A Comparative Study of the Reading Disability in Neurologically Organized and Neurologically Disorganized Fifth Grade Children

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A COMPARATIVE STUDY OF THE READING DISABILITY IN NEUROLOGICALLY ORGANIZED AND NEUROLOGICALLY DISORGANIZED FIFTH GRADE CHILDREN

by

Sister Mariam, O.P.

A Dissertation Submitted to the Faculty of the Graduate School Of Loyola University in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

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1965
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Not the less significant are the children in schools visited by the author whose growth in reading was one of her major concerns.

Sincere appreciation is due Dr. Arthur O'Mara and other members of the Loyola University faculty for their interest, their fine qualities of scholarship and leadership as well as their aid in the preparation of this dissertation.

Finally many persons shared in the tedious aspects: cooperating with the administering of the tests; scoring and checking them; and typing the manuscript. To these persons the author is most grateful.
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CHAPTER I

INTRODUCTION

One of the most stimulating experiences in working with teachers and children in the area of reading instruction at the elementary level is being witness to the improvement in teacher competence. It is encouraging to find young boys and girls achieving close to their potential, to see them moving from one level of development to another with ease and assurance, to witness vocabulary growth, and to feel the impact that library reading effects in a classroom. These are positive rewards a reading consultant experiences as she works in schools of differing socio-economic background with children of varying potential.

But there is another side of the coin. In almost every classroom there is a population not responding to the prepared teacher, not meeting the goals of learning anticipated by following and enriching a textbook sequence.

Children with intellectual deficits may constitute a majority of any school's population of slow readers. On the other hand, it is feasible that many children develop (or bring with them) personality problems which hinder academic instruction from making its mark. Other causes have been suggested for reading retardation, including environmental deprivation, absence of motivation, inadequate instruction and crowded classrooms. However, in the absence of these causes there remains a large percentage of children who cannot
read on a level commensurate with their intelligence. It is precisely these children whom we study for additional clues to their reading problems, for it is quite possible that they have dyslexia or a problem of such a specific nature as to merit the term "specific language disability." \(^1\)

The motive for this study developed from interest in children with reading disability and in the teachers working with these children. In spite of the tremendous strides that have been made during the last fifty years in methods of teaching and in diagnostic and remedial procedures, a surprisingly large number of children still make slow progress in reading achievement. Many of these children appear to have adequate sensory efficiency for reading, and their intelligence, experience backgrounds and language ability compare favorably with those of other children of the same chronological age who are reading well.

A survey of the research studies in the area of laterality and directionality point up the confusion that poor readers experience in these functions. "Since 1925, a number of published accounts have emphasized the etiological relationship of two factors to reading disability. These factors, largely physiological in nature, are (1) vertical and lateral imbalance of the eye muscles (alleged to result in incoordinate binocular vision), and (2) mixed cerebral or mixed ocular and manual dominance (alleged to cause the reversals, faulty eye-movements, and other difficulties which characterize poor readers)." \(^2\) Currently, the work of Dr. Carl Delacato of the Institutes


for the Achievement of Human Potential in Philadelphia is renewing the interest in neurological organization as a clue to reading disability in children.

In the literature of reading disability there have appeared a number of studies purporting to show an etiological relationship between certain conditions of laterality (sidedness) and poor reading. The "frequent association" of left-handedness and dyslexia has been emphasized in some investigations. Left eyedness has been associated with poor reading by others. Finally, one author has hypothesized causal relationships between mixed eye-hand dominance (left-handedness and right-eyedness) and legasthenia.

The most widely discussed theory of dominance is that of Dr. Samuel Torrey Orton, a neurologist. He asserted that if a person fails to develop a consistent dominance of one side over the other, difficulties arise. In such a case, according to Orton, there will be confusion and conflict between the two sides of the brain. The child will have great difficulty in learning to read and spell and reversal errors will be present. It was really Dr. Orton's theory and investigation which served as a foundation and gave strength to Dr. Delacato's interest in the neurological aspect of reading disability. This in turn proved to be the spark for this investigator.

The present study had two purposes: (1) to ascertain the incidence of neurological disorganization present in fifth grade children reading below grade level; and (2) to compare the patterns of reading disability of children


5 Dearborn, op. cit., XXXI, p. 634.

who are neurologically disorganized with those who are neurologically organized.

It is hoped that the present investigation will throw further light on the relation of neurological organization to reading disability, point out the incidence of neurologically disorganized children, provide further insight into the types of reading disability, and give direction to consultants and teachers in how to adjust instruction for children who are neurologically disorganized.

The study was planned and conducted to test the following hypotheses:

(1) The results of the testing for neurological organization will show a greater incidence of poorly organized children than of well organized children in fifth grade reading disability cases.

(2) The pattern of reading disability as measured by the Iowa Test of Basic Skills and the Silent Reading Diagnostic Test will differ for children who are well organized and for those who are poorly organized neurologically.

(3) The neurological realm will be indicated as a potential etiological factor in poor language and reading development.

Procedure of the investigation.—This investigation proposes to study the pattern of reading difficulties of children reading below grade level in schools of differing economic environments. Schools were selected in neighborhoods determined to be high economic, middle class, and low or poor economic class. Social classes were defined by examining the occupational position of the parents of the children, the residential area from which the children came and the level of educational attainment of the parents. Fifth grade children were selected because by their chronological age these children should have established clear patterns of neurological organization. They had been placed on levels through previous standardized tests, informal reading inventories, and the judgment of the teacher based on their actual daily performance. The
opinion of the investigator supported the results of the tests and it was agreed by the teacher and the reading consultant that the children were properly placed for reading instruction.

To form the conceptual framework for the study a testing program was conducted. A new set of tests, none of which had been administered during the academic year, was selected to provide the following data for each child:

1. The index of brightness or innate potential as far as can be measured by standardized instruments. For this purpose the Lorge-Thorndike Intelligence Test: Non-Verbal Battery was selected and administered.

2. The present level of reading achievement as determined by standardized reading tests. For this purpose the Iowa Test of Basic Skills was administered.

3. Since these children were already known to be experiencing difficulty in reading performance, another test, the Silent Reading Diagnostic Test, by Bond, Clymer and Hoyt was administered. This would attempt to provide a further breakdown of the type of difficulties children experience.

4. An inventory of neurological organization was given to each child to ascertain handedness, eyedness, footedness. Tests of cortical opposition, supination and pronation as well as level of creeping efficiency were also given. The Doman-Delacato Scale was used and administered to each child individually.

After the tests were administered and scored the data compiled arranged the children into two categories:

1. Group A. Fifth grade children reading below grade expectancy as measured by the Lorge-Thorndike Intelligence Test. The children in Group A were those classified as well-organized neurologically as measured by the Doman-Delacato Scale.
Group B. Fifth grade children reading below grade expectancy as measured by the Lorge-Thorndike Intelligence Test. These were the children who were poorly organized neurologically as measured by the Doman-Delacato Scale.

A population of 203 fifth grade children was selected from schools in three differing socio-economic areas of Chicago. This population represented negro and white children for whom English was the native language.

This research was designed to determine the incidence of neurologically poorly organized children in reading disability cases and also to determine if reading disability in neurologically disorganized individuals differs in any significant way from reading disability in individuals who are neurologically well organized.

Explanation of the Terminology

It is a matter of considerable importance that there exist an understanding of the terminology used in this study.

Language disability: The children in the study were selected because they are language disability problems. Marion Fenwick Stuart, in *Neurophysiological Insights into Teaching* presents a diagnostic breakdown of language difficulties in the following outline:

A. Non-specific language disability

1. Poor intellectual endowment
2. Basic emotional disturbance

These conditions constitute a learning disability. In such cases, probably all school work suffers; reading, spelling and writing problems are non-specific to the learning disability.

B. Specific language disability

This constitutes a language disability. In this case, reading, spelling, writing problems are specific. This is the child who may

---

say he could learn if someone would read to him, or if someone would listen to him "say back" his lesson, rather than require him to write it down. It is easily understood that his language problems give rise to emotional problems which are secondary to the primary problem of specific language disability.

