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### An evaluation of a reading comprehension improvement program at the eighth-grade level in terms of a standardized rate-of-comprehension test

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AN EVALUATION OF A READING COMPREHENSION IMPROVEMENT  
PROGRAM AT THE EIGHTH-GRADE LEVEL IN TERMS OF A  
STANDARDIZED RATE-OF-COMPREHENSION TEST

by

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B.A., MONTANA STATE UNIVERSITY, 1948

Presented in partial fulfillment of the  
requirements for the degree of  
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1955

Approved by:

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Chairman, Board of Examiners

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Aug 15 1955  
Date

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## CHAPTER I

### THE PROBLEM

Statement of the problem. This paper describes a study type of reading comprehension project which was undertaken to determine the effect on the reading rate-of-comprehension for an eighth grade class. The effectiveness of this project was measured in terms of (1) daily performance record of students using the special comprehension exercises; (2) two alternate forms of a standardized rate-of-comprehension test given at the initiation and conclusion of the reading improvement program.

Importance of the problem. There were several reasons why a program of this type was thought to be of value: (1) Past achievement test scores for the class indicated inadequate reading skills; (2) Students were handicapped in all areas of the curriculum because of their lack of reading skills; (3) Reading improvement for this class was necessary in order for the students to adequately handle high school reading material.

It was noted early in the school year that most of the students disliked oral reading. Few would volunteer to read passages orally from various materials, and in most cases, the reading that was attempted lacked continuity and expression. The check-out list of library

materials indicated that little outside reading was being done. Further investigation of permanent records and actual testing proved that corrective action was necessary for the group in matters of vocabulary and in reading rate.

Purpose of the problem. The purpose of this project was to evaluate a special study reading type of comprehension program in terms of the results obtained on a standardized rate-of-comprehension test.

Delimitation of the problem. This project was carried on during the regular reading class period. The study was conducted with the eighth grade class at the Jefferson Elementary School in Missoula, Montana. The class was a self-contained unit of 29 pupils during the past year. Another eighth grade class\* in School District No. I, being similar in size and following the same curriculum pattern, served as a control group for this project.

---

\*The identity of this class is not divulged in this paper.



## CHAPTER II

### BACKGROUND INFORMATION

Review of the literature. The teaching of reading in the upper elementary and secondary levels often tends to become the teaching of literature with little thought or time devoted to fundamental reading skills which are necessary for the actual reading of literature.

Betts explains the importance of teaching upper level reading skills as follows:

At all levels of elementary and secondary education there is a need for all students to have specific instruction on reading and study habits. Since opportunistic instruction is notoriously ineffective, this means that separate periods should be set aside for the work.<sup>1</sup>

Poor reading has been labeled the chief cause for low achievement in other areas of the curriculum. As the content material becomes more and more specialized, the necessity for good basic reading habits becomes more acute. Dolch says:

All subjects benefit tremendously from improved reading. The work with problems in arithmetic will become easier. The study and recitation in geography and history will become more intelligent. The resentment against lessons that can not be read will diminish and disappear. The whole attitude of large numbers of pupils will change. Thus remedial reading furnishes at

---

1. Emmett A. Betts, The Prevention and Correction of Reading Difficulties (New York: Row Peterson & Co., 1936), p. 47.

present the best opportunity for general improvement of work in our schools.<sup>1</sup>

The enlarging of meaning vocabulary is an important phase of all classroom instruction. Dolch<sup>2</sup> believes that one of the most effective steps that teachers can take in helping children deal with school books is to increase meaning vocabulary. Meager meaning vocabulary, he says, is the greatest cause of poor reading in high school. The teaching of meaning of words, therefore, becomes our readiest method of helping the poor reader.

Betts<sup>3</sup> says that vocabulary building should be a definite part of the reading program. He wants special attention to be directed to science, social studies, arithmetic and literature vocabularies, for reading vocabularies are as specific as reading skills.

Reading authorities have emphasized that pupils adjust the speed of their reading to the difficulty of the material at hand. Many pupils do not read material within their comprehension range as rapidly as their ability to understand would permit. Obviously, these pupils need special help which will enable them to increase their speed in reading such material.

---

1. Edward W. Dolch, Problems in Reading (Champaign, Illinois: The Garrard Press, 1948), p. 179.

2. Ibid., p. 189.

3. Betts, op. cit., p. 251.

The problem of teaching reading comprehension is two-fold. Bond and Bond write:

- (1) It consists of teaching the child how to go about using various comprehension abilities.
- (2) It gives him practice in the use of these abilities in various sorts of situations so that he may learn how to become a versatile reader.<sup>1</sup>

A comparatively slow rate-of-comprehension may be considered as a symptom - or an indication of underlying difficulties in perception, word knowledge, and comprehension, according to McCullough and Strang.<sup>2</sup> They feel that if visual defects are corrected, if vocabulary is increased and enriched, if more effective methods of comprehension are taught, increase in speed appropriate to the material and the purpose of the reader may be expected.

Review of materials used. There is an abundance of evidence from carefully controlled teaching experiments to show that reading comprehension can be greatly improved by the use of carefully prepared practice materials. The material with which this project is primarily concerned is the Practice Reader, Book 4, by C. R. Stone, C. C. Grover and S. Phillips, published by the Webster Publishing

---

1. Guy L. Bond and Eva Bond, Teaching the Child to Read (New York: The Macmillan Company, 1943), p. 246.

2. Constance M. McCullough and Ruth M. Strang, Problems in the Improvement of Reading (New York: McGraw-Hill Book Company, 1946).

Company.<sup>1</sup> The Practice Readers are a series of four paper-covered, inexpensive booklets of 192 pages each. They are carefully graded for use in grades three to eight, inclusive. The main function of the series is the development of basic skills essential to effective study-reading. The content is informative; much information related to social studies, nature, science, character development, and safety and health is included.

The seven skills practiced by these readers are as follows:

1. Giving direct details. (Answer stated definitely in the reading matter).
2. Giving implied details. (Answer inferred in reading matter but not directly stated).
3. Giving meaning to the whole selection. (Answer involves meaning or impression of the whole selection rather than merely a part of detail).
4. Determining whether a given idea is stated affirmatively, negatively, or not at all. (Answer based on statements in the reading material and must not be supplemented by the pupil's own knowledge).
5. Giving reference by selecting the word or words referred to by a given word, such as they, some, who, smallest, those, this, each, one, it, which.
6. Selecting statements not true according to the reading matter. (Again answer must be determined using only the information contained in the reading).

---

1. C. R. Stone and C. C. Grover, Practice Readers Book 4 (New York: The Webster Publishing Company, 1949).

7. Selecting words from the reading matter similar in meaning to those listed in the questions. (Answers involve understanding the meaning of certain of the more difficult words appearing in the page of reading matter).

In connection with the reading and recording of responses and in connection with the checking, discussion and verification immediately following, various other skills involved in study reading are developed. In getting correct responses and in the subsequent verification of these in the group discussion, the pupil gets much practice in locating items of information related to a problem, in selection of sentences relevant to a point or a statement, in discriminating between the relevant and the irrelevant, in discriminating between exactness of comprehension and slipshod reading, and in sensing the organization of the reading material.

On the question pages throughout the series, various types of responses commonly used in study-reading and in school tests are required, including the following: (1) questions answered by word or words to be selected from the reading matter; (2) completion of sentences by words selected from the reading matter; (3) answer to be selected from several listed (multiple choice); and (4) two false statements to be selected from the five listed.

The pupils record their responses on special answer sheets. (See Figure 1, page 8). The answers to the six questions for an actual case are written in the blanks

and after the items have been checked, the number of correct answers is then marked for each group of questions. When all nine tests within each unit are completed, the summary at the bottom of the answer sheet is filled out. In the sample answer sheet in Figure 1, it can be noted that the number right by tests is 44. The number of possible correct answers is 54. This total appears in Figure 2, page 10, which shows the progress made in total number of correct answers for the nine units.

The summary of numbers of right answers by question is made at the bottom righthand corner of the answer sheet, (Figure 1). This total must correspond with the total obtained from the number-right-by-test summary. Figure 3, page 11, shows for an actual case the diagnostic charts graphing the level of achievement and progress in each of the six skills exercised in the practice reader. Notice was taken that the child whose scores were recorded was weakest on the fifth and sixth questions, but improved rapidly.

Each pupil also kept a daily graph to chart his progress. Figure 4, page 12, shows a portion of the graph kept by one pupil. The Y axis shows the number of correct answers. The X axis shows the tests for each unit. Some fluctuation can be expected on this graph, but a general improvement in scores can be noted.

To obtain evident early improvement in the

Answers

Answers

Answers

1. D ✓	1. B ✓	1. C ✓
2. e	2. B ✓	2. B ✓
3. A ✓	3. C ✓	3. A ✓
4. Peapauls	4. Candles	4. Blue Whales
5. A, B	5. A, C	5. B, C
6. Glittering	6. Filtered	6. Hunted ✓
① No. Right 4	② No. Right 4	③ No. Right 5
1. B	1. C ✓	1. B ✓
2. C ✓	2. D	2. D
3. B	3. B	3. C
4. Oxygen	4. Aluminum ✓	4. Highway ✓
5. B, E	5. B, E	5. C, D
6. Averages	6. Malleable	6. Recognized
④ No. Right 5	⑤ No. Right 4	⑥ No. Right 5

II

This page and the next show a sample answer record sheet for Practice Readers.

Answers

Answers

Answers

1. B	1. C	1. A ✓
2. B	2. B	2. C
3. C	3. B	3. A
4. Bedouin Arabs	4. Generation	4. Santos-Dumont
5. B, D	5. B, D	5. C, E
6. Distinguished	6. Imitate	6. Rigid
⑦ No. Right 6	⑧ No. Right 6	⑨ No. Right 5

III

No. Right by Tests

1. <u>4</u>	6. <u>5</u>
2. <u>4</u>	7. <u>6</u>
3. <u>5</u>	8. <u>6</u>
4. <u>5</u>	9. <u>5</u>
5. <u>4</u>	

Total 44

Questions No. 1: No. Right	<u>6</u>
Questions No. 2: No. Right	<u>7</u>
Questions No. 3: No. Right	<u>7</u>
Questions No. 4: No. Right	<u>7</u>
Questions No. 5: No. Right	<u>9</u>
Questions No. 6: No. Right	<u>8</u>

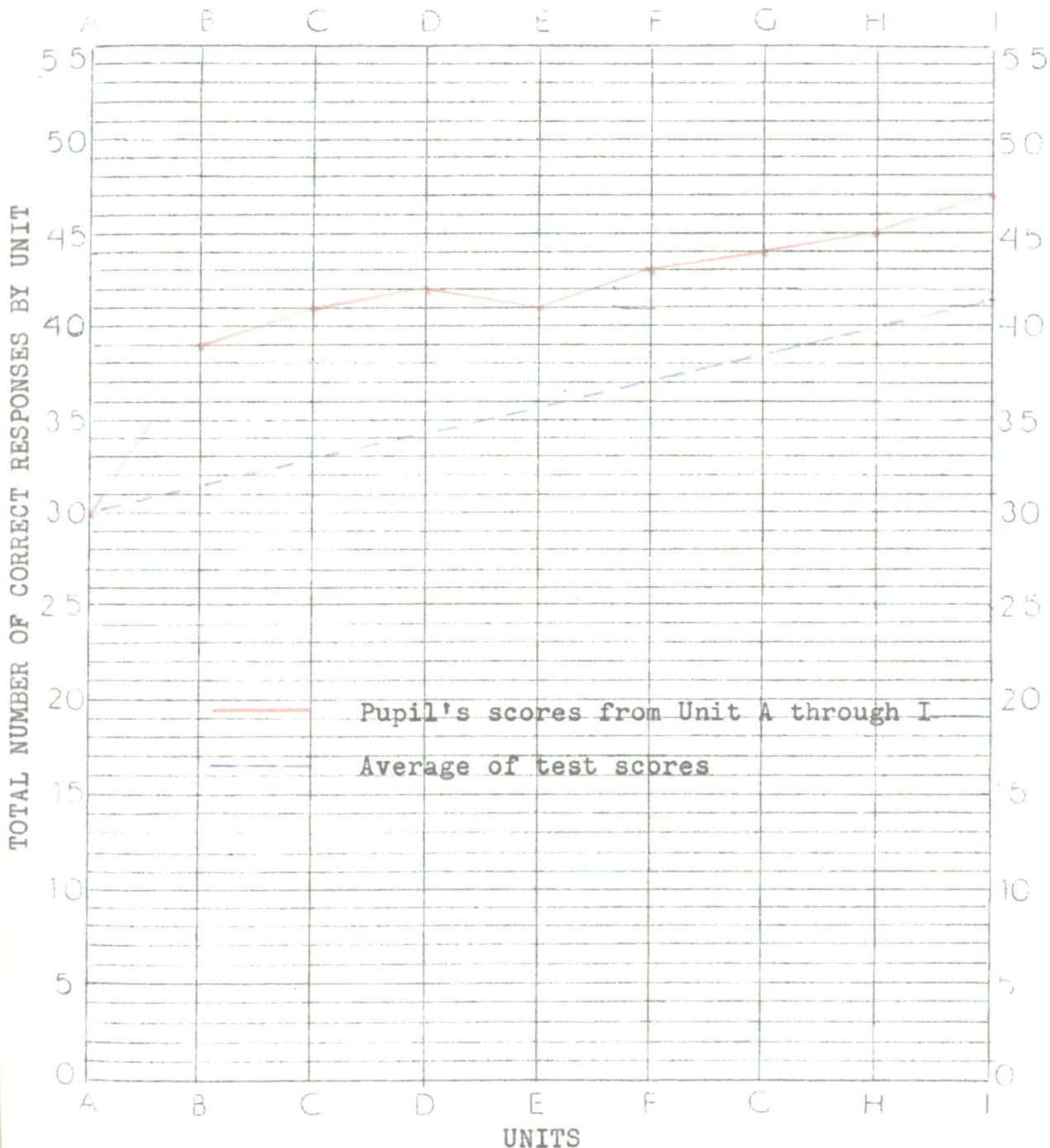
Total No. Right 44

FIGURE 1

-10-  
FIGURE 2

GENERAL PROGRESS RECORD SHOWING TOTAL SCORE ON EACH UNIT

After the number for the total at the bottom of the answer sheet for Unit A has been filled in, make a dot on the A line of the chart below to show this total. After the answer sheet for Unit B has been completed, make a dot on line B to show the total score for Unit B. Then connect the two dots with a straight line. Add to this chart record upon completing each answer sheet. Watch your progress from unit to unit. Try to make your line go up from unit to unit.





