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The relative order of difficulty of several types of study skills in the intermediate grades

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Boston University

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School of Education

Thesis

The Relative Order of Difficulty of Several Types of Study Skills in the Intermediate Grades

Submitted by
Katherine G. Keneally
(B. S. in Ed., Boston University, 1938)

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

1939

First Reader: Donald D. Durrell, Professor of Education
Second Reader: Ray C. Billett, Professor of Education
Third Reader: Herbert F. Blair, Professor of Education
THE RELATIVE ORDER OF DIFFICULTY
OF SEVERAL TYPES OF STUDY SKILLS
IN THE INTERMEDIATE GRADES
Acknowledgments

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Thanks are also due to Mr. Allen P. Keith, Superintendent of Schools and to Miss Ellen C. Sweeney, Elementary Supervisor, for permission to carry on this experiment in the New Bedford Public Schools. I wish to express my appreciation to the principals and intermediate grade teachers in the John Hannigan, William H. Taylor, Abraham Lincoln, Parker Street and Charles S. Ashley Schools for their help in gathering the data.

Finally thanks are due to Miss Dorothy Santimaw for mimeographing the material and for typing this thesis.
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INTRODUCTION
Introduction

The problem of this thesis is to find the relative order of difficulty of several types of study skills and their grade placement.

Educators do not agree in regard to the reading abilities that should be taught in the intermediate grades. The number of skills to be taught in grades 4, 5, and 6 varies in the lists found in current educational literature. There is much overlapping in these lists of abilities compiled by educators, text-book writers and curriculum makers.

Yoakam presents a list of 63 general and specific abilities which he considers essential for the intermediate grades. The specific abilities are listed under the following general headings:

1. Recognition
2. Comprehension
3. Organization
4. Retention
5. Location of Data
6. Appreciation
7. Reproduction
8. Integrated Procedures

1. Yoakam, Gerald, "The Improvement of Reading in the Middle Grades" Education, 56: 1-15 September 1935
Gray 2 compiled a list of 43 skills in order to suggest some of the important types of knowledge and skills that should be emphasized during the 4th, 5th and 6th grades. He has listed these skills under the following general headings.

1. Locating information
2. Selecting and evaluating material needed
3. Organizing material
4. Solving a problem or making application of what is read
5. Remembering what is read for specific purposes

Gates 3 has drawn up an outline of items to be considered in an appraisal of reading ability. The list represents an outline of abilities and skills that should be investigated during the school career of a pupil from kindergarten to college. In this list he suggests 15 study skills that should be taught.

Stone 4 lists the following specific objectives in connection with special skills in study reading:

2. Gray, Wm. S., "The Nature and Organizing of Basic Instruction in Reading"
The Thirty-Sixth Year Book of the National Society for the Study of Education

3. Gates, Arthur I., "Measurements of Achievement in Reading"
The Thirty-Sixth Year Book of the National Society for the Study of Education

4. Stone, Clarence R., Better Advanced Reading
Webster Publishing Company 1937
1. Quickness in locating items of information by skimming, by observing headings in reading matter, and by use of tables of contents, index, dictionary and encyclopedia.

2. Ability to comprehend the meaning of the unit as a whole, the organization, and details.

3. Skill in a good technique of study for retention and recall.

4. Precision in understanding printed directions.

5. Speed, accuracy and power in reading informative material for various purposes.

6. Habit of thoughtful questioning and problem raising while reading.

7. Ability to find answers to questions, to check the accuracy of statements, to reproduce the main thought of a unit, to select the central thought of a paragraph or section, to select an important point and supporting details, to collect information for solving a problem, to make or complete an outline of a selection, and to evaluate the worth of material.

King 5 outlines specific abilities to be taught in grades 4, 5, and 6. Dolch 6 lists five goals for reading in the intermediate grades.

Wilkinson and Brown 7 list 14 abilities for the middle grades.


7. Wilkinson and Brown - Improving Your Reading Noble and Noble Publishers Inc.
Townsend presents a list of reading skills that was developed for the intermediate grades in connection with the experiences children have in their social studies.

Goodykoontz presents a method of procedure for teaching pupils to organize what they read. The following list outlines a series of lessons to develop the ability to organize what has been read and to formulate the selected elements into a usable product.

I. Analyzing What is Read

A. Finding the principal ideas
   1. Matching questions with answering paragraphs
   2. Asking key questions. Stating the key questions which each paragraph answers
   3. Matching titles or paragraph headings with paragraphs
   4. Naming paragraphs
   5. Improving paragraph headings
   6. Finding a keynote sentence in a paragraph
   7. Recognizing the climax in a story
   8. Taking running notes

B. Recognizing the relation of ideas to each other
   9. Anticipating the content of a chapter
   10. Arranging ideas in order
   11. Classifying or grouping ideas
   12. Grouping paragraphs around main points
   13. Locating subordinate or supporting points

8. Townsend, W. B., "Reading in the Intermediate Grades" Instructor 43:43 June 1934

9. Goodykoontz, Bess, "Teaching Pupils to Organize What They Read" Elementary English Review 7: 87-90 April 1930
14. Completing a skeleton outline
15. Making an outline

II. Synthesizing the Important Ideas for Use

16. Reproducing from an outline or from notes
17. Securing material in answer to a problem
18. Summarizing

Durrell 10 has abridged the eighteen steps presented by Goodykoontz by using the following exercises:

1. Matching headlines and paragraphs
2. Discovering topic sentences
3. Selecting the best summaries
4. Developing the word outline or idea line
5. Classifying major and minor ideas
6. Oral and written reproduction from these idea lines

Horn 11 has contributed the following analysis of groups of abilities needed in such study as is done with books.

1. There are those abilities needed in locating information. This involves skill in using the dictionary, in using the index, in using the table of contents in using libraries and general reference books, and in skimming to locate information.

10. Durrell, Donald D., "Basic Abilities in Intermediate Grade Reading" *Education* 59: 45-51 September 1938

11. Horn, Ernest, From the Preface of *Learn to Study Readers*, Book IV Ginn and Co. 1926
2. There are those abilities involved in accurately comprehending what is read, in selecting items for one's purpose, and in appraising the value of these items.

3. There are those abilities involved in organizing the data so understood and selected, according to the purposes for which one is reading at the time.

4. There are those abilities needed in providing for remembering what has been read.

McKee states that from actual analyses of many different types of situations in which one reads silently for informational purposes show that required abilities may be classified into five large groups. These groups are as follows:

1. Those knowledges, skills, habits and attitudes bound up in the ability to comprehend material read quickly and accurately in the light of the problem in mind.

2. Those knowledges, skills, habits and attitudes bound up in the ability to locate information quickly and accurately in the light of the problem in mind.

3. Those knowledges, skills, habits and attitudes bound up in the ability to select and evaluate material read quickly and accurately in the light of the problem in mind.

4. Those knowledges, skills, habits, and attitudes bound up in the ability to organize material read quickly and accurately in the light of the problem in mind.

12. McKee, Paul, Reading and Literature in the Elementary School
    Houghton, Mifflin 1934
5. Those knowledges, skills, habits and attitudes bound up in the ability to decide quickly and accurately what part of the material read should be remembered and how to remember it.

