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> Boston University School of Education

> > Thesis

THE RELATIVE ORDER OF DIFFICULTY OF THREE TYPES OF DIRECTIONS FOR COMPREHENSION IN STUDY-TYPE READING AT A FOURTH GRADE LEVEL

Submitted by Marjorie Munsil (B. S. in Ed. State Teachers College at Framingham 1935)

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

1947

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inanke are bareby appressed to Dr. Denald L. Darrell, aredapr of Macation. Dr. Males A. Marphy, Professor of acation, and Mar R. Alice Orecelsy. Instructor in Acation--all of Coston University School of Macation--for his bally in planning and executing this atmay.

Approved by

First Reader: Dr. Donald D. Durrell, Professor of Education

Second Reader: Dr. Helen A. Murphy, Assistant Professor of Education

Third Reader: Dr. W. Linwood Chase, Professor of Education

First Reader: Dr. Donald D. Murrell, Troisser of Mucation

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Acknowledgments

Thanks are hereby expressed to Dr. Donald D. Durrell, Professor of Education, Dr. Helen A. Murphy, Professor of Education, and Miss B. Alice Crossley, Instructor in Education--all of Boston University School of Education--for their help in planning and executing this study.

Thanks are also extended to Dr. Homer W. Anderson, Superintendent of Schools in Newton, Massachusetts, and to the principals and teachers of the Hyde, Mason, and Oak Hills Schools of that city for the privilege of conducting experimental work in their class rooms.

To Miss Elizabeth P. Kenrick and Mr. Robert O. Bruce, respectively, go thanks for their work in typing and mimeographing the material of this thesis.

Acidnowled gnents

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Several of the studies have contrasted directed study with mere reading. Most of these conclusions seem to be in general agreement.

Beauchamp¹, in his study using elementary science material at high school level, concludes that directed study aimed at:

- 1. Finding the central thought of a paragraph and its subtopics.
 - Determining what questions it was necessary to construct and answer in order to obtain an understanding of the topic.

l Beauchamp, Wilbur L., "A Preliminary Experimental Study of Technique in Mastery of Subject-Matter in Elementary Physical Science", <u>Studies in Secondary Education, I,</u> <u>Supplementary Educational Monographs</u> No. 24, Chicago; The University of Chicago, 1923. pp. 47-87. vere nearly all conceivable aspects having any hearing on the topic; the relation of apead to commenter ion, the effect of vocabulary on contrehension, the effect of the length and types of sentences on contrehension, the effect of content material on comprehension, the offect of form of presentation on comprehenolou, and even the effecte of nunctuation, prior, paper, and light on comprehension. Iron these various treatments of the comprehension of a contrehension of the set of the comprehension of a comprehension of the comprehension of the effecte of nunctuation of the comprehension of the effecte of the set of the comprehension of the effect of the offect of the comprehension of the effect of the offect of the comprehension of the effect of the offect of the comprehension of comprehension.

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brought, "...more thorough comprehension of the subject matter than undirected study on the same material."

In reporting his study on the effect of a single reading, carried out in grades three to eight with slightly over fifteen hundred pupils, Yoakam² reports the following tentative conclusions:

Single reading is relatively efficient in the middle grades with simple narrative material.

Single reading of factual material in a sixth grade seemed to show that, if unmotivated by directions or problems, such a reading is not productive of efficient results, either for temporary or permanent use.

Previous knowledge, motivation, and practice with tests have a large influence in promoting accurate retention of materials which are read a single time. This emphasizes the desirability of using problem assignments, directed reading, and other means of causing the reader to work with a purpose. Such reading is to a marked degree more efficient than the undirected "study" or reading of the lesson.³

From his study of seventh and eighth graders in the effect of two readings compared with a single reading, Yoakam⁴ finds that the first reading added much more to previous information than a second reading--but that directed reading

1 Ibid p. 87.

2 Yoakam, Gerald Alan, <u>Reading and Study--More Effective</u> <u>Study Through Better Reading Habits</u>, New York: The Macmillan Company, 1929. pp. 190-209.

3 Ibid pp. 204-205.

4 Ibid pp. 218-220.

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2 Yoakdm, Gerald Alen, Reading and Sundy--Nore Bilaciive study Through Retter Reading Mabita, New York: The Massillon Guagany, 1927. pp. 190-205.

5 Inid pp. 204-205.

added more than undirected.

Germane¹, working with pupils from the fifth to the ninth grade level, on the value of a corrected summary outline--compares one group directed to read as many times as possible in a given time with another group directed to do the following:

- 1. Read once as rapidly as possible, asking themselves what it is all about, and what are the main points to know and remember?
- 2. Summarize, organizing the main points under headings.

3. Re-read, noting omissions, and making corrections. Here he finds that a consistent superiority from 4.4 to 20.4 per cent existed for the re-reading group, and that the value of the corrected summary as a method of study was decidedly questionable.

Growing out of this experiment came his study² in sixth to ninth grades where re-reading was compared to a general information introduction of two paragraphs, plus a set of questions presented before reading. In this instance he finds that controlling the summary by presenting questions first, to arouse

l Germane, Charles E., "Outlining and Summarizing Compared with Re-reading as Methods of Study", <u>The Twentieth</u> <u>Yearbook of the National Society for the Study of Education</u>, Part II, Bloomington, Illinois: Public School Publishing Company, 1921, pp. 103-106.

2 Germane, Charles E., "The Value of the Summary When Stimulated and Directed by Specific Problems", <u>The Twentieth</u> <u>Yearbook of the National Society for the Study of Education</u>, Part II, Bloomington, Illinois: Public School Publishing Company, 1921, pp. 106-110.

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2 Cormane, Charles R., "The Value of the Summery Nen. Stämulated and Directed by Snecific Irollands", The Tuntisth Yourbook of the Estional Society for the Sauty of Mudotion, Port II, Bloomington, Illinois: Fublic School Fubliahing Sompany, 1921, pr. 103-110. interest, "... is a somewhat more efficient method than the rereading of an article,"¹ and states that the summarizing group would have done better had they known how to skim for answers.

Germane², in an experiment with college sophomores--comparing the reading of an article, followed by using a list of questions to answer mentally--with just reading and re-reading the article, concludes that specific questions on an assignment in the hands of the students is more efficient than undirected reading. Further study in grades six to eight confirms this finding.

Holmes^o, in her follow up of the above experiment with college students, reports that, "Reading guided by questions significantly surpassed careful reading and re-reading without questions,"⁴ in both immediate and delayed recall.

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1 Ibid p. 87.

2 Germane, Charles E., "The Value of the Controlled Mental Summary as a Method of Studying", <u>School and Society</u>, XII (December 11, 1920), pp. 591-593.

3 Holmes, Eleanor, "Reading Guided by Questions Versus Careful Reading and Re-reading Without Questions", <u>The School</u> <u>Review</u>, XXXIX (May, 1931), pp. 361-371.

4 Ibid p. 370.

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4 Ibid p. 570.

Through a slightly different approach, an experimental effort to improve silent reading comprehension of factual material over an entire semester was conducted by Alderman¹. He worked with over nineteen hundred pupils in grades four to eight. The methods he used were:

- 1. Selection of important thought from paragraph for organization around a central topic or problem.
- Reading carefully for purpose of picking out essential facts--followed by test.
- 3. Vocabulary exercises to increase comprehension by enlarging reading vocabulary.

The following conclusions appear to have some bearing on this study:

- Silent reading comprehension, measured by Thorndike-McCall Scale, may be improved by two semesters in one, in these grades, through use of a systematic thirty minute drill daily, in this type of work.
- 2. "A teacher who is interested in improving comprehension ability in silent reading would be justified in using such type of drill work just described in this experiment."²
 - 3. Before attempting improvement in comprehension, chil-

l Alderman, Grover H., "Improving Comprehension Ability in Silent Reading", <u>Eleventh Annual Conference on Educational</u> <u>Measurements</u>, Bloomington, Indiana: The School of Education of Indiana University, 1925, pp. 28-37.

2 Ibid p. 36.

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dren should be grouped according to ability, "...since the type of training needed by one group may actually do harm to another."1

While Carroll's² study of sixth to eighth graders deals with comprehension of directions as an end in itself, several of his findings seem most pertinent--especially to the construction of directions in this study. He notes as chief sources of errors:

- 1. Sentences involving slight math calculations.
 - 2. Prepotent factors in questions or materials.
 - 3. Sentences with conditional clauses.
 - 4. Sentences too compact or involved.
 - 5. Material with ideas implied rather than stated.

It was concluded that the type of selection had very little effect on reading score: directions on going places, doing things, and using things were read with about the same efficiency; while <u>too compact</u> or <u>too elaborate directions</u> decreased both speed and comprehension decidedly.

1 Ibid p. 36.

2 Carroll, Robert P., <u>An Experimental Study of Compre-</u> hension in Reading with Special Reference to the Reading of <u>Directions</u>, Teachers College, Columbia University Contributions to Education, No. 245, New York City: Bureau of Publications, Teachers College, Columbia University, 1926. 72 pp. dred abould be rouped according to ability, "...since the type of training needed by one group may actually do harm to another."1

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1 Inid p. 26.

2 Corroll, Robert F., An Constinental Study of Constannemelon in Reading Mith Suscial Sciences to the Eville of Directions, Tessiers Chilege, Column University Contribu-Lians to Movertion, No. 240, Low Fork City: Durest of Rublicstions, Tessiers College, Columnia University, 1936. 72 pp. Working with general science material at a ninth grade level, Jacobson¹ set out to determine the results of the effect of sixty work-type reading exercises, covering several science units, on a pupil's reading comprehension score and on knowledge gained in general science. Mimeographed true-false and multiple choice questions on the lesson were placed in the pupils' hands at the beginning of a study period. From this directed reading he concludes:

1. Reading lessons given in general science produce superior knowledge of general science to an extent which cannot be explained by chance.

2. Reading lessons given in general science have a beneficial affect on the general scholastic achievement of ninth grade pupils.

3. Reading lessons of the type used in the experiment are more beneficial to poor initial readers than to good initial readers.²

He also reports that reading in the field in which content mastery is desired is better than giving it in another field and expecting transfer to the content field.

In so far as placement of questions for aiding comprehension is concerned, opposing conclusions are found.

Washburne³, in his studies with eight hundred sixty pupils of seventh, eighth, and ninth grades, states the following:

l Jacobson, Paul B., "Effect of Work-Type Reading Instruction Given in the Ninth Grade", <u>The School Review</u>, XL (April, 1932), pp. 273-281.

2 Ibid p. 281.

3 Washburne, John N., "The Use of Questions in Social Science Material", <u>The Journal of Educational Psychology</u>, XX, No. 5 (May, 1929), pp. 321-359. 8

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2 IN 6 7. 221.