C. Other causes for language difficulties include:

1. Frequent absence.
2. Frequent change of schools.
3. Poor teaching.
4. Speech disorders.
5. Physical illness, and eye and ear defects.
6. Brain damage.
7. Factors in the environment.

Neurological organization: A sequential continuum, which ends at about the age of six, or at about the age when reading is generally taught formally.

It includes the following stages:

Medulla: This is the stage at birth where we see movement of arms and legs without bodily movement: the cry, grasp reflex, light reflex, startle reflex, Babinski reflex (the upper extension of the toes when the sole is flexed).

Pons: This is the stage from about three to twenty weeks. Here is seen a basically one-sided level of function. Mobility is homolateral or one side used for propulsion at a time; vision is biocular; audition is biaural. Crawling in a prone position culminates in cross-pattern crawling.

Mid-brain: This is the stage from about seven to nine months of age. As the child moves, opposite appendages are used for propulsion. As he moves, the right hand and left knee are used at one time and then the left hand and right knee are used for propulsion. He has become a cross-patterned organism. He no longer is one-sided, but now is distinctly two-sided. He becomes a bilateral human being. He experiences binocularity or the use of two eyes in concert, and he is
Binaural, or uses two ears in concert.

Cortex: This is the stage at about ten months of age. Stereo or depth within receptive and expressive mobilities, cross-pattern walking, cortical opposition in either hand, convergence of vision and stereo functions lead to the level of the development of complete cortical hemispheric dominance.

Later cortex period: This stage continues from ten months to six years or older and refines the actions of the cortex period.

The following aspects of this period may be considered:

**Mobility:** Walking with arms freed; walking and running in a cross-pattern; using a leg in a skilled role which is consistent with the dominant hemisphere.

**Language:** Skill in this area grows from using two words spontaneously, to two-word couplets, to short sentences and finally to complete vocabulary and proper sentence structure.

**Manual competence:** This is manifest first in cortical opposition in either hand, then bilaterally and simultaneously; bimanual function with one hand in a dominant role; using a hand to write which is consistent with the dominant hemisphere.

**Visual competence:** This is convergence of vision resulting in simple depth perception; identification of visual symbols and letters within experience; reading words using a dominant eye consistent with the dominant hemisphere.

**Auditory competence:** Here there is a growth from understanding two words of speech, then 200 words and simple sentences, finally to complete vocabulary and proper sentences with the proper ear.
Tactile competence: The child experiences tactile understanding of the third dimension in objects which appear to be flat; description of objects by tactile means; tactile identification of objects using a hand consistent with hemispheric dominance.  

Dominance: (1) Cerebral dominance: When used by physiologists without further qualifications this refers to the increasingly important role played by the cerebral cortex, as the animal scale is ascended, in controlling and integrating the activities of the lower nervous centers such, for example, as the cerebellum and the spinal cord.

(2) Unilateral cerebral dominance: When used with this qualifying adjective the expression refers to the concentration of functional control of language in one half of the brain such as is revealed by the fact that speech, for example, may be entirely lost although only one hemisphere of the brain has suffered injury.

(3) Eye dominance: One eye which is habitually used for sighting is referred to as the dominant or the master eye. The children in the study were tested to determine the dominant eye or eyedness.

Footedness: Consistent preferential use of either the right or left foot for such unilateral functions as kicking, hopping, starting upstairs, etc.

Handedness: Consistent use of either the right or the left hand in skilled acts such as cutting with a scissors, grasping, eating, brushing the teeth, etc.

Sinistral: Left; also used as an abbreviation for a left-handed person.

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8Carl Delacato, The Ontogeny of Reading Problems, Institute of Language Disability, Philadelphia (Philadelphia: By the author). Many of the ideas in this work are taken and supplemented in books by the author to be quoted later.
Sinistrad: to or toward the left.

Dextral: Right; also used as an abbreviation for a right-handed person.

Dextrad: toward the right side or hand or in the right-handed direction.

Laterality: Sidedness. We say a child is well lateralized when he is consistently either right-eyed, right-handed and right-footed or left-eyed, left-handed and left-footed.

Dyslexia: Defective reading. The reading defect may represent loss of competency following brain injury or degeneration; or it may represent a developmental failure to profit from reading instruction.⁹

⁹ Orton, loc. cit. (New York: W. W. Norton and Company, Inc., 1937). The definitions were checked in Dr. Orton's work because of the value of his work as professor of neurology and neuropathology at Columbia University. Many of the subsequent studies used his work as a springboard either in whole or in part.
CHAPTER II

CONCEPTUAL FRAMEWORK OF THE STUDY

Since reading forms so early an acquisition in academic education, and since facility in this subject is usually acquired even by children who quite obviously are below average in brightness, we are prone to assume that any child who is not grossly defective in intelligence can learn to read. Like all generalities this assumption has its exceptions. That certain physical defects such as very faulty vision or hearing may serve as a hindrance to easy acquisition of reading is self evident. It requires more explanation when the statement is made that children with normal or even superior intelligence and with normal vision and audition and even with normal use of ordinary pictorial material may have great difficulty in learning to read, or may even prove to be unable to learn from ordinary teaching methods. This statement is, however, demonstrably true and suggests a problem on which the neurologist may throw some light.

It is for this reason that we turn to the work of Dr. Samuel Orton who from the first was strongly impressed with the idea that specifically retarded readers formed a homogeneous group who differed only in the degree of handicap and not in type.¹ He was convinced that the nature of errors in

¹Ibid., p. 12.
Orton's theory was a startling one to the educators who heard it. He maintained that the explanation of the causes of the handicap rests on well-known facts of brain anatomy and brain pathology. Unlike many of the organs of the body, the brain is made of two symmetrical halves or hemispheres separated from each other by a deep cleft or fissure and connected only by a massive bridge of fibers. It is more nearly comparable to the two arms than to the heart or liver, and this simile may be carried further since the two hemispheres are exactly like each other but are an antitropic right and left like the two hands. We recognize that structurally these two halves are quite distinct, at the same time we know that they do not work as separate units. Nor are their relations to each other exactly the same in the various functions in which the brain participates. For example, the way the two halves function in control of voluntary motion is not like the way in which they function in the reception of visual impressions, and in neither of these is their relation to each other the same as in reading and writing.

In speaking of control of voluntary motion, each hemisphere acts on the opposite side of the body exclusively. Though there is exceedingly close coordination between movements of right and left hands, for example, each is independently governed by nerve cells situated in a narrow strip of gray matter, the so-called motor area, of the opposite hemisphere. This independence of the two sides is shown when disease or injury destroys the motor area of one hemisphere. This results in a loss of voluntary movement of
the opposite half of the body but does not interfere with voluntary movement on
the same side.

As early as 1925, Samuel Orton was investigating the neurological
organization of man and pointing to the importance of consideration of man's
superiority over animals in the area particularly of speech and locomotion. In
Reading, Writing and Speech Problems in Children, published later in 1937,
Orton had these remarks to make:

Man's dominant position in the animal world rests largely if not entirely
on his possession of two faculties: - first, his ability to make use of
sound, markings, and gestures for the purpose of communicating with others
of his kind and as a background for his own ideation, and, second, the very
high degree of skill which he has developed in the use of his hands since
they were freed from the duties of support and locomotion, by the abandon-
ment of the arboreal habit and adoption of the erect posture. In most of
the simpler functions of the nervous system man is inferior to animal
competitors. Mention need only be made here of the superiority of most
mammals in the sense of smell, of the strikingly greater acuity of vision
possessed by the soaring birds of prey by virtue of their second macula, of
the exquisite vibratory sense of many fish, and of the fact that certain
insects - notably the honeybee - are capable of responding to light waves
in the ultra-violet which are well beyond the range of human vision. It is
therefore of arresting interest to note that in the two faculties whence
man's superiority derives - speech and manual dexterity - a highly novel
physiological pattern has been evolved in the brain whereby the functional
control of these faculties is restricted sharply to one of the two cerebral
hemispheres - a plan of activity in sharp contrast to that existing in the
lower functional units of the central nervous system where exact bilateral
symmetry is the rule.