Several studies on the value of different skills in work-type reading have been done on the secondary level. Germane\(^{13}\) found that rereading an article was superior, to outlining and summarizing when the pupils' ability to study was followed by two types of comprehension tests. The first comprehension check was the question and answer test involving major and minor ideas. The second test required the selection of the correct answer from a group of four answers. McDowell and Anderson\(^{14}\) concluded from their study in testing the ability of pupils to outline that outlining is a fundamental study skill in any content subject. Crawford\(^{15}\) found no significant differences between outlining and rereading in order to prepare for a test. Salisbury\(^{16}\) showed in her experiment on 474 high school pupils that the experimental group gained in ability to solve problems and achieve in content subjects after 30 lessons in outlining which stressed thought getting.

13. Germane, Charles E., "Outlining and Summarizing Compared with Reading as Methods of Study" The Twentieth Year Book of the National Society for the Study of Education 1921


15. Crawford, C. C., "Relative Values of Reading and Outlining as Methods of Study" Educational Method 8: 454 May 1929

Leggitt 17 measured the progress of a class in 9th grade civics and found great improvement in the experimental group and concluded that instruction in organizing subject matter improves that ability to a high degree. Alderman 18 found these types of exercises beneficial in improving comprehension in silent reading. The exercises that were found to be of most value to the pupils were exercises in organization, retention and vocabulary.

Jacobs and Liveright 19 found that 17 weeks of intensive instruction in study type reading in the 4th, 5th, and 6th grades improved the abilities of the pupils in the experimental group 12 months. Barton's 20 study showed that pupils learned more facts if they were taught to systematically and thoughtfully outlined the subject matter assigned for study.

In regard to grade placement of these various study skills McKee 21 says,


19. Jacobs and Liveright, "The Improvement of Study Type Reading" *The Tenth Year Book of the Dept., of Elementary Principals* N. E. A. 1931

20. Barton, Wm. A., "Outlining as a Study Procedure" *Teachers College, Columbia University Contributions to Education*, No. 556

In addition to the discovery of these abilities it is important to know the grade or grades in which each one should be taught. Unfortunately the evidence relative to this grade placement is meager. Present practice is largely a matter of opinion and personal experience. Much objective experimentation is needed to discover just when and where a given ability shall be taught.
Chapter II.

Plan and Procedure of the Study
Since the problem was to find the relative order of difficulty of several types of study skills and their grade placement, the material had to be constructed in order to test these specific skills. Five topics, presumably of interest to intermediate grade children, were chosen as the basis for these selections. Each selection contained approximately 250 words. The vocabulary burden was focused at the fourth grade level. The writer endeavored to keep the vocabulary level of each paragraph constant, but the skills tested were graded in difficulty. Thirty tests were constructed, six for each selection written. The following study skills were tested:

1. Matching headlines and paragraphs
2. Finding minor ideas with major ideas supplied (skeleton outline)
3. Finding major ideas with minor ideas supplied (idea line)
4. Retention of order of ideas
5. Selection of best summary (from memory)
6. Writing original headlines

A preliminary try-out of the tests was given to grades 4A, 5A and 6A in one school primarily to discover if the paragraphs were of interest to the children, and to determine whether any skill was duplicated by the tests. These tests showed that finding minor ideas in a skeleton outline form, and finding minor with the major ideas supplied in an idea line resulted in identical answers; consequently the test finding minor ideas in the idea line was eliminated from the final study. The data obtained from the preliminary try-outs were not used in the final study because at the time of the final testing these classes had been promoted and the personnel of the classes had changed.
Since the problem was to find the relative order of difficulty of several types of study skills and their grade placement, the material had to be constructed in order to test these specific skills. Five topics, presumably of interest to intermediate grade children, were chosen as the basis for these selections. Each selection contained approximately 250 words. The vocabulary burden was focused at the fourth grade level. The writer endeavored to keep the vocabulary level of each paragraph constant, but the skills tested were graded in difficulty. Thirty tests were constructed, six for each selection written. The following study skills were tested:

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The final tests were given to 475 children in grades 4, 5, and 6, approximately 150 children in each grade. Complete data were obtained on only 438 children for this study due to the absence of some pupils when the mental ages or reading achievement levels were obtained.

Mental ages for this group of children were obtained by giving the Otis Self-Administering Test of Mental Ability, Form A. The Durrell-Sullivan Reading Capacity and Reading Achievement Tests were given to obtain the grade equivalents in reading.

Accelerated classes and retarded classes were not tested as the writer desired to test only classes progressing at a normal rate of speed. Children in accelerated classes presumably would have reading accomplishment levels far in advance of their grade placement.
The following table indicated the method of rotation of the tests.

<table>
<thead>
<tr>
<th>Paragraphs</th>
<th>Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Driver Ants</td>
<td>a. Matching Headlines and Paragraphs</td>
</tr>
<tr>
<td>2. The Seeing Eye</td>
<td>b. Minor ideas (major ideas supplied)</td>
</tr>
<tr>
<td>3. The Chameleon</td>
<td>c. Major ideas (minor ideas supplied)</td>
</tr>
</tbody>
</table>
| 4. The Wonderful Art of Pottery Making | d. 1. Order of Ideas  
                                      | 2. Selection of retention best summary                     |
| 5. Radio Altimeter              | e. Original headlines                                        |

ex: 1a - Driver Ants - paragraph read  
Matching Headlines and Paragraphs test used

3e - The Chameleon - paragraph read  
Original Headlines - test given.
### Table Showing Rotation of Tests.

<table>
<thead>
<tr>
<th>School</th>
<th>Grade</th>
<th>Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4A</td>
<td>1a</td>
</tr>
<tr>
<td>2</td>
<td>4A</td>
<td>2a</td>
</tr>
<tr>
<td>3</td>
<td>4A</td>
<td>3a</td>
</tr>
<tr>
<td>4</td>
<td>4A</td>
<td>4a</td>
</tr>
<tr>
<td>1</td>
<td>5A</td>
<td>1a</td>
</tr>
<tr>
<td>2</td>
<td>5A</td>
<td>2a</td>
</tr>
<tr>
<td>3</td>
<td>5A</td>
<td>3a</td>
</tr>
<tr>
<td>3</td>
<td>5A</td>
<td>2a</td>
</tr>
<tr>
<td>1</td>
<td>6A</td>
<td>1a</td>
</tr>
<tr>
<td>2</td>
<td>6A</td>
<td>2a</td>
</tr>
<tr>
<td>3</td>
<td>6A</td>
<td>5a</td>
</tr>
<tr>
<td>3</td>
<td>6A</td>
<td>4a</td>
</tr>
</tbody>
</table>
Directions for giving the tests.

A mimeographed copy of the selection to be read was given to each child as well as a mimeographed copy of the test for the selection. The pupils filled in the blank spaces provided for name, school, teacher, grade and date.

**Test 1.** - Matching headlines and paragraphs.

A brief discussion of newspaper headlines preceded the testing. The children were instructed as follows: "Imagine that you are news reporters and are choosing headlines for stories you have written. Be sure to select a headline that tells the whole story. Let us read the directions you find on your test papers."

The following directions were read orally by the class. "Below you will find several headlines for each paragraph. Draw a circle around the number of the headline that you think is the best headline."