5 washburne, John M., "The Use of Questions in Social Science Esterial", The Journal of Educational Ferchology, IX, No. 5 (May, 1929), pp. 321-339.

- All questions should be grouped at the beginning of the story.
- Above grouping shows significant gain in recall and understanding of the part covered by the questions with no corresponding loss in other parts.
- 3. Worst placement is to group all questions at the end, as such grouping shows some gain in recall and understanding of the parts covered by the questions, but a proportional loss of the parts not covered by the questions.
- Girls appear to do better with questions first, and boys with questions at the end.

However, in Golden's¹ study of two hundred thirty-eight parochial school children at fifth and sixth grade levels, she reports that, while differences were not significant, they showed a consistent tendency for reading followed by questions to have a greater effect on the learning process than questions guiding the reading.

Perhaps more nearly approaching the experiment at hand than other previously cited studies, is that of Distad² with

l Golden, Mary Laurentia, "Reading Guided by Questions Versus Careful Reading Followed by Questions", <u>The Journal of</u> <u>Educational Psychology</u>, XXXIII-No. 6 (September, 1942), pp. 463-468.

2 Distad, H. W., "A Study of the Reading Performance of Pupils Under Different Conditions on Different Types of Materials", <u>The Journal of Educational Psychology</u>, XVIII-No. 4 (April, 1927), pp. 247-258.
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grade six A pupils in the fields of geography, nature, narrative and poetry material of factual content. Comparison of reading performance was made using single readings of four types:

- 1. Undirected.
 - 2. To answer eight specific questions.
 - 3. Given a general problem.

4. To answer pupil raised questions. Included in the results of that work are these findings:

- 1. For measuring immediate recall on the entire content after a single reading, justification of types of reading directing attention to content appears doubtful--due to length of time needed for reading. It might be that undirected reading for the same amount of time would be no more effective.
 - 2. For gaining definite information, directed types of reading with problems or questions are, "...intrinsically worth while," developing, "...habits of reading effectively for different purposes."¹

Although his study was in a slightly different vein, Krause² came to some conclusions which seemed pertinent to the building of this study. His work at fifth and sixth grade levels compares the reading of science to answer specific

1 Ibid p. 258

2 Krause, LaVern W., "A Comparison of Two Methods of Study", <u>The Elementary School Journal</u>, XLIV-Nó. 1 (September, 1943), pp. 45-48. and postry material of factual content. Comparison of reading

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sudy", The Manantan Jelool Journal, MIN-Yo. 1 (Jerse Der, 1940), The Manantan Jelool Journal, MIN-Yo. 1 (Jerse Der, questions following each unit with reading science to formulate ones own test.

He finds that, "The groups which made their own tests increased their learning by an average of 10.2 per cent over the groups answering questions."¹ He concludes that in answering questions pupils concentrated only on the part that they thought contained the right answer, while the test making method caused pupils to be more inquisitive and carry on more actual mental activity--everything acting as a challenge.

Bringing to mind the question of the possible value of more specific directions is the study of Greene²--working with grades four to six in geography comprehension. Directions first given to pupils were, "See how carefully you can read a short paragraph."³ Greene followed this with directions for performing certain test activities. The conclusions reached are:

...children read and glibly discuss certain content material placed in their hands, but when they are held strictly to account by an objective indication of comprehension, the scores made are startlingly low. Among the factors which may effect the results: (a) silent reading ability; (b) geographical knowledge; (c) mechanical features of the test; (d) lack of motive on the part of the pupils.⁴

1 Ibid p. 46.

2 Greene, Harry A., "Measuring Comprehension of Content Material", The Twentieth Yearbook of the National Society for the Study of Education, Part II, Bloomington, Illinois: Public School Publishing Company, 1921, pp. 114-126.

3 Ibid p. 116.

4 Ibid p. 125.

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5 Ibid p. 116.

Thid D. 125.

On the basis of previously cited research, it seemed apparent that, although studies had been conducted on various directed and undirected readings in relation to the amount and variety of comprehension, little had been done on the degree of specificity of directions.

Considering Miss Skahan's¹ statements--that, "In all teaching which is devoted to the development of comprehension, there is one basic principle. Children will find meaning in what they read only if they are looking for it," and, "The more meaning a child is asked to get from an assignment, the more he will obtain," there comes to mind the question of how much or how little help children really need to best facilitate comprehension in reading.

Primarily this study is an effort to answer that question. It is carried out in the field of science, at a fourth grade level. It attempts to determine the relative order of difficulty of (a) general, (b) more specific, and (c) decidedly specific directions as shown through the amount of comprehension of the factual material read.

l Skahan, Mary G., "Improving Reading Comprehension in the Social Studies, "Unpublished Master's Service Paper, Boston University School of Education, Boston, 1945. pp. xix-xx.

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1 Sjahan, Mary S., "Improving Leading Compulsion in the Social Studies, " Inpublished Master's Service Reper, Secton University School of Maussiler, Feston, 1945. pp. rix-rs.

CHAPTER II

Procedure

a Beauchamp, Wilber Le, Post, Karrist K., Grampton, . estruis, and Wray, William S., Solance Stories Poor Three. Were erk: Scott, Foreignen and Company, 1936. pp. 28-35. Doi: 50-00

CHAPTER II

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Procedure

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Procedure

In preparation for exploring the relative order of difficulty of three types of directions for comprehension in studytype reading at a fourth grade level, the first step was to seek a field of study-type reading common to many fourth grades.

Science was decided upon as being content material which the fourth grade child is called upon to read with increasing independence. It would be expected to contain factual material with fairly high interest value.

Comprehension was chosen for the reading skill, being an important one at this level.

After considerable reading in relation to testing material it was decided that three selections, of about five hundred words in length, would be adequate for the situation. Subsequently after consideration and elimination of numerous topics, the following three stories were prepared, being adapted from <u>Science Stories Book Three¹</u>:

- I "How Water Animals Live", about three hundred sixtyfive words.
- II "How Land Plants Live", approximately five hundred ten words.

III "The Trap-door Spider's Nest", around three hundred

1 Beauchamp, Wilbur L., Fogg, Harriet M., Crampton, Gertrude, and Gray, William S., <u>Science Stories Book Three</u>, New York: Scott, Foresman and Company, 1936. pp. 28-35, pp. 54-63, pp. 97-100.

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fifty-five words.

Story I is included here as an illustration.

How Water Animals Live

As long as a trout is in water he can move fast. His strong body has fins and a tail that take him quickly through the water. Water runs fast down a mountain-side. It pushes hard against anything in its way. But the shape of the trout helps him swim against the moving water. His long pointed body moves through the water easily.

When a trout gets hungry he swims into slowly moving water near the edge of a brook. He rests there until some flies or insects are above the water where he is. Suddenly he jumps, catches an insect in his mouth, and drops back into the water.

Have you ever watched fish open and shut their mouths? They seem to be eating even when there is nothing to eat. But they are not eating then. They are breathing. There is air in water. Plants help to put it there. Fish can take in air from the water. They breathe with gills instead of lungs. A fish's gills are soft and feathery. They are in an opening on each side of his head. Over them is a thin, hard cover that comes open along one edge. The opening under the cover goes inside the fish's mouth. As the fish breathes he takes water into his mouth. The water goes back through the gills, and the gills take the air from the water as it runs over them. Then the gill cover opens and the water runs out. The fish must have air all the time. So water is always going through his mouth, then through his gills, and out again from under the gill cover.

Animals that live in water do not need skins that keep them from drying out. Water pushes against the animals that live in it. It sometimes knocks them against sharp rocks that are in the water. Most fish have scales to cover their bodies. The scales are small and flat and hard, and they fit over each other very tightly like shingles on a house. They make a tight hard covering that helps the fish's body move through the water easily and protects him as he is pushed about.

In an effort to eliminate all possible vocabulary diffculty, words contained in the stories were checked against the third grade lists of Gates¹ and Durrell². The only words not

l Gates, Arthur I., <u>A Reading Vocabulary for Primary</u> <u>Grades</u>, New York City: Bureau of Publications, Teachers College, Columbia University, 1935. 27 pp.

2 Durrell, Donald D., Primary Reading Vocabulary, Boston University Educational Clinic, Boston. (Mimeographed)

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As long as it of is is a whet he can nove fast. His acrong body has that and a tail that then him onickly through the veter. Wher runs 1 at form a mountlin-oide. It pushes where against anything is its way. In the shape of the trout helps him said against where a fig where. He hap of the front anyes through the water we artig.

Aren a trout geta bungry he sains into alculy moving actor near the adge of a brook. Is rests there intil some flies or insects are abave the water whire he is. Suddenly he juma. cutches an insect in his south, and drops hach into the water.

New you you seen a const that own and shad and the function that are not esting them. We are breaking. There is air in whiter. Flants help to not it there. Nich can take in air from the water. They breathe the sills instead of lungs. A fish's side of his head. Wer the is thin, hard cover that comes also of his head. Wer the is thin, hard cover that comes the state solt and load or is thin, hard cover that comes the field of his head. Wer the breather the cover that comes cover that head. Wer the field bre then is the sole instice the field of his head. Wer the field breather the cover that comes the field of his head. Wer the field breather the cover that comes the field of his head. Wer the field breather the cover that comes the field of his head. The field breather the cover the cover the field of his head. The field breather the cover the cover the field of the stor that off. The field must have all the cover opene and the stor that off. The field must have all the through his cover, is a field off. The field must have all threather field off. All off off. The field have been the cover opene and the stor that off. The field must have all the through his cover, and out egain from under the gill cover.

Animals that live in which do not need skine that keep then from dr ing out. Sater pushes a think the animals that live in it. It constince knocks them against shorp rocks that are in the unter. Mout find have so les to cover their bodies. The socies are small un flat and bard, and they fit over such other very tightly live animales on : house. They make a tight hard covering that helps the fish's body nove through the water ously and exotects his is is to pushed about.

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1 Gatas, artinir 1., <u>a Resairer Vocabeltar for Frimery</u> Grader, Make Vork uitre Russen of Emblications, Seachars Gollage, Goldenbie University, 1935. 77 pr.

2 Marral", Doucld D., Printory Realing Vogevilary, Edaton

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appearing in the third grade range were those peculiar to the subject matter as follows:

Story 1 Story 11	Story III
trout soaks fins moist insects directions gills deserts lungs cactus scales proof shingles fuzzy microscope	moist insect .

Although it was assumed that fourth graders would have the power to get the words above, a child was to be told any word he requested.

Three tests were next prepared--one per story. Each test consisted of fifteen objective items including five multiple choice, five matching, and five completion type. (Adherence to that arrangement allowed for direct comparison of scores later on.) An effort was made to keep the difficulty as balanced as possible. The tests were mimeographed and presented on a separate page immediately following a single directed reading of the story. Reliability of the tests was established as .76 for Test I, .80 for Test II, and .68 for Test III. Low reliability was doubtlessly due in part to there being only fifteen items per test.

