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Educational achievement of a rural school relative to the national norm.

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EDUCATIONAL ACHIEVEMENT OF A RURAL SCHOOL
RELATIVE TO THE NATIONAL NORM

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EDUCATIONAL ACHIEVEMENT OF
A RURAL SCHOOL RELATIVE TO THE NATIONAL NORM

by

Katherine M. Dwyer

A problem presented in partial fulfillment of
the requirements for the Master of
Science Degree
University of Massachusetts
1947

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THE INTRODUCTION

CHAPTER I

THE INTRODUCTION

One of the major emphases in education of late years has been the evaluation of our educational offerings. We now have many very good objective tests available for the measurement of various phases of education. These measurements make it possible to compare the results of educational experiences in various types of school systems.

The Small School -- One of the most important, as well as numerous types of school systems, is the so-called "small school." A school may be small either because of pupil enrollment or the size of the community it serves. Educators do not agree as to the enrollment necessary to classify a school as being a "small school." The division between the large and small school comes at some point between 150 and 300 students. Generally, it can be said that any school with an enrollment of less than 150 students is a small school.¹

In 1936, of the total number of high schools in the United States, 72 percent had an enrollment of 150 or fewer. Nearly all schools enrolling fewer than 150 pupils are located in rural areas, while most of those enrolling over 300 are found in cities.² Of the 22,237 public high schools in this country, 53 percent or 12,007 had enrollments of fewer than

1. Langfitt, R. E., Cyr, Frank, Newsom, N. Wm. The Small High School at Work p.36

2. Ibid, p. 36

100 pupils: 16,610 or 74 percent, 200 or fewer pupils; and 18,243 or 82 percent fewer than 300 pupils.³

The fact that so many are enrolled in small schools would in itself make it imperative that those attending such schools have the same opportunities in education as would be found in institutions of larger enrollments. This is not the case. The problems that the small schools face make it impossible for them to afford the same opportunities as are offered by the larger schools. These problems confronting the small secondary schools are; finances, poorly planned and equipped physical plants, inadequate curriculum, and a weak extra-curricular program.⁴

The Rural School -- Problems of the small schools become more pronounced when these schools are located in rural areas, a community of fewer than 2,500 inhabitants. The opportunities that the rural school may offer to its students are limited by many factors.

From the economic standpoint the rural school cannot compete with larger city schools. Rural schools have never had the financial support that has been given to urban schools. It is a well-known fact that states with a largely rural population have not been able to meet the national standards in the amount of funds necessary to offer educational opportunities

3. Biennial Survey of Education in the United States, Bulletin 1931, No. 20, Vol. 2, pp. 699-702.

4. Works, Geo., Lesser, Simon Rural America Today, Its Schools and Community Life pp. 25-37.

needed by American students. These conditions result in salaries for rural teachers which are somewhat less than half the salaries of urban teachers.⁵ Such low salaries force rural teachers to seek better paying positions in city schools.

Rural schools do not have a flexible course of study, and this is because of limited enrollments and funds. The curriculum of the small school is restricted. With the exception of possible courses in home economics and agriculture, few if any opportunities are offered, outside a college preparatory course. This single college course answers the future needs of but one-eighth of the students enrolled in rural secondary schools.⁶

Teachers in rural areas, because of low salary, inexperience and rapid turnover are not the caliber of those found in prosperous, better paying urban areas.⁷

Rural children are not exposed to the cultural environment that is prevalent in the cities. Rural students are children of unskilled workers with few professional representatives in their numbers. Libraries, of a school nature, are, for the most part, nonexistent. If, as it has been stated, rural students are not on a scholastic par with those of urban schools, the reasons are understandable. The Iowa Welfare Station says that rural children are not inferior

5. Marsh, C. S. Committee on Rural Education The Rural Child in the War Emergency, Chapter IV, p 18

6. Works, Geo., Lesser, Simon op. cit. p 36

7. Ibid, pp 25-26

to city children at the beginning of the educational climb.⁸
The difference between the two is brought about by inequalities of educational opportunities.

National Norms -- Every accredited statistical measure has shown that the education received in rural areas is below the national norm.⁹ Why the rural school, which has within it 13 million pupils, should fall below the national norm, as proven by accredited testing, is clear.

These educational measuring tests, to which the students of the nation are subjected, are not especially adapted to rural boys and girls. Rather, these tests contain vocabularies and questions which are relative to the living and environment of urban areas. In tests where facility in reading and language uses do not count greatly, it has been found that the rural student is above the national norm.¹⁰

The Attendance -- One of the unique problems of the rural school is that of attendance. Rural school attendance, particularly in agrarian sections, is regulated by the four seasons. In these agricultural localities the school term is shortened to allow for the planting and harvesting of crops,

8. "Iowa Welfare Research Station Report." Nations' Schools
Vol. 7, No. 6, 1931

9. Woffard, Kate, Modern Education in the Small Rural School
pp 42-43

10. "Iowa Welfare Research Station Report." op. cit. p 76

which means early closings in the Spring and late openings in the Fall. In many rural areas the Winter with its inaccessible roads is another cause for a shortened school term.

This Study -- This particular study deals with a small rural high school in an agricultural area. It has all the problems of the typical small rural school; inadequate funds, inflexible curriculum, poor physical plant, and a school term continually interrupted by farm employment. In this school, standardized tests were given to determine the relation of these rural high school students to the national scholastic norm.

STATEMENT OF PROBLEM AND PROCEDURE

CHAPTER II

STATEMENT OF PROBLEM AND PROCEDURE

This study is concerned with the position of rural students relative to the national norm of educational achievement. To determine this relation three tests were given. These tests included an Intelligence Test, and two standardized Achievement Tests.

The Problem -- How do test scores of students in a small rural high school compare with national norms in such fields as reading, mathematics, social science, natural science and language?

The Subjects -- The subjects used in this study were 120 students enrolled in Grade 9, Grade 10, Grade 11 and Grade 12. These students were enrolled at Hopkins Academy in Hadley, Massachusetts, which is a small rural high school.

The Material -- The materials upon which this study was based included; the Otis Group Intelligence Test,¹ the Iowa Tests of Educational Development,² and the Progressive Achievement Test.³

The general headings of the Iowa Tests were:

1. Understanding of Basic Social Concepts
2. Background in Natural Sciences
3. Correctness in Writing
4. Ability to do Quantitative Thinking
5. Interpretation of Reading in Social Studies

-
1. Otis, Arthur S. Otis Group Intelligence Scale
 2. State University of Iowa Science Research Associates, The Iowa Tests of Educational Development
 3. Tiegs, Ernest W. and Clark, Willis W. Progressive Achievement Tests, Advanced Battery Form A

6. Interpretation of Reading in Natural Sciences
7. General Vocabulary
8. Uses of Sources of Information
9. Interpretation of Literature

The general headings of the Progressive Achievement Tests were:

1. Reading Vocabulary
2. Reading Comprehension
3. Mathematical Reasoning
4. Mathematical Fundamentals
5. Language

The Procedure

(a) Choice of Tests

The Otis Group Intelligence Scale was chosen in order to test to an approximate degree the general mental ability of those students to which this study applied.

The Iowa Tests of Educational Development and the Progressive Achievement Tests were both given in order to achieve some measure of the attainment, on the part of these students, of the objectives of secondary education.

(b) Administration and Scoring

These three tests were all administered by two members of the faculty.

The Progressive Achievement Test was hand scored by the two examiners. The Iowa Tests were machine scored. These tests were given under conditions approximate to those under which it was standardized. All scores had standardized norms.