These further instructions were given to the class. "Remember that there are three paragraphs. Find them on your papers. Point to them with your finger - paragraph one, paragraph two, paragraph three. Be sure you draw a circle around one number for each paragraph, making three circles in all. If you cannot decide which headline to choose read your paragraph again."

**Test 2.** - Minor ideas (with major ideas supplied)
(skeleton outline form)

After the class had filled in the blank spaces at the top of their papers the title of the second selection was briefly discussed. The second selection was tested in skeleton outline form. The instructions were as follows:
"This skeleton outline tells the story in a few words by having only the important ideas written. Find I on your paper - Read it to me. Read A under I. How many numbers are there under A?" If, for example, the answer was 4, the instructions continued, "You will find these 4 minor ideas in your paragraph. Count and find out how many minor ideas you must look for in paragraph. You may re-read your paragraph if necessary to find these minor ideas."

Test 3. - Major ideas with minor ideas supplied (idea - line)

The pupils filled in the blank spaces at the top of their papers. The title of the selection to be read was briefly discussed. The directions were as follows: "In this test you are to fill in the major ideas. You are given the minor ideas and are to write the major idea over them in the space provided for it. Read the minor ideas under A. Can you suggest a major idea for those minor ideas?" This was used for a sample. Several major ideas were suggested by the children and written on the blackboard. The class selected the idea they thought was most appropriate. On the blackboard the writer illustrated the similarity between the skeleton outline and the idea line. "In the last test, I gave you the major ideas and asked you to write the minor ideas. This time I have given you the minor ideas and want you to write the major ideas." If the word major seemed to confuse the children they were told it meant important.

Tests 4 and 5. - Order of ideas. Selection of best summary.

Tests 4 and 5 were given as tests of retention. The selection was read by the class before the tests were distributed. The directions were as follows:
"This skeleton outline tells the story in a few words by having only the important ideas written. Find I on your paper – Read it to me. Read A under I. How many numbers are there under A?" If, for example, the answer was 4, the instructions continued, "You will find these 4 minor ideas in your paragraph. Count and find out how many minor ideas you must look for in paragraph. You may re-read your paragraph if necessary to find these minor ideas."

Test 3. – Major ideas with minor ideas supplied (idea - line)

The pupils filled in the blank spaces at the top of their papers. The title of the selection to be read was briefly discussed. The directions were as follows: "In this test you are to fill in the major ideas. You are given the minor ideas and are to write the major idea over them in the space provided for it. Read the minor ideas under A. Can you suggest a major idea for those minor ideas?" This was used for a sample. Several major ideas were suggested by the children and written on the blackboard. The class selected the idea they thought was most appropriate. On the blackboard the writer illustrated the similarity between the skeleton outline and the idea line. "In the last test, I gave you the major ideas and asked you to write the minor ideas. This time I have given you the minor ideas and want you to write the major ideas." If the word major seemed to confuse the children they were told it meant important.

Tests 4 and 5. – Order of ideas. Selection of best summary.

Tests 4 and 5 were given as tests of retention. The selection was read by the class before the tests were distributed. The directions were as follows:
"Read your story once very carefully as I am going to ask you to remember what you have read. When you have finished reading your story put it on the table." The papers containing both tests 4 and 5 were distributed to the class. The blank spaces on the papers were filled in.

"Read the directions to me. Number these ideas in the order in which they occurred in the paragraph. Look at paragraph I. Do you see the numbers in front of the headlines? Find number 1. Number one tells you the first thing the paragraph told you about. Find number 2. Number 2 tells you the second thing that happened in the story. Number three tells you the third thing that happened. These numbers are not in order, you see. You will have to think and try to remember what happened first, what happened second and what happened third. Put your finger on Paragraph II.

Read these ideas carefully. Decide which one occurred first in the paragraph and put figure 1 in front of it on the line provided for it. Put figure 2 in front of the idea that happened second and number 3 in front of the third idea. When you have finished paragraph 2, do paragraph 3 in the same way. Number the ideas as they occurred in the paragraph."

"Look at the test at the bottom of the page. Read the directions to me. Draw a circle around the number of the summary that you think is the best. These three summaries tell you the same story that you have just read. I want you to select the one that you think best tells the whole story."
Scoring.

The tests were scored in the following manner:

1. Matching headlines and paragraphs.
   Five headlines were given for each selection.
   The headlines were so constructed that there was only one correct answer as
   two headlines were too narrow and two were too broad.

2. Selection of order of ideas - This test was scored for accuracy
   of recall of ideas in the order in which they occurred in each paragraph.

3. Selection of best summary - Three summaries were given for each
   selection. The summaries were so constructed that only one summary contained
   all the major ideas of the selection.

4. Minor ideas (outline form) - Major ideas (Idea-line form) The
   writer outlined all selections indicating correct responses for both major
   and minor ideas. The responses were scored correct if the child indicated
   the correct idea regardless of his selection of words.

5. Writing Original headlines - The writer listed all possible
   correct headlines for each paragraph. Care was taken to see that the headline
   was neither too narrow nor too broad but indicated exactly the main idea of
   each paragraph.

All tests were given as power tests so were not timed.
Chapter III.

Analysis of the Data
The data were analyzed:

1. To determine the relative order of difficulty of the following study skills and their grade placement.

   1. Finding minor ideas with major ideas supplied (skeleton outline)
   2. Selection of best summary (test of retention)
   3. Retention of order of ideas
   4. Matching headlines and paragraphs
   5. Finding major ideas with minor ideas supplied (idea line)
   6. Writing original headlines
Figure IA shows that the chronological age distribution of the 85 children reading on a 4th grade reading level ranged from 9 years 2 months to 16 years and 11 months, a spread of 7 years 9 months. Figure 1B shows that the chronological age of the 136 children reading on a fifth grade level ranged from 8 years 10 months to 15 years 5 months, a spread of 6 years 5 months. Figure 10 shows that the chronological age of the group of 115 children reading on a 6th grade level ranged from 9 years 0 months to 16 years 2 months, a spread of 7 years 2 months.

The range of chronological age for the group of 66 pupils having 7th grade reading equivalents was from 9 years 4 months to 14 years 7 months, a spread of 5 years 3 months. (See Figure II A) Figure III B shows the chronological age distribution for the group of 25 pupils having 8th grade reading equivalents ranged from 10 years 2 months to 14 years 3 months, a spread of 4 years 1 month.

The mental ages for the group of children tested were based on the results of the Otis Self Administering Test of Mental Ability, Form A. The results of the Otis Test showed that the group of children reading on a 4th grade level ranged from 8 years 5 months to 12 years 6 months. (See Figure III A) Figure III B shows the mental age of the group reading on a 5th grade level ranged from 9 years 5 months to 13 years 9 months. The greatest spread, 5 years 7 months was obtained by the group reading on a 6th grade level. This group ranged from 9 years 3 months to 14 years 10 months. (See Figure III C)

Figure IVA shows the range of mental ages for children reading on a 7th grade level was from 10 years 3 months to 15 years 10 months. The mental age distribution for children reading on an eighth grade level ranged from
12 years 1 month to 15 years 6 months. (See Figure IV B)

For this study the children were divided into groups on the basis of their reading grade equivalents. Figure V shows that the reading achievement levels for the group of 438 children was as follows.