An interesting fact and one which seems to be of major meaning in
understanding the language disorders of children is that one side of the
brain is all important in the language process and the other side either use-
less or unused. This is most striking when we reflect that a very small area
of destruction in an appropriate area of the controlling or dominant
hemisphere of the brain will give rise to extensive loss in speech or reading
while an equal area of destruction in exactly the same part of the non-

2 Ibid., p. 13.
dominant hemisphere will be followed by no language disorder whatsoever. This concentration of the whole control of speech, reading and writing in one half of the brain bears an intimate relation to the development of unilateral manual skill in the individual and is the unique pattern which has contributed much to give man his commanding position in the animal world. It is this development of unilateral manual skill in children that appears to be, in some cases, a contributing factor to success in reading.

In 1935 a committee for The National Conference on Research in Elementary School English published abstracts of twenty-four studies containing suggestions for the analysis of reading disability. The problem of laterality was investigated by four members. Although the results of the studies are by no means conclusive, several investigators believed that there is little, if any, relationship between reversal errors and mixed hand-eye dominance. Therefore, the significance of the factor of mixed eye-hand dominance in poor reading is naturally questioned despite the emphatic conclusions and assertions of Dearborn, Orton and Monroe. Some investigators, with seemingly insufficient evidence, continue to emphasize the importance of lateral eye-muscle imbalance and fusion imperfections in reading.

Witty asserts that certain physiological factors, obviously accompanying reading disability, but not yet found by group analyses to differentiate poor from good readers should receive attention in the individual diagnosis which should precede effective remedial endeavor.

3 Several investigators support this theory, including Arthur Gates, C. Woody and J. Phillips. Lorene Teegarden's studies of clinical identification of the non-reader also maintains this point.

4 This theory was supported primarily by B. Crider, C. A. Selzer and Betts. Some of their studies will be referred to later in the paper.

5 Paul Witty, loc. cit., p. 458.
Studies Concerning Handedness

Several researchers have contributed valuable information about handedness which is pertinent to this investigation.

Studies made by Gesell and Louise Ames assume that handedness is an extremely complex trait which is intricately bound up with the total action system of the child. Accordingly, it becomes important to inquire into the various developmental expressions of laterality, and to approach the whole subject from the standpoint of ontogenetic patterning and organization. Gesell offers a schematic sequence of major forms of handedness - the characteristic age shifts in the handedness of subjects all of whom eventually showed clear-cut right handedness. The information may be easily reported in the following chart format:

<table>
<thead>
<tr>
<th>Age</th>
<th>Form of Handedness</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-20 weeks</td>
<td>Contact unilateral and, in general, tends to be with the left hand.</td>
</tr>
<tr>
<td>24 weeks</td>
<td>Definite shift to bilaterality.</td>
</tr>
<tr>
<td>28 weeks</td>
<td>Shift to unilateral and oftenest the right hand is used.</td>
</tr>
<tr>
<td>32 weeks</td>
<td>Shift again to bilateral.</td>
</tr>
<tr>
<td>36 weeks</td>
<td>Bilateral dropping out and unilateral coming in. Left predominates in the majority.</td>
</tr>
<tr>
<td>40-48 weeks</td>
<td>Same type behavior, unilateral, but now the right predominates in the majority.</td>
</tr>
<tr>
<td>48 weeks</td>
<td>In some a temporary, and in many a last shift, to use of the left hand - as well as use of right - either used unilaterally.</td>
</tr>
<tr>
<td>52-56 weeks</td>
<td>Shift to clear unilateral dominance of right hand.</td>
</tr>
<tr>
<td>80 weeks</td>
<td>Shift from rather clear cut unilateral behavior to marked, interchangeable confusion. Much bilateral and use of non-dominant hand.</td>
</tr>
<tr>
<td>Age</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td>2 years</td>
<td>Relatively clear cut use of the right hand.</td>
</tr>
<tr>
<td>2.5-3.5 years</td>
<td>Marked shift to bilaterality.</td>
</tr>
<tr>
<td>4-6 years</td>
<td>Unilateral, right-handed behavior predominates.</td>
</tr>
<tr>
<td>7 years</td>
<td>Last period when left hand, or even both hands bilaterally, are used.</td>
</tr>
<tr>
<td>8 years</td>
<td>Unilateral right once more.6</td>
</tr>
</tbody>
</table>

Ames in a similar report of the characteristics of age shifts in handedness points out that bilateral behavior, though occurring to some extent at nearly all ages, tends to occur outstandingly in the normal infant and child at certain definite age periods. The fact that patterned alternation of periods of bilateral and unilateral manual responses seems to be characteristic of all subjects studied suggests that periods of bilaterality occur as a result of developing inner forces. These periods occur regardless of postural orientation (that is, whether the child is seated or supine); and by the fact they occur in leg as well as in arm behavior.7

Gertrude Hildreth made a concise and scholarly contribution to research by means of her study, "The Development and Training of Hand Dominance." The study dealt with (1) characteristics of handedness; (2) developmental tendencies in handedness; (3) origins of handedness and lateral dominance; (4) developmental problems associated with handedness; and, (5) the training of handedness.

In speaking about the characteristics of handedness, Hildreth points that every normal person is endowed with two arms and hands which serve for the

manipulation of tools and other manual activities. In early life the child apprehends his environment largely through the cooperation of eye and hand; perhaps for this reason the hand has been described as the instrument of the mind, a tool that surpasses in its flexibility, power, and strength any other tool in existence. The hands execute impulses from the brain by means of nerve tracts which activate the efferent muscles. These reactions may be on an automatic, reflex level or consciously controlled by thought. The latter tend to be more complex activities, more elaborately patterned, less readily habituated or newer than the former. Although organically the brain is structured with two halves or hemispheres which are connected by nerves and muscles to the opposite-sided limbs, functionally the brain operates as a unit and the entire cerebrum is involved in motor responses. Manual habits and adaptation reflect the individual's mental processes and reveal mental and physical anomalies of function.

In the normally sighted person, through a process of mental and physical development, the eyes and hands function coordinately. Oculomotor control is a prominent feature of dextrous movements and characterizes our most highly specialized manual skills. Even in small children the eyes begin to guide the hands; by the time adulthood is reached the eye and hand have become a highly efficient team for intricate psycho-motor performance.8

Significant indeed, are the concluding remarks of Hildreth in the section of her study on the training of handedness. Most children grow up and continue through life without much attention to their handedness, yet this is a phase of child training which should concern

everyone who is responsible for rearing and educating children. Not all children develop consistent sidedness and avoid uncertainty and confusion in hand usage with the same degree of efficiency. The matter may receive no attention at all, however, unless the child's development has been particularly difficult. By suitable training it may be possible to reduce the number of cases of speech disturbances, failures in writing and reading, vocational motor handicaps, and cases of social embarrassment attributable to manual deficiency.

The author reminds us that no one has yet proved that eyedness cannot be changed or does not change with shift in handedness. There has been little research on this point. The question is whether it would not be advisable to change dominant eyedness along with handedness. The evidence suggests that consistent eye-hand dominance is far less essential to skilled motor performance than hand dominance alone. Hildreth concluded that the best thing to do would be not to attempt to influence eye-dominance. The questions she had in regard to this conclusion seemed apparent.9

Helen Lois Kooh reports a study of the nature, measurement and determination of hand preference. The manual choices in 105 situations of 201 university students were studied by means of observation of actual behavior and by means of a questionnaire paralleling these observations. The findings of her study that are pertinent to this investigation are summarized in this statement:

Our results suggest that hand preference is a trait influenced by many variables among which are probably: instruction, example, convenience, obviousness of choice, previous habits, specific nature and familiarity of the tasks to be performed, hand strength, and genetic factors. The method of measuring strength of preference profoundly influences the results obtained.10


R. H. Ojemann, in his doctoral dissertation, investigates these three aspects of handedness: 11

(1) The method of testing unimanual handedness.

(2) The results obtained in testing bimanual handedness and the relation of bimanual handedness to unimanual handedness.

(3) The results obtained in the investigation of the effect produced upon the speech function by training left-handed individuals to write with the right hand.