It was eventually decided to confine the types of directions to a single category which might be described as degrees of specificity. The directions were prepared and will be referred to throughout the study as:

- a General Direction.
- b More Specific Direction.
- c Decidedly Specific Direction.

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Nore Specific Direction.

Isnernl Direction.

Illustration from Story I - directions

Ia Read this story and find out how fish live. There will be some questions to answer afterwards.

Ib Read this story and find out how a trout swims, eats, breathes, and protects himself. There will be some questions to answer afterwards.

Ic Here is a story about fish. Read it and find out

1. what helps a trout swim.

2. what a trout eats.

3. how a fish breathes.

4. what fish use when they breathe.

5. what protects fish.

There will be some questions to answer afterwards.

The appropriate direction was mimeographed at the top of the page, preceding the story to be read.

In order to cover each story with each type of direction a plan of rotation was set up to use three groups of children as follows:

Table I Plan of Rotation

Group	Story and Direction	Story and Story and Direction Direction		
A	Ia	IIb	IIIc	
В	IIa	IIIb	Ic	
C	IIIa	Ib	IIc	

Thus the children of group A had a general direction (a) for story I, a more specific direction (b) for story II, and

111ustration from Story I - Girections
Is .eed this story and fine out how fish live.
Iners will be some questions to answer ofterwards.
Th lead this story and find out how a trout swime.
eats, breathes, and protects himself. There will be some
ousstions to answer afterwards.

Io More is a story about fish. Newd it and find

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- 1. what helps a trout swim.
 - . that a trout asts.
 - 3. Nov e fish breathes.
- 4. shut fish use when they breathe.
 - . Thet protects fish.

There will be sone questions to ensure siterwords.

the page, preceding the story to be read.

le order to opver each story with each tree of direction as

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IIIc	573	al	h
101			
	La St.		

Thus the o'dildren of graup A had a general direction '

a decidedly specific direction (c) for story III. As the rotation was completed each group had read three stories, using a different direction for each, and all directions had been applied to each story by one group or another. This enabled the combining of results from all "a" directions, all "b" directions, and all "c" directions, with a complete cross section of population, for analysis of data.

The population chosen for the experiment consisted of six fourth grades from three schools in the Greater Boston area. These schools were selected because of the fact that they are adjoining districts with similar socio-economic backgrounds. One hundred seventy-six children were included in the study, but complete data was obtained on only one hundred thirtyeight cases for final analysis.

Chronological ages for these children ranged from 8-10 to 11-8 with a mean of 9-10.

The groups were equated on the basis of I.Q. ratings from a previously administered Kuhlman Anderson Intelligence Test and a pretest with a Durrell-Sullivan Reading Achievement Intermediate Test, Form A, Tests one and two.

I.Q.'s ranged from 75 to 127 with a mean I.Q. of 104.

Reading scores ranged from 16 to 123, reading grade equivalents from 2.6 to 8.4, and reading ages from 7-10 to 13-10. The mean reading score was 71, with a grade equivalent of 5.7, and reading age of 11-3.

Actual administration of the experimental testing pro-

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gram was done from March third to seventh by the individual class room teachers, after explanation of the material and its purposes had been made. All class tests were accompanied by a detailed set of instructions for administration in an effort to control that variable as much as possible. A copy of these directions will be found in the appendix, as will copies of all other materials prepared for this study.

Although it is realized that rate and comprehension appear to be rather closely allied, it was decided--after due consideration--to test wholly for power, that being the primary concern of this study. The only timing was a blanket allotment of thirty minutes to prevent wasting time. This arbitrary figure was set following preliminary testing of small groups in which all children finished within twenty-three minutes.

Scoring of the test was based simply on the number of items answered correctly.

Data and analysis on the relative order of difficulty of three types of directions for comprehension in study-type reading at a fourth grade level follows in the next chapter. crea van dan from Erch third to asvento by the individual cleas room teachers, ofter explanation of the material and the parocaes had been made. All class tests sere accompanied in a detailed set of instructions for edulateriation in a effort to convers to training as much as possible. A conv of these directions will be found in the emendix, as will copies of all other materials prevated for this sund.

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CHAPTER III

Analysis of Data

The data were analyzed to determine the relative order of difficulty of three types of directions for comprehension in study-type reading at a fourth grade level. Directions were of general, more specific, and decidedly specific types.

Results were compared on a basis of per cent of items correct for each direction on

- 1. Total group.
- 2. Grouping by I.Q. ranges for dull, average, and bright.
 - 3. Grouping by reading grade equivalent.
- 4. Grouping by boys and girls.

Distribution of 138 Fourth Grade Children-by Chronological Age

CHLPTON III

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The data vers analyzed by determine the relative order of difficulty of three types of directions for convrshension in study-type reading at a fourth grade level. Directions vers of general, more specific, and decidedly seedific types.

Results mere contarts an a built of yer cent of term

- 1. Total group.
- 2. Crousing by T.C. ranges for dull, average, and bricht.
 - 2. Grouping by reading grade equivalent.
 - 4. Prophing by boys and girls.

Figure 1 shows the chronological age distribution for the one hundred thirty-eight fourth grade children ranging from eight years ten months to eleven years eight months, a spread of two years ten months.



Table II presents the relative order of difficulty of the three types of directions for the fourth grade as a whole, giving the probable errors of the per cents of items correct on each direction and the significance of the differences.

Figure 1 anore the caronological age distribution for the one hundred thirty-sight fourth grade deliders ranging from eight years to mouths to sloven years aight rouths, a spread of the years isn months.

Table 11 presents the relative order of difficulty of the three types of directions for the fourth grade as a shale, giving the probable errors of the per cents of iters correct on each direction and the significance of the differences. Table II Relative Order of Difficulty of Directions

for Fourth Grade as a Whole

No. Cases	Direc- tion	% Items Correct	P.E.p	Diff.	P.E./ diff.	Diff./ P.E.diff.	Chances in 100
138	a	60	2.8		SLOD.		
				7	1,5	4.7	100
138	b	67	2.7		soliona.	The differ	ndu te-
138	С	68	2.7]	0.5	2,0	91
	antica		- anu	1th on	biandro	t that this !	an a true

a. General Direction.

b. More Specific Direction.

c. Decidedly Specific Direction.

, 1 Edgerton, Harold A. and Paterson, Donald G., <u>Table</u> of Standard Errors and Probable Errors of Percentages for Vary-<u>ing Number of Cases</u>, Thesis, Boston University School of Education Library. Photostat from <u>Journal of Applied Psychology</u>, vol. 10, September, 1926. pp. 378-391.

2 Sorenson, Herbert, <u>Statistics for Students of</u> <u>Psychology and Education</u>, New York: McGraw-Hill Book Company, Inc., 1936. p. 368. (Adapted)

Table II Helstive Grder of Difficulty of Directions for Fourth Trade as a Whole

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Chances 2 is 100	2111./ 	7.2./ diff.	.1110	2.2.2 μ ²			No.
				°.g			
100	4.7	e. 1		".S	PA		
	0.8	a.a		2.7		0	

- . General Diraction.
- b. More Specific Direction.
- c. Decidedly Specific Direction.

1 Edgerton, Earold A. and Paterson, Donald B., Table of Standard Errors and Probable Errors of Fercentages for Verving unber of Heads. Theats, Boston University School of Education Hibrers, Frotests, Tron Journal of April 6 Englishing, vol. 16, September, 1926, pp. 378-391.

2 Sorenson, Herbert, Statistics for Students of Devolutory and Iduestion, New York: Teuram-1911 Book Company, Inc., 1986. m. 368. (Adapted) The Edgerton¹ tables were used for reading the probable errors of per cents while Sorenson's² table was used to convert Diff./P.E._{diff.} into chances in one hundred.

Results of the study for the fourth grade group as a whole showed progression of difficulty in this order:

- 1. Decidedly Specific Direction.
- 2. More Specific Direction.
- 3. General Direction.

A statistically significant difference was found between the general and more specific directions. The difference between more specific and decidedly specific was not significant. The chances were ninety-one in one hundred that this was a true difference.

Figure 2 gives a summary of per cent of items correctly answered on each of the three directions by the group as a whole.

I.Q. results obtained from previously administered Kuhlmann-Anderson Tests showed the children ranging from an I.Q. of seventy-five to one hundred twenty-seven, the spread covering fifty-three I.Q. points. (see Figure 3)

1 Edgerton, Harold A., and Paterson, Donald G., <u>Table of</u> <u>Standard Errors and Probable Errors in Percentages for Varying</u> <u>Number of Cases</u>, Thesis, Boston University School of Education <u>Library</u>. Photostat from <u>Journal of Applied Psychology</u>, vol. 10, September, 1926. pp. 378-391.

2 Sorenson, Herbert, <u>Statistics for Students of Psychol-</u> ogy and <u>Education</u>, New York: <u>McGraw-Hill Book Company</u>, Inc., 1936. p. 368. (Adapted) The Dijerton' tables were wood for reading the probable errors of per cents while Sorenson(a² table and used to convert Diff./I.E.diff. into chunder in one hundred.

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- 1. Decidedly Specific Miraelion.
 - S. More Specific Firection.
 - 5. General Direction.

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1 Edgerton, Derold A., and Peterson, Denold D., Table of Standard Mirore and Prohible Prove in Percentarias for Valving Mander of Cases. Thesis, Paston University School of Dimostion interf. Thetostat from Journal of Apoliad Psychology, vol. 10, September, 1986. pp. 578-581.

2 Sorenoon, Merhart, Statistics for Studenty of Payeholour and Education, New York: Medraw-Mill Noor Soupeny, Inc., 1956. p. 368. (Adapted)









Table III		Relative Order of Difficulty of Three						
Directions by I.Q. Grouping.								and in
No. Cases	I.Q.	Direc- tion	% Items Correct	P.E.p	Diff.	P.E./ diff.	Diff./ P.E.diff.	Chan ces in 100
22	115- 129	æ	75	5.9				
22	115-	Ъ	78	5.6	3	1.3	2.3	94
	122				3	1.3	2.3	94
22	115- 129	С	81	5.3				
89	95- 114	a	62	3.4				
89	95- 114	Ъ	69	3.3	7	1.8	3.9	100
89	95- 114	с	70	3.3	1	0.7	1.4	83
27	75 - 94	Э,	44	6.5				
27	75- 94	С	47	6.5	3	2.2	1.4	83
27	75- 94	Ъ	53	6.5	6	3.1	1.9	90

a. General Direction.

b. More Specific Direction.

c. Decidedly Specific Direction.