<table>
<thead>
<tr>
<th>Reading Grade Equivalent</th>
<th>Number of Pupils</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>4</td>
<td>85</td>
</tr>
<tr>
<td>5</td>
<td>136</td>
</tr>
<tr>
<td>6</td>
<td>115</td>
</tr>
<tr>
<td>7</td>
<td>66</td>
</tr>
<tr>
<td>8</td>
<td>25</td>
</tr>
</tbody>
</table>

438 total number of pupils
Group of 85 children having 4th grade reading equivalents

Group of 136 children having 5th grade reading equivalents

Group of 115 children having 6th grade reading equivalents

Chronological Age Distribution
For groups of children having 4th, 5th, and 6th grade reading equivalents
Group of 46 pupils having 7th grade reading equivalents

Group of 28 pupils having 8th grade reading equivalents

Chronological Age Distribution
For the groups of children having 7th and 8th grade reading equivalents
Figure III

A
Group of 85 children having 4th grade reading equivalents

B
Group of 186 children having 5th grade reading equivalents

C
Group of 115 children having 6th grade reading equivalents

Mental Age Distribution

For groups of children having 4th, 5th and 6th grade reading equivalents
Figure IV

Group of 66 children having 7th grade reading equivalents

Group of 25 children having 8th grade reading equivalents

Mental Age Distribution

For groups of children having 7th and 8th grade reading equivalents
12 years 1 month to 15 years 6 months. (See Figure IV B)

For this study the children were divided into groups on the basis of their reading grade equivalents. Figure V shows that the reading achievement levels for the group of 438 children was as follows.

<table>
<thead>
<tr>
<th>Reading Grade Equivalent</th>
<th>Number of Pupils</th>
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</thead>
<tbody>
<tr>
<td>3</td>
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<tr>
<td>4</td>
<td>85</td>
</tr>
<tr>
<td>5</td>
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<td>115</td>
</tr>
<tr>
<td>7</td>
<td>66</td>
</tr>
<tr>
<td>8</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td><strong>438 total number of pupils</strong></td>
</tr>
</tbody>
</table>
Figure V

Reading Grade Level

Number of pupils in each reading grade level
Table I shows the percent of items correct in each test by groups of children with reading achievements of grades 4, 5, 6, 7 and 8. Table II shows the order of difficulty of the study skills measured for pupils having a 4th grade reading equivalent. Table III shows the order of difficulty of study skills for pupils reading on a 5th grade level. Table IV shows the order of difficulty of study skills for children reading on a 6th grade level. Table V shows the order of difficulty of study skills for children reading on a 7th grade level. The order of difficulty for children reading on an eighth grade level is found in Table VI.

Table VII shows the percent of items correctly passed in the intermediate grades and in the grades above the intermediate grade level. The probable errors of the percents were obtained from the "Table of Standard Errors and Probable Errors of Percentages for Varying Numbers of Cases," published in the Journal of Applied Psychology, 10: 378 - 391 1926.

Figure VI shows the percents of items correctly passed on 6 study skills measured in grades 4, 5, and 6 having reading grade equivalents of grades 4, 5, 6, 7, and 8. Figure VII shows a comparison of the order of difficulty of the 6 study skills for pupils reading on the intermediate grade level with the order of difficulty of the same study skills for pupils reading above the intermediate grade level.

The tables in Figure 8 show the range of reading achievement levels according to grade placement.

A range of 5 years in reading grade level was found in grades 4, 5, 6.
Figure VI

Per cents of items correctly passed on 6 study skills measured in grades 4, 5 and 6 having reading grade equivalents of 4, 5, 6, 7, and 8.
Figure VII

Percents of items correctly passed on 6 study skills measured in grades (4, 5, 6) and grades (7 and 8)

A Comparison of the Order of Difficulty of 6 Study Skills
### Range of Reading Achievement Levels According to Grade Placement

<table>
<thead>
<tr>
<th>R.A.</th>
<th>8 - 9&quot;</th>
<th>9 - 10&quot;</th>
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**Reading Achievement Levels of Boys in Grade 4**

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**Reading Achievement Levels of Girls in Grade 4**

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**Reading Achievement Levels of Boys in Grade 5**

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**Reading Achievement Levels of Girls in Grade 5**

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**Reading Achievement Levels of Boys in Grade 6**

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</table>

**Reading Achievement Levels of Girls in Grade 6**
Table I shows the percent of items correct in each test by groups of children with reading achievements of grades 4, 5, 6, 7 and 8. Table II shows the order of difficulty of the study skills measured for pupils having a 4th grade reading equivalent. Table III shows the order of difficulty of study skills for pupils reading on a 5th grade level. Table IV shows the order of difficulty of study skills for children reading on a 6th grade level. Table V shows the order of difficulty of study skills for children reading on a 7th grade level. The order of difficulty for children reading on an eighth grade level is found in Table VI.

Table VII shows the percent of items correctly passed in the intermediate grades and in the grades above the intermediate grade level. The probable errors of the percents were obtained from the "Table of Standard Errors and Probable Errors of Percentages for Varying Numbers of Cases," published in the Journal of Applied Psychology, 10: 378-391, 1936.

Figure VI shows the percents of items correctly passed on 6 study skills measured in grades 4, 5, and 6 having reading grade equivalents of grades 4, 5, 6, 7, and 8. Figure VII shows a comparison of the order of difficulty of the 6 study skills for pupils reading on the intermediate grade level with the order of difficulty of the same study skills for pupils reading above the intermediate grade level.

The tables in Figure 8 show the range of reading achievement levels according to grade placement.

A range of 5 years in reading level was found in grades 4, 5, and 6.
Table I Showing % of Items Correct in Each Test.

<table>
<thead>
<tr>
<th>Number of Pupils</th>
<th>Grade Equivalent</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>85</td>
<td>4</td>
<td>30</td>
<td>39</td>
<td>31</td>
<td>21</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>136</td>
<td>5</td>
<td>51</td>
<td>53</td>
<td>59</td>
<td>23</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>115</td>
<td>6</td>
<td>65</td>
<td>50</td>
<td>39</td>
<td>23</td>
<td>16</td>
<td>10</td>
</tr>
<tr>
<td>66</td>
<td>7</td>
<td>77</td>
<td>53</td>
<td>44</td>
<td>33</td>
<td>27</td>
<td>23</td>
</tr>
<tr>
<td>25</td>
<td>8</td>
<td>88</td>
<td>44</td>
<td>65</td>
<td>44</td>
<td>33</td>
<td>32</td>
</tr>
</tbody>
</table>

* Tests:

- Test 1 - Finding Minor Ideas
- Test 2 - Selection of Best Summary
- Test 3 - Retention of Order of Ideas
- Test 4 - Matching Headlines and Paragraphs
- Test 5 - Major Ideas
- Test 6 - Writing Original Headlines
Table II  Showing Order of Difficulty of Study Skills for Pupils Reading on a 4th grade level.

<table>
<thead>
<tr>
<th>Test</th>
<th>% of items correct</th>
<th>P.E. (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Selection of Best Summary</td>
<td>39</td>
<td>3.6</td>
</tr>
<tr>
<td>2. Retention of Order of Ideas</td>
<td>31</td>
<td>3.4</td>
</tr>
<tr>
<td>3. Minor Ideas (Skeleton Outline)</td>
<td>30</td>
<td>3.4</td>
</tr>
<tr>
<td>4. Matching Headlines and Paragraphs</td>
<td>21</td>
<td>3.0</td>
</tr>
<tr>
<td>5. Major ideas (idea line)</td>
<td>6</td>
<td>1.8</td>
</tr>
<tr>
<td>6. Original Headlines</td>
<td>4</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Table III  Showing Order of Difficulty of Study Skills for Pupils Reading on a 5th grade level.