(c) Tabulating Results

The scores were put into percentile ranks taking

into account the level at which the work was accomplished. From these percentile norms the mean average of the various grades in each specific subject was tabulated.

(d) Summary

An attempt was made to summarize the findings for each general subject for each of the four grades in the school.

The results of the study are found in Chapter III.

TEST RESULTS

CHAPTER III

TEST RESULTS

In the Spring of 1945, two achievement tests were given at Hopkins Academy in Hadley, Massachusetts. These were the Iowa Achievement Test and the Progressive Achievement Test devised by Tiegs and Clark.

The Iowa Test was divided into the following sections: Backgrounds in Social Studies and Natural Science; Correctness in Writing; Quantitative Thinking; Reading, which tested separately ability in the Social Studies, Natural Sciences and in Literature; and Uses of Information. The Iowa Tests propose to measure the basic skills necessary for success in senior high school rather than achievement in a particular grade.

The Progressive Achievement Tests covered five subjects; Reading Vocabulary, Reading Comprehension, Mathematical Reasoning, Mathematical Fundamentals and Language. Each of these main subjects was divided into as many as five sub-topics. The Progressive Achievement Tests aim to measure accomplishment in the basic skills of reading, language, and arithmetic.

Both tests were administered to the students by the same group of teachers and in each case were given over a period of two days. The Iowa Test was machine corrected by the Iowa Testing Bureau, while the Progressive Achievement Test was corrected within the school itself. In this study both tests used the percentiles which came with the teacher's manual. It must be noted that in the Iowa Test, the percentiles given were based on beginning-of-year norms though the test

was given in June, for that reason it is well to interpret these results with caution.

The results of both Achievement Tests have been classified under the various headings as is indicated by the paragraph headings below.

Intelligence Test Results -- To give some basis to this study the results of the Otis Group Intelligence Test were tabulated. This test was given throughout the Hadley School System in 1944. The results for the pupils in the various grades are to be found in Table I.

TABLE I

Summary of Results in the Otis Group Intelligence Test for the Four Grades

Results	Grades			
	9	10	11	12
132 - 136	1	0	0	0
127 - 131	3	0	0	0
122 - 126	3	1	0	1
117 - 121	8	4	3	1
112 - 116	5	1	2	1
107 - 111	8	3	3	2
102 - 106	4	5	2	5
97 - 101	4	2	1	3
92 - 96	3	1	0	2
87 - 91	0	0	1	0
82 - 86	0	1	2	1
77 - 81	0	1	0	0
Mean	112.8	106.6	105.9	105.7

Table I would show that Grade 9 meets about the normal level in Intelligence Quotient but that each of the other grades is lower on the average than might be expected. This

can be explained in part for Grade 10 by the fact that there are no pupils in the upper I. Q. brackets but one in each of the lower brackets which would bring the average down considerably. This is even more marked in Grade 11 where we find no students in the three upper brackets but one in the lower third and two in the lower second. Grade 12 has a mean comparable to Grade 11 and its case, too, may be explained in the same way.

Yearly Averages -- In this study the yearly average of each student was considered. The passing grade at Hopkins Academy is 60. There is a great variance in the curriculum of each student, with students following courses for college preparatory, business, or home economics. The great majority, however, take the General Course which includes some elements of each of the former three. The yearly averages of the students in the different grades may be noted in Table II.

TABLE II

Summary of Yearly Averages of the Students

Results	Grades			
	9	10	11	12
90 - 94	3	1	0	0
85 - 89	3	3	0	1
80 - 84	5	4	4	5
75 - 79	8	4	4	3
70 - 74	8	5	5	5
65 - 69	3	4	2	5
60 - 64	9	0	1	1
55 - 59	0	1	2	1
Mean	74.8	76.6	73.1	72.9

This table would show that the highest average was held by Grade 10. Grade 9, which holds the highest I.Q. average, falls somewhat below the mean that might be expected. This may be simply explained by the student's inability to adjust himself to the more mature curricula and methods of teaching. In senior high school students are often bewildered by the lack of elementary procedures to which they were accustomed in junior high school. Grades 11 and 12 have the grade averages that you would expect after having considered their I.Q. In both cases it will be noted that there are no students averaging as high as 90 and only one coming up to a mark of 85.

Vocabulary Tests -- Both of the Achievement Tests given contained a section devoted to vocabulary skills. The Iowa Test was designated as General Vocabulary and the Progressive Achievement as Reading Vocabulary. The results of both tests may be noted in Tables IIIa and IIIb.

TABLE IIIa

Reading Vocabulary Results From the Progressive Achievement Test

Percentiles	Grades			
	9	10	11	12
90	5	1	0	0
80	2	1	0	1
70	4	3	3	0
60	0	1	0	4
50	2	2	2	2
40	6	0	0	1
30	5	4	1	0
20	3	1	0	2
10	1	3	1	3
0	0	3	1	3
Mean	56.8	42.4	48.8	38.1

TABLE IIIb

General Vocabulary Results From the Iowa Achievement Test

Percentiles	Grades			
	9	10	11	12
90	4	1	1	0
80	5	1	2	2
70	7	1	3	2
60	6	3	2	4
50	5	1	2	3
40	1	4	1	1
30	0	6	0	3
20	9	3	5	1
10	1	1	2	4
0	1	4	0	3
Mean	58.6	40.2	51.7	43.3

Using the results in Tables IIIa and IIIb, we find that Grade 9 holds the highest means in both Vocabulary Tests. The other three grades fall short of the means attained by Grade 9 to a marked degree. In both tests Grade 9 has from four to five placements in the upper twenty percentiles and seven in the lower thirty percentiles. Grades 10 and 11, on the other hand, have but one student in the upper two percentiles. In the two lower percentiles Grade 9 has but one pupil while Grades 10, 11 and 12 have as many as four. Grade 11 ranks second to Grade 9 in both of the Vocabulary Tests, with mean averages of 48.8 and 51.7.

Reading Test Results -- The Iowa Test devoted three separate divisions to Reading. These were; Reading Literature, Reading Social Studies and Reading Natural Sciences. In the test devised by Tiegs and Clark, the entire material was

designated under the heading Reading Comprehension. The results for the four grades are found in Tables IVa, IVb, IVc, and IVd.

Reading Literature -- Table IVa shows the percentile ranks of the four grades in the Iowa Reading Literature Test.

TABLE IVa

Percentile Ranks of Reading Literature From the Iowa Test

Percentiles	Grades			
	9	10	11	12
90	4	2	0	0
80	4	1	2	0
70	4	1	1	3
60	5	3	0	2
50	5	1	3	2
40	4	1	0	1
30	3	3	4	1
20	4	9	4	2
10	3	1	2	5
0	3	3	2	7
Mean	53.0	40.2	38.3	30.7

This test in Reading Literature shows Grade 9 to have a mean average considerably higher than the other three grades. With the exception of Grade 9, each class has more pupils represented in the percentiles below 50 than in those above.

Reading Social Studies -- Table IVb shows the respective percentiles of the four grades in the Reading Social Studies Test of the Iowa Achievement.

This table would indicate that Grade 9 continues to show

a higher mean average than Grades 10, 11, and 12. Grade 9 has no pupils in the two lower brackets while Grade 10 has 4, Grade 11, 5 and Grade 12, 7. Here again, as in the Reading Vocabulary Test, Grade 11 placed second.

TABLE IVb

Percentile Ranks of Reading Social Studies From the Iowa Test

Percentiles	Grades			
	9	10	11	12
90	8	3	1	0
80	4	0	1	4
70	2	1	2	2
60	2	2	4	0
50	9	3	3	2
40	3	3	1	3
30	7	4	1	0
20	4	5	0	5
10	0	3	4	4
0	0	1	1	3
Mean	60.4	44.2	50.0	40.7

Reading Natural Science -- The third reading test included in the Iowa battery was the Reading Natural Sciences. The results for the pupils in the various grades are to be found in Table IVc.