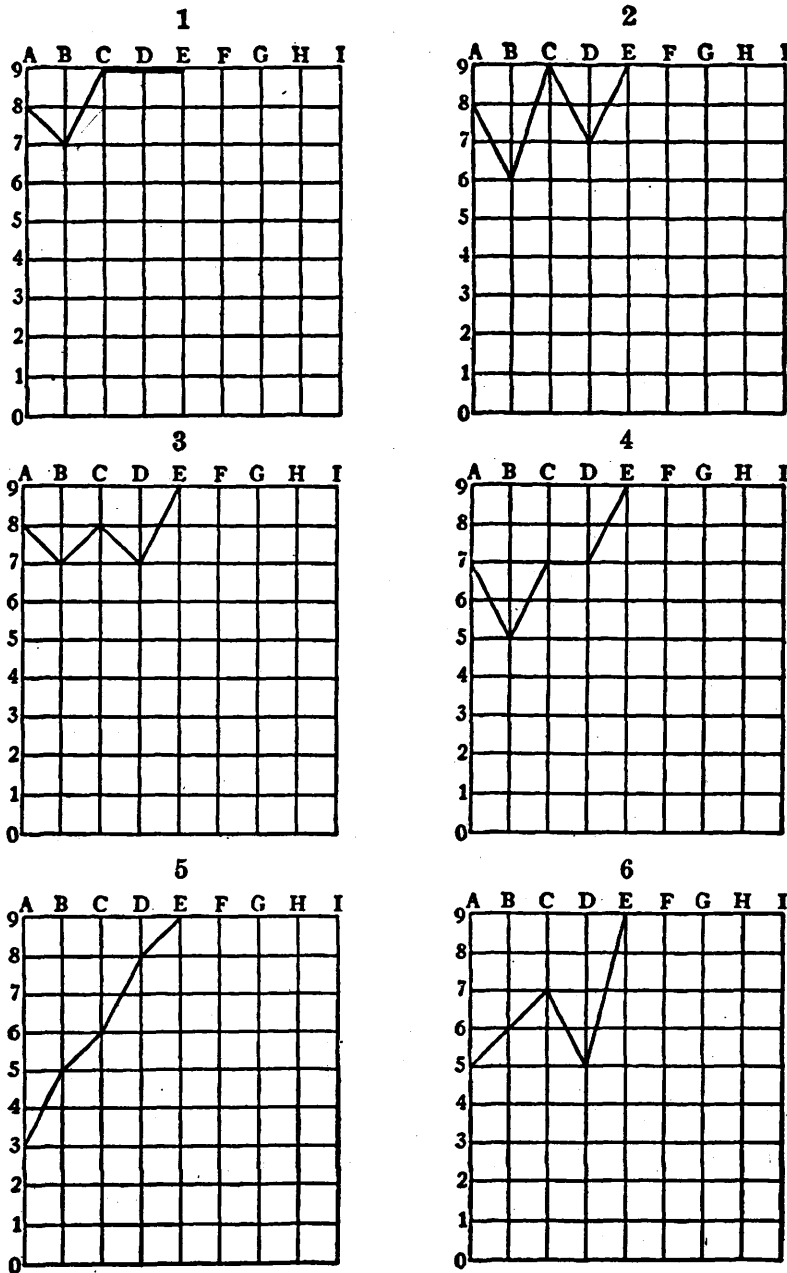


FIG. 2. Diagnostic Charts Showing Level of Achievement and Progress in Each of the Six Skills Exercised in Books II and III of *Practice Readers*. After a high degree of accuracy is reached on all six elements, the diagnostic charts are no longer needed. Note that this child was weakest on 5 and 6 at the beginning but improved rapidly.

I

FIGURE 3

PROGRESS RECORD FOR EACH OF THE SIX QUESTIONS

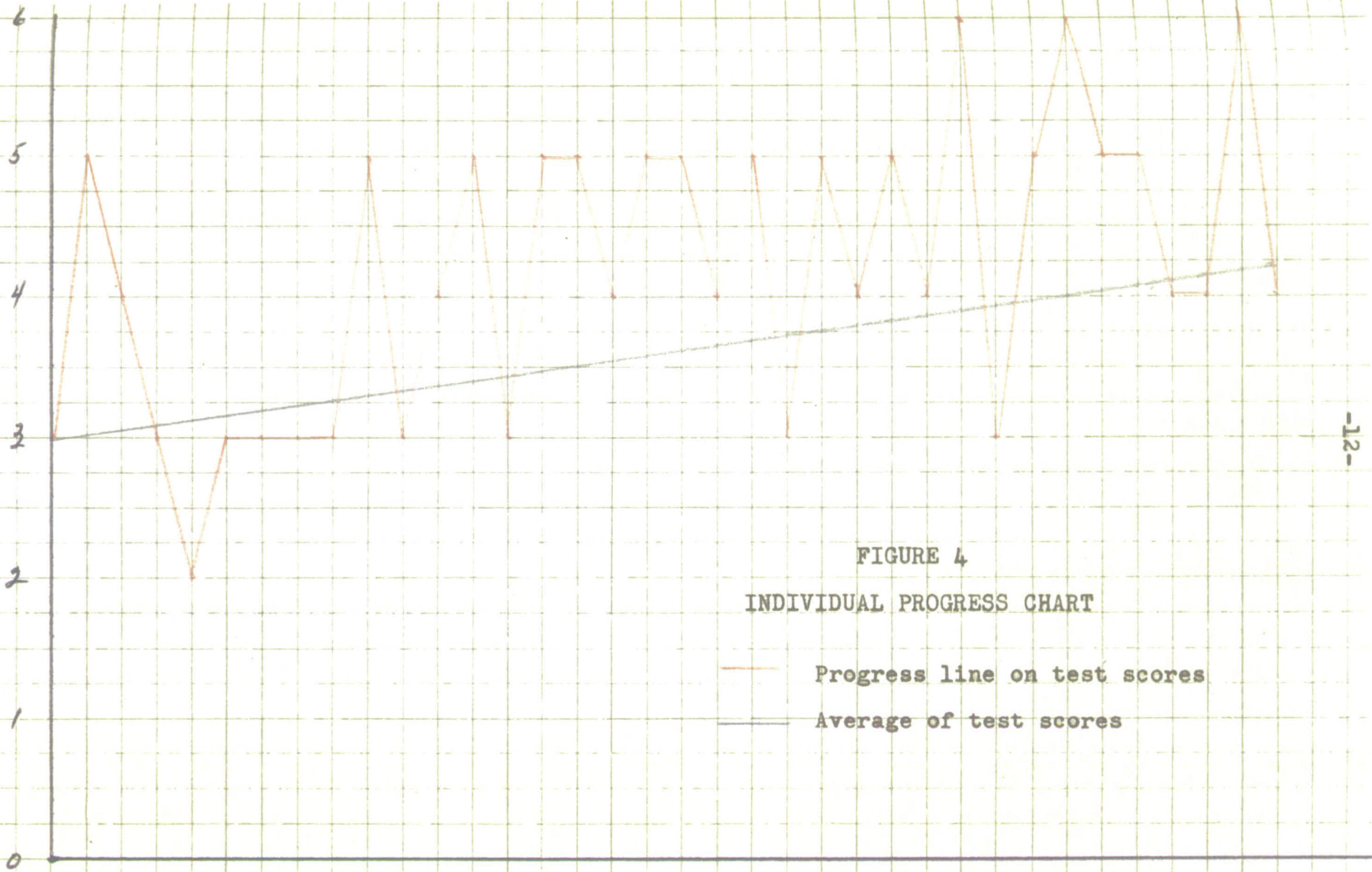


FIGURE 4  
INDIVIDUAL PROGRESS CHART

— Progress line on test scores  
— Average of test scores

I 1 2 3 4 5 6 7 8 9 1 2 3 4 5 6 7 8 9 1 2 3 4 5 6 7 8 9 1 2 3 4 5 6 7 8 9  
I UNIT A I UNIT B I UNIT C I UNIT D I

WEBSTER PRACTICE READER EXERCISES

particular phases of comprehension in which the pupil is weak, the vocabulary and the concepts embodied in the reading material should be easy enough so as not to be obstacles to success. In the Practice Readers, the vocabulary, with a few exceptions, has been kept one grade below the grade for which the book is recommended for use in average classes, and the nature of the content and the sentence structure have been kept sufficiently simple.

In each of the Practice Readers the first pages used by the pupils contain illustrations with a minimum of descriptive words. (See Figure 5, page 14). These are designed to stimulate interest in the content and to familiarize the pupils with the concepts and the vocabulary of the exercises between this set of pictures and the next. The pages of illustrations, therefore, perform a specific function in the matter of readiness to read the following pages of material.

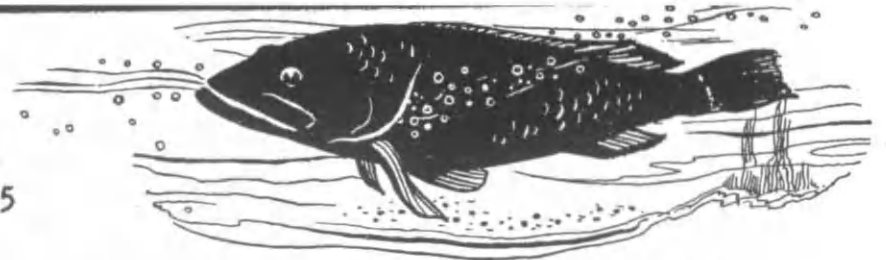
In conjunction with the Practice Readers, a daily vocabulary lesson was held using the Dynamic Vocabulary Exercises, by W. J. Osburn.<sup>1</sup> (See Appendix A, page 41). The Dynamic Vocabulary Exercises, consisting of words taken from the Thorndyke List of 10,000, teach the following relations between words: subject-verb, verb-

---

1. W. J. Osburn, Dynamic Exercises in Vocabulary. Seattle, Washington. A. S. U. W. Bookstore.



FIGURE 5

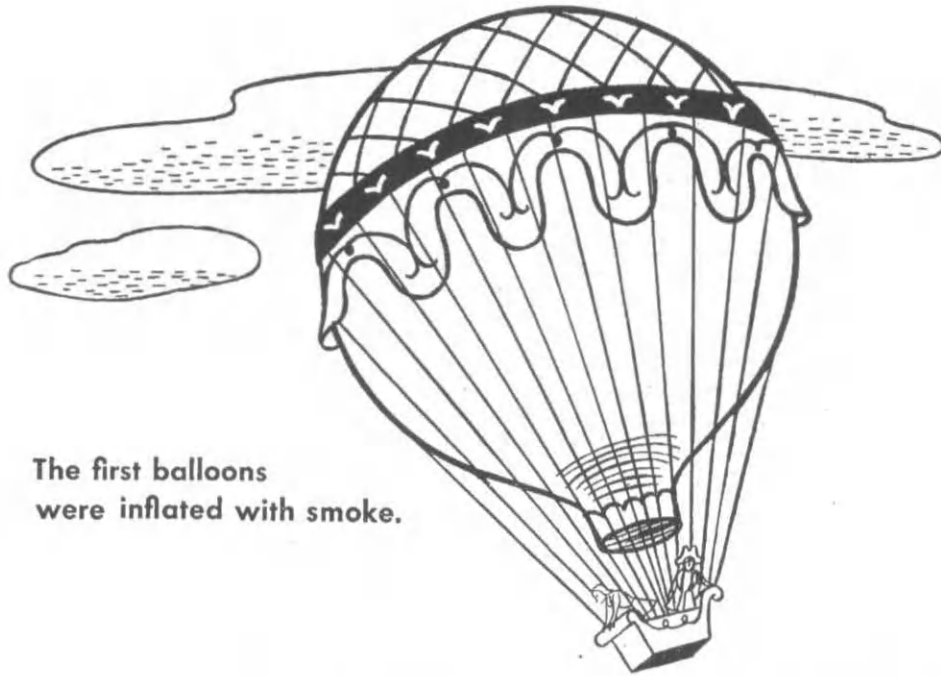


How fish breathe

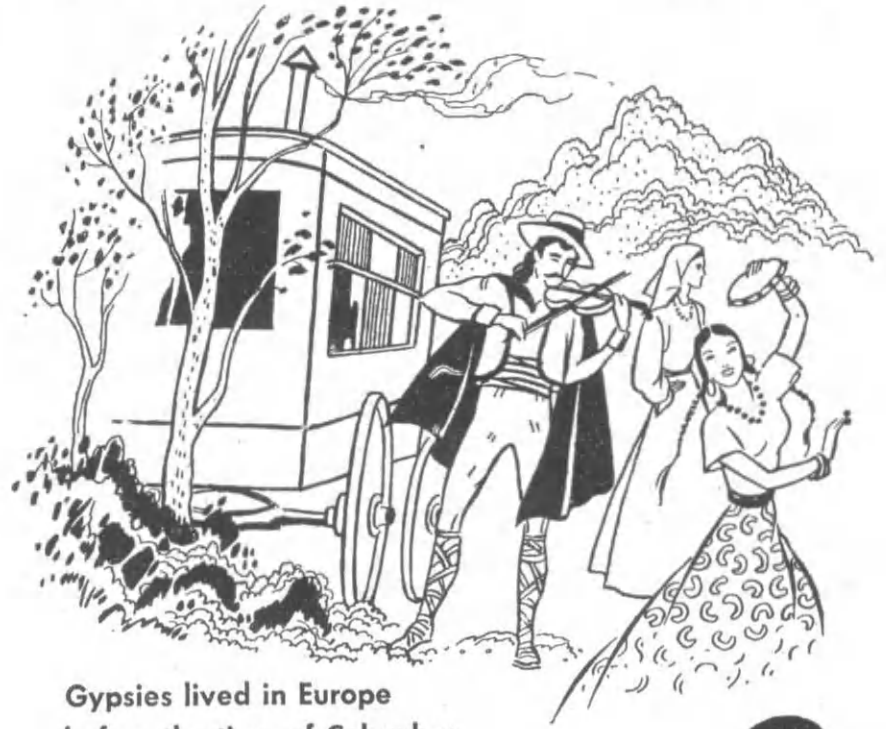


ORIENTATION PICTURES FOR UNIT A

Nickel is a war material.



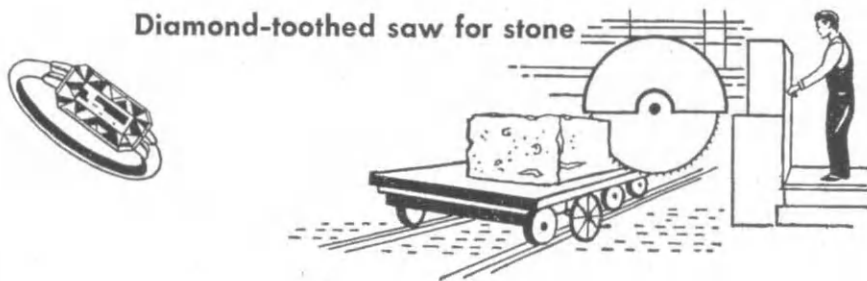
The first balloons were inflated with smoke.



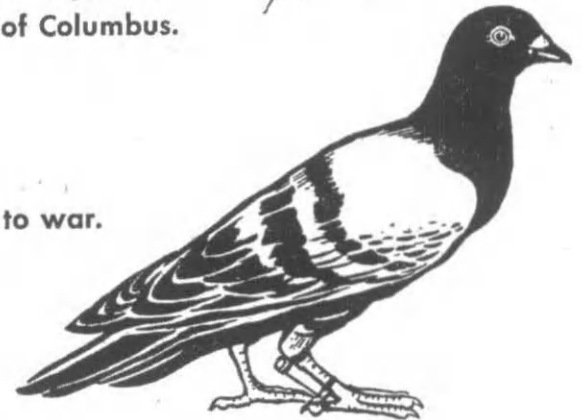
Gypsies lived in Europe before the time of Columbus.

-4-

Diamond-toothed saw for stone



Pigeons go to war.



object, adjective-noun, synonyms-antonyms, genus-species, part-whole, implicate and other functional relationships. Groups of words are presented to the pupil in which there is one word that does not belong in the relationship featured in that group. The pupil is asked to identify the relationship and the misplaced word, and tell why the word does not belong in the group.

There are 180 lists of five words each which are to be grouped in the Book 7 series. The first list contains these words: collection, hamlet, village, childhood. The proper grouping for these words is: Hamlet and village, collection and hoard. Reason: (#2) synonyms.

Such exercises have proved to be immensely interesting to children. They offer strong motivation for the learning of new words. Reports on the use of Dynamic Exercises indicate that higher achievement test scores have resulted from their use. The following is quoted from the University of Washington News Letter, Volume II, Number 2, page 3, 1940: "A very encouraging report comes also from Mrs. C. J. Sheldon of Douglas, Arizona. Last year Mrs. Sheldon used the Dynamic Vocabulary technique with a very slow class. This year on a test given by a state supervisor, the same children as a whole led the entire city in reading ability on their grade level."