<table>
<thead>
<tr>
<th>Test</th>
<th>% of items correct</th>
<th>P.E. (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Retention of Order of Ideas</td>
<td>59</td>
<td>2.8</td>
</tr>
<tr>
<td>2. Selection of Best Summary</td>
<td>53</td>
<td>2.9</td>
</tr>
<tr>
<td>3. Minor Ideas (Skeleton Outline)</td>
<td>51</td>
<td>2.9</td>
</tr>
<tr>
<td>4. Matching Headlines and Paragraphs</td>
<td>23</td>
<td>2.5</td>
</tr>
<tr>
<td>5. Major ideas (idea line)</td>
<td>12</td>
<td>1.9</td>
</tr>
<tr>
<td>6. Original Headlines</td>
<td>10</td>
<td>1.8</td>
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</table>

Table IV  Showing Order of Difficulty of Study Skills for Pupils Reading on a 6th grade level.

<table>
<thead>
<tr>
<th>Test</th>
<th>% of items correct</th>
<th>P. E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Minor Ideas (Skeleton Outline)</td>
<td>66</td>
<td>3.0</td>
</tr>
<tr>
<td>2. Selection of Best Summary</td>
<td>50</td>
<td>3.2</td>
</tr>
<tr>
<td>3. Retention of Order of Ideas</td>
<td>39</td>
<td>3.0</td>
</tr>
<tr>
<td>4. Matching Headlines and Paragraphs</td>
<td>23</td>
<td>2.6</td>
</tr>
<tr>
<td>5. Major Ideas</td>
<td>16</td>
<td>2.7</td>
</tr>
<tr>
<td>6. Original Headlines</td>
<td>10</td>
<td>1.9</td>
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</table>

Table V  Showing Order of Difficulty of Study Skills for Pupils Reading on a 7th grade level.

<table>
<thead>
<tr>
<th>Test</th>
<th>% of items correct</th>
<th>P. E.</th>
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<tbody>
<tr>
<td>1. Minor Ideas (Skeleton Outline)</td>
<td>77</td>
<td>3.5</td>
</tr>
<tr>
<td>2. Selection of Best Summary</td>
<td>53</td>
<td>4.1</td>
</tr>
<tr>
<td>3. Retention of Order of Ideas</td>
<td>44</td>
<td>4.1</td>
</tr>
<tr>
<td>4. Matching Headlines and Paragraphs</td>
<td>38</td>
<td>4.0</td>
</tr>
<tr>
<td>5. Major Ideas (idea line)</td>
<td>27</td>
<td>3.7</td>
</tr>
<tr>
<td>6. Original Headlines</td>
<td>23</td>
<td>3.5</td>
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</table>
Table VI  Showing Order of Difficulty of Study Skills for Pupils Reading on an 8th grade level.

<table>
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<th>Test</th>
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<th>P. E. (G)</th>
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<tbody>
<tr>
<td>1. Minor Ideas (Skeleton Outline)</td>
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<td>2. Retention of Order of Ideas</td>
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<tr>
<td>3. Selection of Best Summary</td>
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<tr>
<td>4. Matching Headlines and Paragraphs</td>
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<td>6.7</td>
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<td>5. Major Ideas (idea line)</td>
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<td>6.3</td>
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<td>6. Original Headlines</td>
<td>32</td>
<td>6.3</td>
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</table>

3. op. cit.
Table VII  

Showing the Probable Errors of the Percents of Items Correctly Passed in the Intermediate Grades and in Grades Above the Intermediate Level.

<table>
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<th>Reading Grade</th>
<th>Test</th>
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<td>1.8</td>
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<td>4, 5 and 6</td>
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<td>4, 5 and 6</td>
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4. op. cit.
Table Showing the Significance of the Differences in Tests Given to Pupils in the Intermediate Grades.

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<td>100</td>
</tr>
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Table Showing the Significance of the Differences in Tests Given to Pupils above the Intermediate Grades.

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<td>91</td>
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<td>4 - 5</td>
<td>11</td>
<td>4.6</td>
<td>2.3</td>
<td>94</td>
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<tr>
<td>5 - 6</td>
<td>4</td>
<td>4.3</td>
<td>.9</td>
<td>73</td>
</tr>
</tbody>
</table>
Summary and Conclusions
Summary and Conclusions

The purpose of this study was to find the relative order of difficulty of several types of study skills and their grade placement.

Tests were constructed to measure these study skills and were given to 438 children in grades 4, 5, and 6 with the following results:

1. The order of difficulty for the study skills measured was the same for the groups of children reading on an intermediate grade level (grades 4, 5, and 6) and for those reading above the intermediate grade level (grades 7 and 8).

2. The order of difficulty secured for the 6 study skills measured was as follows:
   a. Finding minor ideas with major ideas supplied (skeleton outline)
   b. Selection of best summary
   c. Retention of order of ideas
   d. Matching headlines and paragraphs
   e. Finding major ideas with minor ideas supplied (idea line)
   f. Writing original headlines

3. The order of difficulty for the following tests was not constant at all grade levels:
   a. Finding minor ideas with major ideas supplied (skeleton outline)
   b. Selection of best summary
   c. Retention of order of ideas

4. The order of difficulty for the following tests was constant on all grade levels:
   a. Matching headlines and paragraphs
a. Matching headlines and paragraphs

b. Finding major ideas with minor ideas supplied (idea line)

c. Writing original headlines

5. According to grade placement all classes tested had a range of 5 years in reading achievement level. The implication that can be drawn from this fact is that the teachers of intermediate grades must teach all study skills in their classes to provide for individual differences at the 5 levels of reading ability.
Problems for Further Research
Problems for Further Research

One of the values of this research has been to make the writer more conscious of new problems to be solved in the field of work-type reading. Some of the questions that have arisen during the progress of this study are as follows:

1. Would an item analysis of the 6 tests constructed for measuring study skills used in this study determine:
   a. What percent of the children on each reading grade level select headlines that are too narrow?
   b. What percent of the children on each reading grade level select headlines that are too broad?
   c. Do children with a high mental age tend to select headlines that are too narrow or too broad?
   d. How do children of low mental age compare with children high mental age in regard to selection of headlines that are too narrow or too broad?
   e. Are there any sex differences in selection of headlines that are too narrow or too broad?

2. Would an item analysis of all the tests of skills used in this study determine:
   a. Which items are correctly selected by children on all grade levels?
   b. Which items are correctly selected by 5th grade children that were not correctly selected by 4th grade children?
   c. Which items were correctly selected by 6th grade children that were not correctly selected by 4th and 5th grade
children?

3. Which study skills are learned incidentally?

4. Which study skills require teaching?

5. Why are the two tests requiring retention (order of ideas, and selection of best summary) simpler at all reading grade levels than the following three tests? (Finding major ideas, matching headlines and paragraphs, writing original headlines)

6. What would be the order of difficulty secured if these tests of study skills were given to pupils reading on a third grade level? on a junior high school level?