In studying Table IVc we note that in the Reading Natural Science Test Grade 9 maintains the highest mean, while Grade 10 has the second highest mean average. This mean attained by Grade 9 can be explained by the fact that there are more students in the percentiles above 50 than there are below. Grade 12 has the lowest mean of the four grades. This low

mean of Grade 12 would be explained by the number of students in the zero percentile, the number being six.

TABLE IVc

Percentile Ranks of Reading Natural Sciences From the Iowa Test

Percentiles	Grades			
	9	10	11	12
90	4	2	2	0
80	6	1	0	2
70	5	1	5	2
60	6	3	0	2
50	3	1	3	2
40	4	1	1	2
30	2	3	2	0
20	5	9	1	4
10	2	1	0	3
0	2	3	4	6
Mean	57.3	40.2	49.4	35.9

Reading Comprehension -- The achievement test of Tiegs and Clark contained but one section on reading. This test was identified as Reading Comprehension.

TABLE IVd

Percentile Ranks of Reading Comprehension From the Progressive Achievement Test

Percentiles	Grades			
	9	10	11	12
90	5	2	0	0
80	1	1	2	0
70	9	4	1	1
60	2	1	1	1
50	1	1	1	1
40	3	2	1	3
30	4	1	0	1
20	2	4	0	6
10	1	2	1	1
0	0	1	1	2
Mean	62.9	50.3	53.8	33.7

The results of this test in Reading Comprehension show Grade 9 to hold the highest score with Grades 10 and 11 falling short of the mean attained by Grade 9. The poorest score of the four grades was made by Grade 12. This rank held by Grade 12 may be explained by the fact that no students placed in the upper two percentiles but three students are in the two lower percentiles. Grade 9 had five placements in the 90th percentile and none in the zero percentile. In this test of Reading Comprehension, Grade 11 again held the second highest mean.

Mathematical Test Results -- Student achievement in the field of mathematics was considered by both of the tests given. The Progressive Achievement devoted two sections to mathematical testing; namely, Mathematical Reasoning and Mathematical Fundamentals. The Iowa Achievement test covered all phases of mathematical skills by one test -- Quantitative Thinking.

The results for the pupils in the two mathematical tests of the Progressive Achievement may be found in Tables Va and Vb.

Mathematical Reasoning -- Table Va shows the student results in the Progressive Achievement Test of Mathematical Reasoning.

In this test on Mathematical Reasoning we find that the means attained by the four grades are somewhat higher than those in the preceding tests. Grade 9 has the mean average of 75. This score is explained by the number of students in

the upper two percentiles. Eight students placed in the 90th percentile and five in the 80th percentile, no students are to be found in the two lower percentiles. Both Grades 10 and 11 have means averaging above 50. Grade 12 which has no students in the upper percentiles, has three in the zero percentile and one in the tenth. These factors would explain the low mean of 43.1 made by Grade 10.

TABLE Va

Percentile Ranks of Mathematical Reasoning From the Progressive Achievement Test

Percentiles	Grades			
	9	10	11	12
90	8	1	0	0
80	5	2	1	3
70	8	6	2	1
60	1	0	0	1
50	2	2	3	0
40	1	0	1	4
30	2	2	0	1
20	1	3	0	2
10	0	2	0	1
0	0	1	1	3
Mean	75.0	52.9	56.2	43.1

Mathematical Fundamentals -- In Table Vb are tabulated the results of the four grades in Mathematical Fundamentals.

The following table shows both Grades 9 and 10 with scores well in advance of Grades 11 and 12. In the 90th percentile Grade 9 has five pupils and Grade 10 has two, neither Grade 11 nor 12 have any representatives in this bracket. Both Grades 9 and 10 have more students above the 50th

percentile than below it, while Grades 11 and 12 have the greater number of students below this 50th percentile.

TABLE Vb

Percentile Ranks of Mathematical Fundamentals From the Progressive Achievement Test

Percentiles	Grades			
	9	10	11	12
90	5	2	0	0
80	9	3	1	2
70	2	4	1	1
60	4	1	1	2
50	3	2	1	1
40	2	4	1	2
30	1	0	1	3
20	2	1	1	1
10	0	1	0	0
0	0	1	1	4
Mean	71.0	60.3	48.8	41.9

Quantitative Thinking -- In the following chart are the results of the four grades in the Iowa Achievement Test on Quantitative Thinking.

This table of Quantitative Thinking shows the means of the four classes to be lower than those averaged under the two mathematical tests of the Progressive Achievement. This difference shown in the mathematical skills is the greatest that has been evidenced to this point between any of the sections of the two achievement tests. Grade 9 has the highest mean as it had in both Progressive Achievement mathematical tests. This table shows Grade 10, which scored second to

Grade 9 in the preceding tests, to have the lowest mean average of the four grades.

TABLE Vc

Percentile Ranks of Quantitative Thinking From the Iowa Achievement Test

Percentiles	Grades			
	9	10	11	12
90	6	2	0	2
80	2	1	2	4
70	10	3	1	0
60	2	0	4	1
50	3	1	2	1
40	4	2	0	3
30	4	7	0	1
20	3	3	7	6
10	1	0	0	3
0	4	6	2	3
Mean	56.8	39.8	49.5	44.6

Miscellaneous Tests -- Included in both the Iowa and the Progressive Achievement were four separate tests, none of which had a counterpart in the other. These tests include Social Studies Background, Natural Science and Language.

Social Studies Background -- Table VI shows the ratings of the four classes in Social Studies Background.

In Social Studies Background we find Grade 9 with the highest mean and Grade 11 taking second place. Grade 10 falls below, to some degree, the means averaged by the other three grades. As Grade 10 has six placements above the 50th percentile, and 16 below this percentile, it is clear why her mean average is so low.

TABLE VI

Percentile Ranks of Social Studies Background From the Iowa Test

Percentiles	Grades			
	9	10	11	12
90	8	1	1	0
80	2	1	2	1
70	5	2	4	4
60	6	2	2	2
50	5	3	1	5
40	3	2	2	0
30	3	2	3	1
20	3	1	1	3
10	3	6	1	1
0	1	5	1	6
Mean	59.8	37.0	55.0	41.1

Natural Science -- One of the subdivisions of the Iowa Test was devoted to aptitude in the field of Natural Science. The conclusions brought forth by the various grades in this field may be noted in Table VII.

TABLE VII

Percentile Ranks of Natural Science From the Iowa Test

Percentiles	Grades			
	9	10	11	12
90	3	1	0	0
80	3	2	2	1
70	6	1	2	1
60	2	6	0	4
50	9	1	0	3
40	2	1	4	3
30	3	3	4	2
20	8	2	2	1
10	2	4	4	4
0	1	4	0	4
Mean	52.4	42.6	41.7	39.0

Grade 9, with a mean of 52.4 has the highest score of the four grades in the Natural Science test. This score may be understood by a comparative study of grade placements in the three upper percentile brackets.

Language -- The Progressive Achievement Tests devoted a section to Language skills. Results for this test are found in Table VIII.