The tests used to obtain measures of reading rate were the Van Wagenen Rate-of-Comprehension Scale, Form A and Form B.<sup>1</sup> (See Appendix B and C, pages 48 and 49 ). These five-minute tests contain 56 paragraphs that must be read. Each paragraph contains one word which does not fit in with the meaning of the rest of the words, and must be crossed out. For example:

The carpenter asked Tom to go to the hardware store and get him a pound of nails. When Tom came back with the ~~matches~~ the carpenter gave him a nickle.

The word matches, of course, does not fit in with the meaning of the rest of the paragraph, so it must be crossed out.

A scale on the first page of the test is used to convert the number of paragraphs read and correctly marked to words-per-minute. The words-per-minute score may then be easily converted on an age scale (in years and months) or on a grade scale, both of which are on the back page of the test form, (see Appendix B, page 48 ). The highest speed obtainable on this test, for grades four, five, six, seven, eight, and nine, is 336 words-per-minute.

---

1. M. J. Van Wagenen, Rate of Comprehension Scale, Minneapolis, Minnesota, (1953). \*Psycho-educational Research Laboratories, Bloomington Ave., Minneapolis, 7, Minn.

## CHAPTER III

### PROCEDURE

As stated previously, this study was an attempt to evaluate a reading comprehension improvement program at the eighth grade level to determine its effect on rate-of-comprehension as measured by a standardized test. Improvement in reading was necessary because the class in general was below normal in achievement test scores, and the students were handicapped in their studies in the content fields because of reading disabilities.

Before initiating the project, an accurate measure of the rate-of-comprehension for the class participating in the reading program, and also for another similar eighth grade class, which acted as a control group, was determined. The selected control group was that eighth grade class in School District No. 1 which most nearly matched the experimental group. In both cases, there was only one eighth grade room in the two schools involved. Both classes used in this study were approximately the same size. Many of the children in both rooms had parents who worked in lumber mills as a means of providing a livelihood. Both schools include in their school population many students from "fringe" areas, outside the actual city limits of Missoula.

No further attempt was made to equate the two groups or to control the many other existing variables. The purpose in using a control group was to get an indication of what normal program might be expected of an eighth grade class in rate-of-comprehension. This information was necessary to provide a yardstick against which the progress of the experimental group might be measured.

The results of the initial rate-of-comprehension tests are shown on Table I, page 19. They were given to both groups at about the same time. It can be noted in column 7 that the average reading rate for Group I, which designated the class under special instruction, was 138 words per minute. The range was from 66 to 336 words per minute. In column 1 it will be noted that for Group II, which designated the class used for comparison purposes, the average reading rate was 162 words per minute, and the range was from 96 to 312 words per minute.

During the succeeding twelve weeks, Group I, the experimental group, was given (1) daily exercises from the Practice Readers, Book 4, and (2) daily exercises from the Dynamic Vocabulary Word List. The time spent on this project was approximately twenty minutes for each session. The total number of exercises in the Practice Reader was 81.

Each exercise in the Practice Reader consisted of one page of reading material and a page of six questions.



TABLE I

SCORES MADE BY CONTROL AND EXPERIMENTAL GROUPS

ON THE VAN WAGENEN RATE-OF-COMPREHENSION

SCALES - FORM A AND B

CONTROL GROUP							EXPERIMENTAL GROUP						
Pupil	1st TEST-A		FINAL TEST-B		CHANGES		Pupil	1st TEST-A		FINAL TEST-B		CHANGES	
	Words per Min.	Grade Level Equiv.	Words per Min.	Grade Level Equiv.	Words per Min.	Grade Level Equiv.		Words per Min.	Grade Level Equiv.	Words per Min.	Grade Level Equiv.	Words per Min.	Grade Level Equiv.
1	312	13.0	312	13.0	--	--	1	336	13.0	324	13.0	-12	--
2	228	12.4	186	10.0	-42	-2.4	2	246	13.0	252	13.0	+6	--
3	228	12.4	282	13.0	+54	+ .6	3	192	10.4	204	11.0	+12	+ .8
4	216	11.8	234	12.8	+18	+1.0	4	192	10.4	198	10.8	+6	+ .4
5	204	11.0	186	10.0	-18	-1.0	5	180	9.8	192	10.4	+12	+ .8
6	204	11.0	186	10.0	-18	-1.0	6	174	9.4	186	10.0	+12	+ .8
7	204	11.0	228	12.4	+24	+1.4	7	174	9.4	240	13.0	+66	+3.8
8	192	10.4	234	12.8	+42	+2.4	8	174	9.4	210	11.4	+36	+2.0
9	192	10.4	186	10.0	-6	-.4	9	150	8.0	156	8.4	+6	+ .4
10	186	10.0	186	10.0	--	--	10	144	7.8	198	10.8	+54	+3.0
11	186	10.0	174	9.4	-12	-.6	11	144	7.8	168	9.0	+24	+1.4
12	174	9.4	162	8.8	-12	-.6	12	144	7.8	174	9.4	+30	+1.8
13	168	9.0	150	8.0	-18	-1.0	13	138	7.4	138	7.4	--	--
14	162	8.8	168	9.0	+6	+ .2	14	138	7.4	168	9.0	+30	+1.8
15	150	8.0	126	6.8	-24	-1.2	15	126	6.8	144	7.8	+18	+1.0
16	150	8.0	108	5.1	-42	-2.2	16	114	6.2	150	8.0	+36	+1.1
17	144	7.8	90	4.1	-54	-2.3	17	114	6.2	192	10.4	+78	+4.2
18	138	7.4	150	8.0	+12	+ .6	18	108	5.1	126	6.8	+18	+1.1
19	138	7.4	132	7.0	-6	-.4	19	108	5.1	114	6.2	+6	+ .4
20	120	6.4	144	7.8	+24	+1.4	20	108	5.1	138	7.4	+30	+1.6
21	114	6.2	132	7.0	+18	+ .8	21	108	5.1	90	5.0	-18	-.1
22	114	6.2	138	7.4	+24	+1.2	22	102	5.6	138	7.4	+36	+1.1
23	114	6.2	114	6.2	--	--	23	96	5.2	102	5.6	+6	+ .4
24	108	5.1	124	6.2	+6	+ .4	24	90	4.1	114	6.2	+24	+1.4
25	108	5.1	120	6.4	+12	+ .6	25	78	4.4	102	5.6	+24	+1.2
26	102	5.6	114	6.2	+12	+ .8	26	72	4.0	138	7.4	+66	+3.4
27	102	5.6	132	7.0	+30	+1.6	27	66	3.8	78	4.4	+12	+ .6
28	96	5.2	90	4.1	-6	-.4	28	66	3.8	108	5.1	+42	+2.2
Ave.	162.6	8.8	163.5	8.9	+26	--		138.6	7.4	162.2	8.8	+660	+1.4

Column Nos. 1 2 3 4 5 6 7 8 9 10 11 12

Figure 6, page 21, is the actual A-1 story page. Figure 7, page 22, is the actual question page for the A-1 story.

Questions were answered as follows:

Questions numbered 1: After selecting the answer from among the four listed, it's letter (a, b, c, or d) was written in the proper space on the answer sheet. The answer was not directly stated in the reading matter, but was a reasonable conclusion from ideas contained in the selection.

Questions numbered 2: After selecting the right expression from the four that were listed, it's letter (a, b, c, or d) was written in the proper space on the answer sheet. The whole selection related to the correct expression.

Questions numbered 3. First, it had to be determined whether there was anything in the selection which directly or by implication was related to the statement. If not, the answer was (c). If there was, it had to be determined whether the statement was true or not true, and then yes or no was selected.

Questions numbered 4. In these questions there was a word printed in italics which referred to a word or expression in the reading matter that appeared previously. That word had to be located and written on the answer sheet.

Questions numbered 5. From the reading matter could be determined which two of the six sentences listed in this item were true. The two true sentences were identified on the answer sheet.

Questions numbered 6. The word which meant the same as the word printed in italics was located and written on the answer sheet.

An examination of these questions shows that emphasis has been placed on careful reading and thorough understanding of the selection. "Reading-between-the-lines" is a necessary function in the determination of correct responses. As previously mentioned, on page 6,

### A-1

Pigeons render a very important service in modern warfare. Over 500,000 of them were used in the first world war, and many were employed in the second great world war also.

In modern battle, the fighting units may be many miles apart, yet every unit, every movement is closely knit into the whole scheme of combat by the communication system.

However, the usual means of communication may break down. Telephone and telegraph wires may be cut. Perhaps radio messages cannot be used because they may be heard by the enemy. In such an emergency pigeons furnish a very trustworthy messenger service. Being small and swift in flight, they are very likely to arrive safely at their destination.

The lightest of paper is used for messages carried by pigeons. After the communication has been written, usually in code, it is tightly rolled and placed in a small aluminum receptacle which is fastened to the bird's leg. When released, the pigeon immediately starts for home. Home for the pigeon is a place where it has been fed and trained behind the battle line.

### FIGURE 6

SAMPLE PAGE FROM WEBSTER PRACTICE READER, BOOK 4

A-1

1. Which of the following is not directly stated, but is a reasonable conclusion?
  - (a) Pigeons are useful in warfare because they require little care.
  - (b) Pigeons must be taken to the point from which the message is to be sent.
  - (c) Pigeons will not cross enemy lines.
2. This article as a whole is chiefly about
  - (a) the training of pigeons.
  - (b) pigeons in battle.
  - (c) the importance of communications in war.
  - (d) pigeons as messengers in the army.
3. There are more pigeons being used in the second world war than in the first world war.
  - (a) yes
  - (b) no
  - (c) does not tell
4. The word *their* in the last sentence of the third paragraph refers to what word?
5. Which two sentences are not true?
  - (a) The message is placed in a small tube.
  - (b) Pigeons cannot carry code messages.
  - (c) Telephones are uncertain during a battle.
  - (d) Pigeons fly very swiftly.
  - (e) When released, a pigeon will fly to the general.
6. What word in the first paragraph means about the same as *perform*?

many skills essential to effective study reading are practiced, and are necessary to answer these questions.

After answering the six questions, the pupils noted and recorded the time taken to complete the exercise. When twenty-seven of the twenty-nine pupils had completed the exercises, time was called for the group and all writing stopped. Then a discussion of the answers followed, to determine the right answer - under teacher guidance - by common agreement of the group when possible. The pupils were asked for a show of hands on each answer suggested for each item. Then the pupils were allowed to prove or disprove the answer, making references to the particular expressions or sentences to cite a fact related to the discussion. This helped the pupil and the teacher to locate comprehension weaknesses and gave the pupils clues for correcting deficiencies. The oral discussion of the answers should be considered a very important part of this program.

Exercise A-1 in the Practice Reader (see Figure 6 and 7, pages 21 and 22) was undertaken after preliminary explanations had been made and picture helps designed for Unit A had been noted and discussed. (See Figure 5, page 14).

Summarizing the results on this exercise, the total number of correct responses was 104 out of 174 possible for the class. (See Table II, page 24). The average number of correct responses was 3.59 questions correct

TABLE II  
NUMBER OF CORRECT RESPONSES ON WEBSTER PRACTICE READER EXERCISES,  
UNITS A TO I

TEST	UNIT A	B	C	D	E	F	G	H	I
1	104	111	165	133	141	150	143	154	147
2	123	117	127	146	151	136	141	157	151
3	137	132	140	144	133	156	138	129	159
4	114	142	131	141	162	137	131	138	148
5	104	105	142	129	136	143	136	129	164
6	126	141	123	127	139	137	147	141	141
7	127	102	132	138	113	133	139	147	146
8	146	149	135	141	130	133	145	141	131
9	<u>100</u>	<u>119</u>	<u>139</u>	<u>119</u>	<u>126</u>	<u>149</u>	<u>161</u>	<u>154</u>	<u>151</u>
TOTAL	1081	1118	1234	1218	1231	1274	1281	1290	1338
AVERAGE	120	124.3	137.1	135.3	136.8	141.6	142.3	143.3	148.7

out of a possible 6.

The remaining eight daily exercises in Unit A were completed in the same manner. Then individual summaries were drawn up, and graphs drawn by each student to show if progress was being made. A total was recorded for the number of right answers by question as well as by test. (See Figure 1, page 9). This would show if a particular comprehension element was in need of more attention for each student. For example, if a student scored six or seven correct responses for each question type, except question 3, and got only three of the nine questions of this type right in the first unit, it would indicate that the student was having difficulty in relating a thought or a sentence to the article as a whole.

A master sheet was kept by the teacher to record the progress of the class as a whole. The daily tabulation of data such as average number of correct responses, and average time consumed for a test was done by those students who performed well in their math, and was checked by the teacher. Figure 8, page 26, is a graph kept by the students to show class progress on average number of correct responses by unit on the reader exercises. It shows that the class scored an average of 120 right answers on the nine tests in Unit A, and this average increased to about 149 right answers in Unit I.

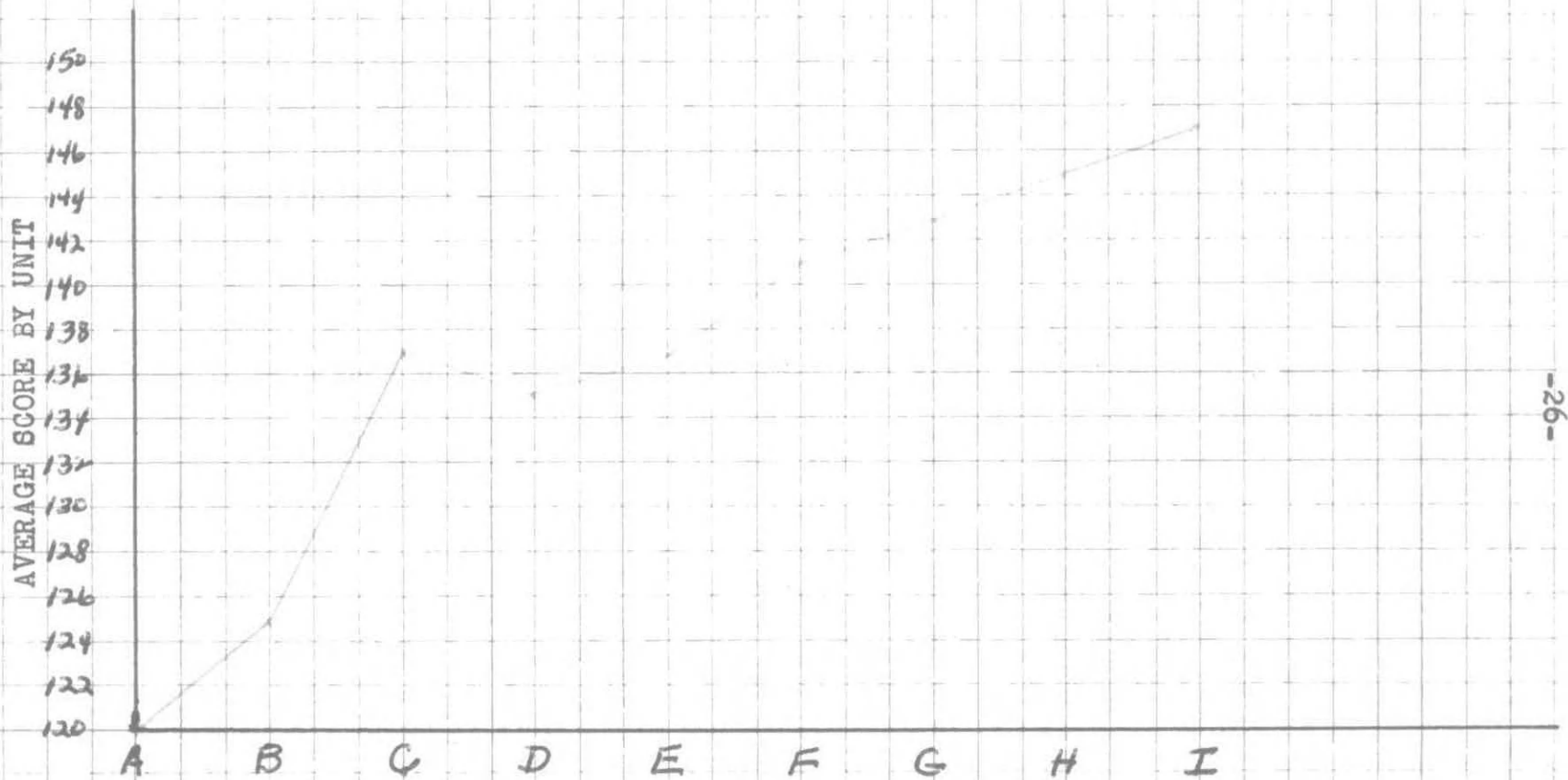


FIGURE 8

AVERAGE NUMBER OF CORRECT RESPONSES BY UNIT  
ON WEBSTER PRACTICE READER EXERCISES



## CHAPTER IV

### EVALUATION OF THE PROJECT

As stated in the "Purpose of the Study", this investigation was made to determine the value of a reading comprehension improvement program at the eighth grade level in terms of a standardized rate-of-comprehension test. At the initiation of the program, the Van Wageningen Rate-of-Comprehension Scale, Form A<sup>1</sup> was given to the experimental group and to a control group. After completing the eighty-one reading exercises in the Webster Practice Reader, Book 4<sup>2</sup>, and the Dynamic Vocabulary Word List<sup>3</sup>, a second form of the Van Wageningen Rate-of-Comprehension Scale was administered to both classes.