7. How much value would there be in work-books constructed to teach these study skills in graded steps at different reading grade levels?

8. What would be the result of teaching study skills if there were adequate diagnostic tests to indicate where the emphasis in teaching these skills is needed?
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APPENDIX
Driver Ants

Driver ants live in hot countries, like Africa, South America, and southern Asia. They are flesh eating ants which capture live creatures for their food. Their favorite food is the flesh of ground beetles, mayflies, and crickets.

These ants are much feared for they hunt in long columns of millions of individuals and are as savage as tigers. They charge along in single file most of the time, but occasionally march in columns one-half to two inches wide like a vast and over-excited miniature army. The head of the advancing column of ants resembles an arrowhead with the pioneer ants or the trail blazers leading the way.

Driver ants seize upon their victims ferociously and sink their vicious needle-sharp pincers into them. Not only the timid antelope, but the powerful elephant, the horned rhinoceros, the tiger, and the terrible gorilla crash through the jungle when attacked by this tiny creature. The largest and fiercest animals are helpless before them and perish under the millions of bites unless they can flee to water and drown their tormentors. Animals confined in pens are killed and devoured by these insects in a few hours. When a swarm of ants is seen approaching, the people leave their houses and let the ants clear out any insects which they may find, as well as the rats and mice.

K. G. Keneally 1939
Driver Ants

Below you will find several headlines for each paragraph. Draw a circle around the number of the headline that you think is the best headline.

Paragraph I.
1. Ants — that live in hot countries
2. Food of the driver ants
3. Capturing live creatures for food
4. Driver Ants
5. Ants

Paragraph II.
1. Pioneer Ants
2. A Miniature Army
3. Charge of the Army Ants
4. Hunting in Arrowhead Formation
5. The Army of Driver Ants

Paragraph III.
1. Victims of Driver Ants
2. Jungle Animals Attacked By Ants
3. Fighting Methods of Driver Ants
4. Jungle Animals Perish in Pens
Fill in the minor ideas under each major idea.

A. Driver Ants

1. Location
   A. Countries
      1.
      2.
      3.

II. Food
   a. 
   b. 
   c. 

III. Methods of charging
   a. 
   b. 

IV. Leaders of Army
   a. 

V. Fighting
   a. Method
      1. 
   b. Animals attacked
      1.
      2.
      3.
      4.
      5.

VI. Methods of Escape Iron Ants
   a. Jungle animals
      1. 
   b. People
      1.
Fill in the major ideas

<table>
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<th>A.</th>
<th>B.</th>
<th>C.</th>
<th>D.</th>
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<tbody>
<tr>
<td>1. Africa</td>
<td>1. beetles</td>
<td>1. single file</td>
<td>1. pioneer ants</td>
</tr>
<tr>
<td>2. South America</td>
<td>2. mayflies</td>
<td>2. wide columns</td>
<td></td>
</tr>
<tr>
<td>3. Asia</td>
<td>3. crickets</td>
<td></td>
<td></td>
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<tr>
<th>E.</th>
<th>F.</th>
<th>G.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. biting</td>
<td>1. antelope</td>
<td>1. flee to water</td>
</tr>
<tr>
<td>2. elephant</td>
<td>2. vacate houses</td>
<td></td>
</tr>
<tr>
<td>3. rhinoceros</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Tiger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. gorilla</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

K. G. Keneally 1939
Number these headlines in the order in which you find them in the story.

Example:
Paragraph I.
3 Favorite food of driver ants
2 Capture live creatures for food
1 Driver ants live in hot countries

Paragraph II.
5 A miniature army
3 Marching ants resemble arrowhead
1 Driver ants feared

Paragraph III.
2 Insects devour animals confined in pens
1 Jungle animals attacked by ants
2 Ants kill victims with sharp pincers

Draw a circle around the number of the summary that you think is the best.

1. Driver ants live in Africa. Their favorite food is ground beetles. They are as savage as Tigers.

2. Driver ants are flesh eating ants that live in hot countries. They hunt in long columns resembling an army. These ants attack both animals and people and are very much feared by them.

3. Driver ants charge along in single file. Tigers, elephants and gorillas are afraid of these ants. The only way the jungle animals can protect themselves is to run to water and drown the ants.
The Seeing Eye

There is a farm in Morristown, New Jersey where dogs are trained to become eyes for blind people. The German Shepherd dog was chosen for the job because he learns so easily and because he is so dependable. The Seeing Eye, which is really a school for both dog and owner starts to train the dogs when they are fifteen months old. The first thing that the dog is taught is to obey. Next he learns to go left, right or forward, as he is ordered. Then the dog is taught to disobey for he must learn to use his judgment when danger is near.

After the dog has been trained for three months his new master comes to the school. A blind person must be taught to follow his dog as well as the dog is taught to lead him. The blind people stay at the school for a month taking lessons with the dogs who are to be their guides. The man learns how to take care of his dog, what to feed him, how to harness him and what kind of bed he should have. In this way the dog comes to depend on his master, just as his master depends on him.

The final test comes when the master goes into town with his dog and makes his way through the traffic with only his dog for a guide. At first the blind man cannot believe his dog will lead him safely through the dangers before him. Soon he finds that his dog will let no harm come to him, and will tell him when to stop and go. He has been given another pair of eyes.
Below you will find several headlines for each paragraph. Draw a circle around the number of the headline that you think is the best headline.

The Seeing Eye

Matching Headlines and Paragraphs

Paragraph I.

1. A School for the Blind
2. Lessons taught to German Shephard Dogs
3. "The Seeing Eye"
4. A Farm in New Jersey
5. Teaching German Shepherd Dogs

Paragraph II.

1. Taking Care of Dogs
2. Lessons Taken With Dogs As Guides
3. A Month at "The Seeing Eye"
4. Dogs Trained
5. Training the Blind

Paragraph III.

1. The Final Test
2. Another Pair of Eyes
3. In Traffic
4. Confidence in Dog Guide
5. A Safe Guide
I. Location

II. Type of School

a.

III. German Shepherd dogs

a. Selected because

1. 
2.

b. Lessons Taught

1. 
2. 
3.

IV. Training the Blind Owners

a. Amount of time necessary

1. 

b. Lessons learned

1. 
2. 
3.

V. Results of Training

a. Location of Final Test

1. 

b. Owner trusts dog because

1. 
2.
<table>
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<tr>
<th>A.</th>
<th>B.</th>
<th>C.</th>
<th>D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Morristown, New Jersey</td>
<td>1. Training School for dogs &amp; their blind owners</td>
<td>1. learns easily 1. To obey</td>
<td>2. dependable 2. To go right, left or forward. 3. To disobey</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>2. How to care for dog</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. What to feed dog</td>
<td>2. owner has confidence in dog</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. how to harness dog</td>
<td></td>
</tr>
</tbody>
</table>

K. G. Keneally 1939
Example:

Paragraph I.
1. Dependable German Shepherd dog chosen to lead the blind
2. Seeing Eye School located in New Jersey
3. German Shepherd dogs learn many lessons

Paragraph II.
- Blind owners taught to care for dogs
- Dogs trained for three months at school
- Blind owners remain at school one month

Paragraph III.
- Blind owner given new pair of eyes
- Final test in traffic
- Owner gains confidence in dog

Draw a circle around the summary that you think is the best.