TABLE VIII

Percentile Ranks of Language From the Progressive Achievement Test

Percentiles	Grades			
	9	10	11	12
90	7	3	0	0
80	4	1	1	2
70	5	1	2	1
60	4	2	0	2
50	2	1	0	1
40	2	3	2	2
30	3	2	2	3
20	1	3	0	1
10	0	2	0	0
0	0	1	1	4
Mean	70.3	49.7	50.0	41.9

A mean of 70.3, averaged by Grade 9, was the highest scored in this section devoted to Language. This score by Grade 9, is understandable from the fact that seven students were placed in the upper 20 percentiles and no students in the lower 20 percentiles. Twenty students held averages above the 50th percentile with but six students averaging below the 50th percentile. In this test the lowest mean of 41.9 was held by Grade 12.

Summary of Results for Reading Vocabulary -- The results shown above in comparing the four classes in various subjects are summarized below in terms of each class taken separately. In the tables showing reading percentiles the following records were made by the individual classes.

TABLE IX

Summary of Results for Reading Vocabulary

Percentiles	Grades			
	9	10	11	12
90	4	1	1	0
80	3	1	1	1
70	5	2	3	1
60	3	2	1	4
50	3	1	2	2
40	4	2	1	1
30	2	5	1	1
20	6	2	2	1
10	1	2	1	3
0	1	3	1	3
Mean	57.7	41.4	50.2	40.7

Summary of Results for Reading Comprehension -- Table X shows the averaged results of four separate tests on Reading Comprehension. These tests were: Reading Social Studies, Reading Natural Sciences, Reading Literature, and Comprehensive Reading.

TABLE X

Summary of Results for Reading Comprehension

Percentiles	Grades			
	9	10	11	12
90	5	2	1	0
80	4	1	1	1
70	5	2	2	2
60	4	2	1	1
50	4	1	2	2
40	3	2	1	2
30	4	3	2	0
20	4	7	1	4
10	1	2	2	3
0	1	2	2	4
Mean	58.4	43.7	47.9	37.0

Summary of Results in Mathematics -- In this study three tests were devoted to Mathematics. They were: Mathematical Reasoning, Mathematical Fundamentals and Quantitative Thinking. Table XI gives the averaged means and percentile placements of the three mathematical tests.

The following table shows the class records made in Mathematics.

TABLE XI

Summary of Results for Mathematics

Percentiles	Grades			
	9	10	11	12
90	6	2	0	1
80	5	2	1	3
70	7	4	1	1
60	2	0	2	1
50	3	2	2	1
40	2	2	1	3
30	2	3	0	2
20	2	2	3	3
10	0	1	0	1
0	1	3	1	3
Mean	67.6	51.0	51.5	43.2

CONCLUSIONS FROM THE STUDY

CHAPTER IV

CONCLUSIONS FROM THE STUDY

The object of this study has been to compare, through the use of achievement tests, the mean averages of the grades in various subjects with the national norm. In Chapter III, the results of each test, were given in complete form.

A summary of the findings of this study is to be found below:

Summary of Results

(1) The mean Intelligence Quotient of the pupils in the various grades were as follows: Grade 9, 112.8; Grade 10, 106.6; Grade 11, 105.9; and Grade 12, 105.7. These means show the Intelligence Quotient to be above that considered normal for the secondary school, although the means for the classes do not follow the pattern usually found. In most cases the means averaged by the classes become higher as the grades advance. This improvement of means, as the grades advance, is due to retardation and elimination of the slower pupils.

(2) Yearly Averages -- The yearly averages of the four grades were: Grade 9, 74.8; Grade 10, 76.6; Grade 11, 73.1; and Grade 12, 72.9. A general average is considered to be about 75. In this study, the approximate average of 75 was nearly met in three classes and bettered by one.

(3) Reading Vocabulary -- The means of the classes in Reading Vocabulary were as follows: Grade 9, 57.7; Grade 10, 41.4; Grade 11, 50.2; and Grade 12, 40.7. These means show only two classes to be above the national norm. Grade 12, which should have averaged the highest mean of the four

classes, had the lowest mean score. This mean of 40.7 was below the norm to a considerable degree.

(4) Reading Comprehension -- In Reading Comprehension the class means were: Grade 9, 58.4; Grade 10, 43.7; Grade 11, 47.9; and Grade 12, 37. In this test only Grade 9 was above the norm. In the case of Grades 10, 11, and 12, each fell below.

(5) Mathematics -- The means in the Mathematical Test of the four grades were: Grade 9, 67.6; Grade 10, 51; Grade 11, 51.5; and Grade 12, 43.2. The three lower classes have a mean above the national norm, whereas, Grade 12, with a mean of 43.2, fails to meet this standard.

(6) Social Studies -- The means of the four classes in this test were: Grade 9, 59.8; Grade 10, 37; Grade 11, 55; and Grade 12, 41.1. Both Grades 9 and 11 are above the national norm, whereas Grades 10 and 12 are below.

(7) Natural Science -- The means in the Natural Science section were as follows: Grade 9, 52.4; Grade 10, 42.6; Grade 11, 41.7; and Grade 12, 39. In this test the classes fell below the norm in three instances; namely, Grades 10, 11, and 12. Grade 9 again was slightly above the norm.

(8) Language -- In the Language test the mean averages of the classes were: Grade 9, 70.3; Grade 10, 49.7; Grade 11, 50; and Grade 12, 41.9. In this test Grade 9 had a mean average considerably higher than the norm, while Grades 10 and 11 just met this standard. With a mean of 41.9, Grade 12 fell, to a marked degree, short of the norm.

(9) Grade 9 -- Of the four grades, Grade 9, alone, maintained all test scores above the national norm. In this class a large proportion of students consistently placed in the upper percentiles with few, and sometimes none, ranking in the 0-20th percentile.

(10) Grade 10 -- Grade 10 made a poor record. In five tests they fell below the national norm and in only one did they score above this norm. In this class there were evidently several poor students who made consistently low scores, thereby pulling down the entire class. This is shown even more clearly in the profile charts in the appendix where it is evident that the low pupil is low in everything and so far down on the chart as to have a decided effect on the mean percentiles.

(11) Grade 11 -- Grade 11 was above the national norm in four tests and below in two.