Table I, page 19, shows the data obtained after administering the first rate-of-comprehension test to both groups on February 9, 1955. The average reading rate for the experimental group was 138.6 words per minute, which would be the reading rate expected at the 7.4 grade level according to the scale score chart on the Van Wageningen test. (See Appendix B, page 48 ). The average reading rate for the control group was 162.6 words per minute, which

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1. Van Wageningen, loc. cit.

2. C. R. Stone and C. C. Grover, loc. cit.

3. W. J. Osburn, Dynamic Exercises in Vocabulary (Seattle: University of Washington Book Store).

corresponds to the 8.8 grade level in reading rate. These results gave additional evidence of the reading deficiencies that existed within the experimental group.

Table I, page 19, shows the results of the second test given to both groups on May 11, 1955. Thirteen of the twenty-eight pupils in the control group obtained higher scores on the second test than on the first. Three pupils showed no change, and twelve pupils scored lower on the second test than on the first. The greatest gain made by any pupil in the control group was 54 words per minute, and the greatest loss registered by any pupil in the control group was 54 words per minute. The total gain for the thirteen pupils showing gain in reading rate was 282 words per minute while the twelve students who had a loss showed a total loss of 256 words per minute on Form B. The net gain for the group was 26 words per minute for the 28 pupils in the control group, or slightly less than a one-word-per-minute increase. The average reading rate for this group on the second test was 163.5 words-per-minute.

In the experimental group, 25 pupils showed a gain in reading rate, one had no change, and two showed a loss. The greatest gain made by any pupil in the group was 78 words per minute, while one pupil showed a loss of 18 words per minute and another scored 12 words slower in reading rate. The total gain for this group was 690

words per minute, giving a net gain of 660 words per minute, or an average gain of 23.6 words per pupil. The average grade-level increase in reading rate was 1 year and 4 months. The average reading rate for this group on the second test was 162.2 words per minute, which corresponds to the 8.8 grade level in reading rate.

Summarizing the results on the two forms of these standardized tests, the control group, without benefit of a program of reading improvement, but following the normal, prescribed curriculum, increased in rate-of-comprehension from 162.6 to 163.5 words-per-minute. The experimental group, following the regular curriculum and utilizing a program of reading improvement, increased in rate-of-comprehension from 138.6 to 162.2 words-per-minute. This substantial increase demonstrates that on the basis of this test<sup>1</sup>, the special program in reading had considerable merit.

As was mentioned previously, the six phases or elements of comprehension involved in the Webster Practice Reader exercises were:

- Question 1 - Implied details.
- Question 2 - Meaning of the whole.
- Question 3 - Correctness of a statement in relation to the selection.
- Question 4 - Understanding the meaning of reference words such as they, some, who, smallest, those, this, each, one, and it.

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1. Van Wageningen, op. cit.

Question 5 - Perception of the truth or falseness of a statement.

Question 6 - Selection of word or words similar in meaning of those listed in the questions.

On the nine tests in Unit A, question 1 was answered correctly a total of 188 times out of a possible 252. (see Table III, page 31). Skill in answering questions of this type improved with practice, and on Unit I there were 214 correct answers. Improvement in answering each question type can be noted from Table III: question 2, increased from 199 to 233; question 3, from 158 to 207; question 4, from 173 to 205; question 5, from 186 to 248; question 6, from 177 to 231.

Question 5 showed the greatest percent of increase in number of correct answers, 34 per cent, and question 1 the least, 14 per cent. This is probably due to the fact that question 5 was essentially a true-false item and was more familiar to the students than the other types. The percent of increase in total correct answers from Unit A to Unit I was 24 per cent.

The yearly achievement tests given in School District No. 1 were administered this year on March 8, 1955. At this date, the reading improvement project had been in effect for six weeks, and fifty-five exercises had been completed. The test used this year was the Stanford Achievement Test, Form L.

The scores made by the class on this year's achievement test showed a considerable amount of improvement over

TABLE III  
 TOTAL NUMBER OF CORRECT RESPONSES BY QUESTION ON TESTS  
 IN PRACTICE-READER MATERIAL

QUESTIONS	UNITS									TOTALS
	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>G</u>	<u>H</u>	<u>I</u>	
1	188	176	179	193	179	191	224	216	214	1760
2	199	171	216	209	206	217	199	221	233	1871
3	158	196	207	207	208	232	194	238	207	1847
4	173	188	223	190	208	218	216	192	205	1813
5	186	196	207	221	224	211	221	219	248	1933
6	<u>177</u>	<u>191</u>	<u>202</u>	<u>198</u>	<u>206</u>	<u>205</u>	<u>227</u>	<u>204</u>	<u>231</u>	<u>1841</u>
TOTAL	1081	1118	1234	1218	1231	1274	1281	1290	1338	11065

the previous year's scores. The battery median for this class last year, (April, 1954), was a 6.1 grade placement as compared to an actual grade placement of 7.7, indicating approximately one year and six months lag in achievement as measured by this test. (Table IV, page 33). The battery median on this year's test was 8.0, with a grade placement of 8.6. (See Table V, page 34). This would indicate that with respect to expectancy for an average class there still exists a six months lag in achievement. However, the average chronological age for the class at the time of the test was 14.4, the average mental age was 13.7, and the average I.Q. was 95.5. The achievement lag, then, is understandable. The battery median, nevertheless, showed a two-year advancement for the class in the one year that elapsed since the previous test.

It may be noted in Table IV, column 3, that the grade median for reading on last year's test was 6.7. This year's median was 8.0. The spelling median increased from 6.8 to 7.6; language, from 6.1 to 7.4; arithmetic reasoning, from 7.0 to 8.7; arithmetic composition from 6.8 to 9.0; social studies, from 6.5 to 8.3; science, from 7.0 to 9.1; and study skills, from 6.2 to 8.5.

The greatest gain recorded by any pupil on this year's achievement test over last year's was three years

TABLE IV  
 STANFORD ACHIEVEMENT TEST SCORES OBTAINED BY  
 EXPERIMENT GROUP DURING SCHOOL YEAR 1953-54

COLUMN	1	2	3	4	5	6	7	8	9	10	11	12
PUPIL	PAR. MEAN.	WORD MEAN.	AVER. READ.	SPELL.	LANG.	ARITH. REAS.	ARITH. COMP.	ARITH. AVER.	SOC. ST.	SCI.	STUD. SK.	BATT. MDN.
1	11.0	8.5	9.7	10.7	11.2	9.0	9.7	9.4	7.9	10.3	9.8	9.8
2	10.3	9.1	9.7	8.0	8.4	7.2	7.8	7.5	10.7	10.8	9.4	9.1
3	8.9	9.5	9.2	7.6	3.5	9.0	8.2	8.6	8.1	10.3	6.0	8.2
4	8.0	8.5	8.3	6.7	6.9	8.1	6.6	7.4	8.1	9.1	9.8	8.0
5	8.9	7.6	8.3	7.9	7.9	7.0	7.6	7.3	7.2	7.6	5.8	7.6
6	7.1	7.2	7.2	7.7	8.7	7.6	6.7	7.2	8.1	8.1	6.8	7.6
7	7.4	7.6	7.5	6.8	6.6	7.2	6.8	7.0	7.9	8.1	8.9	7.4
8	7.1	7.4	7.3	7.0	7.4	7.0	7.1	7.1	6.5	7.3	6.8	7.1
9	6.2	7.4	6.8	7.8	5.3	6.8	7.1	6.9	7.6	8.4	6.6	7.1
10	6.5	7.6	7.1	6.7	6.4	7.0	6.7	6.8	7.9	9.1	7.1	7.0
11	6.2	7.2	6.7	8.4	6.1	7.9	6.9	7.4	6.0	7.9	6.8	6.9
12	6.0	7.4	6.7	7.3	6.4	5.7	4.0	4.9	7.9	7.3	5.6	6.4
13	8.0	6.1	7.1	5.4	3.5	7.0	7.3	7.2	6.7	6.1	5.2	6.1
14	8.5	5.8	7.2	6.8	6.1	5.5	4.3	4.9	6.0	6.6	6.0	6.0
15	4.3	6.5	5.4	7.3	0	5.0	6.2	5.6	6.0	6.1	5.2	6.0
16	4.3	6.1	5.2	8.1	4.5	7.9	7.9	7.9	5.8	4.7	5.2	5.8
17	5.7	5.7	5.8	5.6	7.6	7.4	7.1	7.3	5.0	6.3	5.6	5.8
18	6.7	6.1	6.4	3.7	5.7	6.0	5.1	5.6	7.2	4.7	5.8	5.8
19	5.1	5.8	5.5	5.6	7.2	7.2	6.8	7.0	5.0	5.2	4.1	5.6
20	5.1	5.6	5.4	5.1	4.9	6.7	6.7	6.7	5.0	6.3	7.8	5.6
21	5.3	5.4	5.4	5.4	4.0	6.5	6.6	6.6	6.4	5.2	6.2	5.4
22	5.5	4.2	4.9	4.6	3.5	5.3	6.2	5.8	5.2	6.6	6.8	5.3
23	5.5	4.0	4.8	4.5	0	5.2	6.8	6.0	6.4	5.2	6.2	5.2
24	5.1	5.2	5.2	5.2	4.5	5.5	7.1	6.3	5.1	4.3	5.2	5.1
25	<u>4.3</u>	<u>3.8</u>	<u>4.1</u>	<u>3.9</u>	<u>0</u>	<u>5.7</u>	<u>6.1</u>	<u>5.9</u>	<u>5.3</u>	<u>4.1</u>	<u>5.6</u>	<u>4.3</u>
Median	6.2	6.5	6.7	6.8	6.1	7.0	6.8	7.0	6.5	7.0	6.2	6.1

TABLE V

STANFORD ACHIEVEMENT TEST SCORES OBTAINED BY  
EXPERIMENT GROUP DURING SCHOOL YEAR 1954-1955

COLUMN	1	2	3	4	5	6	7	8	9	10	11	12
PUPIL	PAR. MEAN.	WORD MEAN.	AVER. READ.	SPELL.	LANG..	ARITH. REAS.	ARITH. COMP.	AVER. ARITH.	SOC. ST.	SCI.	STUD. SK.	BATT. MDN.
1	11.6	12.1	11.9	12.4	11.5	12.6	12.7	12.7	12.9	12.3	12.9	12.4
2	11.6	10.6	12.1	11.3	10.9	10.4	11.4	10.9	9.8	9.8	12.6	10.9
3	10.9	9.7	10.3	8.8	9.0	11.0	9.3	10.2	12.0	10.5	10.1	10.5
4	9.6	10.0	9.8	6.9	8.5	10.1	10.1	10.1	12.8	11.4	9.4	10.0
5	12.0	10.0	11.0	7.7	6.0	9.7	9.3	9.5	11.4	10.1	11.2	10.0
6	10.5	9.3	9.9	9.3	11.8	8.7	8.7	8.7	10.5	11.1	9.8	9.8
7	9.2	10.6	9.9	8.3	8.8	7.9	9.7	8.8	9.8	10.5	11.2	9.7
8	8.3	7.1	7.7	7.3	7.2	10.7	10.1	10.4	10.1	9.4	11.2	9.4
9	12.0	11.0	11.5	7.7	6.0	8.7	10.4	9.6	12.0	9.1	9.4	9.4
10	9.2	8.0	8.6	11.6	9.3	11.0	9.7	10.4	11.2	7.5	8.9	9.3
11	6.9	9.0	8.0	7.8	7.9	10.4	11.1	10.8	10.5	9.1	8.5	9.0
12	9.2	7.7	8.5	7.8	10.5	7.0	8.0	7.5	8.3	9.4	10.8	8.3
13	8.7	10.0	9.4	8.1	4.9	7.2	6.2	6.7	10.5	9.1	8.1	8.1
14	7.2	9.3	8.3	7.3	7.4	9.1	8.0	8.6	10.7	9.8	8.1	8.1
15	7.9	8.0	8.0	8.1	6.3	11.0	10.4	10.7	6.9	8.4	7.8	8.0
16	7.2	8.5	7.8	6.9	7.6	7.2	7.9	7.6	7.9	8.7	8.9	7.9
17	8.3	8.0	8.2	7.5	8.2	6.3	8.5	7.4	7.9	9.4	7.2	7.9
18	7.9	7.5	7.7	7.6	7.6	7.6	10.1	8.9	7.7	9.1	7.5	7.6
19	6.9	6.4	6.7	7.4	7.4	6.3	7.7	7.0	9.8	9.8	8.1	7.4
20	6.4	7.3	6.9	6.1	6.3	7.2	8.0	7.6	7.7	7.8	7.8	7.3
21	7.2	6.4	6.8	8.5	7.9	10.4	10.1	10.3	5.6	6.7	7.8	7.2
22	8.3	7.1	7.7	5.7	6.0	7.4	7.1	7.3	6.7	9.8	6.1	7.1
23	6.4	6.0	6.2	6.9	7.4	8.7	8.2	8.5	6.4	6.9	8.9	6.9
24	6.9	7.3	7.1	4.0	4.5	6.0	7.3	6.7	5.6	8.4	6.5	6.5
25	5.8	6.2	6.0	6.4	6.3	7.4	9.0	8.2	6.4	7.8	5.8	6.4
26	6.0	6.4	6.2	6.3	5.2	7.4	7.7	7.6	6.2	5.0	6.7	6.3
27	5.0	5.8	5.4	6.3	6.2	7.2	8.7	8.0	6.0	5.5	7.5	6.2
28	5.6	6.0	5.8	7.8	6.9	6.1	7.9	7.0	5.3	5.5	5.9	6.0
29	5.4	5.5	5.5	7.1	4.1	8.7	9.7	9.2	5.3	4.6	9.4	5.5
Mdns.	7.9	8.0	8.0	7.6	7.4	8.7	9.0	8.7	8.3	9.1	8.5	8.0
Mdns. 53-54	6.2	6.5	6.7	6.8	6.1	7.0	6.8	7.0	6.5	7.0	6.2	6.1



and three months. This same pupil showed an increase of 78 words-per-minute on the reading comprehension test, an increase in grade level of four years and two months. Eleven pupils had scores above the grade placement level on this year's test, as compared with four on last year's tests.

It is reasonable to assume that since the reading improvement project constituted the only addition or alteration of significance to the regular classroom program, it was a significant factor in the total achievement gain for this class. As has been indicated, improvement was shown in all areas measured, i.e., reading, language, arithmetic reasoning, arithmetic computation, social studies, science, spelling and study skills.