1. Dogs are trained to lead blind people at a school in New Jersey. The German Shepherd dog was chosen because he learns easily and is so dependable. The dog is taught to obey, to go right and left and to disobey. The dog is taught to lead his master through traffic.

2. German Shepherd dogs are trained at the Seeing Eye for three months. Their blind owners stay at the school for one month taking lessons with the dogs that are to become their guides. The dog and his owner learn to go through traffic safely.

3. The Seeing Eye is a school at Morristown, New Jersey, that trains German Shepherd dogs to become eyes for their blind owners. The dog is trained to guide his master safely through busy traffic. The blind person has full confidence in his dog and feels that he has been given a new pair of eyes.
The Chameleon

The chameleon is a lizard that changes the color of its skin to match its surroundings. One moment it may be a bright green, the next a gray - black or chestnut and black or covered with yellow spots. If the chameleon is on green grass it, too, is green. Wherever the chameleon is it takes on the color of its new surroundings, and so keeps invisible. This is nature's way of protecting this little lizard. The chameleon moves so slowly that without this power to take on the color of things around it, it would soon be killed by snakes and birds. Layers of cells containing yellow, black and red coloring matter show through its transparent skin and make the color changes.

Even without this power the chameleon would be a most interesting animal. Its big eyes are entirely covered with eyelids except for a tiny, round hole, and the lids move with the ever rolling eyes. It can roll its eyes in any direction, so that one eye may be looking at a fly in front of it while the other watches something behind. It has a tongue more than half the length of its body, which darts out like a flash, skillfully catching insects on the sticky end.

The true chameleon, of which there are more than fifty kinds, are found only in Africa and a few other parts of the Old World. The best known chameleon has a body about six inches long and a tail nearly as long as his body. The so-called American chameleon is smaller and more active than its Old World namesake, but has the same power of changing its colors.
The Chameleon

Below you will find several headlines for each paragraph. Draw a circle around the number of the headline that you think is the best headline.

**Paragraph I.**

1. The World's Champion Turncoat
2. How Nature Protects the Chameleon
3. Chameleons Killed by Snakes and Birds
4. A Bright Green Lizard
5. Many Color Changes Made By Chameleon

**Paragraph II.**

1. An Interesting Animal
2. Catching Insects
3. The Chameleon's Queer Eyes
4. Interesting Features of the Chameleon
5. A Sticky Tongue

**Paragraph III.**

1. Fifty Kinds of Chameleons
2. Size of the Chameleon
3. The American Chameleon
4. Where True Chameleons are Found
5. Comparison of the American and Old World Chameleons
The Chameleon

Fill in the minor ideas under each major idea.

I. The World's Champion Turncoat

A. Colors of the Chameleon

1.
2.
3.
4.

B. How Nature Protects the Chameleon

1.

II. Interesting Features of the Chameleon

1. Eyes

   a.
   b.

2. Tongue

   a.

III. Comparison of American and Old World Chameleon

1. Number of Kinds

   a.

2. Old World Chameleon

   a. size

   l.

3. American Chameleon

   a. size

   l.
Chameleon

Major Ideas

Fill in the major ideas.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
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<tbody>
<tr>
<td>1. green</td>
<td>1. power of changing color</td>
<td>1. entirely covered with eyelids except for tiny round hole</td>
<td>1. catches insects on the sticky end.</td>
</tr>
<tr>
<td>2. gray-black</td>
<td></td>
<td></td>
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<tr>
<td>3. chestnut &amp; black</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. yellow spots</td>
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<td></td>
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<tbody>
<tr>
<td>1. 50 Kinds</td>
<td>1. body 6 in., long plus a tail nearly as long as its body</td>
<td>1. smaller than Old World chameleon</td>
</tr>
</tbody>
</table>

K. G. Keneally 1939
Number these headlines in the order in which they occurred in the paragraph.

Example:

Paragraph I.
1. Lizard changes color to match surroundings
2. How Nature protects the chameleon
3. Chameleon keeps invisible
4. Color changes made by layers of cells

Paragraph II.
- Chameleon catches insects on tongue
- The chameleon’s queer eyes
- A most interesting animal

Paragraph III.
- Size of chameleon
- American chameleon smaller than Old World chameleon
- Fifty kinds of chameleons

Draw a circle around the number of the summary that you think is the best.

1. The chameleon is a lizard that has the power of becoming invisible by changing the color of its skin to match its surroundings. The color changes are made by layers of cells containing red, yellow and black coloring matter which show through its transparent skin. This is nature’s way of protecting the chameleon from its enemies.

2. There are more than fifty kinds of chameleons. The American chameleon is smaller than those found in Africa. Both African and American chameleons have the power of changing the color of their skins.

3. The chameleon is an interesting animal. It can change the color of its skin. It has queer eyes that look in opposite directions. It catches insects on the sticky end of its tongue.
Wonderful Art of Pottery Making

Many years ago, Indian tribes wove baskets and lined them with unbaked clay. When they tried to cook meat or grain in them, the baskets burned, but they found that the clay lining had been hardened by the fire. These tribes found that pots, bowls, and jugs were apt to crack if the tiniest bit of gravel was left in the clay. They learned to pound the clay to powder, to melt it in water, to strain out all the little stones through baskets, to dry the melted clay, to work it to a powder again, to sift it and to add water to make smooth dough. The dough was then shaped into pots and bowls by turning it around and around. Then the pots and bowls were baked in pits. Unless these pots of burned clay were broken by accident, they lasted as long as stone.

Many people think we make more beautiful pottery today. We can make it more easily and cheaply by machinery and we can make more kinds and shapes. In the olden days, the Indians mixed the clay and water with their feet. Then they got the clay ready for moulding or shaping by beating and kneading the clay dough with their hands. The pots and bowls were shaped by hand and then baked in the sun. This was, of course, very slow work. Today all this work is done by machinery. The shaping of pottery is done on a potter’s wheel run by electricity. Gas-fired kilns and ovens are now being used to bake the pottery.

When the pottery is baked, it has a dull, rough surface. It is then dipped into a solution which covers every part of it evenly. Then the pottery is baked again at a lower temperature until the covering is hard and glassy. Decorating is done by hand or by transfer patterns. Some colors change a great deal in baking. Different colors require different temperatures to set them. Sometimes a vase has to be baked eight or nine times before the design is complete.