For the first part of the study the following summary was made:

(1) A single test such as the tapping test, the ball-throwing test, the paper-cutting test, the needle-threading test or the block-packing test cannot be used to differentiate accurately between the various unimanual handedness groups. On each test there is considerable overlapping of the scores made by the left-handed individuals with the scores made by the ambidextrous subjects, and similar overlapping of the scores made by the ambidextrous subjects with the scores made by right-handed individuals.

(2) If, however, the scores on an increasing number of tests are combined, the overlapping of the scores tends to decrease. When scores on the five tests - tapping, paper-cutting, ball-throwing, block-packing and needle-threading - are combined, the overlapping of the scores made by the left-handed, ambidextrous and right-handed individuals is relatively small.

(3) When the combined scores on the five unimanual tests for an unselected group are presented graphically, the resulting curve is distinctly bimodal. Handedness appears, therefore, to be a general factor which tends to divide individuals into two groups. Relatively few individuals are ambi-

dextrous. Individuals tend to cluster about a right-handed tendency or a left-handed tendency. This finding tends to indicate that handedness is an inherited characteristic. There is no environmental factor which would account for the bimodal distribution of handedness found in this study.

In the second section bimanual handedness was tested. Four bimanual tests were used: sweeping, raking, shoveling, and batting. If the subject held the right hand nearer the business end of the instrument and did the work on the right side of the body, a score of right was given. Left was recorded for the opposite action. In his summary Ojemann notes these two points:

1. The customary classification of handedness as applied to such activities as sweeping, raking and shoveling is in error. According to the customary classification, the majority of the human race is left-handed in these activities, and bimanual handedness varies inversely with unimanual handedness. When the customary classification is reversed, the majority of individuals is designated as right-handed and the direct relationship of bimanual handedness to unimanual handedness is at once apparent.

2. The handedness in bimanual activities varies somewhat with the nature of the activity, as sweeping is more closely related to the handedness in such activities as raking and shoveling than to the handedness in such an activity as batting.

In addition to the unimanual and bimanual handedness tests each dextro-sinistral was given three speech tests: (1) an articulation test; (2) a spontaneous speech test; and (3) an oral reading test. The data presented in this study show however, that under ordinary conditions, the danger of producing a speech disturbance after the speech habits have been formed by training a left-handed child to write with the right hand is very slight. The nervous system is sufficiently flexible to allow an individual
having a strong left-handed tendency to be trained to develop the complex coordination required for writing with the right hand without bringing about a disturbance in a closely related series of fine coordinations such as are involved in speech. 12

Clifford Woody and Albert Phillips also investigated handedness in an attempt to reveal the differences in the responses of right and left-handed children to various situations involving skills emphasized in reading or activities closely related to reading. The investigation involved 136 pairs of right-and left-handed pupils matched according to the following categories: (1) sex, (2) chronological age, (3) mental age, (4) reading ability, and (5) section of a grade with the same teacher in the same school.

The one outstanding conclusion derived from the many comparisons that were made of the responses given to situations in the battery of tests involving reading is that handedness per se had little or no influence on the type of reading responses made. Left-handed children reacted to the various reading situations just as right-handed children did. In these two groups of pupils selected maximum attention was paid to obtaining groups of children who had pure handedness. 13

Ivor Burge approached the problem of handedness from the standpoint of one who is interested in physical education. Consequently his study was more concerned with answers to such questions as,

(1) Is the preferred hand really stronger, faster and more accurate than its partner?

12Ibid.

(2) Does its superiority increase, remain the same, or decrease as the child grows older?

(3) Is the hand which is strong also fast and accurate? As regards the superiority of one hand over its partner, are there any significant sex differences?

A strength test, an accuracy test and a speed test were given each of the 312 primary school children who participated in this study. The tests were administered to groups of three or four children at a time, the testee being matched against each other in an endeavor to produce their best efforts. No indication was given that there was any competition between each child's own hands, but, in every case the children were encouraged to see which of them had the strongest grip, who could throw the straightest, and who could effect the largest number of bounces in the allotted thirty seconds. The more commonly used hand was tested first, but so keen was the competition amongst the children that each attempted to increase the score of the first performance when the other hand was tested.

The summary of the major findings include the following:

(1) In all three tests, the differences between the performances of the right and the left hands was smaller in the dextra-sinistral than it was in the dextral or the sinistral.

(2) The results indicate that there is little or no relation between the three abilities tested.

(3) Dextrals rely more on the right eye than they do on the left, while sinistrals, as a group, rely on the right eye almost as often as they rely on the left.14

Arthur Fitt and K. H. O'Halloran correlated handedness with several aspects of intellectual ability, with psychopathic tendency, and with height and speed of tapping.

In his summary Fitt reports:

(1) The data show a definite correlation between handedness and scholastic ability. Left-handedness seems to be associated with relatively low scholastic ability.

(2) With a group of children of average age twelve to thirteen years, the dominantly left-handed seem to be somewhat more psychopathic than the dominantly right-handed.

(3) Left-handed boys of thirteen to fourteen years seem to be somewhat shorter than the right-handed. There is a slight tendency to reversals at fifteen years with an equally slight tendency to physical dominance of the right-handed group at sixteen years.

(4) No clear relation was found between handedness and speed of tapping except that dextrosinistrals do not appear to be equal to dextrals on their right hand score. 15

Finally, in Hildreth's study of reversals in reading and writing, children under standard test conditions indicated a decline in frequency of the tendency in higher as contrasted with lower grades in making reversals. None of the children examined showed a high degree of consistency in the tendency to make reversals. The inconsistency of this reversal tendency prevents a conclusion that reversal tendency is a cause of poor reading.

Studies of Eyedness or Eye Dominance

The two eyes, like most of the paired organs with which man is endowed, are seldom equally efficient. They may differ in many ways, and especially in the manner in which they control muscular co-ordinations.

H. Bannister pointed out from his study in eye dominance that the dominant eye is an important factor affecting ability with the rifle, and that the man whose right eye is dominant has a considerable advantage, other things being equal, over other men when required to shoot from the right shoulder. 17

The purpose of Blake Crider's investigation was to determine whether unilateral sighting preferences (ocular dominance) were related to characteristic differences in the ocular muscle balance of the two associated eyes. Insufficiencies were listed for: (1) the eye which did not converge in the fixation test; (2) the eye which recovered its fixation more slowly on removal of a screen; (3) the eye which converged or diverged in contrast to the eye which maintained its equilibrium; and (4) the eye which made the greatest excursion behind the screen. The relation between unilateral sighting preferences, or eye dominance, and eye muscle insufficiencies is very close. The eye with the muscle insufficiencies is seldom the sighting or dominant eye. It also seems reasonable to believe we have another valuable method for determining eye dominance from this study. 18


Gould (1908) advanced the theory that dominant handedness originates in dominant eyedness, and that eyedness is an index of native handedness; but Gould apparently did not collect much evidence concerning eyedness tendencies in the general population. Parsons worked in this area also. According to Parsons, all right-handed, left-eyed individuals are those who were originally left-handed but were forced to change, but the theory does not explain the opposite group, the left-handed, right-eyed individuals. Parsons also asserts that when discrepancies between eye-and-hand dominance occur, the eye dominance may be considered the surer indication of "original" or "natural" laterality, since the handedness tends to change through the growth period far more frequently than eyedness. Eyedness is significant chiefly as an indication of early hand usage. The neurologist Brain does not believe that eyedness plays any part in actually causing handedness. 19

Hildreth, on whose references we have placed value earlier in this paper, summarized the points on eyedness worthy of note: The dominant eye normally corresponds with the individual's sidedness and lateral dominance in general. Eye dominance is considered to be a significant feature of human development because of the relation between eye-hand functioning and problems of motor adjustment including speech, reading, writing and certain vocational skills. Eyedness is not affected by the visual acuity of the eyes, for in many cases the master is weaker. Eyedness is primarily a matter of motor control. Eye movements develop in infancy ahead of hand movements. The eye tends to control and direct the hands in manipulation activity. The infant gains control over eye coordination before he achieves hand control; it is doubtful whether unilateral sighting develops before hand control. Eye dominance like

Handedness increases to some extent with age, suggesting that eye preference is an acquired visual-motor habit and that it is modifiable. Ocular dominance is established in early childhood and, unlike handedness, from then on tends to persist unless the sighting eye becomes incapacitated. Eyedness is not so obvious a trait as handedness, and is not directly trained as in the case with handedness.