The library facilities for this grade proved to be completely inadequate as the desire to read developed. Many additions to the library were made by having the children supplement the room's supply with books borrowed from home.

Indications were that oral reading showed marked signs of improvement. Each of the class members was given an opportunity to record his reading of a favorite passage, and then a general discussion evaluated the important features of the reading. On many occasions

the passage selected for reading came from the practice readers.

In the opinion of the writer, these desirable outcomes were based primarily on the success of the reading project. The pupils never tired of the daily exercises, and were enthusiastic about their progress which was evident to them from their daily progress records.

## CHAPTER V

### SUMMARY, CONCLUDING STATEMENT, AND RECOMMENDATIONS

Summary. This study has described a program of reading improvement for the eighth grade class at the Jefferson School, in Missoula, Montana. The reading improvement program was initiated for several reasons: (1) past achievement test scores for the class indicated inadequate reading skills; (2) it was apparent students were handicapped in all areas of the curriculum because of their lack of reading skills; (3) reading improvement for this class was necessary in order for the students to provide for adequate handling of high school reading material.

The reading improvement program included: (1) daily exercises from the Practice Reader Book 4; (2) daily exercises from the Dynamic Vocabulary Exercises. Two forms of a standardized rate-of-comprehension test were administered to the group under special instruction, and to a control group, to determine the effectiveness of the program. The results of this program can readily be noted from an examination of Table I, page 19. The reading rate for the control group showed no significant improvement, while the experimental group showed an

increase of one year and four months in reading rate, as measured by the Van Wageningen Rate-of-Comprehension Scale Form B. Table IV, page 33, shows that the experimental group increased almost two years in total achievement as measured by the Stanford Achievement Test Form L.

Concluding statement. Most of the reading improvement materials and projects available today attempt to improve reading comprehension through the process of developing speed in reading. In general such exercises provide training in fast phrase reading with attention given to eliminating eye fixations. Time consumed in reading such exercises is recorded immediately after the reading has been completed and before the answering of comprehension questions. Such projects often produce remarkable results on easy reading level material in which comprehension questions require as answers merely knowledge of facts. However, one must admit that a great dissimilarity exists in types of reading done on these exercises, and the reading demanded of children in content field books.

An attempt was made in this study to provide a study type of reading material demanding thorough comprehension or integration of material read. In other words, the reading comprehension exercises used in this study require reading more similar to the type demanded of

children using content field books. Although speed was considered in this program, it was given secondary importance. One might contrast the two approaches to reading comprehension by saying that where the former process concentrates on speed in developing comprehension, the latter emphasizes thorough comprehension to develop speed of comprehension. In the opinion of the author, the latter approach, that is, the approach used in this study, is the sounder of the two for improvement of content field reading.

Recommendations. This project could have been of more value to the pupils if it had been started at the beginning of the school year. Book 3 of this series is designed for use in grades five and six. A teacher beginning this program in the fall could use Book 3 for review purposes, and continue with Book 4 if sufficient progress was being made. With this longer period of time allotted to reading improvement, more individual assistance would be possible.

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BIBLIOGRAPHY

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**APPENDIX**



Department of Special Education  
School District No. 1  
Missoula, Montana

Bulletin No. 4

DYNAMIC VOCABULARY DEVELOPMENT

The approach to vocabulary development as described below is a relatively new one in that it incorporates fundamental components of thinking. Dynamic vocabulary exercises differ from other vocabulary exercises in that they teach words in relation to other words. The unit of study is a group of words, not the usual single word. Some current vocabulary teaching tends to use sufficient reference to related work.

The dynamic vocabulary exercises teach the following relations between words; subject-verb, verb-object, adjective-noun, synonyms-antonyms, genus-species, part-whole, implicate and other functional relationships. Groups of words are presented to the pupil in which there is one word that does not belong in the relationship featured in that group. The pupil is asked to identify the relationship and the misplaced word, and tell why the word does not belong in the group.

Such exercises have proved to be immensely interesting to children. They offer a strong motivation for the learning of new words. There is evidence to indicate that low intelligence quotients are due in some part to children's inadequate grasp of word meaning and to inability to express concepts (meanings) in words. Reports on the use of Dynamic Exercises indicate that higher achievement test scores have resulted from their use. The following is quoted from the University of Washington News Letter, Vol. II, No. 2, p. 3, 1940: "A very encouraging report comes also from Mrs. C. J. Sheldon of Douglas, Arizona. Last year Mrs. Sheldon used the Dynamic Vocabulary technique with a very slow class. This year on a test given by a state supervisor the same children as a whole led the entire city in reading ability on their grade level."

Procedure

The exercises on the first grade level have proved very helpful with children who are too immature to learn to read. Children below the fourth grade can hardly be expected to write down their reason for the cross-out, even when they know what the reason is. Oral work here is used for the kindergarten, and grades one, two and three. In the first two levels three words are used. The following procedures are suggested for kindergarten or first grade.

Consider the pattern "dog, cat, flower." The teacher can draw or show pictures of the three items. Ask the children to cross or blot out the picture that does not belong and tell why. Or the teacher may put the three words on the board. Talk about each as first done. Then the children are asked to cross out the one that does not belong.

Here is a sample of a first grade response to man, miss, girl. Some interpreted miss as a verb and directed that it be taken out. Their several reasons follow: "A man takes a girl out for a ride and all sorts of things." "A man is a little girl's daddy." "A man and a girl stay together." "It should say 'mother,' not 'miss.'" "Miss ain't in the family." "The other two are people." "A man can take a girl." and "Man and girl can walk; miss can't."

Some would take out girl because, "A man and a Miss might live together." Three said, "A Miss and a man are married." "Man and Miss are both grown up." "A girl is not a lady or a man." Two would take out man because "Miss is a girl when she

The reaction of children to these patterns is always interesting. They often see unexpected relationships. This pattern was made with the expectation that man would be crossed out because Miss indicates a girl. But only one pupil looked at it that way. In such situations, we count every answer right that the pupil can defend logically. Nearly always some misinformation shows up, as, for example, the interpretation of Miss as a verb here. Often a child cannot hold all three words in his memory span as in, "You don't call your mother Miss." Sometimes a pattern is sensed only very dimly, as in, "Miss is no man or girl." Five crossed out Miss but could give no reason.

None of these pupils could give a complete answer such as, "Cross out man because Miss is a name for a girl and not for a man." In this entire class only one pupil could use a compound sentence answer, and this was given in response to the pattern, laundry, soap, glass: "Cross out glass because you wash clothes with soap, but you cannot wash them with glass."

Above the first grade the patterns contain five words. In some there are four words that are alike. For example -- fiddle, play, spread, buy, touch. This is the noun-adjective type. Spread is to be crossed out because you can play a fiddle, buy a fiddle, and touch a fiddle, but you can't spread a fiddle. Other patterns are made of two pairs of words with an extra which does not belong, as in over, top, under, bottom, along. Along is to be crossed out because over is the opposite of under and top is the opposite of bottom. The purpose of repeating a relationship in a single pattern is to stimulate transfer. Transfer takes place when the learner is conscious of identical elements.

Here is a report of five word patterns from a class of thirty-one pupils (fourth grade). The total number of erroneous responses for the whole class was ten. Since there were thirty-one pupils and five chances for each pupil to make an error, the total of possible errors for the entire class was 5 x 31 or 155 errors. The class actually made only ten errors, yielding only a six per cent error which is very good in anyone's class. The following responses were considered as more or less incorrect: Horse, bug, spider. "Cross out horse because a bug is a spider." Experts in a nature study would probably call this incorrect information: "A horse is not a spider and a horse cannot crawl on its legs but a spider can crawl on its legs." Somehow the bug got lost. It looks like a short memory span. Over, top, bottom, under, along: "Cross out along because you can look over the top of a wagon and you can look under the bottom of a wagon but you cannot look over an along." This is not bad, but it could be better. Fiddle, play, spread, buy, touch: "You can play spread, buy and touch a post. Fiddle does not belong." This is muddled thinking. Where did the post come from?

The following sheet contains sample exercises taken from the booklet, Dynamic Exercises in Vocabulary, Grades I, II, and III, by W. J. Osburn, Professor of Education, University of Washington. These exercises (and those for grades four through fifteen) may be purchased at the University Book Store, University Way, Seattle 5, Washington.

DYNAMIC VOCABULARY EXERCISES MANUAL

The following sample exercises show how these exercises are to be used. The reasons which the children give have proved to be more important than the mere crossing out of one word. Any logical reason is to be counted as correct.

Sample Exercises

1. Opposites  

large	<del>good</del>	high	small	low
-------	-----------------	------	-------	-----

Good is crossed out because large is an antonym (opposite) of small, and high is an antonym of low.
2. Synonyms  

odd	insane	queer	crazy	<del>erect</del>
-----	--------	-------	-------	------------------

Queer is a synonym of odd, and insane is a synonym of crazy; hence erect does not belong here.
3. Classification  

<del>sugar</del>	lion	tiger	deer	bear
------------------	------	-------	------	------

Sugar does not belong here because all the other words are names of animals.
4. Function  

bluing	shirt	anchor	ship	<del>freed</del>
--------	-------	--------	------	------------------

Freed does not belong here because bluing is used on shirts and anchors are used on ships.
5. Genus-species  

flask	amber	vessel	resin	<del>companion</del>
-------	-------	--------	-------	----------------------

Flask is kind of vessel and amber is a kind of resin; so companion does not belong here.
6. Part-whole  

battery	troop	cell	soldier	<del>drygoods</del>
---------	-------	------	---------	---------------------

Drygoods is crossed out because a cell is part of a battery, and a soldier is part of a troop.
7. Implicate  

voters	<del>connection</del>	votes	appetite	health
--------	-----------------------	-------	----------	--------

Votes implies voters and appetite implies health; so connection does not belong here.
8. Mixed sentence  

water	<del>kind</del>	of	lots	drink
-------	-----------------	----	------	-------

Kind does not belong here because drink lots of water makes a sentence Kind is not needed.
9. Subject-verb  

pigs	ships	<del>distress</del>	squeal	land
------	-------	---------------------	--------	------

Pigs squeal and ships land; so distress does not belong here.
10. Verb-object  

display	<del>assassination</del>	emblem	feature	actor
---------	--------------------------	--------	---------	-------

We may display an emblem and feature an actor; assassination is not needed here.
11. Adjective-noun  

ring	<del>inch</del>	bell
------	-----------------	------

You can ring a bell but you can't inch one.
12. Materials  

costume	leather	silk	<del>custom</del>	black
---------	---------	------	-------------------	-------

We may have a black leather and a silk costume; so custom does not belong here.
13. Materials  

carrot	yellow	<del>crazy</del>
--------	--------	------------------

A carrot can be yellow but it can't be crazy.
14. Materials  

bag	paper	<del>weed</del>
-----	-------	-----------------

A bag may be made out of paper but not out of weed.

## How to Grade a Pupil's Paper

Give full credit for all logical reasons, regardless of misspellings. A list of the misspellings may be kept for later study as a spelling exercise.

### Levels of Performance

- Level 1 --- Correct thinking  
Crossing out the correct word but unable to give the reason orally.  
Credit as perfect on Level 1.
- Level 2 --- Incomplete oral answers of the type:  
baboon          badger          ~~baboon~~          bobolink          falcon  
Bocoon is not an animal.  
Credit such answers as correct on Level 2.
- Level 3 --- Complete oral answers.  
Cocoon is not an animal and the rest are.  
Credit as correct on Level 3.
- Level 4 --- Answers as in Level 2, but written in incomplete form. Credit as correct on Level 4.
- Level 5 --- Answers as in Level 3, but written in incorrect form. Credit as correct on Level 5.
- Level 6 --- Complete written exercises in correct form (spelling, punctuation, capitalization). Give no credit on any level for answers like "Because cocoon is not a bobolink," which omit part of the words.

There is a wide gap of difficulty between oral and written answers. If a child fails to give an intelligible answer, give him a chance to give it orally. You will usually get a surprise.

DYNAMIC VOCABULARY EXERCISES BOOK VII

In each line cross out the word that does not belong. Tell why the rest belong together.

I

1. hoard	collection	hamlet	village	childhood
2. parallel	church	gang	denomination	crew
3. jury	household	nations	panel	league
4. auction	craft	duplicate	sale	guild
5. import	highland	export	management	lowland
6. myth	occupation	fairy tale	business	horizon
7. lookout	mercury	limestone	opal	mineral
8. fellowship	bunting	expression	friendliness	ornament
9. nails	hair	manicure	explanation	marcel
10. error	gossip	film	mistake	picture

II

1. issue	lease	journal	house	influence
2. lecture	license	menace	permission	threat
3. play	letter	climax	oracle	paragraph
4. joy	exhibition	rapture	exposition	copyright
5. labor	snowflake	spirit	patience	patriotism
6. revenge	triumph	pardon	defeat	responsibility
7. reverence	ticking	tenderness	disrespect	harshness
8. sympathy	peril	severity	safety	wealth
9. wrath	verse	meridian	anger	stanza
10. per-cent	product	physiology	rate	science

III

1. primer	education	textbook	schooling	fever
2. reverse	alto	hair	warfare	permanent
3. protection	slaughter	remainder	safety	massacre
4. pen	sedan	battle	stockade	struggle
5. leave	picture	ray	permission	portrait
6. rainfall	proposition	proverb	proposal	axiom
7. remark	tidings	statement	rent	news
8. sacrifice	treaty	rim	religion	government
9. chapter	rudder	book	boat	slang
10. petroleum	platinum	runaway	sulphur	emerald

IV

1. pinnacle	planet	hill	star	rut
2. saver	ravine	tempest	gully	storm
3. seaport	surf	shoal	bard	harbor
4. section	torrent	sewing	640 acres	deluge
5. region	vale	territory	valley	sharpener
6. post card	tornado	wilderness	whirlwind	desert
7. pneumonia	tuberculosis	rheumatism	mumps	telegram
8. chapter	percentage	plaything	lodge	base
9. remedy	repose	cure	resort	rest
10. land	wage	real estate	salary	phonograph

V

1. shortage	emblem	sermon	deficit	token
2. county	railway	yacht	pike	vehicle
3. ship	revolution	schedule	transport	time table
4. robbery	layer	allegiance	burglary	loyalty
5. majesty	reign	sovereign	bluing	nobility
6. execution	commonwealth	hanging	state	alto
7. device	bedspread	cushion	comforter	pad
8. clock	canal	feather	dial	quill
9. trifle	fetter	dagger	trinket	hand cuff
10. washer	staple	bolt	wire	right fielder

VI

1. burial	funeral	millinery	instant	moment
2. communion	corpse	church	graveyard	vine yards
3. grazing	prayer	vice	religion	temptation
4. dram	fathom	drygoods	league	volt
5. goblin	fisheries	imp	phantom	nymph
6. pence	half-dollar	pound	sixpence	embroidery
7. noonday	water	boards	irrigation	lumberyard
8. eyesight	springtime	dram	vision	drink
9. liquid	sesquicentennial	orangeade	hearing	occasion
10. shawl	event	amid	worn	yearly

-19- APPENDIX C

# Van Wageningen RATE OF COMPREHENSION SCALE Form B

Also Part I Van Wageningen Verbal Mental Abilities Scales Form A Division 2  
 and Part I Dvorak-Van Wageningen Diagnostic Examination of Silent Reading Abilities  
 Junior Division

In Grades 4, 5, 6, 7, 8 and 9, give five minutes for working on the scale and use this conversion table.

No. of paragraphs correctly read	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Words per minute in grades 4-9	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
No. of paragraphs correctly read	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Words per minute in grades 4-9	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	216	222	228	234	240
No. of paragraphs correctly read	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56				
Words per minute in grades 4-9	246	252	258	264	270	276	282	288	294	300	306	312	318	324	330	336				

In Grades 10, 11 and 12, give four minutes for working on the scale and use this conversion table.