- 1 Edgerton, op. cit.
- 2 Sorenson, op. cit.
Coble TIL Relative Order of Difficulty of Three

Sirections by I.C. Grouping.

Ohm one in 108	\.1227 	\.E.C .1111	.3210				• • •	. 01 86 6 8 8
-				e.a			115-	
24	2,5	2.1		1.5				
94				.a.			115-	22
-						11 2		
200	P.6	R . E	2_			đ		63
	1.4	1.0	1	5.5			9.5- 114	
				8.a	44			
58	1.6	2.2		d.3			75+ 94	
90	1.9	5.1	1 3	2.3			-07	53
and the second s								

c. Gameral Direction.

h. dore Specific Direction.

o. Decidedly Specific Direction.

1 Idgerton, on. ett.

2 Soranson, op. cit.

Relative order of difficulty of the three directions is shown broken down by I.Q. grouping in Table III. Probable errors of per cents of items correct are given, accompanied by the significance of their differences. Results showed:

1. For the good group-

a. There was little difference between decidedly specific, more specific, and general directions.

b. Per cent of items correct was fairly constant and definitely higher than normal group.

2. For normal group-

a. The progression in difficulty continued in the same order:

- (1) Decidedly Specific Direction.
- (2) More Specific Direction.
- (3) General Direction.

b. In this instance a statistically significant difference was found between general and more specific directions. The difference between more specific and decidedly specific directions was not significant.

3. For the poor group-

a. Relative order of difficulty changed to show progression in this order:

- (1) More Specific Direction.
 - (2) Decidedly Specific Direction.
 - (3) General Direction.

Relative order of difficulty of the three directions is shown broken down by 1.0. roughny in Table III. Probable errors of per cents of filmus correct are given, accompanied by the significance of their differences. Results showed:

1. For the good groun-

a. There was little difference between decidedly apecific, more specific, and seneral directions.

b. Fer cent of items correct was feirly constant

- during farmer tou .S

a. The programation in difficulty continued in

(1) Decidedly Stocific Direction.

(2) More Specific Direction.

(3) Careral Direction.

b. In this instance a statistically significant difference was found between general and more a coific directions. The difference between nore specific and decidedly macific if sections was not a chifteent.

. Por the near graup-

A. Telative order of difficulty changed to show bro ression in this order:

(1) More Epsoilie Direction.

(2) Dadidadly Snacific Direction.

(3) General Direction.

These differences were not statistically significant. The chances of true difference between more specific and decidedly specific directions were ninety in one hundred. Chances of a true difference between decidedly specific and general directions were eighty-three in one hundred.

4. Intelligence is definitely a factor in this skill. It is apparent in the step up between I.Q. levels of the means of the per cents of items correct for each direction.

In I.Q. grouping the step up in general direction increases the per cent of items correct by eighteen from dull to normal and by thirteen from normal to bright. The more specific direction increases per cent of items correct by sixteen from dull to normal and nine from normal to bright. The decidedly specific direction increases per cent of items correct by twentythree from dull to normal and by eleven from normal to bright.

Figure 4 compares the per cents of items correctly answered on each of the three directions on a basis of I.Q. grouping.

The Durrell-Sullivan Reading Achievement Intermediate Test, Form A., was administered as a pretest. Tests one and two were used to equate the children on the basis of their reading ability. Figure 5 shows the number of children by reading grade equivalents, ranging from second grade sixth month to eighth grade fourth month, a spread of approximately six reading grades. These differences vers not stricteril; significant. The chances of true difference between yors specific and degidedly specific directions wars ninety in one imadred. Oh roos of a true difference istaen decidedly specific and general directions were escity-three in one lundred.

Intelligence, is definitely a factor in this skill.
It is amparent in the stop up between 1.7. levels of the means of the means of the stop up in the solution.
In I.C. spendar the step up in reserval "irection.

increases insper cant of items correct by similar from full for normal of by thirteen from normal to bright. The nore specific direction increases per case of items correct by sixteen from cult to normal and sime from normal to bright. The feeldedly freesific direction increases per cant of items correct by twentythree from dult to normal and by eleven from normal to bright.

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Test, Form A., we administered as a retest. Tests one and two rars much to squate the children on the basis of their rending skility. Nigure 5 shows the number of children by recitng arade equivalents, renging from second grade sixth month to signth grade fourth wouth, a spread of suproximately six reading erades.







Distribution of 138 Fourth Grade Children-by Reading Grade Equivalents



Table IV Relative Order of Difficulty of Three Types of Directions by Reading Grade Equivalents.

No. Cases	Read. Grade	Direc- tion	% Items Correct	P.E.p	Diff.	P.E./ diff.	Diff./ P.E.diff.	Chances in 100	64
27	4	г.	44	6.5					-
27	4	Ъ	60	6.3	16	4.8	3.3	100	
27	4	с	60	6.3	0	0.0	0.0	50	
					11 - 11 - 2 Marcol Samonador - 20 - 20 - 20 - 20 - 20 - 20 - 20 - 2				-
33	5	Ъ	64	5.7					-
33	5	a,	65	5.6	1	1.1	• 9	73	
33	5	C	68	5.5	3	2.0	1.5	84	
				0.0					-
35	6	a	66	5.4					
					7	2.9	2.4	95	
35	6	С	73	5.1					-
35	6	b	74	5.0	l	1.1	.9	73	

a. General Direction.

b. More Specific Direction.

c. Decidedly Specific Direction.

- 1 Edgerton, op. cit.
- 2 Sorenson, op. cit.

Table IV Deletive Order of Difficulty of Three Types.

	Diff./	1.2.2	.7710	f		-aet id. vi.co	.basil	.0
				18.8				27
	2.2	a	16	8.8	0à	đ	N	22
50	0.0	0.0	9	6.3	08			
				7,8	64		5	
73	@ .	1.1		8.8			5	P.B.
an	0.1			5.5	93	D		56
				5.4		S .		
C E	2.3			1.8	75	D	9	35
73		Lol	1	5.0			a	

a. Ganeral Direction.

h. More Specific Direction.

o. Decidedly Specific Direction.

1 Edgerton, op. dit.

Soreman, op. cit.

A breakdown into the relative order of difficulty of directions by reading grade equivalents for those pupils falling within the fourth, fifth, and sixth grade levels is shown in Table IV. Included are probable errors of per cents of items correct and the significance of their differences.

In this comparison on a basis of reading grade equivalents, only grades four, five, and six were included. Above and below these groups the number of cases was insufficient to warrant validity.

The results showed little consistency for order of difficulty among reading grade levels four, five and six.

1. In grade four progression of difficulty was in the following order:

1. and 2. {Decidedly Specific Direction. More Specific Direction.

General Direction.

3.

There was absolutely no difference between decidedly specific and more specific directions. A statistically significant difference was found between both of them and the general direction.

2. In grade five results showed progression of difficulty in the following order:

1. Decidedly Specific Direction.

2. General Direction.

3. More Specific Direction.

Boston University School of Education Library A brackdown into the relative order of difficulty of directions by reading grade equivalents for these pupils folling within the fourch, fifth, and sixth grade levels is shown in Table IV. Included are probable errors of per cents of items correct and the significance of their differences.

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The results showed little consistency for order of difficulty smong reading grade levels four, five and air.

1. In grade four progression of difficulty was in the

Decidedly Specific Direction.

Concisal Divection.

There was absolutely no difference between docidedly specific and more specific directions. A statistically significant difference was found between both of they and the general threation.

. In grade five results shared progression of diffi-

- 1. Jeoidedly Sneetfic Directics.
 - . Concept Direction.
 - . Tule Specific uipeation.

Bestine University Achool of Education Library No statistically significant differences were found.

3. In grade six progression of difficulty was as follows:

1. More Specific Direction.

2. Decidedly Specific Direction.

3. General Direction.

No statistically significant differences were found. Chances of a true difference between the decidedly specific direction and general direction were ninety-five in one hundred.

In Figure 6 per cents of items correct for each direction are compared on a basis of fourth, fifth, and sixth grade reading equivalents.

. a statistically highlicant differences were found.

S. In grade six progression of difficulty was as

SE.

Loll ows.

- 1. More Specific Direction.
- 2. Decidadly Specific Diraction.
 - 5. General Direction.

do statistically significant differences were found. Ohences of a true difference between the decidedly specific direction and general direction were ninety-five in one hundred.

In Figure 6 per dents of items correct for each directions are compared on a hasis of fourth, fifth, and sixth grade reading equivalents.





Figure 7 simply shows the distribution of one hundred thirty-eight fourth grade children consisting of seventy-seven boys and sixty-one girls.



Distribution of Fourth Grade-by Boys and Girls

Pigura 7 sianly shows the distribution of one hundred thirty-oight fourth grade children consisting of seventy-seven boys and sixty-one girls.

Table V shows the relative order of difficulty of the three types of directions for boys and girls, giving probable errors of per cents of items correctly answered and the significance of their differences.

> Table V Relative Order of Difficulty of Three Types of Directions for Boys and Girls

No. Cases	Sex	Direc- tion	% Items Correct	P.E.p	Diff.	P.E./ diff.	Diff./ P.E.diff.	Chances ² in 100
77	Boys	a	57	3.8				
777	Desta		CP	7 6	10	2.3	4.3	100
(1	DOYS	D	07	0.0	0	0.0	0.0	50
77	Boys	с	67	3.6				
61	Girls	a	65	4.1		7 6		0.2
61	Girls	Ъ	68	4.0	3	C.L	2.0	ЭТ.
					2	1 9	7 7	87
61	Girls	с	70	4.0	~	1 • ~		01

a. General Direction.

b. More Specific Direction.

c. Decidedly Specific Direction.

1 Edgerton, op. cit.

2 Sorenson, op. cit.

Table V shows the relative order of difficulty of the three types of directions for boys and girls, civing probable errors of per dents of items correctly unswared and the significance of their difforences.

Table V Relative Order of Difficulty of Three Types

	2.2.diff.	3.2./ diff.	. 19:10	2 9		Direc-		• 013 66 369
				8.0			Evot	
001	0+	0.5	01	3.8	67			
	a	•		3.6				
				E.	68			£ð
7.8	0.5	G	0	0.5				
	1.7	2.2	65	0.1				51

a. General Direction.

b. Nore Specific Miraction.

c. Dacidadly Epecific Direction.

1 Edgerton, on. eit.

2 Sorenson, ob. cit.

In analyzing the relative order of difficulty of three types of direction by boys and girls the results show:

1. For Boys--a progression of difficulty in this order:

1. and 2. {Decidedly Specific Direction. More Specific Direction.

3. General Direction.

There was no difference at all between the more specific and decidedly specific directions. The difference between them and the general direction was statistically significant.