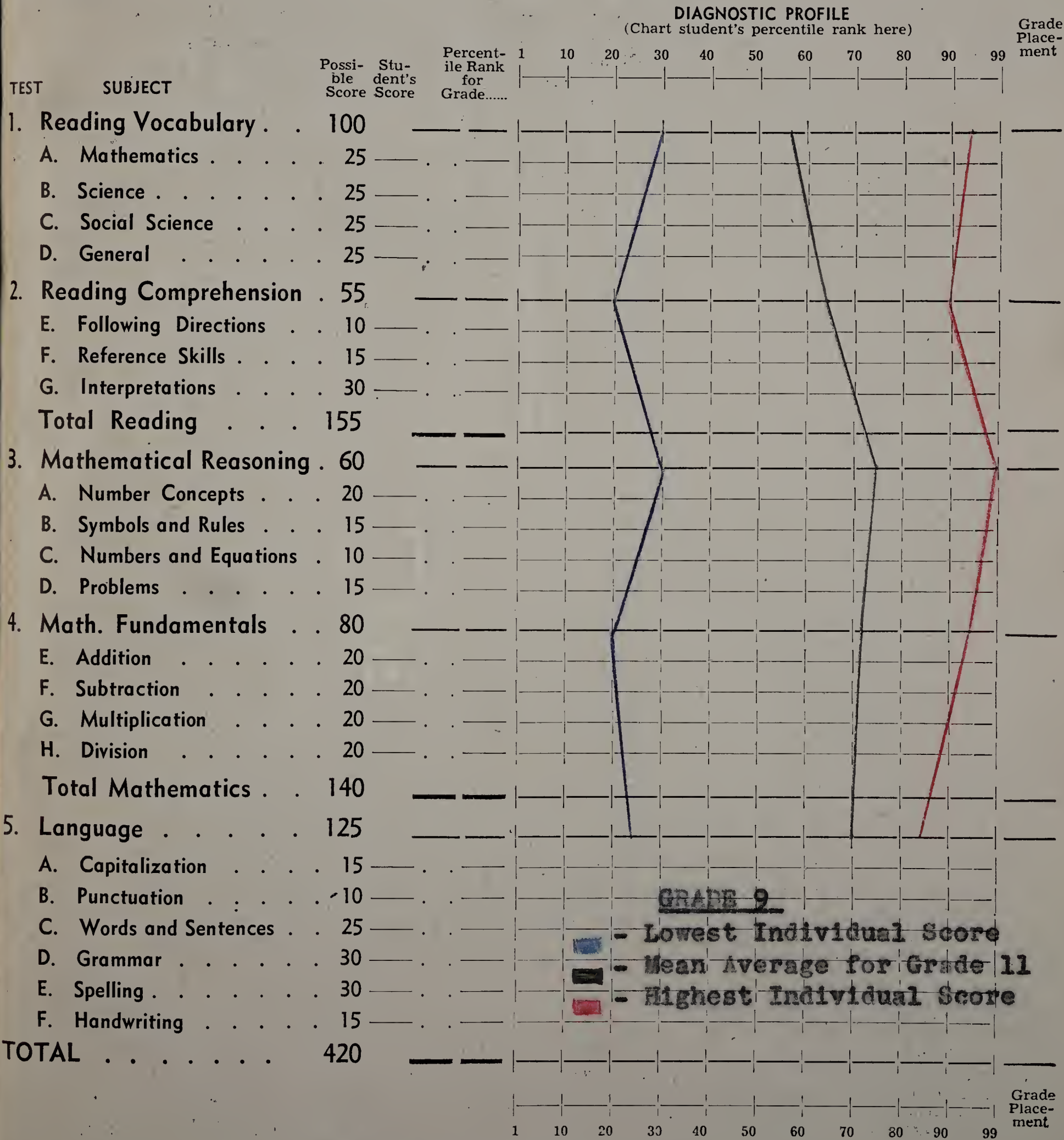
(12) Grade 12 -- Of the four classes, the poorest record was made by Grade 12. Grade 12 was below the national norm in each of the eight subject tests. Looking at the various profile charts, one notes that as in the case of Grade 10, the mean averages of Grade 12 are kept down by a number of students who in each test rank in the lowest percentiles.

APPENDICES

PROGRESSIVE ACHIEVEMENT TESTS—ADVANCED BATTERY, Form A
(Diagnostic Tests Keyed to the Curriculum)

Devised by Ernest W. Tiegs, Dean, University College, The University of Southern California,
and Willis W. Clark, Director of Research and Guidance, Los Angeles County Schools.

Name _____ Grade _____ Sex: Male—Female
School _____ Age _____ Birthday _____
Teacher _____ Date _____



DIAGNOSTIC ANALYSIS OF LEARNING DIFFICULTIES

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Once an adequate diagnosis has been made, remedial instruction is frequently a simple matter. However, teachers have in the past found the clerical work incident to following each individual student a heavy burden. Such extra work is almost completely eliminated if this diagnostic analysis is torn from the test booklet and kept on the teacher's desk, where the various items may be checked off as the student masters them.

READING

1. Reading Vocabulary

A. MATHEMATICS:

_____ Basic vocabulary.....1-25

B. SCIENCE:

_____ Basic vocabulary.....1-25

C. SOCIAL SCIENCE:

_____ Basic vocabulary.....1-25

D. LITERATURE:

_____ Basic vocabulary.....1-25

2. Reading Comprehension

E. FOLLOWING SPECIFIC DIRECTIONS:

_____ Directions in mathematical situations.....1, 2, 5, 9, 10
_____ Reading definitions and following directions.....3, 4, 6, 7, 8

F. REFERENCE SKILLS:

_____ Vocabulary.....1-6
_____ Use of index.....7-9
_____ Selecting references.....10-13
_____ Report outline.....14-15

G. INTERPRETATION OF

MEANINGS:

_____ Selecting topic or central idea.....1, 10
_____ Understanding directly stated facts.....4, 5, 7, 8, 11, 12, 13, 14, 19, 22, 26, 28, 29
_____ Making inferences.....2, 3, 6, 9, 15, 16, 17, 19, 20, 21, 23, 24, 25, 27, 30.

MATHEMATICS

3. Mathematical Reasoning

A. NUMBER CONCEPT:

_____ Writing integers.....1-3
_____ Writing money.....4
_____ Writing fractions.....5-7
_____ Roman numbers.....8-10
_____ Fractions and decimals.....11-13
_____ Exponents and roots.....14-16
_____ Negative numbers.....17
_____ Abstract numbers.....18-20

B. SYMBOLS AND RULES:

_____ Symbols.....1-3, 8-10
_____ Vocabulary.....4-7
_____ Rules.....11-15

C. NUMBERS AND EQUATIONS:

_____ Negative numbers.....1-4
_____ Solving equations.....5-10

D. PROBLEMS:

_____ Simple problems.....1-2
_____ Sharing and averaging.....3-4
_____ Square and cubic measure.....5-6
_____ Budgeting.....12
_____ Ratio and percentage.....7-11
_____ Insurance and discount.....13-15

4. Mathematical Fundamentals

E. ADDITION:

_____ Simple combinations.....1

_____ Carrying.....2-4
_____ Zeros.....1, 6
_____ Column addition.....3, 4
_____ Adding money.....4, 6
_____ Denominate numbers.....4-6
_____ Adding numerators.....7
_____ Reducing fractions to common denom.....8, 10-13
_____ Adding mixed nos.....9-13
_____ Adding fractions and decimals.....14-15
_____ Writing decimals in column.....16-17
_____ Adding percentages.....18
_____ Adding abstract nos.....19-20

F. SUBTRACTION:

_____ Simple combinations.....1
_____ Borrowing.....2-5
_____ Zeros.....1, 3, 5
_____ Subtracting money.....4, 5
_____ Denominate numbers.....4-6
_____ Subtracting numerators.....7-8
_____ Reducing fractions to common denominators.....9-10
_____ Integer from mixed no.....11
_____ Borrowing with mixed numbers.....12, 13
_____ Subtraction: fractions and decimals.....14, 15

_____ Writing decimals in column.....16, 17
_____ Subt. abstract nos.....19, 20

G. MULTIPLICATION:

_____ Tables.....1-5
_____ Zeros in multiplicand.....2, 5
_____ Zeros in multiplier.....4, 5
_____ Two-place multipliers.....3-5
_____ Denominate nos.....6
_____ Mult. denominators.....8
_____ Cancellation of fractions.....7, 9, 10, 11, 13
_____ Fractions and mixed numbers.....12
_____ Fractions and decimals.....15
_____ Pointing off decimals.....16, 17
_____ Mult. abstract nos.....19, 20

H. DIVISION:

_____ Tables.....1-5
_____ Zeros in quotient.....1-4
_____ Remainders.....5
_____ Inverting divisor in fractions.....6-13
_____ Mixed numbers.....11-13
_____ Reducing fractions to decimals.....14
_____ Pointing off decimals.....15-17
_____ Cancel. of fract.....18
_____ Div. abstract nos.....19-20

LANGUAGE

5. Language

A. CAPITALIZATION:

_____ First word of sentence.....1
_____ Names of persons.....2, 7, 9
_____ Names of places.....2, 3, 8, 9
_____ Days of week and months.....4, 6
_____ Titles.....5, 7
_____ First word of quotation.....6
_____ Over-capitalization.....