X. G. Keneally 1937.
The Wonderful Art of Pottery Making

Headlines

Paragraph I.
1. How the Indians Learned to Make Pottery
2. Indian Tribes Weave Baskets
3. How To Make a Smooth Clay Dough
4. Making Pottery
5. Pottery Lasts as Long as Stone

Paragraph II.
1. Hand-Made Pottery
2. Pottery Made By Machinery
3. Old and New Methods of Making Pottery
4. How Pottery is Made
5. Beautiful Pottery

Paragraph III.
1. Hand-Painted Pottery
2. Decoration on Pottery Made by Transfer Patterns
3. Colors in Pottery Changed by Baking
4. Baking Pottery
5. Glazing and Decorating Pottery
Skeleton Outline

I. How the Indian Tribes Learned to Make Pottery

A. Lessons learned by Indians
   1. 
   2. 
   3. 
   4. 
   5. 
   6. 
   7. 

B. Pottery Shaped by
   1. 

C. Length of Time Pottery Lasted
   1. 

II. Methods of Making Pottery

A. Indian Method
   1. Shaping Pottery
      a. 
   2. How Pottery was baked
      a. 

B. Modern Method
   1. Shaping Pottery
      a. 
   2. How Pottery is baked

III. Decorating Pottery

A. Methods of decorating
   1. 
   2. 

B. Baking of Pottery
   1. Effect on colors
      a. 

K. G. Kenecally 1939.
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<th>A</th>
<th>B</th>
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<tbody>
<tr>
<td>1. To pound clay to powder</td>
<td>1. clay dough shaped by turning it around and around.</td>
<td>1. as long as stone</td>
<td>1. pottery shaped by hand</td>
</tr>
<tr>
<td>2. To melt clay in water</td>
<td></td>
<td></td>
<td>2. baked in the sun</td>
</tr>
<tr>
<td>3. to make a smooth dough</td>
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<tbody>
<tr>
<td>1. pottery shaped on potter's wheel</td>
<td>1. by hand</td>
<td>1. colors change a great deal</td>
</tr>
<tr>
<td>2. baked in gas-fired kilns</td>
<td></td>
<td>2. by transfer patterns</td>
</tr>
</tbody>
</table>

K. G. Keneally 1939.
Paragraph I.

3 Pottery Lasted as Long as Stone
2 Lessons Learned by the Indians
1 Indian Tribes Wove Baskets and Lined Them With Clay

Paragraph II.

_____ Indians Used Hands and Feet to Make Pottery
_____ Pottery Made Cheaply By Machinery
_____ Modern Pottery Shaped on Potter's Wheel

Paragraph III.

_____ Pottery Baked Several Times Before Design is Complete
_____ Pottery Decorated by Hand or by Transfer Patterns
_____ Pottery Dipped in Solution for Glazing

Summary

1. We have learned many things from the Indians about pottery making. Today we make pottery more easily and cheaply by machinery. We have learned how to glaze it and to decorate it in many different colors.

2. Indian Tribes learned how to make pottery from clay dough. They mixed the dough and shaped the pots by hand. Today we make our pottery by machinery.

3. In the olden days Indian tribes made pottery from clay. They shaped it by hand and then baked it in the sun. This was very slow work. Today we make pottery much more easily and cheaply by machinery.
Radio Altimeter

Aboard a big United Air Lines plane, flying over New York City a few weeks ago, aeronautical engineers and news reporters saw the successful try-out of an instrument new to aviation. The new instrument is called a radio altimeter or radio feeler and is used to register the exact height of an airplane above the ground. Airmen think it is the greatest aid to air safety ever made.

If a pilot is flying along in a fog, the radio altimeter enables him to take constant readings of the distance from the earth. In case the fogbound plane is off the course and the pilot is unknowingly approaching a mountain peak at dangerously low altitude, the new instrument warns him in time to fly higher and avoid a crash. When the pilot makes a blind landing the radio feeler signals exactly when the wheels will touch the ground.

In order to compare the old standard altimeter with the new radio altimeter the testing plane was equipped with both instruments. When flying over the skyscrapers of New York City, the hands of the old altimeter stood still since the plane was flying a level course. But the pointer of the radio altimeter was dancing crazily across its dial. It was recording the distance from the plane to each of the roof-tops below! During the landing at the Newark Airport the radio altimeter registered the progress of the landing while the standard altimeter was still dropping after the plane had landed. In addition to the radio altimeter, all planes owned by the United Air Lines Company will have a tell-tale red warning light that will automatically flash on when the pilot flies at an unsafe distance from the ground.

______________________________
K. G. Keneally 1939
Radio Altimeter

Below you will find several headlines for each paragraph. Draw and circle around the number of the headline that you think is the best headline.

Paragraph I.

1. A New Instrument
2. A Radio Altimeter
3. The Greatest Aid To Air Safety
4. Successful Try-Out of a New Instrument
5. Abcard a United Air Lines Plane

Paragraph II.

1. How the Radio Altimeter is Used
2. New Instrument Helps Pilots
3. A Blind Landing
4. Flying in Mountainous Country
5. Altimeter Warns Aviators of Danger

Paragraph III.

1. Flying Over New York City
2. Comparison of Old and New Altimeters
3. Landing at the Newark Airport
4. Plans for Future Use of Radio Altimeter
5. Recording Distance From Plane to Roof-Tops

K. G. Keneally 1939
Radio Altimeter

Fill in the minor ideas under the major ideas.

I. Successful Try-Out of Radio Altimeter
   A. Where Try-Out was Held
      1. 
   B. Try-Out soon by
      1. 
      2. 
   C. New instrument is called
      1. 
      2. 
   D. Opinion of airmen
      1. 

II. Uses of Radio Altimeter
   A. In fog
      1. 
   B. In landing
      1. 

III. Comparison of Old and New Altimeters
   1. Flying over New York City
      a. Old altimeter
         1. 
      b. New altimeter
         1. 
   2. Landing
      a. Old altimeter
         1. 
      b. New altimeter
         1. 

IV. Future Plans of United Air Lines Co.
    1. 
    2. 

K. G. Kenally 1939
**Radio Altimeter**

**Major Ideas**

Fill in major ideas.

<table>
<thead>
<tr>
<th>1. New York City</th>
<th>1. aeronautical engineers</th>
<th>1. radio altimeter</th>
<th>1. greatest aid to safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. news reporters</td>
<td>2. radio feeler</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1. in fog</th>
<th>1. hands stood still when flying over skyscrapers</th>
<th>1. pointer dancing crazily when flying over skyscrapers</th>
<th>1. To make radio altimeter standard equipment on all planes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. in landing</td>
<td>2. altimeter still dropping after plane landed</td>
<td>2. registered exactly</td>
<td>2. to add an automatic red warning light</td>
</tr>
</tbody>
</table>

X. G. Kenally 1939
Number these headlines in the order in which they occurred in the paragraph.

Example.

P I.
3 Greatest aid to air safety
1 New instrument successfully tried
2 Radio altimeter registers exact distance above ground

P II.
Radio feeler signals when landing
New instrument warns pilot of low altitude
Radio altimeter enables pilot to fly in fog

P III.
Testing plane equipped with old and new instruments
Comparison of altimeters when flying over New York City
Future plans of United Air Lines Company
Radio altimeter records distance from plane to roof-tops
Standard altimeter records distance inaccurately

Draw a circle around the number of the summary that you think, is the best.

1. When trying-out the radio altimeter the testing plane was equipped with a radio altimeter and a standard altimeter. The radio altimeter measured the distance of the plane from the ground much more accurately than the standard altimeter. Airmen think it is a great invention.

2. Aeronautical engineers and news reporters saw the successful try-out of a radio altimeter in New York City. It registered the distance of the plane to the roofs of the skyscrapers. It also registered the progress of the plane when landing at the airport.

3. The radio altimeter is a new instrument that registers the exact height of an airplane above the ground. It is a great aid to aviation as it enables the pilot to fly safely in a fog and to make a blind landing without an accident. It is a great improvement over the old standard altimeter and in the future will be used on all United Air Lines planes.