2. For the girls -- progression of difficulty was:

- 1. Decidedly Specific Direction.
- 2. More Specific Direction.
- 3. General Direction.

The differences were not statistically significant. Chances of a true difference between a more specific and a general direction were ninety-one in one hundred.

Figure 8 compares per cent of items correct in each di rection for boys and girls.

1. and 2. (Decidedly Specific Direction.

L'ore Egenitie Direction.

Caneral Dirachion.

and the general direction was statistically significant.

2. For the girls -- progression of difficulty and

1. Logidadly Egecific Direction.

C. More Specific Minection.

. . . General Direction.

.

The differences your not statistically similiant. Chances of Sion were minet; - one in one mudrod.

d rection for boys and girls.

CHAPTER IV

Summary of Conclusions

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Suggestions for Further Research

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hree Types of Directions - by Boys and Girl







CHAPTER IV

Summary of Conclusions

a nd

Suggestions for Further Research

The aim of this study was to discover the relative order of difficulty of three types of directions for comprehension in study-type reading at a fourth grade level.

Three tests were constructed to measure the order of difficulty of general directions, more specific directions, and decidedly specific directions for comprehension in each of three factual science stories.

They were administered to one hundred thirty-eight fourth grade children of similar socio-economic background, in three schools of a suburban area of Boston.

Conclusions

According to the results shown in this study:

 There was no difference of any statistical significance between the more specific and decidedly specific directions.

2. For the whole group, on the basis of total analysis, a statistically significant difference was found between the general and more definite types of direction.

3. For the "normal" group, on the basis of I.Q. analysis, a statistically significant difference was found be-



tween the general and more definite types of direction.

4. For grade four, on the basis of analysis by reading grade equivalent, a statistically significant difference was found between the general and more definite types of direction.

5. For boys, on the basis of analysis by sex, a statistically significant difference was found between the general and more definite types of direction.

6. Relative order of difficulty of directions progressing (1) decidedly specific, (2) more specific (3) general was not constant. It appeared in only four of the nine comparisons.

7. Intelligence is definitely a factor in this skill. It is apparent in the step up between I.Q. levels of the means of the per cents of items correct for each direction.

The results of this study would lead to the inference that children of "normal" intelligence and fourth grade reading ability, especially boys, will find a general direction less of an aid to comprehension than more definite types of directions.

From lack of constancy in the results it may be inferred that effectiveness of directions may vary with individual differences, some types being more effective with one child and others with another.

truen the general and more definite these of encettor. 4. For grade four, on the beste of neights by reading grade equivalent, a statistically similtont difference has found between the gameral and more definite trues of direction.

2. Nor boys, on the "ests of analysis by say, a statistically an milicant difference was found between the general and more doffinite types of direction.

5. Relative order of difficulty of firections programming (1) decidedly specific, (1) more specific (3) general our not constant. It appeared in only four of the nine compariaons.

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er;

Suggestions for Further Research

1. With greater numbers would there be any significant trends from lower to upper reading grade levels in relation to type of directions considered in this study?

2. What would be the relative order of difficulty of these same directions considered in the light of <u>rate</u> and comprehension?

3. If this study were conducted allowing for re-reading, how would it effect the relative order of difficulty of the three types of directions?

Surgestions for surfner Masenrel

2. With greater mumbers would there he and significant breads from lover to upper reading grade levels in relation to type of directions considered in this study?

2. "Dat mould be the relative order of difficulty of these anne directions considered in the light of miss and comprehension?

3. If this study were conducted alloving for re-readine, how would it effect the relative order of difficulty of the three types of directions?





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DURRELL-SULLIVAN43READING CAPACITY AND ACHIEVEMENT TESTS

READING ACHIEVEMENT TEST

By DONALD D. DURRELL Professor of Education and Director of the Educational Clinic Boston University

> and HELEN BLAIR SULLIVAN Associate Director of the Educational Clinic Boston University

Inter. Achievem't



a

INTERMEDIATE TEST: FORM A For Grades 3 to 6

Name	Grade	Teacher	Boy or girl
AgeWhen is your next birthday?.		How ol	d will you be then ?
Name of school	City		Date

Test	Score	GRADE Equiva- lent	Age Equiva- lent
1. Word Meaning		199. 201	the M
2. Paragraph Meaning	1		
Total	7		
Option	VAL TEST	5	1.1
3. Spelling	1.42	1000	
4. Written Recall Rat	ing	1.13 2	. 15.5
And a second second second second second second second second second second second second second second second	the second second second second second second second second second second second second second second second s	and the second sec	

Patent No. 1,586,628

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TEST 1. WORD MEANING Samples. An apple is a kind of — 1 paint 2 metal 3 animal 4 fruit 5 chair. Large means — 1 angry 2 big 3 hurt 4 little 5 like To shut means to - 1 help 2 give 3 take 4 run 5 close 5 orange **1.** A dog is an - 1 answer 2 elephant 3 animal 4 excuse 2. A robin is a - 1 crow 2 bird 3 bug 4 flower 5 leaf 3. To bring is to -1 find 2 carry 3 think 4 lose 5 fall 4. Small means — 1 hurry 2 large 3 little 4 like 5 help 5. To fall is to - 1 pay 2 lift 3 touch 4 drop 5 face 6. To bake is to - 1 break 2 lose 3 cook 4 speak 7. A dollar is - 1 copper 2 money 3 business 4 healthy 5 clothing 8. A voice is used to - 1 clamp 2 speak 3 point 4 write 5 mark... 9. A potato is a - 1 song 2 planet 3 vegetable 4 table 5 postman. 10. Beef is a kind of -1 horse 2 boat 3 maze 4 ranch 5 meat.....

11. To chop means — 1 roll 2 note 3 come 4 chide 5 cut..... 12. If a thing is above, it is - 1 glad 2 pleasant 3 short 4 higher 5 between 13. A thing that is bent is — 1 warm 2 sharp 3 crooked 4 straight 5 tight... 14. Travel means — 1 trouble 2 journey 3 serious 4 prepare 5 junction. 15. Oil is used for — 1 fuel 2 water 3 fun 4 writing 5 presents..... 16. Quarrel means — 1 stop 2 travel 3 fight 4 forget 5 throw..... 17. A hall is a - 1 horn 2 road 3 tooth 4 room 5 field..... 18. An island is surrounded by -1 sugar 2 gardens 3 earth 4 salad 5 water 19. Remain means — 1 ride 2 measure 3 happen 4 stay 5 accompany 20. Salt is used on - 1 holidays 2 water 3 food 4 birds 5 flowers. 21. Marriage means — 1 image 2 civil 3 bitter 4 obtain 5 wedding ... 22. A carpenter makes things of - 1 iron 2 stone 3 cement 4 wood 5 grass 3 girl 4 heart 5 fruit 23. A maid is a - 1 smile 2 father 24. A palace is a — 1 crown 2 storm 3 land 4 building 5 policeman. 25. A helmet is worn on the - 1 knees 2 breast 3 feet 4 elbows 5 head [2]

26. When you miss school, you are — 1 tardy 2 absent 3 present 4 taught 5 fair 27. A person is alone who is without — 1 money 2 food 3 company 4 shelter 5 danger **28.** A stomach is part of the - 1 sea 2 sky - 3 body 4 country 5 world 29. A man's daughter is his — 1 parent 2 child 3 sister 4 son 5 niece! 30. Ill means — 1 sick 2 hungry 3 well 4 safe 5 sorry **31.** Excellent means very — 1 weak 2 good 3 happy 4 poor 5 tired. **32.** A hive is for -1 oil 2 school, 3 robbers 4 peaches 5 bees **33.** To tumble is to - 1 type 2 ask 3 knock 4 fall 5 tickle **34.** A grandparent is an - 1 antagonist 2 elephant 3 ancestor 4 impostor 5 umpire 35. A smell is an - 1 amount 2 answer 3 office 4 odor 5 idea **36.** An elm is a - 1 mold 2 helm 3 bug 4 tree 5 tool..... 37. A mule is a — 1 splinter 2 pearl 3 beast 4 ditch 5 handle..... **38.** Costly things are — 1 expensive 2 pliant 3 scorched 4 liberal 5 domestic

39. An author is a - 1 patron 2 policeman 3 statesman 4 treasurer 5 writer 40. A mayor is an - 1 expert 2 animal 3 invalid 4 umbrella 5 official **41.** A zone is a — 1 number 2 stepson 3 region 4 sliver 5 habit 42. To injure is to -1 slump 2 insure 3 wound 4 sell 5 splash 43. To rouse means to - 1 waken 2 rule 3 roast 4 throw 5 love . . . 2 price 3 wild 4 new 5 behind 44. Mild means — 1 gentle **45.** Wicked means — 1 generous 2 grateful 3 unselfish 4 evil 5 brilliant **46.** To make preparations is to get - 1 over 2 measles 3 ready 4 upon 5 cloudy 2 capital 3 desire 47. A selection is a - 1 bullet 4 choice 5 folder. 48. To tour is to - 1 prepare 2 toast 3 lean 4 travel 49. Twinkle means — 1 wrinkle 2 ringing 3 pitiful 4 glisten 5 feeble... 50. Coarse cloth is -1 smooth 2 fine 3 rough 4 cold 5 short 51. A bough is a - 1 limb 2 leaf 3 pail 4 crest 5 trunk To welcome means to — 1 endure 2 persist 3 receive 4 believe 5 practice 52.

31

53. A blunt thing is - 1 dull 2 sharp 3 disagreeable 4 black 5 thin 54. Circular means — 1 careless 2 familiar 3 round 4 square 5 jealous 3 radical 4 expert 5 kindly 55. Skillful means — 1 laborious 2 excited 2 above 3 empty 4 dreary 5 inside... 56. Interior means — 1 inferior 5 dull. 57. Stupid means — 1 studious 2 false 3 stylish 4 cowardly 58. To surrender is to — 1 surround 2 soften 3 colonize 4 yield 5 dance. 59. Destruction causes — 1 discipline 2 ruin 3 government 4 scandal 5 satisfaction 60. To convince means to -1 declare 2 design 3 combine 4 nourish 5 persuade 61. A sign is an -1 offering 2 agreement 3 acquaintance 4 indication 5 address 62. A portion is a — 1 gate 2 home 3 wall 4 riddle 5 share..... 63. To overcome is to -1 discover 2 happen 3 anticipate 4 defeat 5 worry 64. An insult is an -1 instinct 2 insertion 3 announcement 4 embrace 5 offense 65. To confirm is to make — 1 angry 2 equal 3 trouble 4 certain 5 time 66. Valiant means — 1 valid 2 lenient 3 brave 4 royal 5 loyal

[4]

5-

TEST 2. PARAGRAPH MEANING

Sample.