B. PUNCTUATION:

_____ Commas.....
_____ Question marks.....
_____ Quotation marks.....

C. WORDS AND SENTENCES:

_____ Singulars and plurals.....1, 8, 11
_____ Case.....5, 6, 9, 12
_____ Tense.....2, 4, 7, 8, 10, 13-15
_____ Good usage.....3
_____ Recognizing sentences.....16-25

D. GRAMMAR:

_____ Vocabulary of grammar.....1-7
_____ Parts of sentences.....8-10
_____ Kind of sentences.....11-13
_____ Parts of speech.....14-30

_____ Nouns.....
_____ Pronouns.....
_____ Verbs.....
_____ Adjectives.....
_____ Adverbs.....
_____ Conjunctions.....
_____ Prepositions.....

E. SPELLING:

_____.....
_____.....
_____.....

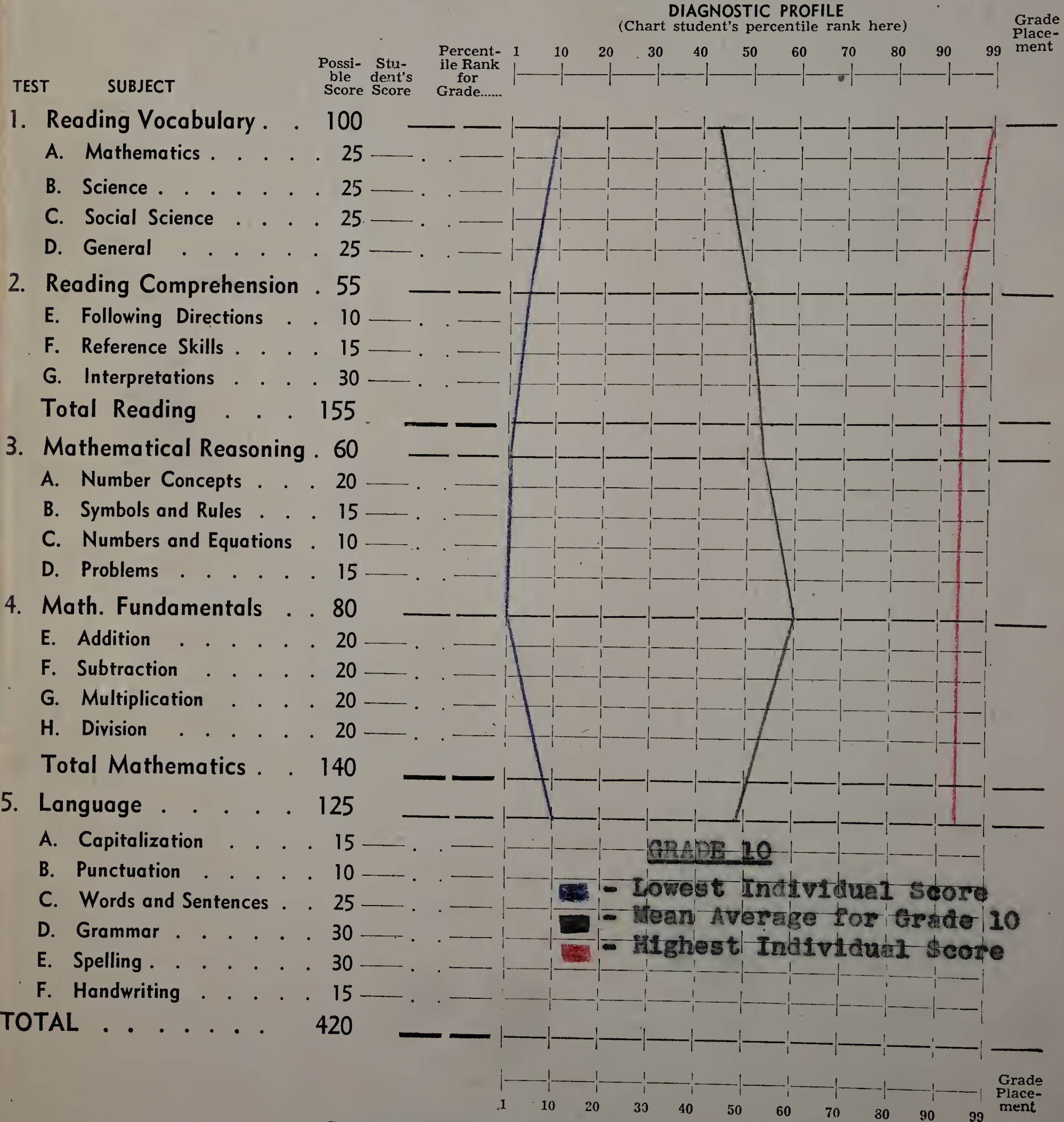
F. HANDWRITING:

_____ Quality and legibility.....

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Devised by Ernest W. Tiegs, Dean, University College, The University of Southern California,
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B. SCIENCE:

_____ Basic vocabulary.....1-25

C. SOCIAL SCIENCE:

_____ Basic vocabulary.....1-25

D. LITERATURE:

_____ Basic vocabulary.....1-25

2. Reading Comprehension

E. FOLLOWING SPECIFIC DIRECTIONS:

_____ Directions in mathematical situations.....1, 2, 5, 9, 10
_____ Reading definitions and following directions.....3, 4, 6, 7, 8

F. REFERENCE SKILLS:

_____ Vocabulary.....1-6
_____ Use of index.....7-9
_____ Selecting references.....10-13
_____ Report outline.....14-15

G. INTERPRETATION OF

MEANINGS:

_____ Selecting topic or central idea.....1, 10
_____ Understanding directly stated facts.....4, 5, 7, 8, 11, 12, 13, 14, 19, 22, 26, 28, 29
_____ Making inferences.....2, 3, 6, 9, 15, 16, 17, 19, 20, 21, 23, 24, 25, 27, 30.

MATHEMATICS

3. Mathematical Reasoning

A. NUMBER CONCEPT:

_____ Writing integers.....1-3
_____ Writing money.....4
_____ Writing fractions.....5-7
_____ Roman numbers.....8-10
_____ Fractions and decimals.....11-13
_____ Exponents and roots.....14-16
_____ Negative numbers.....17
_____ Abstract numbers.....18-20

B. SYMBOLS AND RULES:

_____ Symbols.....1-3, 8-10
_____ Vocabulary.....4-7
_____ Rules.....11-15

C. NUMBERS AND EQUATIONS:

_____ Negative numbers.....1-4
_____ Solving equations.....5-10

D. PROBLEMS:

_____ Simple problems.....1-2
_____ Sharing and averaging.....3-4
_____ Square and cubic measure.....5-6
_____ Budgeting.....12
_____ Ratio and percentage.....7-11
_____ Insurance and discount.....13-15

4. Mathematical Fundamentals

E. ADDITION:

_____ Simple combinations.....1

_____ Carrying.....2-4
_____ Zeros.....1, 6
_____ Column addition.....3, 4
_____ Adding money.....4, 6
_____ Denominate numbers.....4-6
_____ Adding numerators.....7
_____ Reducing fractions to common denom.....8, 10-13
_____ Adding mixed nos.....9-13
_____ Adding fractions and decimals.....14-15
_____ Writing decimals in column.....16-17
_____ Adding percentages.....18
_____ Adding abstract nos.....19-20