Due to the difficulty of studying eye-dominance in infancy and early childhood, the developmental trends in eyedness have not been thoroughly explored at these age levels. Investigation in these early levels would answer many perplexing problems concerning the development of the relation between eye and hand functioning. 20

It would appear that high priority be placed on an understanding of the neurological organization (particularly laterality) in children by teachers who attempt to train them to read.

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20 Gertrude Hildreth, "The Development and Training of Hand Dominance: Parts I-V" Journal of Genetic Psychology LXXV and LXXVI (December, 1949; March, 1950). At this point the reader is referred to the five parts of this work because of its value and contribution to the fields of education, psychology and neurology. The work has been referred to in parts earlier in the paper.
CHAPTER III

CONCEPTUAL FRAMEWORK OF THE STUDY (CONTINUED)

In the overall framework there are some studies which move to the foreground and form a pattern of sequence to this present work. They are cited here, not for their agreement, but because they form a line of thinking that contributes to the motivation for this investigation. These authors have influenced educators and psychologists for decades and it is hoped that in viewing their work within the context of the learning process we will perhaps see a value in outlining a method of treatment for the children who fall under the scope of their search.

Orton, a neurologist, suggested the hypothesis that reading disability is due not to an organic defect in the brain but to failure to train the brain to work exclusively from the dominant hemisphere. He discussed the necessity of clear-cut unilateral dominance to prevent confusion. In his early writings he described a diagnostic rationale which evaluated the level of cortical hemispheric dominance. He looked to brain anatomy and brain pathology as an explanation of reading difficulty.¹

With the awareness of neurological problems that Orton contributed and the information that he made available to research students in medicine and

¹Orton, op. cit., p. 17.
education, it is no small wonder that many persons followed his ideas and made them applicable to the learning process. There were many studies undertaken from 1930 through 1960 that concerned themselves with the incidence of crossed dominance in children. No one had suggested a treatment nor a reorganization process for these children with disability until Carl Delacato's work at the present time.

At the same time Orton was making his studies of cerebral physiology of language showing the importance of proper laterality establishment for maximum efficiency in speech, reading and writing, Marion Monroe's classic monograph on reading disability appeared (1932). She studied the incidence of crossed dominance among 101 normal children, 155 disability cases, and forty-four intellectually defective cases. Her final list of fifteen possible causative factors in reading disability includes both defective form perception and insecure directional sense.

Monroe assumed that the first type of disability, "lack of precision in discrimination of complex visual patterns," was reflected in the child's reading in the form of an inability to comprehend words as units although they might be recognized when they were spelled out. The second disability, "lack of precision in discrimination of spatial orientation," was assumed to reflect itself in the static and kinetic reversals described by Orton. However, Monroe merely postulated that these perceptual deficits were significant correlates of developmental dyslexia. She employed no independent measure of form perception or directional sense as they applied to non-linguistic material and did not adduce any empirical evidence that defective perceptual reactions of these types extended beyond the process of reading itself. In contrast, in dealing with such factors as motor speech defects and defective auditory word discrimination, Monroe did show a significant association between these
defects and developmental dyslexia.

The work of Monroe emphasized the objective analysis of errors and the development of specific material to correct these errors. She also placed considerable emphasis on physiological factors. Finally, she attempted to determine specific methods that are adapted to the needs of the individual.²

There followed two research reports which were to be influential in guiding subsequent thinking about the role of higher level visual capacities in developmental dyslexia. The first was Fildes' study in 1921 of visual discrimination and memory in readers and nonreaders. She found that nonreaders showed some degree of disability in visual form discrimination and memory, not on a gross level to be sure, but in the perception of minor differences between visually presented figures. They also experienced difficulty in discriminating identical figures on the basis of spatial orientation alone, e.g., mirror images of the same figure. Similar results were secured in the auditory area; these findings leading her to conclude that developmental dyslexia is but one aspect of a more general defect in either the visual or auditory regions or in both. All the non-readers showed a reduction in the normal power in dealing with forms visually presented - especially when these forms were like each other, their defect being shown most definitely in their failure to remember such forms.³

In sharp contrast to these results of Fildes, quite negative findings were reported the following year by Gates (1922) in his study of the correlates of reading ability in school children. He could find no evidence


that poor readers differed from good readers in respect to the visual discrimination of nonlinguistic material and he denied that visual perception or memory could account for reading disability. Indeed, he denied the validity of the concept of "general visual perception" asserting that there are abilities to perceive words, digits, geometric figures, etc., each of which is relatively independent of other perceptual abilities. Adopting a pluralistic approach, he implicated poor educational methods, unfavorable home influences, emotional factors, and defects of vision as determinants of retardation in reading development. 4

A theory that was forward looking at this time was proposed by Parsons. The publication of his work on left-handedness disclosed the phenomenon of unilateral sighting in binocular vision, and definitely raised the question of the relationship between the dominant eye and the favored hand. Parsons concluded that in order to avoid difficulties in reading and writing one should be either left-eyed and left-handed, or right-eyed and right-handed, and preferably the latter. 5

Parsons 6 further points out that in writing and reading (in our language) the movement of the hand and the eye are dextrad. It is this sequence from left to right which has to be followed to build up the correct visual and kinesthetic images of words. This is the natural and easiest movement of the right-handed away from the center of the body. Left-handed and left-eyed children have a preference for the other direction, i.e., sinistrad. The opposite or dextrad direction is so awkward for them that at the start they

6 R. S. Parsons, Left-Handedness. (Chicago, Macmillan, 1924).
appear to "push" the pencil in writing. When lateral dominance has not been established, the trouble is not so easily detected. There is sometimes uncertainty about the correct sequence of letters in words because of conflicting tendencies of hands and eye. The result is that faulty word images with letters interchanged are stored up in the mind which later makes prompt recognition of words almost impossible. Surely here we might expect then to find reading disability among children who are not properly lateralized.

Fernald examined the work of Orton and asked questions about unilateral cerebral dominance. She questioned the correlation between failure to establish unilateral cerebral dominance and reading disability as Orton suggested. She would ask why such dominance had not been established. And what trait it is in the individual that has prevented this dominance from being established under conditions that develop it in the ordinary person. She believed there were fundamental traits that explain the failure on the part of intelligent individuals to develop the brain condition that is essential for learning in connection with quite limited subject matter.

Perhaps what Fernald suggested is more teamwork between neurology and education in offering solutions to the problems met by both. None of the theories seems to explain adequately the failure of certain individuals to learn to read. At least this would be true of the cases of total disability. The data concerning brain function are still inadequate for the formulation of a satisfactory theory of the physiological basis for reading disability.

Later in her treatment of causation of reading disability, Fernald points out that lack of the finer eye adjustments was characteristic of all of her reading disability cases at the start. In her case analyses she always tested for handedness and sometimes for eye dominance, but the latter was not always recorded.
Fernald, in working with reading disability cases and in speaking of eye and hand dominance noted:

The right-handed cases and the cases of matched eye-hand dominance resemble the cases in which the dominance is not matched, are as serious in their deficiency, learn by the same methods, and are as successful in the final outcome. The eye and hand dominance is not changed as a result of the remedial work; that is, the subject with unmatched eye and hand dominance learns to read and is able to read in an entirely normal manner with eye and hand dominance still opposite.\(^7\)

Working with large groups of children, Fernald was in a position to make valid observations which were in variance with the opinion of Monroe. She states:

1. Corresponding eye and hand dominance is found in many of our cases of extreme disability. In our last fifty cases of extreme disability, forty have corresponding eye and hand dominance, six have mixed eye and hand dominance, and four are ambidextrous. The cases of matched eye and hand dominance resemble the cases in which the dominance is not matched, are as serious in their deficiency, learn by the same methods, and are successful in the final outcome.

2. In the cases of unmatched eye and hand dominance, the dominance is not changed as the result of remedial work. The subject with unmatched eye and hand dominance learns to read and is able to read in an entirely normal manner with eye and hand dominance still opposite.