B

C

One warm, sunny day Helen and her brother went on a trip to the beach. Their mother and aunt went with them. They took their bathing suits so that they could all go into the water. When noontime came, they had lunch on the sand. After lunch the children gathered sea shells. They saw a starfish and some funny little crabs.

A.	What	did	Helen	and her	brother do	2
41.	11 IIac	ulu	TICICII	and net	Divenci uv	ł.

1 went to see their aunt2 went to the seashore3 went on a train4 went for crabs5 went fishing	1	2 	3	4
The weather was —1 quiet2 funny3 fair4 gloomy5 rainy		2 	3	4
The best name for this story is —1 Helen and Her Aunt2 Gathering Shells3 Eating Lunch Outdoors4 One Warm Day5 A Trip to the Beach	1	2	3	4

Ι

Mary and John go to camp as soon as school closes in the summer. They go on the train and stay until it is time for school to open again in the fall. They have a happy time at camp because there are many other boys and girls there too. They ride, swim, and play games together every day.

1.	When do Mary and John go to camp? 1 before school 2 when school is over 3 in the fall 4 when school starts 5 every day		2	3	4	5
2.	Which word tells what kind of a time the children have at camp?1 lonesome2 sad3 joyous4 funny5 weary		2	3	4	5
3.	How do the children travel to camp? 1 on a train 2 on a bus 3 in an automobile 4 on a car 5 in an airplane.	L 	2	3 	4 	5
4.	The best name for this story would be —1 Close of School2 Playing Games3 A Trip on the Train4 A Summer at Camp5 The Boys at Camp	L	2	3	4	5
5.	Mary and John enjoy camp life because they — 1 are glad to be away for the summer 2 like the ride on the train 3 are glad to be out of school 4 like to study nature 5 have fun playing games with the other children		2	3	4	5

6

Π

- Jack had a new fish line. His father took him fishing in a little brook at the back of his grandfather's house. Jack was the first to feel a bite. There was a strong pull at his line. He tried hard to pull the fish out of the water, but it pulled so hard his father had to help him. He was happy when he saw his fish lying on the grass near the stream.

0.	1 to his grandfather's house 2 into the water 3 fishing with his father 4 to buy a fish line 5 to the ocean to fish	1 	2	3	4	5
7.	The fish — 1 helped 2 struggled 3 ate 4 tried 5 fell	1 .	2	3 	4	5
8.	Jack tried to —1 fish near the stream2 pull his father back3 land his own fish4 put fish in the brook5 lie on the grass	1 	2	3	4	5
9.	The best name for this story is —1 A Trip to Grandfather's2 Catching Some Fish3 Jack's Fishing Trip4 Buying a New Fish Line5 How Father Fished	1 	2	3	4	5
10.	Jack enjoyed his trip because —1 the fish got away2 the brook was near grandfather's3 he caught a fine fish4 he went to a stream5 his father helped him	. 1	2	3	4	5

III

In the cold northlands many animals go to sleep for the whole winter. They have to store up enough fat on their bodies in the summertime to last them all winter while they are sleeping. These animals grow huge in the summer. Bears, which are among the animals which sleep all winter, get so large in the summer that they can hardly move about. All these animals which sleep during the winter crawl into caves or hollow trees when winter nears and stay until spring comes once more. When they come out, they are very thin and are starving.

11. How do the animals which sleep through the winter get their winter food?

	1 by carrying their food in with them2 by getting fat in summer3 by coming out for food as they need it4 by eating the bark of trees5 by living on small animals	L	2	3	4	5
12.	The climate where these animals live is very —1 windy2 warm3 breezy4 cold5 hot	1 	2	3	4	5
13.	How do the animals look when they come out of the cave? 1 huge and fat 2 lean and hungry 3 thin and tired 4 large and strong 5 huge and starving	1	2	3	4	5
14.	The best title for this story would be — 1 Bears Which Go into Caves 2 Thin and Hungry Animals 3 Animals Which Sleep through the Winter 4 Large Animals Sleep in Winter 5 While They Are Sleeping		2	3	4	5
15.	The animals which sleep through the winter make winter dens — 1 in the summertime 2 in the open woods 3 when spring comes 4 in caverns or hollow logs 5 while they are sleeping [6]		2	3	4	5

The St. Bernards are among the bravest of dogs. They are large and very strong. In Switzerland these dogs are trained to go out and find travelers who are lost in the snowdrifts on the high mountains. A first-aid kit containing food and medicine is hung about their necks, and a warm blanket is strapped on their backs. When they find worn-out travelers, they dig them out of the snow and help them if they are awake and able to move. If the traveler is injured and helpless, the dog is trained to go back to the town below and bring aid. Many lives are saved every year by these fearless animals.

16. What is the most valuable thing that St. Bernard dogs do?

1 They can climb over snowdrifts. 2 They are good mountain climbers.

 3 They are trained to rescue lost travelers.
 4 They are large and strong.
 1
 2
 3
 4
 5

 5 They carry first-aid kits.
 1
 1
 2
 3
 4
 5

 17. The St. Bernard dog is —
 1
 2
 3
 4
 5

 1 cowardly
 2 speedy
 3 courageous
 4 rough
 5 fierce
 1
 1
 2
 3
 4
 5

 18. How does the dog assist worn-out travelers ?
 1
 1
 2
 3
 4
 5

 1 by digging large holes in the snow
 2 by climbing the drifts to the traveler
 1
 2
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 19. The best title for this story is —
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20. What do the dogs do for the travelers they cannot help? 1 stand the man on his feet

2 give him food and medicine 3 return to the village for aid

4 carry him down the mountain 5 give him the first-aid kit

V

The camel possesses a most uncommon body, which almost seems made to order for the many purposes he fills in the life of the desert people. His mouth is peculiarly fitted for securing food. The strong membrane and powerful teeth enable him to tear off the dry shrubs and stiff, prickly cactus of the desert. His huge nostrils allow him to breathe deeply. They close tightly when a sandstorm arises, thus shutting out the choking sands. His hump, a mere lump of fat, is of great use if food fails, for he can obtain nourishment from it for many days. He is also provided with inside reservoirs which hold enough water to last him for four or five days. Unfortunately the camel is dull. To kneel down at a given signal is about the only trick he ever learns. Although the camel is homely he is nevertheless valuable, for without him many portions of the earth would remain untraveled.

23. The mouth of the camel — 1 is harmed by thorny cactus 2 is small and tough
3 is well suited for procuring food 4 tightens when a sandstorm arises 1
5 provides an inside reservoir

24. The best title for this story is — 1 The Homely Body of the Camel
2 Why the Camel Is Useful 3 The Stupidity of the Camel

4 Sandstorms on the Desert 5 How the Camel Eats

25. The camel is — 1 unsuited for desert travel 2 helpless in a sandstorm 1 3 a tricky animal 4 well adapted for desert travel 5 friendly and intelligent ...

[7]

8=

Bill vaulted the fence into the corral and faced the bucking pony. At his approach the little animal struck out with his forefeet, but Bill was quick and avoided him. The boy caught the pony close to the head and with a rapid movement sprang into the stirrups. Then began the real task. With head down, back up, and whinnying loudly, the animal reared into the air, bouncing back to earth with terrific force. He tried every trick possible to throw his rider, plunging and rearing in all directions, but Bill held on. Finally, after many minutes, the exhausted pony, wet with perspiration, stood still. His nostrils trembled, but one felt that though his body had been subdued, his spirit was still unbroken.

26.	When Bill approached, the pony was — 1 tired and broken 2 quieted in spirit 1	2	3	4	5
	3 impatient to be ridden 4 disturbed and angry 5 thrown to the ground				
27.	The pony was finally — 1	2	3	4	5
	1 overbalanced 2 exultant 3 overpowered 4 distracted 5 restored				
28.	The little pony tried to — 1 outlive his rider 2 aid the boy 1	2	3	4	5
	3 unseat his rider 4 exhaust the animal 5 butt Bill				
29.	The best title for this story is —				
	1 Riding the Range 2 An Exhausted Pony 3 Breaking a Pony 1	2	3	4	5
	4 A Perspiring Pony 5 Bill Approached a Pony				
30.	The article illustrates —				
	1 how to enter a corral 2 a whinnying pony 3 trickery in riding 1	2	3	4	5
	4 leading a pony 5 skill in horsemanship		1		

VII

Studying bird life with a camera is certainly an entrancing sport. One can engage in it without destroying life, yet get great satisfaction from the thrilling activities it offers. The sport is appropriate for any time or place. From it one can derive all sorts of adventures, for to be a good photographer of birds in their native haunts it is necessary to climb trees and cliffs as well as travel on land and water. How interesting it is to find their nests, learn where they stay at various times during the day, how the young are fed and cared for, and procure photographs of the birds in various attitudes. Hiking with the camera through the woods is always an enjoyment. There is a feeling of excitement and expectancy present, for one never knows at what moment he may come upon some unusual bird activity.

31. Making studies of bird life is interesting because -

	1 they haunt native places 2 of the various activities one can observe				
	3 it is always done on water 4 the young are fed and cared for 1	2	3	4	5
	5 the sport is appropriate				
32.	Using a camera in place of a rifle encourages wild life by promoting — 1	2	3	4	5
	1 destruction 2 conservation 3 dissatisfaction 4 conversation 5 haunts				
33.	Bird study is a satisfying sport because —				
	1 the young are fed 2 the birds like it 3 one can get eggs out of nests 1	2	3	4	5
	4 it can be enjoyed during all seasons 5 one can use a rifle	1		1	
34.	The best title for this story is —				
	1 Interesting Birds 2 The Excitement of Adventure 3 Taming Wild Birds	2	3	4	5
	4 Photography of Wild Birds 5 Destroying Bird Life				
35.	Taking pictures of bird life is fascinating because —				
	1 it is helped by a camera 2 it takes much time 3 it gives more bird pictures 1	2	3	4	5
	4 it brings adventure without destruction of life 5 it scatters the birds about	1			

In the part of our country which gets very little rain in the summer the ground must be wet by irrigation to make the plants grow. Otherwise all the crops would be spoiled by dry weather. This form of agriculture is carried on in states where snow is found high up in the mountains the entire year. A large reservoir is made by damming up the mountain streams. The snow, melting in summer, rushes into a stream. This, in turn, is joined to a large ditch. At the head of the ditch is an intake gate. This can be opened and closed at will. In this way water is drawn off and the various fields are irrigated. The water can be turned on whenever the fields need it. The parts of our country where irrigation is possible seldom have crop failures, because water can be secured when it is needed.