F. SUBTRACTION:

_____ Simple combinations.....1
_____ Borrowing.....2-5
_____ Zeros.....1, 3, 5
_____ Subtracting money.....4, 5
_____ Denominate numbers.....4-6
_____ Subtracting numerators.....7-8
_____ Reducing fractions to common denominators.....9-10
_____ Integer from mixed no.....11
_____ Borrowing with mixed numbers.....12, 13
_____ Subtraction: fractions and decimals.....14, 15

_____ Writing decimals in column.....16, 17
_____ Subt. abstract nos.....19, 20

G. MULTIPLICATION:

_____ Tables.....1-5
_____ Zeros in multiplicand.....2, 5
_____ Zeros in multiplier.....4, 5
_____ Two-place multipliers.....3-5
_____ Denominate nos.....6
_____ Mult. denominators.....8
_____ Cancellation of fractions.....7, 9, 10, 11, 13
_____ Fractions and mixed numbers.....12
_____ Fractions and decimals.....15
_____ Pointing off decimals.....16, 17
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H. DIVISION:

_____ Tables.....1-5
_____ Zeros in quotient.....1-4
_____ Remainders.....5
_____ Inverting divisor in fractions.....6-13
_____ Mixed numbers.....11-13
_____ Reducing fractions to decimals.....14
_____ Pointing off decimals.....15-17
_____ Cancel. of fract.....18
_____ Div. abstract nos.....19-20

LANGUAGE

5. Language

A. CAPITALIZATION:

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_____ Names of places.....2, 3, 8, 9
_____ Days of week and months.....4, 6
_____ Titles.....5, 7
_____ First word of quotation.....6
_____ Over-capitalization.....

B. PUNCTUATION:

_____ Commas.....
_____ Question marks.....
_____ Quotation marks.....

C. WORDS AND SENTENCES:

_____ Singulars and plurals.....1, 8, 11
_____ Case.....5, 6, 9, 12
_____ Tense.....2, 4, 7, 8, 10, 13-15
_____ Good usage.....3
_____ Recognizing sentences.....16-25

D. GRAMMAR:

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_____ Pronouns.....
_____ Verbs.....
_____ Adjectives.....
_____ Adverbs.....
_____ Conjunctions.....
_____ Prepositions.....

E. SPELLING:

F. HANDWRITING:

_____ Quality and legibility.....

PROGRESSIVE ACHIEVEMENT TESTS—ADVANCED BATTERY, Form A

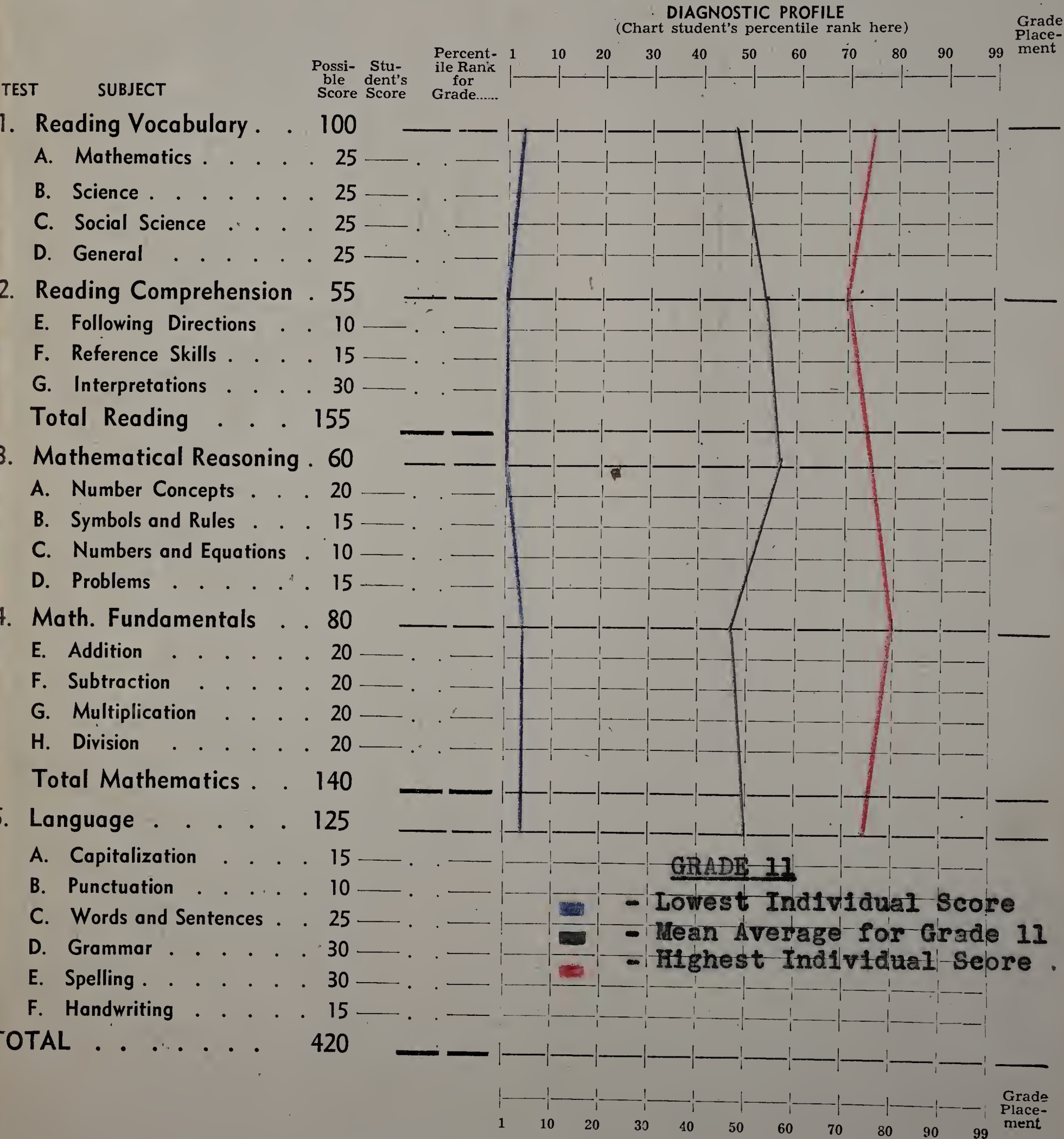
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B. SCIENCE:

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C. SOCIAL SCIENCE:

_____ Basic vocabulary.....1-25

D. LITERATURE:

_____ Basic vocabulary.....1-25

2. Reading Comprehension

E. FOLLOWING SPECIFIC DIRECTIONS:

_____ Directions in mathematical situations.....1, 2, 5, 9, 10

_____ Reading definitions and following directions.....3, 4, 6, 7, 8

F. REFERENCE SKILLS:

_____ Vocabulary.....1-6

_____ Use of index.....7-9

_____ Selecting references.....10-13

_____ Report outline.....14-15

G. INTERPRETATION OF

MEANINGS:

_____ Selecting topic or central idea.....1, 10

_____ Understanding directly stated facts.....4, 5, 7, 8, 11, 12, 13, 14, 19, 22, 26, 28, 29

_____ Making inferences.....2, 3, 6, 9, 15, 16, 17, 19, 20, 21, 23, 24, 25, 27, 30.

3. Mathematical Reasoning

A. NUMBER CONCEPT:

_____ Writing integers.....1-3

_____ Writing money.....4

_____ Writing fractions.....5-7

_____ Roman numbers.....8-10

_____ Fractions and decimals.....11-13

_____ Exponents and roots.....14-16

_____ Negative numbers.....17

_____ Abstract numbers.....18-20

B. SYMBOLS AND RULES:

_____ Symbols.....1-3, 8-10

_____ Vocabulary.....4-7

_____ Rules.....11-15

C. NUMBERS AND EQUATIONS:

_____ Negative numbers.....1-4

_____ Solving equations.....5-10

D. PROBLEMS:

_____ Simple problems.....1-2

_____ Sharing and averaging.....3-4

_____ Square and cubic measure.....5-6

_____ Budgeting.....12

_____ Ratio and percentage.....7-11

_____ Insurance and discount.....13-15

4. Mathematical Fundamentals

E. ADDITION:

_____ Simple combinations.....1

MATHEMATICS

_____ Carrying.....2-4

_____ Zeros.....1, 6

_____ Column addition.....3, 4

_____ Adding money.....4, 6

_____ Denominate numbers.....4-6

_____ Adding numerators.....7

_____ Reducing fractions to common denom.....8, 10-13

_____ Adding mixed nos.....9-13

_____ Adding fractions and decimals.....14-15

_____ Writing decimals in column.....16-17

_____ Adding percentages.....18

_____ Adding abstract nos.....19-20

F. SUBTRACTION:

_____ Simple combinations.....1

_____ Borrowing.....2-5

_____ Zeros.....1, 3, 5

_____ Subtracting money.....4, 5

_____ Denominate numbers.....4-6

_____ Subtracting numerators.....7-8

_____ Reducing fractions to common denominators.....9-10

_____ Integer from mixed no.....11

_____ Borrowing with mixed numbers.....12, 13

_____ Subtraction: fractions and decimals.....14, 15

_____ Writing decimals in column.....16, 17

_____ Subt. abstract nos.....19, 20

G. MULTIPLICATION:

_____ Tables.....1-5

_____ Zeros in multiplicand.....2, 5

_____ Zeros in multiplier.....4, 5

_____ Two-place multipliers.....3-5

_____ Denominate nos.....6

_____ Mult. denominators.....8

_____ Cancellation of fractions.....7, 9, 10, 11, 13

_____ Fractions and mixed numbers.....12

_____ Fractions and decimals.....15

_____ Pointing off decimals.....16, 17

_____ Mult. abstract nos.....19, 20

H. DIVISION:

_____ Tables.....1-5

_____ Zeros in quotient.....1-4

_____ Remainders.....5

_____ Inverting divisor in fractions.....6-13

_____ Mixed numbers.....11-13

_____ Reducing fractions to decimals.....14

_____ Pointing off decimals.....15-17

_____ Cancel. of fract.....18

_____ Div. abstract nos.....19-20

LANGUAGE

_____ Quotation within quotation.....

_____ Over-punctuation.....

C. WORDS AND SENTENCES:

_____ Singulars and plurals.....1, 8, 11

_____ Case.....5, 6, 9, 12

_____ Tense.....2, 4, 7, 8, 10, 13-15

_____ Good usage.....3

_____ Recognizing sentences.....16-25

D. GRAMMAR:

_____ Vocabulary of grammar.....1-7

_____ Parts of sentences.....8-10

_____ Kind of sentences.....11-13

_____ Parts of speech.....14-30

_____ Nouns.....

_____ Pronouns.....

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_____ Adjectives.....

_____ Adverbs.....

_____ Conjunctions.....

_____ Prepositions.....

E. SPELLING:

F. HANDWRITING:

_____ Quality and legibility.....

5. Language

A. CAPITALIZATION:

_____ First word of sentence.....1

_____ Names of persons.....2, 7, 9

_____ Names of places.....2, 3, 8, 9

_____ Days of week and months.....4, 6

_____ Titles.....5, 7

_____ First word of quotation.....6

_____ Over-capitalization.....

B. PUNCTUATION:

_____ Commas.....

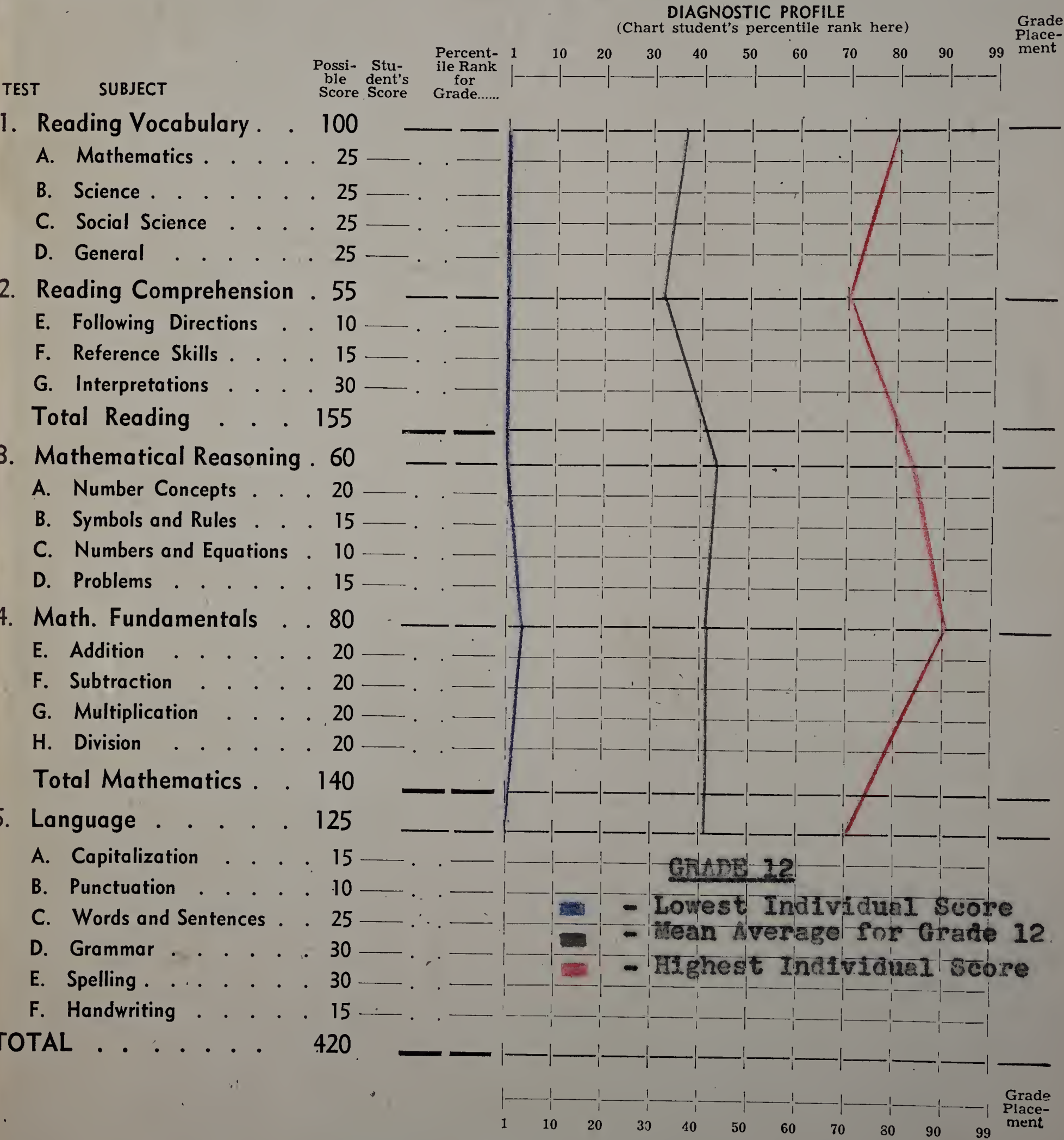
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_____ Quotation marks.....

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_____ Exponents and roots.....14-16

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B. SYMBOLS AND RULES:

_____ Symbols.....1-3, 8-10

_____ Vocabulary.....4-7

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Date May, 1947