No. of paragraphs correctly read	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Words per minute in grades 10-12	7	15	22	30	37	45	52	60	67	75	82	90	97	105	112	120	127	135	142	150
No. of paragraphs correctly read	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Words per minute in grades 10-12	157	165	172	180	187	195	202	210	217	225	232	240	247	255	262	270	277	285	292	300
No. of paragraphs correctly read	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56				
Words per minute in grades 10-12	307	315	322	330	337	345	352	360	367	375	382	390	397	405	412	420				

### DIRECTIONS FOR RATE OF COMPREHENSION TEST

Read paragraph A carefully.

A Jane needed a spool of silk thread to finish her new dress. But when she went to the store for her mother she forgot to get the ~~buttons~~ she needed.

In the last half of this paragraph the word buttons does not fit in with the meaning of the rest of the paragraph, so buttons is crossed out.

B The carpenter asked Tom to go to the hardware store and get him a pound of nails. When Tom got back with the matches the carpenter gave him a nickle.

E When we hit the man as he was crossing the street it made him very angry. While he was getting up and brushing off his clothes he laughed at us.

C We are planning to go on an all day picnic tomorrow. We want to get started just as early in the afternoon as we can get away.

F There was a very large crowd to see the motion picture last night. We got there very early but even then there was hardly an empty table in the place.

D John's car came to a stop because there was no more gasoline in the tank. When he had to walk over a mile to get water it made him cross.

G The ball game was more than half over when we got to it but it was so exciting that we were glad to see even the first part of it.

LAST NAME (PLEASE PRINT)

FIRST NAME

GRADE

SCHOOL

TEACHER

DATE

# RATE OF COMPREHENSION

1. It was the first concert at which the newly formed band was to play. When the players appeared in their new baseball uniforms, a cheer went up from the crowd.
2. I saw Margaret walking down the street this morning carrying her arm in a sling. When I asked her what had happened, she said she broke her leg playing tag.
3. The crowd became so excited while watching the firemen trying to put out the fire that the police had a good deal of trouble keeping them out of the dancer's way.
4. When Albert's father told him he might invite his cousins to go on a fishing trip, he was delighted and ran at once to the post-office to call them.
5. Coffee is so cheap now that everyone can afford to buy as much as he wants. People who like it very much can eat all they want of it now.
6. We are getting very tired of having to carry all the water we use from our neighbor's well. Next summer father plans to have a cellar dug near our house.
7. While John was reading a very interesting story yesterday, his mother called him to go on an errand. He was very glad to give up his reading for a while.
8. When Mr. Black wanted a new car he looked at high priced ones first, but as he had but little money he thought they were all too cheap for him.
9. The children are very fond of our big dog and play with him much of the time. The reason for this must be that he is such a cross dog.
10. Mrs. Glenn has been buying a lot of new furniture for her house. Yesterday the furniture truck came with a new table, a new hat, and several new rocking chairs.
11. Harold is very fond of winter sports but lives where it is always warm, so he looks forward with great pleasure to his yearly visit with his cousin each summer.
12. For a long time we have had only one lawyer in our village. He has a'most starved during the last year as there has been almost no sickness around here.
13. School was out and a joyful vacation was ahead of each boy in the school. It was no wonder that as they marched out of the building they looked downcast.
14. Helen must have given the baby another spanking this afternoon, as she often does when he is very naughty or he would not be laughing so loudly or so long.
15. John wants a new bicycle very much. When he was told he would have to pay for half the cost of it himself, he began spending every penny he could earn.
16. Mrs. Lane worked at the library. The messenger boy who had the telegram for her knew this, so instead of taking it to her home, he took it to the store.
17. Jack has been a clerk in a jewelry store for a good many years. He gets fun out of helping women pick out just the kind of dresses they want.
18. It was such a clear cool morning that no one thought of a shower when we started out. You can imagine our surprise when the breeze came up at noon.
19. We heard John's train go before he left home. Thinking that the clock might be too fast, he hurried to the station only to find that he was too early.
20. When Gertrude was a small child, she fell and badly injured her back. She cannot play rough games with the other children because she cannot get along without her glasses.
21. Our son is learning to be a carpenter. We shall be lucky in having someone in our family who knows what to do when anything about the house needs cleaning.
22. So much snow piled up on the roof of the old house last winter that it fell in and drowned all the people who were living on the top floor.
23. Whenever Ralph receives a toy he always boasts about it to his playmates but refuses to let them use it. For this reason he is very much liked by them.
24. Henry plays the piano much better than most boys do. He should play better, however, as he has been taking lessons from the best golf teacher in the village.
25. David dislikes both cards and checkers, but he is very fond of baseball. In fact, he will gladly miss a meal any time to play a game of cards.
26. Some of the buildings in the large cities are now being built many stories high. It takes people so long to walk to the top that they take a streetcar.
27. Letters mailed in London on Monday may reach New York the next Saturday if they come on the fastest boat. Otherwise they are likely to arrive a few days earlier.
28. Supper was later than usual last night and Tom was very hungry. When his mother called him to come to supper he went just as slowly as he could go.

*Continue on next page*



29. The children's picnic happened on a very hot day in May this year. Although it was still spring, the girls ran around shivering in their thin dresses and bare heads.

30. Sadie is very careful of the new doll she got for Christmas. She is afraid to let any of the children play with it for fear it may get sick.

31. The Greeks were an artistic as well as an athletic people, who enjoyed beauty as well as contests. Their temples that still stand impress one with both their ugliness and endurance.

32. Robert's mother does not want him to get his feet wet for fear he will catch cold. So whenever he goes out when it is wet he wears his raincoat.

33. As I watched the masons at work on the foundation, I noticed that one of them was running around in great excitement. It seems that he had mislaid his saw.

34. Mr. Jones is looking for an old table just like the old one in our living room. He would not buy ours because one of the arms was badly broken.

35. John meant to get books at the library on his way home from school. When he got home he remembered that he had not stopped at the store for them.

36. Joseph was one of the best horseback riders in the circus. He rode so easily and gracefully that everyone enjoyed watching him ride around the ring on his handsome bicycle.

37. The boys' car broke down just as they came to the foot of the mountain. As they were in a hurry they took a boat the rest of the way.

38. Mr. Johnson sings so well that everyone enjoys hearing him. There is always a big crowd out to hear him whenever he gives one of his speeches in the park.

39. Only a light wind was needed on that fall day to blow all the leaves off the trees. Soon after the wind came up, the ground was covered with snow.

40. Robert always forgets to take something along when he goes on a fishing trip. The last time he went on one he forgot to take his gun along with him.

41. It was such a hot day in early June that the girls decided to have their party out of doors. When the boys arrived they stood around in their overcoats.

42. When the painters were at our house, Ralph watched them at work. When they went home at night, he started in to finish roofing the house where they left off.

43. It was a tense moment when we dropped the bag of silverware while the family were talking downstairs. It is odd that no one thought that we might be musicians.

44. The day had been very hot and sultry. Toward evening a strong wind arose and the sky began to fill with clouds. Soon the snow was coming down very fast.

45. A heavy snow began to fall very fast the morning we started out to walk to the village. Before we had gone very far, we found ourselves covered with dust.

46. When we woke up this morning, the ground was already deeply covered with snow. Although it was clear when we went to bed, it must have started raining soon afterwards.

47. George's watch would not start again after he dropped it on the sidewalk. In order to get it repaired as quickly as possible, he took it to the blacksmith shop.

48. Peter lived on a farm far from the water. He thought it would be fun to build something that he could use often so he started to build a boat.

49. Mr. King likes flowers so much that he has a very large flower garden in his back yard in the city. In it he raises many different kinds of animals.

50. It was the first fire that James had ever seen. He was so thrilled by it that he told his mother he hoped there would be a picnic every day.

51. We have an old apple tree in our back yard that used to have fruit on it every year. It is getting so old now that it seldom bears any nuts.

52. The boys came home very tired from their long walk in the woods yesterday. Although they slept late this morning, they still felt too sick to want to do anything.

53. Fred needed a new suit of clothes to wear to school in the fall, so his mother took him to the largest furniture store in the city to find one.

54. Whenever Harriet wants to go to a party in the evening, she takes a rest in the afternoon so that she will not feel too old to enjoy the party.

55. Last summer Ralph made much money from his garden and could have sold much more if he had had it. This year he plans to plant a much smaller garden.

56. When Jesse wanted to find out what time it was after he had lost his way and wandered around in the forest for a time, he looked at his compass.

If you have finished before the time is up, raise your hand and let the examiner know.

LAST NAME (PLEASE PRINT)

FIRST NAME

GRADE SCHOOL

TEACHER

DATE

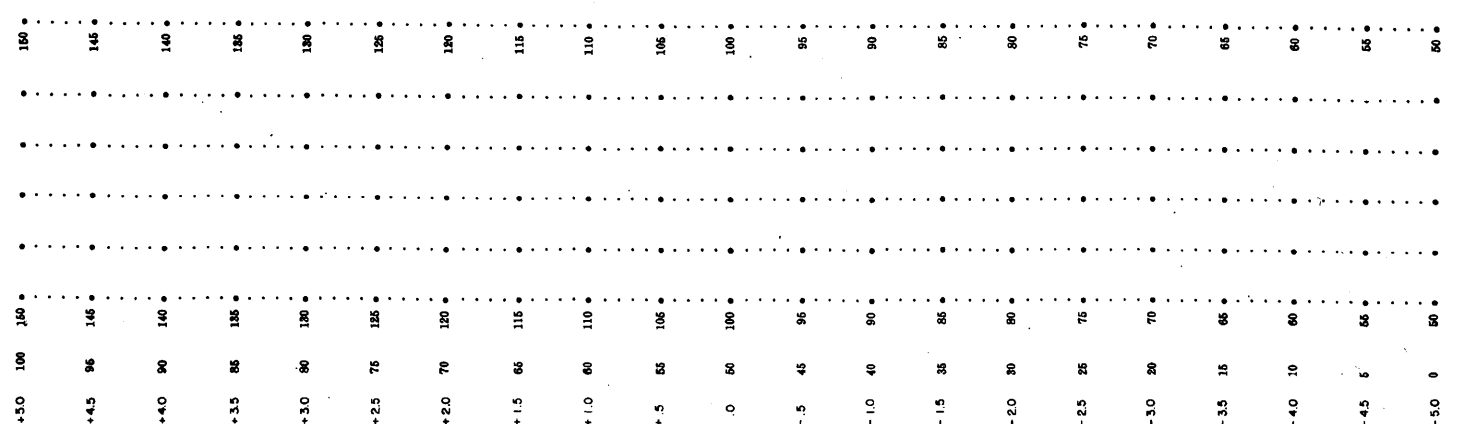
MENTAL PROFILE

C-SCORES and INTELLIGENCE QUOTIENTS

derived from the Van Wagenen Verbal Mental Abilities Scales

Intelligence Quotients

Quarterly Percentile Deviation, I.Q. Composite, 5-Year Verbal I.Q., 5-Year Non-Verbal I.Q., Average Verbal I.Q., Average Non-Verbal I.Q.



Quarterly Percentile Deviation, I.Q. Composite, 5-Year Verbal I.Q., 5-Year Non-Verbal I.Q., Average Verbal I.Q., Average Non-Verbal I.Q.

Scale Scores

Part I: 1. Rate of Comp., 2. Part. of Bal. Compreh., 3. Verbal, 4. Non-Verbal, 5. Range of Inf. in Instruction

Table of Scale Scores with columns for Grade Level, Chron. Age, Part I scores (1-5), Part II scores (1-5), and Data.

Part II: 1. Rate of Comp., 2. Part. of Bal. Compreh., 3. Verbal, 4. Non-Verbal, 5. Range of Inf. in Instruction



## RATE OF COMPREHENSION

1. John earns his own spending money selling papers but he spends it just as rapidly as he earns it. This makes people think that he is a very thrifty boy.
2. John always brings the water from the well for his mother to use in cooking. Whenever she needs some he takes a basket in each hand and goes after it.
3. Jane nearly always forgets to put something on the table when she sets it for her mother. The last time she did it she forgot to put the pillows on.
4. Helen likes to play with the cat and pull its tail, which it doesn't like. Some day she will do it once too often and find that it can sting.
5. Gerald came dashing into the house and up the stairs to his room, slammed his door shut and locked it. From the way he acted he must have been happy.
6. John has been learning to use his new rifle lately. He can shoot so well already that he misses the target nearly every time he aims at it and fires.
7. The roof on Mr. Smith's house was greatly in need of repairs. In order to have it done well he hunted up the best mason he could find in town.
8. Many people complain to the clerk in the shoe store that their shoes hurt their feet but he cannot get them to buy hats that are big enough for them.
9. It was a very hot day for the horse to be galloping for hours without a drink. When he was stopped at noon he must have been cold and thirsty.
10. The train we took was late when it started and then had a breakdown on the way. With so many delays we expected to arrive ahead of time, of course.
11. We started out on a fishing trip early yesterday morning. We did not have very good luck, however, as we brought back for our dinner only a few small rabbits.
12. When Henry's playmates were learning to ride their new bicycles Henry wanted one too. It made him very sad when his mother promised to get him one for his birthday.
13. Helen is expecting an invitation to a party in this morning's mail. Ever since she got up she has been anxiously watching for the milkman to stop at our door.
14. Lucy is always smiling or laughing and making everyone around her happy. Everyone in our village who knows her thinks she must be a very sad girl herself.
15. As long as Tom has been in school he has never missed a day. Not many children who live a long way from school have a poorer record than Tom.
16. One seldom sees two children who look so much alike as the two sisters who live next door. We think they must be orphans as they are both girls.
17. Father is very careful of his watch as it was a present from his grandfather. When anything gets the matter with it he takes it to the very best doctor.
18. One day last week Frank and James went hunting for ducks with their new guns. When they returned from their trip they brought back enough fish to last several days.
19. John was the fastest runner among the boys of our school. When he entered the fifty-yard dash it was expected by the whole school that he would lose the race.
20. Frank is very fond of music and has worked hard to learn to play his violin. He has done so well with it that he plans to study for a doctor.
21. One can go from our village to Chicago on a train or, more quickly, by airplane. When we want to get to Chicago in a hurry we take the boat.
22. All day the sun was bright and hot with not a cloud in the sky. In the early afternoon we had to find shelter from the rain for a while.
23. Henry was very much surprised when his teacher excused him from the final tests. He is certain that it happened because he had done such poor work in her class.
24. The new store is already doing a much bigger business than the older ones. The deliveries are more prompt, the clerks are more courteous, and the prices are much higher.
25. The shower last night was such a heavy one that Joseph did not drive his new car to the village this morning for fear it would get covered with dust.
26. Douglas spent all his time making a new boat. As he was in a hurry to get it done anything that took him away from his work made him happy.
27. Harold is a very tall boy. He finds that this is an advantage in some ways but we find it very hard to get clothes small enough to fit him.
28. In the fall when the frost comes early the leaves change from green to beautiful yellows and reds. To enjoy its brilliant colors many people go out into the desert.

*(Continue on next page)*

29. The boys have been sawing and hammering in the carpenter shop for a week. They expect to surprise their mother with the new cake they have been making for her.

30. There is nothing David likes so well as working in the garden. At school he spends all his spare time studying how to raise chickens of the very finest quality.

31. Cows have to be milked every night and morning, so people who live on farms and keep cows cannot be gone from home more than a week at a time.

32. Whenever Alfred gets a chance he practices shooting with his bow and arrow. He already uses his bow so skillfully that his mother thinks he will be a great violinist.

33. It took Mr. Brown a long time to find a tailor who could make his suits just as he wants them. Now he goes to the same shoemaker twice every year.

34. During the winter squirrels can seldom get food from the earth because it is covered with deep snow, so during the fall they store up fuel for the coming winter.

35. The boys are getting ready to go on a fishing trip tomorrow. They are getting everything ready today so that they can get a very late start in the morning.