36. This form of agriculture is carried on where -

1 crops are grown in summer 2 mountain streams make it possible 4 there are large reservoirs 5 there are crop failures 3 cities are near 37. Because irrigation is possible crop failures are — 4 permitted 5 eliminated 2 reduced 1 increased 3 possible 38. They stop the water from flooding the fields by -1 damming the ditch 2 use of gates 3 opening the reservoir 5 drawing off the water 4 irrigating the fields 39. The best title for this story would be — 1 Damming Up Streams 2 Supplying Water for Irrigation 3 Crops in Dry Weather 4 Building Huge Dams 5 Supplying Water for Colorado 40. Land that is irrigated yields better harvests because -1 in summer it gets little rain 2 it is high up in the mountains 3 water may be applied as needed 4 the water can be turned off 5 agriculture is carried on

IX

Sugar beets must be raised where cheap labor can be secured because the plants require a great deal of cultivation, most of which must be done by hand. First the plants are thinned and then blocked to get the correct number in the rows. The roots from which the sugar is extracted are not like the red beets which are eaten as vegetables, but are more like the common turnips. These roots are washed, sliced, and soaked in water. The water is later drawn off and boiled into beet syrup. Then the syrup is changed to a brown sugar called raw sugar. The last step is to send the raw sugar through the refinery, where it is cleaned and whitened. Then the white sugar is ready to be boxed and sold for use in our homes.

Sugar beets must be raised where labor is not expensive because they require —			
1 much care 2 much washing 3 many plants in a row 4 soaking in water	2	3	4
5 much boiling			
What kind of labor is most used in the raising of sugar beets?	2	3	4
1 machine 2 manual 3 difficult 4 easy 5 unusual			
The raw sugar is — 1 made into syrup 2 refined and whitened	2	3	4
3 boxed and sold 4 left as it is 5 changed to brown sugar		II.	
The best title for this story is — 1 Blocking and Thinning Beets			-
2 Colorado Sugar Beets 3 How Beet Sugar Is Obtained	2	3	4
4 Cleaning Raw Sugar 5 How Beet Sugar Is Whitened			
Raising sugar beets requires — 1 inexpensive labor 2 syrup changed to sugar	2	3	4.
3 sugar to be cleaned 4 many common turnips 5 raw sugar			
	Sugar beets must be raised where labor is not expensive because they require — 1 much care 2 much washing 3 many plants in a row 4 soaking in water 5 much boiling	Sugar beets must be raised where labor is not expensive because they require —1 much care2 much washing3 many plants in a row4 soaking in water125 much boiling	Sugar beets must be raised where labor is not expensive because they require —1 much care2 much washing3 many plants in a row4 soaking in water1235 much boiling

9

10 -

Airplanes are growing more important every year. Today they have traveled to almost every part of the world and into many places that would otherwise have remained unexplored. Daring pilots have been responsible for many outstanding feats. They have gone to the aid of dying men when there was no other opportunity of reaching them. At one time serum was carried to Alaska by plane and saved the lives of many children who were seriously ill of diphtheria. Every day of the year, and in all kinds of weather, Uncle Sam's pilots carry the mail through the air. Practically every day one reads of some new achievements of airplanes.

46.	Airplanes have rendered valuable service to humanity by - 1 carrying many diseases		
	2 having no other opportunity 3 aiding the sick and dying	2	3
*	4 helping boys to become pilots 5 taking passengers in the air		
47.	The life of an airplane pilot is —	2	3
	1 lonesome 2 easy 3 hazardous 4 happy 5 high		
48.	Airplanes are used for a variety of services such as -		
	1 exploring, carrying mail, and aiding the sick 2 carrying mail in all sorts of weather		
	3 bringing serum to diphtheria patients 4 serving humanity	2	3
	5 traveling in all kinds of weather		
49.	The best title for this story is —	165	
	1 Mail Pilots 2 Exploring with Airplanes	2	3
	3 Value of Airplanes 4 Life of an Air Pilot 5 A Trip to Alaska		
50.	The accomplishments of airplanes are —	2	3
	1 unimportant 2 understanding 3 trivial 4 significant 5 serious		

XI

The mode of living on the plantations of the South was vastly different from that of the early New England people. The spacious Southern mansions, surrounded by the many slave cabins, gardens, and poultry yards, were often in themselves small villages. While many of these planters were living in wasteful extravagance, the Puritans of New England were living in modest two-room homes. They were thrifty people who were not in favor of the riotous living and entertaining of the planters. The New England people were more interested in the establishment of good common schools for all people, while the rich planters did not favor this idea. They had tutors at home for their children, or sent them to Europe to be educated.

1 magnificent 2 insignificant 3 unpretentious 4 extensive 5 valuable ...

54. The best title for this story is —

- 1 A Story of Education 2 A Comparison of the Life of the Planters
- 3 Northern and Southern Modes of Living 4 The Thrifty New England People
- 5 Good Schools for All

55. The Southern gentlemen desired —

- 1 common education for all 2 the organizing of good public schools
- 3 good education for members of his own family
- 4 tutors for children in New England 5 good free schools for planters' sons

The pulmotor, a device for the resuscitation of persons suffering from gas poisoning, drowning, or electric shock, consists of a tank of compressed oxygen which is thinned with air and pumped into the lungs of the patient. It must be remembered that if breathing is to be produced artificially the process must be begun within ten minutes after the breathing has stopped or the person may not revive. Therefore it is not safe to wait to begin to revive the person until the pulmotor arrives. Some other method of restoring consciousness should be attempted in order to avoid a fatality. While the pulmotor can be of great advantage, it is also a very dangerous instrument in the hands of an inexperienced person. There is great peril, if the instrument is not properly handled, of drawing the air out of the small air cells in the lungs and collapsing them.

56. The pulmotor is an instrument for —

- 11-
- 1 collapsing the lungs 2 avoiding drowning 3 inducing artificial respiration 4 administering electric shock 5 inducing carbon monoxide 57. What is conveyed to the patient by means of the pulmotor? 3 air cells which collapse 1 2 1 concentrated oxygen 2 a device of great advantage 4 a mixture of oxygen diluted with air 5 a combination of oxygen and nitrogen 58. If the person is to be resuscitated, artificial respiration should be started — 1 by a dangerous instrument 2 for collapsing the lungs 3 within ten minutes 4 by a tank of oxygen 5 by an inexperienced person 59. While waiting for the pulmotor one should — 1 attempt to avoid the instrument 2 apply another type of resuscitation - 3 pump oxygen from a tank 4 draw air out of the lungs 5 dilute the air 60. The pulmotor is a menace in the hands of a novice because — 1 of the danger of injuring the stomach 2 it might not arrive on time 3 it can be of great advantage 4 it should be properly handled 5 of the danger of collapsing the lungs

TEST 4. WRITTEN RECALL

Ι

Blackie was a little kitten. One day a big dog chased him. He became frightened and ran up a tree. After he got high up in the branches, he was afraid to come down. The little girl who owned him came and stood beneath the tree. She called to Blackie and showed him his dish of milk, hoping he would want his supper enough to try to come down. But he would not come. Finally her father called the fire chief. He sent a fireman with a ladder. The man went up the tree and carried little Blackie down. The little girl was happy to have her kitten again.

II

John could hardly wait, so anxious was he to try the new canoe he had received for his birthday. As soon as he finished his breakfast he raced with his brother and sister to the lake. Here they examined his splendid new gift. John's father showed him how to use the paddle and told him that he might take his brother and sister for a short ride in the canoe, but warned him that he must not go too far from shore before he was thoroughly familiar with handling the new craft. All went smoothly, and gradually John forgot his caution and drifted farther from shore. Suddenly there came a great gust of wind. In a moment the lake was filled with heavy waves. John struggled to keep the little canoe upright. Luckily they were not far from a small island. He steered for this and reached the shore just as a particularly large wave turned the canoe bottom side up. The three children scrambled from the water out onto the island just as another huge wave came in. The canoe floated away, and John feared he had lost his precious gift. But a party in a little steamer presently came to the aid of the stranded children and rescued the canoe, which had blown a distance away.

Directions for Administration

To Teacher:

- 1. Illustrate a completed heading for "question sheet" on the board where children can refer to it.
- 2. Distribute story papers.
- 3. Read aloud "directions to pupils". Repeat if necessary -- but only the given set of directions.
- 4. Note time.
- 5. A child may be told any word in the story which he does not know and consequently requests.
- 6. Collect stories and distribute question sheets as individuals finish reading the story.
- 7. Collect all papers after 30 minutes.

Directions to Pupils:

Read the directions at the top of this paper. Follow them carefully. When you finish the story turn your paper face down on your desk. I will give you the questions to answer. Fill in the top of the paper before you answer the questions. (Illustration)

scales are small and flat and mard, and they fit over each other

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1

Ia

Directions

Read this story and find out how fish live. There will be some questions to answer afterwards.

How Water Animals Live

As long as a trout is in water he can move fast. His strong body has fins and a tail that take him quickly through the water. Water runs fast down a mountain-side. It pushes hard against anything in its way. But the shape of the trout helps him swim against the moving water. His long pointed body moves through the water easily.

When a trout gets hungry he swims into slowly moving water near the edge of a brook. He rests there until some flies or insects are above the water where he is. Suddenly he jumps, catches an insect in his mouth, and drops back into the water.

Have you ever watched fish open and shut their mouths? They seem to be eating even when there is nothing to eat. But they are not eating then. They are breathing. There is air in water. Plants help to put it there. Fish can take in air from the water. They breathe with gills instead of lungs. A fish's gills are soft and feathery. They are in an opening on each side of his head. Over them is a thin, hard, cover that comes open along one edge. The opening under the cover goes inside the fish's mouth. As the fish breathes he takes water into his mouth. The water goes back through the gills, and the gills take the air from the water as it runs over them. Then the gill cover opens and the water runs out. The fish must have air all the time. So water is always going through his mouth, then through his gills, and out again from under the gill cover.

Animals that live in water do not need skins that keep them from drying out. Water pushes against the animals that live in it. It sometimes knocks them against sharp rocks that are in the water. Most fish have scales to cover their bodies. The scales are small and flat and hard, and they fit over each other very tightly like shingles on a house. They make a tight hard covering that helps the fish's body move through the water easily and protects him as he is pushed about.

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Directions

Read this story and find out how a trout swims, eats, breathes, and protects himself. There will be some questions to answer afterwards.

How Water Animals Live

As long as a trout is in water he can move fast. His strong body has fins and a tail that take him quickly through the water. Water runs fast down a mountain-side. It pushes hard against anything in its way. But the shape of the trout helps him swim against the moving water. His long pointed body moves through the water easily.

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Directions

Here is a story about fish. Read it and find out

1. what helps a trout swim.

2. what a trout eats.

3. how a fish breathes.

4. what fish use when they breathe.

5. what protects fish.

There will be some questions to answer afterwards.

How Water Animals Live

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II a

Directions

Read this story and find out how plants live. There will be some questions to answer afterwards.