3. A very large number of individuals who have never had the slightest reading disability, many with distinctly superior reading skill, have unmatched eye and hand dominance.

Later in speaking of handedness Fernald says that handedness in itself does not seem to be a sufficient cause for reading disability. She finds no

apparent differences in the type of disability in the right-and left-handed cases. The cases with whom Fernald has worked have not given evidence to support a theory regarding a relationship between handedness, eyedness, and reading disability.8

Gesell9 in a wholistic approach and study of the developmental nature of the child showed his readers that handedness was a developmental phenomenon and that there were many other indices of neurological maturation in addition to handedness. He assumed in his studies that handedness is an extremely complex trait bound up in the total action system of the child. Since the total system is involved, Gesell urged his followers to inquire into the various developmental expressions of laterality. The phenomenon of the tonic neck reflex as connected with total neurological organization seemed to Gesell to be bound up with earliest manifestations of handedness. The head and neck exert a controlling influence upon the action of the rest of the body. This developmental information of total child growth gave educators solid information on which to note behavior in the subjects with whom they worked. If this developmental data would have been correlated with neurological physiology the result would have been a monumental contribution to the study of child growth.

A study of the relationship between various visuo-perceptual skills and reading achievement in first-grade children by Jean Turner Goins deserves mention because its results are being cited as evidence that defective visual form perception and insecure directional orientation are significant determinants of reading disability. In this study a variety of nonverbal

8 Ibid., p. 161.
9 Gesell and Ames. loc. cit.
tests of visual perception, including recognition of similarities and differences in pictures and abstract designs, completing designs from a model and recognition of incomplete pictures, were given to first-grade children relatively early in the school year and repeated later in the school year. Most of the tests correlated positively and significantly with reading level, the coefficients ranging from .2 to .5. Goins also explored the effects of special tachistosopic training in visual perception on reading level, a procedure which is of particular interest because of its possible implications for treatment. This training, however, had no significant influence on reading performance.10

Clinical studies of children with varying degrees of reversal tendency done at this time pointed up the following conclusions pertinent to this study:

(1) The most potent factors in learning to read are intelligence and the degree of tendency to reverse and confuse symbols.

(2) The very bright child is capable of overcoming a strong tendency to reversal and learning to read in spite of it.

(3) Consistent right dominance or left dominance, or ambidexterity with use of the right eye or the left eye are the conditions of lateral dominance most favorable to success in reading.

(4) Ambidexterity with use of either eye, and use of right hand with left eye or vice versa, are less favorable to rapid progress in reading.

Another major theory is that of Dearborn.11 He asserted that it is easier for the left-handed person to move his left hand from right to left than


from left to right, and easier for the left-eyed person to look from right to left than from left to right. Deviations then from right-sidedness would be expected to be accompanied by greater than average tendencies to move the eyes in the wrong direction in reading. With mixed dominance or a lack of consistent preference for either side, confusion in the direction of eye movements in reading, and reversals and other types of word-recognition difficulties would be expected. Orton and Dearborn agreed that consistent left-sidedness is less of a problem than mixed dominance. Orton's theory stressed confusion in mental imagery, while Dearborn placed the major responsibility on confusion in motor activity.

On the other hand, there were investigators who felt that the dominance theory as an explanation of poor school work had been overworked. Eames was one of these. He did a study of the importance of the various dominance anomalies in a group of 100 reading disability cases and a control group of 100 unselected school children of approximately equal age and time spent in school. There was no significant difference in the frequency of anomalies of eyedness and handedness alone, but there was nineteen per cent more mixed dominance among the poor readers. The outstanding type of mixed dominance was that of left eyedness with right handedness in which there was ten per cent more among the poor readers. These differences are not very great but they indicate a tendency that merits further investigation and they suggest that lateral dominance anomalies may be one of the etiological factors in poor reading.12

Similar conclusions were reached by Ullin Leavell in that the results of his study of visual imagery of symbols in space and the directional

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observation of symbols pointed to left-dominance as less favorable to the acquisition of reading skill than right-dominance, and to the conflict between eye and hand dominance as less favorable than complete left-dominance. Leavell found that impartiality of dominance reflects very little upon reading achievement.13

Helen Robinson engaged in research designed to discover whether those pupils with consistent eye-hand preference made slower progress and exhibited more unique problems in learning to read than did the pupils with consistent eye-hand preference. To make this comparison, kindergarten pupils were tested for eye-hand preference and for reversal and directional tendencies, and their subsequent progress was evaluated over a period of approximately two years.

The conclusions reached in Robinson's investigation have definite implications for teachers.

(1) Because bright pupils who prefer their right hand and left eye tend to move from right to left before reading instruction, it is imperative that first-grade teachers place emphasis upon the fact that, to read English, pupils must begin at the left and move to the right. Sufficient practice should be given in using this order or progression to establish a pattern for those pupils who tend to move in the opposite direction.

(2) Her study demonstrated that pupils with inconsistent right preference make no more reversal errors than do those children with consistent right preference and that they make adequate progress in reading if the classroom teacher provides the proper type of instruction. Consequently, classroom teachers of bright children can teach reading to first-grade pupils without

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concern about eye-hand preference except in very unusual cases.\textsuperscript{14}

The conclusions of Robinson differed from opinions and other pieces of research. Perhaps the fact that the investigation was made with young children in whom laterality is not completely established influenced the findings.

Clinical studies such as those done by Harris support the statements of Orton and other neurologists in showing that confusion in laterality and directionality shows up clearly in many children with reading disability when tests are given. Harris composed a test to determine laterality.\textsuperscript{15} His studies show that the development of a fairly consistent preference for one hand takes place later than the age of nine in a far higher proportion of reading disability cases. The significant question pointed up by Harris is whether or not a person shows directional confusion. This of course is shown quite typically in the presence of reversals in reading. It may also appear in spelling and the writing of numbers, in typing, or in speech in the form of stuttering.\textsuperscript{16}

When Orton began his research as a neurologist he worked in the field of reading and speech but his contributions were not utilized to the fullest by educators. They attributed a certain bias to Orton's diagnostic measures and the research in this important field lagged. The contribution that neurology was going to make to education was delayed. However, researchers who followed pointed to the work of Orton and joined him in searching for a central and basic approach to solving the problem of language.


\textsuperscript{15}Harris \textit{Tests of Lateral Dominance}.

\textsuperscript{16}Harris, \textit{loc. cit.}
Only one investigator suggests treatment for poorly organized children. This was Delacato. Even he has not presented controlled studies of disability cases in a re-education environment. His first reported study, however, is worthy of note:

The neuro-psychological concept for the diagnosis of reading problems and neurological organization as the primary treatment modality is based on the premise that language is the distillate of man's phylogenetic neural development, and the normal language function and reading are the distillates of a total ontogenetic neural development. 17

Delacato's study aimed at finding the common characteristics among poor readers, and it was found that there was no significant correlation between the following and poor readers as a group: 1) low intelligence, 2) common socio-economic status, 3) race, 4) religion, 5) divorce in family, 6) very progressive or very conservative schooling, 7) too much or too little phonic instruction, 8) faulty school placement, 9) changing teachers, 10) rigid or lax parents, 11) bi-lingualism, 12) poor hearing or poor vision, 13) poor attitude toward school, 14) lack of interest, motivation or reading materials, 15) severe emotional conflicts, or 16) specific teaching method.

The original studies indicated that groups of poor readers exhibited a lack of neurological organization as their most significant common trait. Approximately seventy per cent of the children seen by his reading clinics had some need of and profited from neurological organization.

This indication of the neurological realm as a potential etiological factor in poor language and reading development caused Delacato and his associates to suggest that after the natural laterality of the child had been determined three things should be done:

(1) Make the dominant hand the most skilled and the most used hand by

re-enforcement or re-education.

(2) Establish the eye on the side of dominance as the controlling eye in binocular vision. This can be done through occlusion and re-training. This should begin at far-point and then be followed at near-point.

(3) Re-educate the child so that proper foot is dominant.