36. When mother started to make pickles she found she was out of vinegar, so she sent Joseph to get a jug full at the well as quickly as he could.

37. The lawn does not have to be sprinkled for some days after a shower. As we had a heavy shower this afternoon it will not need to be raked tonight.

38. Even though it was very cold this morning John went off again without wearing any coat. He is young and does not seem to mind this hot weather at all.

39. For some reason Jacob does not like to go to school. Whenever he can find the slightest excuse to stay at home he does not show up at the store.

40. There are many less children in our village than there used to be a few years ago. It will soon be necessary to build a larger school house for them.

41. Jane's father has a large peach orchard. When we got there Jane had just gone to the orchard to see if any of the apples were ripe enough to pick.

42. Henry's old car breaks down nearly every time he drives it. He says that he is going to trade it in for an old one if it breaks down again.

43. The boys just left the house with their bats and in a great hurry to get somewhere. Alice is sure they must be going to play a game of cards.

44. Our cat came running into the house this afternoon half scared to death about something. We think she must have seen a mouse while she was out in the yard.

45. Mr. Wilson found that he had to get to Chicago just as quickly as he could. The only way that he could think of to do this was by walking.

46. As I went to pay for the concert tickets I found I had forgotten my purse. The gentleman behind me, noticing my confusion, kindly offered to loan me a program.

47. They have very old furniture in Robert's home but they must be going to have some new. We saw the delivery wagon from the grocery store stop there this afternoon.

48. John got a letter this morning from an aunt he doesn't like, asking him to visit her. As his mother plans to take him tomorrow he is very happy today.

49. When we reached home last night we found that the house had been ransacked from cellar to attic. Evidently it had been visited by an inspector while we were away.

50. The boys left early this morning. We think they must have gone hunting again. They would not tell us where they were going but we cannot find their fishpoles anywhere.

51. The building in which the children played during the summer was such an old one that the sun shone through the big holes in the roof whenever it was cloudy.

52. When Helen wanted a new dress she was sure they would not have the latest styles in the village store so she went to the city jewelry store for it.

53. Sadie plays the violin very well. But she should play it well for she has been taking lessons on it a long time of the poorest teacher in the village.

54. We were in such a hurry to see the game that we forgot to wait for our change. So the man selling tickets called us back to get our tickets.

55. David cares more about birds than anything else. The trees around his home are full of bird houses. Even at school he spends all his spare time studying about fish.

56. The other children make so much fun of Henry's table manners that even when he is on a picnic with them he does not like to sing with them.

If you have finished before the time is up,  
raise your hand and let the examiner know.

# MENTAL PROFILE

# C-SCORES and INTELLIGENCE QUOTIENTS

derived from the  
Van Wagenen Verbal Mental Abilities Scales

## Intelligence Quotients

Last name

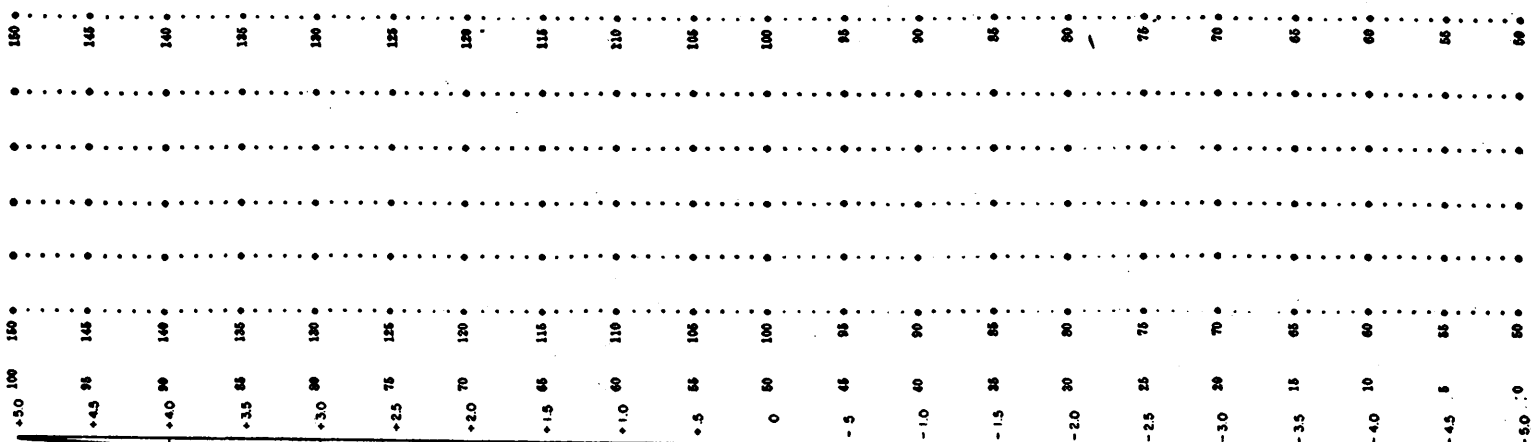
First name

Middle name

Quot. Per Cent  
1. Rate of  
Dev. from  
Mean

2. Per. of  
Comp.

Average  
Verbal  
I. Q.



## Scale Scores

Part I.  
1. Rate of  
Verbal  
per Min.

Part II  
2. Per. of  
Comp.

3. Verbal  
in  
Contest

4. Verbal  
in  
Contest

5. Range  
of I. Q.

420	98	141	142	143	120
412	97	140	141	142	119
405	96	138	139	140	118
397	96	137	138	139	117
390	95	135	136	137	116
382	95	134	135	136	115
375	94	132	133	134	114
367	94	131	132	133	113
360	93	130	131	132	111
352	93	129	130	131	110
344	92	127	128	129	108
336	92	125	126	127	106
328	91	124	125	126	107
320	91	122	123	124	106
324	90	120	121	122	105
321	90	119	120	121	104
318	89	118	119	120	103
312	89	117	118	119	102
305	88	116	117	118	101
300	88	115	116	117	100
294	87	114	115	116	99
288	87	112	113	114	98
282	86	111	112	113	97
276	86	109	110	111	96
270	85	108	109	110	95
264	85	107	108	109	94
258	84	106	107	108	93
252	84	105	106	107	92
248	84	104	105	106	91
248	83	102	103	104	90
242	82	101	102	103	89
236	82	99	100	101	88
230	81	98	99	100	87
224	81	97	98	99	86
218	80	96	97	98	85
212	80	95	96	97	84
206	79	94	95	96	83
200	79	93	94	95	82
194	78	91	92	93	81
188	78	90	91	92	80
182	77	89	90	91	79
176	77	88	89	90	78
170	76	87	88	89	77
164	76	86	87	88	76
158	75	84	85	86	75
152	74	83	84	85	74
146	74	82	83	84	73
140	74	81	82	83	72
134	73	80	81	82	71
128	73	79	80	81	70
122	72	78	79	80	69
116	72	77	78	79	68
110	71	76	77	78	67
104	71	75	76	77	66
98	70	74	75	76	65
92	70	73	74	75	64
86	69	72	73	74	63
80	68	71	72	73	62
74	68	70	71	72	61
68	67	69	70	71	60
62	67	68	69	70	59
56	66	67	68	69	58
50	66	66	67	68	57
44	65	65	66	67	56
38	65	64	65	66	55
32	64	63	64	65	54
26	64	62	63	64	53
20	63	61	62	63	52
14	63	60	61	62	51
8	62	59	60	61	50
2	62	58	59	60	49
-4	61	57	58	59	48
-10	61	56	57	58	47
-16	60	55	56	57	46
-22	60	54	55	56	45
-28	59	53	54	55	44
-34	59	52	53	54	43
-40	58	51	52	53	42
-46	58	50	51	52	41
-52	57	49	50	51	40
-58	57	48	49	50	39
-64	56	47	48	49	38
-70	56	46	47	48	37
-76	55	45	46	47	36
-82	55	44	45	46	35
-88	54	43	44	45	34
-94	54	42	43	44	33
-100	53	41	42	43	32
-106	53	40	41	42	31
-112	52	39	40	41	30
-118	52	38	39	40	29
-124	51	37	38	39	28
-130	51	36	37	38	27
-136	50	35	36	37	26
-142	50	34	35	36	25
-148	49	33	34	35	24
-154	49	32	33	34	23
-160	48	31	32	33	22
-166	48	30	31	32	21
-172	47	29	30	31	20
-178	47	28	29	30	19
-184	46	27	28	29	18
-190	46	26	27	28	17
-196	45	25	26	27	16
-202	45	24	25	26	15
-208	44	23	24	25	14
-214	44	22	23	24	13
-220	43	21	22	23	12
-226	43	20	21	22	11
-232	42	19	20	21	10
-238	42	18	19	20	9
-244	41	17	18	19	8
-250	41	16	17	18	7
-256	40	15	16	17	6
-262	40	14	15	16	5
-268	39	13	14	15	4
-274	39	12	13	14	3
-280	38	11	12	13	2
-286	38	10	11	12	1
-292	37	9	10	11	0
-298	37	8	9	10	-1
-304	36	7	8	9	-2
-310	36	6	7	8	-3
-316	35	5	6	7	-4
-322	35	4	5	6	-5
-328	34	3	4	5	-6
-334	34	2	3	4	-7
-340	33	1	2	3	-8
-346	33	0	1	2	-9
-352	32	-1	0	1	-10
-358	32	-2	-1	0	-11
-364	31	-3	-2	-1	-12
-370	31	-4	-3	-2	-13
-376	30	-5	-4	-3	-14
-382	30	-6	-5	-4	-15
-388	29	-7	-6	-5	-16
-394	29	-8	-7	-6	-17
-400	28	-9	-8	-7	-18
-406	28	-10	-9	-8	-19
-412	27	-11	-10	-9	-20
-418	27	-12	-11	-10	-21
-424	26	-13	-12	-11	-22
-430	26	-14	-13	-12	-23
-436	25	-15	-14	-13	-24
-442	25	-16	-15	-14	-25
-448	24	-17	-16	-15	-26
-454	24	-18	-17	-16	-27
-460	23	-19	-18	-17	-28
-466	23	-20	-19	-18	-29
-472	22	-21	-20	-19	-30
-478	22	-22	-21	-20	-31
-484	21	-23	-22	-21	-32
-490	21	-24	-23	-22	-33
-496	20	-25	-24	-23	-34
-502	20	-26	-25	-24	-35
-508	19	-27	-26	-25	-36
-514	19	-28	-27	-26	-37
-520	18	-29	-28	-27	-38
-526	18	-30	-29	-28	-39
-532	17	-31	-30	-29	-40
-538	17	-32	-31	-30	-41
-544	16	-33	-32	-31	-42
-550	16	-34	-33	-32	-43
-556	15	-35	-34	-33	-44
-562	15	-36	-35	-34	-45
-568	14	-37	-36	-35	-46
-574	14	-38	-37	-36	-47
-580	13	-39	-38	-37	-48
-586	13	-40	-39	-38	-49
-592	12	-41	-40	-39	-50
-598	12	-42	-41	-40	-51
-604	11	-43	-42	-41	-52
-610	11	-44	-43	-42	-53
-616	10	-45	-44	-43	-54
-622	10	-46	-45	-44	-55
-628	9	-47	-46	-45	-56
-634	9	-48	-47	-46	-57
-640	8	-49	-48	-47	-58
-646	8	-50	-49	-48	-59
-652	7	-51	-50	-49	-60
-658	7	-52	-51	-50	-61
-664	6	-53	-52	-51	-62
-670	6	-54	-53	-52	-63
-676	5	-55	-54	-53	-64
-682	5	-56	-55	-54	-65
-688	4	-57	-56	-55	-66
-694	4	-58	-57	-56	-67
-700	3	-59	-58	-57	-68
-706	3	-60	-59	-58	-69
-712	2	-61	-60	-59	-70
-718	2	-62	-61	-60	-71
-724	1	-63	-62	-61	-72
-730	1	-64	-63	-62	-73
-736	0	-65	-64	-63	-74
-742	0	-66	-65	-64	-75
-748	-1	-67	-66	-65	-76
-754	-1	-68	-67	-66	-77
-760	-2	-69	-68	-67	-78
-766	-2	-70	-69	-68	-79
-772	-3	-71	-70	-69	-80
-778	-3	-72	-71	-70	-81
-784	-4	-73	-72	-71	-82
-790	-4	-74	-73	-72	-83
-796	-5	-75	-74	-73	-84
-802	-5	-76	-75	-74	-85
-808	-6	-77	-76	-75	-86
-814	-6	-78	-77	-76	-87
-820	-7	-79	-78	-77	-88
-826	-7	-80	-79	-78	-89
-832	-8	-81	-80	-79	-90
-838	-8	-82	-81	-80	-91
-844	-9	-83	-82	-81	-92
-850	-9	-84	-83	-82	-93
-856	-10	-85	-84	-83	-94
-862	-10	-86	-85	-84	-95
-868	-11	-87	-86	-85	-96
-874	-11	-88	-87	-86	-97
-880	-12	-89	-88	-87	-98
-886	-12	-90	-89	-88	-99
-892	-13	-91	-90	-89	-100
-898	-13	-92	-91	-90	-101
-904	-14	-93	-92	-91	-102
-910	-14	-94	-93	-92	-103
-916	-15	-95	-94	-93	-104
-922	-15	-96	-95	-94	-105
-928	-16	-97	-96	-95	-106
-934	-16	-98	-97	-96	-107
-940	-17	-99	-98	-97	-108
-946	-17	-100	-99	-98	-109
-952	-18	-101	-100	-99	-110
-958	-18	-102	-101	-100	-111
-964	-19	-103	-102	-101	-112
-970	-19	-104	-103	-102	-113
-976	-20	-105	-104	-103	-114
-982	-20	-106	-105	-104	-115
-988	-21	-107	-106	-105	-116
-994	-21	-108	-107	-106	-117
-1000	-22	-109	-108	-107	-118
-1006	-22	-110	-109	-108	-119
-1012	-23	-111	-110</		

- 49 -      APPENDIX C

# Van Wageningen RATE OF COMPREHENSION SCALE      Form B

Also Part I Van Wageningen Verbal Mental Abilities Scales Form A Division 2  
and Part I Dvorak-Van Wageningen Diagnostic Examination of Silent Reading Abilities  
Junior Division

In Grades 4, 5, 6, 7, 8 and 9, give five minutes for working on the scale and use this conversion table.

No. of paragraphs correctly read	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Words per minute in grades 4-9	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
No. of paragraphs correctly read	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Words per minute in grades 4-9	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	216	222	228	234	240
No. of paragraphs correctly read	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56				
Words per minute in grades 4-9	246	252	258	264	270	276	282	288	294	300	306	312	318	324	330	336				

In Grades 10, 11 and 12, give four minutes for working on the scale and use this conversion table.

No. of paragraphs correctly read	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Words per minute in grades 10-12	7	15	22	30	37	45	52	60	67	75	82	90	97	105	112	120	127	135	142	150
No. of paragraphs correctly read	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Words per minute in grades 10-12	157	165	172	180	187	195	202	210	217	225	232	240	247	255	262	270	277	285	292	300
No. of paragraphs correctly read	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56				
Words per minute in grades 10-12	307	315	322	330	337	345	352	360	367	375	382	390	397	405	412	420				

### DIRECTIONS FOR RATE OF COMPREHENSION TEST

Read paragraph A carefully.

A Jane needed a spool of silk thread to finish her new dress. But when she went to the store for her mother she forgot to get the ~~buttons~~ she needed.

In the last half of this paragraph the word buttons does not fit in with the meaning of the rest of the paragraph, so buttons is crossed out.

B The carpenter asked Tom to go to the hardware store and get him a pound of nails. When Tom got back with the matches the carpenter gave him a nickle.

E When we hit the man as he was crossing the street it made him very angry. While he was getting up and brushing off his clothes he laughed at us.

C We are planning to go on an all day picnic tomorrow. We want to get started just as early in the afternoon as we can get away.