How Land Plants Live

Plants need water, light, and air to make food. The leaves of the plant make its food. The stem lifts the leaves up where they can get air and sunlight. The roots hold the plants in the soil and take in the water that the plant uses to make food.

When you water plants the water soaks into the soil around the roots. Then the roots soak up the water, and it goes up into the plant. Roots grow toward moist places. If soil around a plant is kept moist the roots are shorter. But if there is not rain enough while the plant is growing, the roots have to hunt for water. They grow longer and longer, reaching down into the soil that is still moist. A big plant like a tree uses a very large amount of water. It must have many roots hunting for water. The roots of a large tree look like branches under the ground. The large roots branch out into smaller rootlets. Through the soil they go, reaching toward moist places. Some grow deep into the ground. Others stay near the top and spread in all directions. If there is water anywhere in the soil they find it. The large root that grows straight down is called a tap-root. The tap-root grows so deep that it can almost always reach moist soil. Carrots and beets are smaller plants that have tap-roots. When it is dry they grow deeper into the soil.

In deserts the ground is very dry most of the time. When rain falls it soaks deep into the dry ground quickly. But cactus plants grow there. They have long roots that reach down to the water. They also have many roots and rootlets near the top of the ground. These roots take in water very fast before the soil dries out. The plant stores this water inside the stem and uses it when the weather gets dry. Water goes from the roots into the stem and leaves.

If plants lose water too fast they die. They are protected from this by a covering or skin which helps keep the water inside. Trees lose water through their leaves. The trunk, branches, and twigs are covered with a water-proof skin we call bark. Fuzzy hairs on the stems and leaves of some plants help protect them from losing too much water.

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Stems of plants hunt for light just as roots hunt for water. Leaves spread out in every direction to catch the sunlight. A tree hunts for light the same way. Plants with short stems grow leaves close to the ground. They spread out in every direction so they do not shade each other.

Plants use air making food. They do not have noses and mouths to take in air, as many animals do. But their leaves have many small openings through which the air goes into the plant. The openings are so very little that you cannot see them without using a microscope. Under a microscope these small openings look like little mouths. All these things help plants to live.

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Directions

Read this story and find out how plants get food, air, sunlight, and water. There will be some questions to answer afterwards.

How Land Plants Live

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II c

Directions

Here is a story about plants. Read it and find out

1. how land plants get their food.

- 2. how land plants get air.
- 3. how land plants get water.

4. where land plants store water,

5. how land plants get sunlight.

There will be some questions to answer afterwards.

How Land Plants Live

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2. The leaves make the 3. Roots reach into the 4. A plant stores water	plant's (flowers, stems, food). e ground for (worms, warmth, water). r for dry weather inside the
(stems, roots, leaves). 5. Trees lose water thr	cough (bark, roots, leaves).
Draw a line from the words un make a true sentence. Do it	nder A to the words under B that like this one. *
* Most plants grow 1. If soil is moist 2. Plants	roots are shorter. look like branches under ground. in the ground.
long roots that reach down, and many little roots near	make their own food.
the top of the ground 4. Roots of a large	roots are longer. to catch the sunlight.
5. Stems lift the	so they will die.
TOWYOR WP	to help get every bit of water before the soil dries out.
Write in a word to make each like this one. *	of these sentences true. Do it
1. The big root that g	rows straight down is a
2. The water-proof skin and twigs of a tree is the	n that covers the trunk, branches.,
3. The openings through the	h which a plant gets air are in
4. On the stems and lead that keep them from losing to	aves of some plants are
5. From the roots water and leaves of small plants.	r next goes into the

E. Petr -Boy or GITI Toonod ela 法之 der II tel bis al : 1394 the word that makes each sentende (rain, air; dew). The leaves wake the plant's (flowers, stems, food). A Roots reach ifto the round for (varme, warmth, water). A plant stores weter for dr vosther inside the [atens, roots, leares], site (i.r. roots, leares). 5:123 °. Draw a line from the words under A to the bound winder a char make a true sentence. Do it file this one from the make redte ato shorter. * Mont plants grow i. If goil is molet ? Plants . Outus plants meyo long roots that roots hear and miny liftle roots hear look like brandess under ground. In the ground. make their own food. the top of the ground roots are longer. to estin the cunlight. 1 Vagett so they will do . . 3. 81. 50 to help not every bit of allo of 1. AND AND DIT ON IN ST. C. a sea the sea the Write in a word to make each of these sentences true. Do it 11 ce this one. * * · Most plants grow in the grows draight down is a 2. The vater-proof shin that covers, the trunks, branches, and things of a tree is the The openings through which a plant gets sir are in 11 S 10 4. On the stans and leaves of some plants are that keep them from losing too much water. 5. Tron the roots mater next roos into the

III a

Directions

Read this story and find out how the trap-door spider builds her home. There will be some questions to answer afterwards.

The Trap-door Spider's Nest

You can often find many surprises about little animals when you go out to walk in the hills. Have you ever seen a trapdoor spider? She makes a fine, safe nest. When she is in it she is well protected from bad weather and her enemies.

The trap-door spider digs a small round hole deep in the ground. She lines it with silky webbing to keep it dry. To make the door she sticks tiny pieces of moist earth together with silky spider webbing. She fastens one side of the door to the edge of the hole with webbing. While the spider is making the trap-door, she sticks tiny rocks or grass on the outside of it. This makes the door look just like the ground around it. She makes two little holes in the under side of the door. She uses these holes to hold onto the door when she is inside. She can pull it down and it shuts so hard that you couldn't open it. While the door is still moist, she opens it and bangs it shut many, many times. This makes it fit very tightly into the opening of the tiny nest. When the little door is finished at last, it shuts so tightly that not even the wind or the rain can get in under it.

The spider spends her whole life in her dry safe nest in the ground. If she grows too large for the little house, she comes out of the ground just long enough to make a larger one. When the trap-door spider is hungry, she lifts up her door and waits under it until an insect comes near. Then she pops out, catches the insect, and drops back inside as quick as a wink so quick you can hardly see her at all. But she does not go all the way out of her nest. Can you guess why? Yes, because if she did, the little door would close, and she would be shut out of her own home. So, you see, the trap-door spider's home in the ground hides her safely and keeps all other animals out. A The

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The solider avends how whele life in her dry but asst in othe fround. If she arows the large for the liftle house, and ourse out of the ground just long meaning to white a hur or one. She will the train door aptier to hun are and lifts up her door and, out, out, the proposition out, satches the findest, into dress baside an outsid on a winde a no cutok you can intedig and her at sil. Sub the foet not so call the way out of her at all. Sub the foet not so if whe did, the little dest routs of orea, and the routh he applied if whe did, the little dest routs of orea, and the routh he way out of her own home. So, you not, the frag-door artdar's home . two clamine resto ffs agest bas yloted isd wohis hursy out at in the ground hides her refely and keeps all other

Directions

Read this story and find out where and how the trap-door spider's nest is made, lined, and protected. There will be some questions to answer afterwards.

The Trap-door Spider's Nest

You can often find many surprises about little animals when you go out to walk in the hills. Have you ever seen a trapdoor spider? She makes a fine, safe nest. When she is in it she is well protected from bad weather and her enemies.

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III c

Directions

Here is a story about the trap-door spider. Read it and find out

1. how the trap-door spider builds her nest.

2. how she makes the door.

3. how she makes the door tight.

4. how she protects her nest.

5. how she uses her nest.

There will be some questions to answer afterwards.

The Trap-door Spider's Nest

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. tash the trap-door spider builds her nest.

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3. Bow she bala salas the door the work .C

A. how whe protects her nost.

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There will be sens quastions to answer aftermands.

The Trap-door Spides to Heat

You can often find many surprises shout little animals when you go out to walk in the hills. Have you ever seen a trapdear odder? The maker a fine, this nest. When she is in it nhe is well protected from bed weather and her energy. The tran-door toider dire a small round hele deep in the

round. She since it with alley weights to beep it dry. To make the dear she sticke tiny pieces of moice earth together with alley andder webeing. She insteam one side of the dear to the edge of the hole with webbing. While the suider is making the true dear, the sticke timy rocks or grass on the outside of She there two little holes in the under side of the dear. She she there two little holes in the under side of the dear. She ages there holes to held onto the dear side of the dear. She to the the door is oblight, and that you couldn't open it, while the door is otill make it if yory time the sub be any, have the still make, and opens it and bange it she while the door is otill make, and opens it and bange it she that the way, have the the the test if yory time the appendence of the start when the little door is finished at any, have these. This makes it if yory tightly into the opening of the outer the that not so the door is start into, it and the start when the little door is finished at any of the outer the the test. The the is in the wind or the opening of the outer the the test is in the wind or the rain itse, it and the outer the the test is in the rain.

The poider spends her whole life in her dry safe neet in the ground. If the ground fort lone chouch the liftic house, and contor out of the ground fort lone enough to make a larger one. When the three-door solder in humry, she lifts up has door and white under is until as indeet source near. Then all pope out, endenes the incost, and drama huch inside as quick as a wink are unce you can hereity see her at all. But she door not go it the two out hereity see her at all. But she door not go it the the lifts of her would close, and and the out of her interest. Gan you guess why? Yes, because it are did, the liftle coor would close, and and and would be shut it are did, the liftle coor would close, and and would be shut out of her rest. Go, you see, the trac-dear spider's home in the ground hidse her safely and hears all other sminals out, in the ground hidse her safely and hears all other sminals out.

Date	School			
III Questions				
Put a lin like this	ne under the word that makes each sentence true.	Do it		
(hill, ho	This story is about a spider's (<u>nest</u> , spinning, : The spider starts her nest by making a tiny ble, hollow).	family).		

Boy or Girl

Story

To make the door she puts webbing with tiny pieces of 2. moist (leaves, sticks, earth).

3. While the door is still moist she bangs it shut many times so it will fit (lightly, tightly, loosely).

4. When the house is finished not even the wind or rain can get in under the (door, floor, nest).

5. The spider's nest protects her from (insects, people, enemies).

Draw a line from the words under A to the words under B that make a true sentence. Do it like this one.*

A

* This story is -----1. The spider fastens one side of the door to the edge of the opening

2. The spider sticks tiny rocks or grass

3. If the spider grows too large for the house she comes

4. When the spider is hungry she lifts the door and waits under it

5. If the spider went all the way out of her nest

the door would close and she would be shut out of her own home. with mud.

until an insect comes near.

about a spider's nest.

to the outside of the door so it will look like the ground. with webbing.

outside to live.

out just long enough to make a larger one.

Write in a word to make each of these sentences true. Do it like this one. *

* This story is about a spider's mes The spider builds her nest in the 1.

The spider's name is spider.
 The spider spends her whole life in her

The spider uses _____ to line her nest and keep 4. it dry.

in the door so she can hold it shut She makes 5. from the inside.

Name

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B

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