Having ascertained the areas of neurological organization which are lacking, pre-remedial programs aimed at establishing neurological organization are initiated. Reading activities are discontinued during this pre-remedial period. This usually lasts about six to eighteen weeks, during which time re-evaluations are made. When neurological organization is achieved the child is returned to his remedial or educational situation.\(^\text{18}\)

Delacato relates language performance to such functions as birth and early development, sleep patterns, creeping abilities, bi-ocular and binocular skill, handedness and footedness and perceptual patterns. He studied under Temple Fay with the work of Gesell and Orton as underlying research. In working under Fay, a neurosurgeon, we may see merging the disciplines of neurology and education which many of the early researchers neglected to do. Delacato’s search for answers to the prevention of language problems more intelligently, to the prediction of them more reliably, and to the diagnosing of them more validly, centers upon the development of the child in a neurological and wholistic approach. We look for experimentation to support the theories which appear so logical to those who work with children.

CHAPTER IV

PROCEDURE OF THE STUDY

It has been pointed out over and over again that many disabled readers are ill-lateralized, exhibiting inconsistencies of preference between hand, foot and eye. Opinion differs as to the incidence and significance of such anomalies, and some investigations have denied that there is a relationship between neurological organization and reading. It is obvious from research and from experience that not all disabled readers are poorly organized neurologically, and that many individuals with odd or inconsistent lateral preferences learn to read normally and some to their capacity.

The purpose of this study is to point out the incidence of poorly organized children in a reading disability group, and to inquire whether the reading disability of poorly organized children differs in any significant way from the type of reading disability of well organized children.

Plan of the Study

There are 217 Parochial Schools in the City of Chicago participating in the Archdiocesan Reading Program. Approximately thirty-one percent of the total fifth grade population, (11,341 students), judged on the basis of standardized testing and performance are below grade level in reading achievement.
From this reading disability population, (about 3,516 children), a sampling of 203 children in six representative schools was selected for this study.

The schools included in the sampling are staffed by five teaching communities, whose methods and organization of reading instruction have been directed, supervised, and evaluated by the Archdiocesan Reading Consultant assigned to these schools. This type of control with continuing in-service training in the form of demonstration lessons, personal interviews of teachers, and other guidance procedures, has been in effect in these schools for an average period of five years. On this basis it may be assumed that an organized and relatively uniform reading program has been followed by the school personnel involved.

Range in size of student population in the selected schools is from 420 to 2100 pupils. Yearly student transfer rates, not exceeding two percent seem to indicate a stable population. Selection of sampling units were:

From Schools I and II, located in Census Tract 0505, thirty-eight boys, thirty girls, with a mean I.Q. of 99.

From Schools III and IV, located in Census Tract 0808, thirty-five boys, thirty-two girls, with a mean I.Q. of 101.

From Schools V and VI, located in Census Tract 0915, thirty-six boys, thirty-two girls, with a mean I.Q. of 108.

All of the children chosen, fifty-three percent of whom are boys, forty-seven percent of whom are girls, with a mean I.Q. of 102, form the corrective reading groups in their respective schools. Table I describes the composition of the sampling in relation to the reading disability population and the total fifth grade population.
### TABLE I

Composition of Fifth Grade Populations and Sampling in Schools Participating in the Archdiocesan Reading Program

<table>
<thead>
<tr>
<th>Number of Students</th>
<th>Sex</th>
<th>Mean I.Q.</th>
<th>Number of Schools</th>
<th>Range of Number of Students</th>
<th>Rate of Transfer</th>
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<td>Fifth Grade Population</td>
<td>Boys 56%</td>
<td></td>
<td>101</td>
<td>380-2100</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>Girls 44%</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Total Fifth Grade Population</td>
<td>11,341</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading Disability Population</td>
<td>Boys 52%</td>
<td></td>
<td>101</td>
<td>380-2100</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>Girls 48%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Reading Disability Population</td>
<td>3,516</td>
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<tr>
<td>Reading Disability Sampling</td>
<td>Boys 53%</td>
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<td>102</td>
<td>420-2100</td>
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<tr>
<td></td>
<td>Girls 47%</td>
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<td></td>
</tr>
<tr>
<td>Fifth Grade Reading Disability Sampling</td>
<td>203</td>
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</tbody>
</table>

Three broad socio-economic classes appeared to be represented by the 203 children selected for this study. The sixty-eight children attending Schools I and II seemed to be representative of a "low socio-economic" level. A "middle socio-economic" designation seemed to apply to the sixty-seven children from Schools III and IV. The sixty-eight children from Schools V and VI appeared to be "high socio-economic."

Socio-economic levels are delineated for the purposes of this study on the basis of the application of "The Index of Social Characteristics," (I.S.C.) developed by William Lloyd Warner and associates in their
stratificational study of "Jonesville,"\textsuperscript{1} to information tabulated in the 1960 U.S. Census Report for Chicago and environs.\textsuperscript{2}

Table II shows I.S.C. information drawn from the Census Report and indicates the relationship of the schools in the sampling to City-wide median figures.

Briefly, the Index of Social Characteristics is a four point scale based on 1) occupation of head of household, 2) residential area, 3) amount of income, 4) highest level of education attained. This scale applied to information obtained from the 1960 census indicates that there are apparent differences in regard to these four factors.

For the purposes of this study, when a census tract possessed median figures approximating the city-wide medians, the tract was considered to be "middle socio-economic." When a census tract showed medians below, it was considered to be "low socio-economic." When the median figures were above, the census tract was termed "high socio-economic."

A census tract is a small area into which large cities have been divided for statistical purposes. Tract boundaries were established cooperatively by a local committee and the Bureau of the Census, and were generally designed to be relatively uniform with respect to population characteristics, economic status, and living conditions. The average tract has about 4,000 residents. Tract boundaries are established with the intention of being maintained over a long time so that comparisons may be made from census to census.\textsuperscript{3}

Table II shows that Census Tract 0505, in which Schools I and II are


\textsuperscript{3}Ibid., p. 1.
# Table II

A Comparative Socio-Economic Description of the Population and the Sampling Units

<table>
<thead>
<tr>
<th></th>
<th>City of Chicago</th>
<th>Census Tract 595</th>
<th>Census Tract 808</th>
<th>Census Tract 915</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median income</td>
<td>6,738</td>
<td>4,080</td>
<td>7,039</td>
<td>14,813</td>
</tr>
<tr>
<td>in dollars</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of labor force</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>managerial</td>
<td>21.0</td>
<td>3.1</td>
<td>10.2</td>
<td>48.9</td>
</tr>
<tr>
<td>professional</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clerical, sales</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>craftsmen</td>
<td>41.9</td>
<td>22.0</td>
<td>67.6</td>
<td>38.1</td>
</tr>
<tr>
<td>operatives</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>laborers</td>
<td>22.3</td>
<td>53.4</td>
<td>22.1</td>
<td>13.0</td>
</tr>
<tr>
<td>service workers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>household workers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>unemployed</td>
<td>5.6</td>
<td>16.0</td>
<td>4.1</td>
<td>1.3</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median years</td>
<td>10.0</td>
<td>8.3</td>
<td>10.2</td>
<td>12.9</td>
</tr>
<tr>
<td>completed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Residential area</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median value</td>
<td>18,000</td>
<td>13,500</td>
<td>17,500</td>
<td>25,000</td>
</tr>
<tr>
<td>of housing units</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>in dollars</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median number</td>
<td>4.4</td>
<td>2.6</td>
<td>4.5</td>
<td>6.7</td>
</tr>
<tr>
<td>of rooms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per cent units</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>poor condition</td>
<td>15.2</td>
<td>43.7</td>
<td>.04</td>
<td>.01</td>
</tr>
<tr>
<td><strong>Schools</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I and II</td>
<td>68</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III and IV</td>
<td>67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V and VI</td>
<td>68</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Per cent units</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>overcrowded</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1.1 person</td>
<td>13.5</td>
<td>37.0</td>
<td>.08</td>
<td>.02</td>
</tr>
<tr>
<td>per room)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>N</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>68</td>
<td>67</td>
<td>68</td>
<td></td>
</tr>
</tbody>
</table>
located is below the city-wide averages in every respect. The thirty-eight boys and thirty girls attending these schools come from a residential area in which the houses or apartments are in generally poor condition, of low monetary value, small and overcrowded. Their parents' median income is approximately 2,000 dollars below that of the median income given for the city. Typically, the occupation of the father is unskilled. More than half the total of those employed are categorized as laborers, service and household workers. The rate of unemployment in this area is almost three times that of the city-wide rate.