F There was a very large crowd to see the motion picture last night. We got there very early but even then there was hardly an empty table in the place.

D John's car came to a stop because there was no more gasoline in the tank. When he had to walk over a mile to get water it made him cross.

G The ball game was more than half over when we got to it but it was so exciting that we were glad to see even the first part of it.

LAST NAME (PLEASE PRINT)

FIRST NAME

GRADE

SCHOOL

TEACHER

DATE

# RATE OF COMPREHENSION

1. It was the first concert at which the newly formed band was to play. When the players appeared in their new baseball uniforms, a cheer went up from the crowd.
2. I saw Margaret walking down the street this morning carrying her arm in a sling. When I asked her what had happened, she said she broke her leg playing tag.
3. The crowd became so excited while watching the firemen trying to put out the fire that the police had a good deal of trouble keeping them out of the dancer's way.
4. When Albert's father told him he might invite his cousins to go on a fishing trip, he was delighted and ran at once to the post-office to call them.
5. Coffee is so cheap now that everyone can afford to buy as much as he wants. People who like it very much can eat all they want of it now.
6. We are getting very tired of having to carry all the water we use from our neighbor's well. Next summer father plans to have a cellar dug near our house.
7. While John was reading a very interesting story yesterday, his mother called him to go on an errand. He was very glad to give up his reading for a while.
8. When Mr. Black wanted a new car he looked at high priced ones first, but as he had but little money he thought they were all too cheap for him.
9. The children are very fond of our big dog and play with him much of the time. The reason for this must be that he is such a cross dog.
10. Mrs. Glenn has been buying a lot of new furniture for her house. Yesterday the furniture truck came with a new table, a new hat, and several new rocking chairs.
11. Harold is very fond of winter sports but lives where it is always warm, so he looks forward with great pleasure to his yearly visit with his cousin each summer.
12. For a long time we have had only one lawyer in our village. He has almost starved during the last year as there has been almost no sickness around here.
13. School was out and a joyful vacation was ahead of each boy in the school. It was no wonder that as they marched out of the building they looked downcast.
14. Helen must have given the baby another spanking this afternoon, as she often does when he is very naughty or he would not be laughing so loudly or so long.
15. John wants a new bicycle very much. When he was told he would have to pay for half the cost of it himself, he began spending every penny he could earn.
16. Mrs. Lane worked at the library. The messenger boy who had the telegram for her knew this, so instead of taking it to her home, he took it to the store.
17. Jack has been a clerk in a jewelry store for a good many years. He gets fun out of helping women pick out just the kind of dresses they want.
18. It was such a clear cool morning that no one thought of a shower when we started out. You can imagine our surprise when the breeze came up at noon.
19. We heard John's train go before he left home. Thinking that the clock might be too fast, he hurried to the station only to find that he was too early.
20. When Gertrude was a small child, she fell and badly injured her back. She cannot play rough games with the other children because she cannot get along without her glasses.
21. Our son is learning to be a carpenter. We shall be lucky in having someone in our family who knows what to do when anything about the house needs cleaning.
22. So much snow piled up on the roof of the old house last winter that it fell in and drowned all the people who were living on the top floor.
23. Whenever Ralph receives a toy he always boasts about it to his playmates but refuses to let them use it. For this reason he is very much liked by them.
24. Henry plays the piano much better than most boys do. He should play better, however, as he has been taking lessons from the best golf teacher in the village.
25. David dislikes both cards and checkers, but he is very fond of baseball. In fact, he will gladly miss a meal any time to play a game of cards.
26. Some of the buildings in the large cities are now being built many stories high. It takes people so long to walk to the top that they take a streetcar.
27. Letters mailed in London on Monday may reach New York the next Saturday if they come on the fastest boat. Otherwise they are likely to arrive a few days earlier.
28. Supper was later than usual last night and Tom was very hungry. When his mother called him to come to supper he went just as slowly as he could go.

*Continue on next page*



29. The children's picnic happened on a very hot day in May this year. Although it was still spring, the girls ran around shivering in their thin dresses and bare heads.
30. Sadie is very careful of the new doll she got for Christmas. She is afraid to let any of the children play with it for fear it may get sick.
31. The Greeks were an artistic as well as an athletic people, who enjoyed beauty as well as contests. Their temples that still stand impress one with both their ugliness and endurance.
32. Robert's mother does not want him to get his feet wet for fear he will catch cold. So whenever he goes out when it is wet he wears his raincoat.
33. As I watched the masons at work on the foundation, I noticed that one of them was running around in great excitement. It seems that he had mislaid his saw.
34. Mr. Jones is looking for an old table just like the old one in our living room. He would not buy ours because one of the arms was badly broken.
35. John meant to get books at the library on his way home from school. When he got home he remembered that he had not stopped at the store for them.
36. Joseph was one of the best horseback riders in the circus. He rode so easily and gracefully that everyone enjoyed watching him ride around the ring on his handsome bicycle.
37. The boys' car broke down just as they came to the foot of the mountain. As they were in a hurry they took a boat the rest of the way.
38. Mr. Johnson sings so well that everyone enjoys hearing him. There is always a big crowd out to hear him whenever he gives one of his speeches in the park.
39. Only a light wind was needed on that fall day to blow all the leaves off the trees. Soon after the wind came up, the ground was covered with snow.
40. Robert always forgets to take something along when he goes on a fishing trip. The last time he went on one he forgot to take his gun along with him.
41. It was such a hot day in early June that the girls decided to have their party out of doors. When the boys arrived they stood around in their overcoats.
42. When the painters were at our house, Ralph watched them at work. When they went home at night, he started in to finish roofing the house where they left off.
43. It was a tense moment when we dropped the bag of silverware while the family were talking downstairs. It is odd that no one thought that we might be musicians.
44. The day had been very hot and sultry. Toward evening a strong wind arose and the sky began to fill with clouds. Soon the snow was coming down very fast.
45. A heavy snow began to fall very fast the morning we started out to walk to the village. Before we had gone very far, we found ourselves covered with dust.
46. When we woke up this morning, the ground was already deeply covered with snow. Although it was clear when we went to bed, it must have started raining soon afterwards.
47. George's watch would not start again after he dropped it on the sidewalk. In order to get it repaired as quickly as possible, he took it to the blacksmith shop.
48. Peter lived on a farm far from the water. He thought it would be fun to build something that he could use often so he started to build a boat.
49. Mr. King likes flowers so much that he has a very large flower garden in his back yard in the city. In it he raises many different kinds of animals.
50. It was the first fire that James had ever seen. He was so thrilled by it that he told his mother he hoped there would be a picnic every day.
51. We have an old apple tree in our back yard that used to have fruit on it every year. It is getting so old now that it seldom bears any nuts.
52. The boys came home very tired from their long walk in the woods yesterday. Although they slept late this morning, they still felt too sick to want to do anything.
53. Fred needed a new suit of clothes to wear to school in the fall, so his mother took him to the largest furniture store in the city to find one.
54. Whenever Harriet wants to go to a party in the evening, she takes a rest in the afternoon so that she will not feel too old to enjoy the party.
55. Last summer Ralph made much money from his garden and could have sold much more if he had had it. This year he plans to plant a much smaller garden.
56. When Jesse wanted to find out what time it was after he had lost his way and wandered around in the forest for a time, he looked at his compass.

If you have finished before the time is up, raise your hand and let the examiner know.

LAST NAME (PLEASE PRINT)

FIRST NAME

GRADE SCHOOL

TEACHER

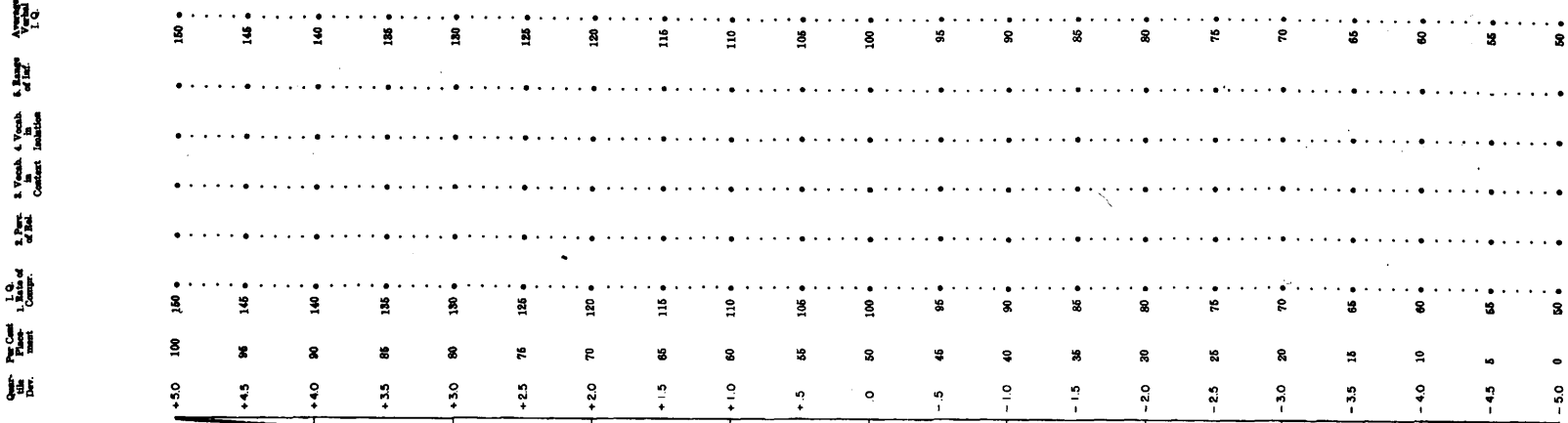
DATE

**MENTAL PROFILE**

**C-SCORES and INTELLIGENCE QUOTIENTS**

derived from the  
**Van Wageningen Verbal Mental Abilities Scales**

**Intelligence Quotients**



**Scale Scores**

Grade Level	Chron. Age	1. Rate of Comp. (per Min.)	2. Perc. of Bal. Constant	3. Verbal Constant	4. Verbal Constant	5. Range of Bal. Constant	Grade Level	Chron. Age	1. Rate of Comp. (per Min.)	2. Perc. of Bal. Constant	3. Verbal Constant	4. Verbal Constant	5. Range of Bal. Constant
13.0	13-2	240	87	101	102	90	13.0	13-2	240	87	101	102	90
12.10	12-0	234	86	100	101	89	12.10	12-0	234	86	100	101	89
12.5	12-6	228	85	99	100	88	12.5	12-6	228	85	99	100	88
12.4	12-4	225	85	98	99	88	12.4	12-4	225	85	98	99	88
12.2	12-2	222	84	97	98	87	12.2	12-2	222	84	97	98	87
12.0	12-0	219	84	96	97	86	12.0	12-0	219	84	96	97	86
11.10	11-0	213	83	95	96	85	11.10	11-0	213	83	95	96	85
11.8	10-8	210	82	94	95	84	11.8	10-8	210	82	94	95	84
11.5	11-5	204	81	93	94	84	11.5	11-5	204	81	93	94	84
11.0	11-0	201	81	92	93	83	11.0	11-0	201	81	92	93	83
10.10	10-0	195	80	91	91	82	10.10	10-0	195	80	91	91	82
10.8	10-8	192	79	90	90	82	10.8	10-8	192	79	90	90	82
10.5	10-5	189	79	89	89	81	10.5	10-5	189	79	89	89	81
10.4	10-4	186	78	88	88	81	10.4	10-4	186	78	88	88	81
10.0	10-0	180	78	87	87	80	10.0	10-0	180	78	87	87	80
9.8	14-10	174	77	86	86	79	9.8	14-10	174	77	86	86	79
9.5	14-5	171	76	85	85	78	9.5	14-5	171	76	85	85	78
9.4	14-4	168	76	84	84	77	9.4	14-4	168	76	84	84	77
9.2	14-2	165	75	83	83	76	9.2	14-2	165	75	83	83	76
8.10	14-0	160	75	82	82	75	8.10	14-0	160	75	82	82	75
8.8	13-8	155	74	81	81	74	8.8	13-8	155	74	81	81	74
8.6	13-6	152	74	80	80	73	8.6	13-6	152	74	80	80	73
8.4	13-4	150	73	79	79	72	8.4	13-4	150	73	79	79	72
8.2	13-2	148	73	78	78	71	8.2	13-2	148	73	78	78	71
7.10	12-10	144	72	77	77	70	7.10	12-10	144	72	77	77	70
7.8	12-8	138	71	76	76	69	7.8	12-8	138	71	76	76	69
7.4	12-6	135	70	75	75	68	7.4	12-6	135	70	75	75	68
7.2	12-4	132	69	74	74	67	7.2	12-4	132	69	74	74	67
7.0	12-2	129	69	73	73	66	7.0	12-2	129	69	73	73	66
6.10	11-10	126	68	72	72	65	6.10	11-10	126	68	72	72	65
6.8	11-8	120	68	71	71	64	6.8	11-8	120	68	71	71	64
6.4	11-6	118	67	70	70	63	6.4	11-6	118	67	70	70	63
6.2	11-4	114	67	69	69	62	6.2	11-4	114	67	69	69	62
6.0	11-2	111	66	68	68	61	6.0	11-2	111	66	68	68	61
6.10	11-0	108	65	67	67	60	6.10	11-0	108	65	67	67	60
5.8	10-10	105	65	66	66	59	5.8	10-10	105	65	66	66	59
5.4	10-6	99	64	65	65	58	5.4	10-6	99	64	65	65	58
5.8	10-4	96	63	64	64	57	5.8	10-4	96	63	64	64	57
5.5	10-2	90	62	63	63	56	5.5	10-2	90	62	63	63	56
4.10	10-0	84	61	62	62	55	4.10	10-0	84	61	62	62	55
4.8	9-10	81	61	61	61	54	4.8	9-10	81	61	61	61	54
4.8	9-8	78	60	60	60	53	4.8	9-8	78	60	60	60	53
4.5	9-4	75	59	59	59	52	4.5	9-4	75	59	59	59	52
4.2	9-2	72	58	58	58	51	4.2	9-2	72	58	58	58	51
3.10	9-0	66	57	57	57	50	3.10	9-0	66	57	57	57	50
3.8	8-10	60	56	56	56	49	3.8	8-10	60	56	56	56	49
3.8	8-8	55	55	55	55	48	3.8	8-8	55	55	55	55	48
3.4	8-4	51	54	54	54	47	3.4	8-4	51	54	54	54	47
3.0	8-0	46	53	53	53	46	3.0	8-0	46	53	53	53	46

Quant. Dev.	Per Cent. of Total	I. Q. Composite	1. Verbal Constant	2. Verbal Constant	3. Verbal Constant	4. Verbal Constant	5. Verbal Constant	6. Verbal Constant	Average Verbal I. Q.
+5.0	100	180	.	.	.	.	.	.	.
+4.5	96	145	.	.	.	.	.	.	145
+4.0	90	140	.	.	.	.	.	.	140
+3.5	86	135	.	.	.	.	.	.	135
+3.0	80	130	.	.	.	.	.	.	130
+2.5	76	125	.	.	.	.	.	.	125
+2.0	70	120	.	.	.	.	.	.	120
+1.5	65	115	.	.	.	.	.	.	115
+1.0	60	110	.	.	.	.	.	.	110
+ .5	55	105	.	.	.	.	.	.	105
0	50	100	.	.	.	.	.	.	100
- .5	46	95	.	.	.	.	.	.	95
-1.0	40	90	.	.	.	.	.	.	90
-1.5	36	85	.	.	.	.	.	.	85
-2.0	30	80	.	.	.	.	.	.	80
-2.5	25	75	.	.	.	.	.	.	75
-3.0	20	70	.	.	.	.	.	.	70
-3.5	15	65	.	.	.	.	.	.	65
-4.0	10	60	.	.	.	.	.	.	60
-4.5	5	55	.	.	.	.	.	.	55
-5.0	0	50	.	.	.	.	.	.	50