus into horses stones swine 80
81 In 1917 there was a great Revolution in Germany Russia Turkey 81
82 A writer of mystery tales was Dickens Poe Scott 82
83 "Styx" was the name of a giant god river 83
84 A city is most likely to own its electric lights gas plant water system 84
85 The author of "Innocents Abroad" is Hawthorne Stevenson Mark Twain ... 85
86 The American Revolution was chiefly a dispute over boundary lines slavery taxation 86
87 "The Last of the Mohicans" was Hiawatha Mowgli Uncas 87
88 Wallace Irwin is an actor baseball player writer 88
89 Coleridge wrote "Ancient Mariner" "Hiawatha" "Thanatopsis" 89
90 The Chautauqua is a kind of entertainment museum music 90
91 A word that means exactly the opposite of joy is sad sorrow sorry 91
92 Marco Polo was a famous philosopher traveler warrior 92
93 "The Charge of the Light Brigade" was written by Burns Longfellow Tennyson .. 93
94 The Mohammedan Bible is the Bagavad-gita Koran Zend-Avesta 94
95 The singular of "are" is is was were 95

Number right .....

Number wrong ..... ÷ 2 = ...

Test 7. Score (subtract) .....

TEST 8. LANGUAGE USAGE

Samples

Apples is / are good.

He told / telled me.

1 I calculate / expect to go soon.

2 Last year uncle gave / give me a pair of skates.

3 His leg was broke. / broken.

4 They have gone / went to town.

5 He isn't any / no better than you.

6 Always bathe / wash your hands before eating.

7 I have a heap / great deal of work to do.

8 We had a delicious / delightful time at the party.

9 The earthquake hurt / damaged four buildings.

10 I had sat / set there for an hour.

11 Yourself / You and your guests are invited.

12 I saw / seen him do it.

13 I think dominoes is an interesting game. / sport.

14 My father is very mad at / angry with me.

15 We had only started till / when Joe came.

16 The news are / is bad today.

17 Where are you going? / going to?

18 They fight as / like demons.

19 I told him to quickly run home. / to run home quickly.

20 He doesn't / don't know anything.

21 I think you had ought / ought to go.

22 I asked him which one he chose. / choosed.

23 This battle transpired / occurred in 1863.

24 He does not go / He goes to school only on Mondays.

25 The idea that the moon is made of cheese is erroneous. / ridiculous.

26 It is they / them who should be blamed.

27 He went to prison for his crimes. / sins.

28 That fellow is no good. / worthless.

29 I remember / remember of seeing him there.

30 He burst / busted a blood vessel.

Go right on to next page.

TEST 8, CONTINUED

31 He acted the part perfect. / perfectly.

32 He worked with much snap. / vigor.

33 He sat / set the vase on the table.

34 Rain has been plenty / plentiful this season.

35 The prisoner finally admitted / declared he was guilty.

36 I have often ridden / rode a horse.

37 He went in search of / for his sheep.

38 I have often risen / rose early.

39 The honest person is to be applauded. / commended.

40 He is disinterested / uninterested in history.

41 He has an appointment / a date with the president.

42 We charged and occupied / possessed their trenches.

43 Slavery was abolished / destroyed in 1863.

44 His attack on my character made me indignant. / peevish.

45 One is not qualified / fit to vote at the age of 18.

46 I have often rang / rung this bell.

47 My work is much / very different this year.

48 He caught nearly / nearly caught a hundred fish.

49 He laid / lay down and went to sleep.

50 All went but I. / me.

51 Charity is when one gives / means giving to the poor.

52 It is now plain and evident / evident why he left.

53 Are you sure he shall / will succeed?

54 Arson means where one sets / setting fire to property.

55 I can hardly endure / stand him.

56 Each man and woman was / were present.

57 Why cherish / pursue a vain hope?

58 I wish John was / were here.

59 He has no fear; nothing can confuse / daunt him.

60 Is that he? / him?

Number right .....

Number wrong .....

Test 8. Score (subtract) .....

TEST 9. DICTATION EXERCISE

Test 9. Full score for easier sentences not dictated .....

Number right in sentences dictated .....

Sum ..... × 2 = *Score* .....