In regard to education, most of the parents do not possess more than eight years of schooling, nearly two years below the city median. These children form the low socio-economic group.

Table II also indicates that median figures for Census Tract 0808 containing Schools III and IV, approximate those of the city-wide medians. The thirty-five boys and thirty-two girls live in neighborhoods containing two family dwellings or single family houses of moderate size. Very few of the homes are in poor condition or overcrowded. Parents of these children are predominately skilled workers, technicians, or involved in some form of clerical or sales work. The unemployment rate is 1.5 percent under the median for the city. Most of the parents have attended high school or possess a high school education. Their median level of education is only two tenths above that of the city-wide figure. Median income is 301 dollars above the median given for the City of Chicago. The children attending these schools constitute the middle socio-economic group.

Census Tract 0915 (Schools V and VI), described in Table II appears well above the City-wide averages in every area. The thirty-six boys and thirty-two girls included in the sampling from these schools are considered to be the high or upper socio-economic group. They live in residential areas
where overcrowding is negligible, homes are large and of high value. The median income of the parents is more than twice that of the city-wide figure. Almost half of the fathers are engaged in occupations of a managerial-professional nature and the unemployment rate is very low. One or both parents have attended or graduated from college; in some cases possessing a degree beyond the college diploma.

These 203 students from six schools not only represent three broad socio-economic classes as seen by the application of the I.S.C. scale to data from the 1960 census; but these children also represent the fifth grade reading disability population in terms of percentage of boys and girls, mean I.Q. and reading retardation.

Subjects of the Study

These children were included in the study:

1) Children who have average or above average intelligence (a few students were classed as below average) and who exhibit difficulty with some or many phases of reading. These children combine an average or high capacity level with a low achievement level.

2) Children whose reading level is below grade expectancy as determined by intelligence scores on the Lorge-Thorndike Non-Verbal Scale. The children in the study had been placed on the instructional level below fifth level on the basis of standardized tests and teacher opinion in collaboration with the reading consultant who services the schools.

The following types of children were not included in the study:

1) Mentally retarded children or very slow-learning children who are already reading to grade capacity.

2) Children for whom the English language is a barrier.
The Tests Administered

All children in the study were given the following tests during the month of November:

1) Lorge-Thorndike Intelligence Test: Non-Verbal Battery
2) Silent Reading Diagnostic Test
3) Iowa Test of Basic Skills
4) Informal Reading Inventory
5) Doman-Delacato Scale for Neurological Organization

After the testing the children were divided into two groups:

1) Fifth grade children reading below grade expectancy level with average or above average intelligence scores who are well organized neurologically. This formed group A.

2) Fifth grade children reading below grade expectancy level with average or above average intelligence scores who are poorly organized neurologically. This formed group B.

Description of the Tests

Lorge-Thorndike Intelligence Test: Non-Verbal Battery: The Lorge-Thorndike Intelligence Test is a group test which is easy to administer. The Non-Verbal Battery was selected because it uses items which are either pictorial or numerical. For the average pupil, such tests do not predict school achievement quite as well as scores from a verbal type test. However, they do give an estimate of scholastic aptitude which has not been influenced by any lack of ability to read. Level three, for grades four to six, was given.

Four types of norms have been developed for the Lorge-Thorndike Test: (1) intelligence quotient equivalent, (2) grade percentile, (3) grade equivalent, and (4) age equivalent.
The intelligence-measuring scales utilize materials that are both verbal and non-verbal in character. Although the authors are not concerned with presenting or insisting upon a formal definition of intelligence, they do state that the following mental processes are descriptive of intelligent behavior and are sampled by their tests; (1) dealing with abstract and general concepts; (2) interpretation and use of symbols; (3) dealing with relationships among concepts and symbols; (4) flexibility in the organization of concepts and symbols; (5) utilizing one's experiences in new patterns; and, (6) utilizing "power" rather than speed in working with abstract materials.

The time for administering this test was about one hour.

Silent Reading Diagnostic Test: The Silent Reading Diagnostic Test is one of the Developmental Tests of Bond, Clymer, and Hoyt. It is particularly designed to give the classroom teacher help in diagnosing the reading needs of her pupils. This test was selected for the high level of its diagnostic value.

The Silent Reading Diagnostic Test is composed of eleven sub-tests which evaluate the areas of word-recognition, comprehension, vocabulary and phonics. Scores were obtained for each of the sub-tests and they were divided into three areas for analysis: (1) Comprehension, (2) word recognition (excluding phonics), and (3) phonics.

The sub-tests were then further analyzed in these areas: (1) comprehension: in isolation and in context; (2) word recognition: visual and auditory; and (3) phonics: analysis and synthesis.

The time for administering this test was about two hours.

Iowa Test of Basic Skills: The Iowa Test of Basic Skills was devised to test fundamental skills in the areas of vocabulary, reading, the mechanics of correct writing, methods of study, and arithmetic. The primary purpose of the tests is to reveal how well each pupil has mastered the basic skills. The test
was selected because it was a valid instrument for measuring the skills of reading and the closely allied skills of correct writing, methods of study and the added skill of arithmetic.

The test battery consists of eleven separate tests, arranged according to grade level. The battery yields grade-equivalent scores on the eleven tests which are suited for measuring growth from year to year.

The reliability coefficients range from .84 to .86 for the major tests and from .70 to .93 for the subtests. The composite reliabilities for the whole test range from .97 to .98 for the different grades. These correlations are sufficiently high for individual diagnosis and prediction.4

Two types of norms are provided: grade norms and percentile norms within grade. One valuable aspect of the norms is their development for beginning-of-year, middle-of-year and end-of-year performance.

The vocabulary tests concentrate attention on understanding the meaning of words. This battery purports to test "basic skills" and not meaning or content aspects of the child's development.

The test of reading comprehension evaluates the specific comprehension skills involved in analyzing, organizing and evaluating a reading selection. Many of the items dealing with detail questions go beyond recognition of facts to understanding and drawing inferences from the reading selections.

The language skills tests cover the four areas of spelling, capitalization, punctuation and usage.

The section on work-study skills contains tests to evaluate the child's ability to use graphic material, reference materials, tables and maps.

The arithmetic section is devised to assess the knowledge of fundamental

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relationships and experiences in number which form the basis of the modern approach to arithmetic. Computation is encountered in meaningful form in the problems subtest.

Informal Reading Inventory: The Betts Informal Reading Inventory was given to each child individually to determine his instructional level and also to receive an evaluation of his oral reading skill. When he read with at least seventy per cent comprehension and without missing more than one word in twenty running words he was considered able to read on that particular level.

Doman-Delacato Scale for Neurological Organization: The Doman-Delacato Scale for Neurological Organization was used by the writer to test each child individually. The tests were divided into two sections: the laterality tests and those pertaining more directly to neurological development.

Laterality: The individual who consistently preferred the right eye, hand and foot in the series of laterality tests, was classified as one having right dominance. If the left eye, hand and foot were preferred, he was classified as having left dominance. This indicated that either the left or right cortical hemisphere of the brain was dominant. However, if the individual indicated by tests that he preferred the left eye and consistently showed right handedness, he was classified as having mixed dominance. This indicated confusion as to which cortical hemisphere was dominant. This in turn indicates that the individual lacked neurological organization and the adequate development of some or all of the lower neurological stages.

Tests to determine eye preference used in this study include the following:

(1) To determine eye preference at far point two instruments were used, a telescope and a board or heavy cardboard. The subject was
asked to sight some distant object through the telescope (cylindrical cardboard tube) held in both hands with both eyes and then to cover one eye and see if the object could still be sighted. The eye which continued to see the object through the telescope while the opposite eye was occluded was recorded as the sighting eye. This is binocular sighting at far point.

(2) An object was sighted with both eyes through a cardboard which had a hole in the center. The cardboard was held at arms' length. The subject was asked to bring the cardboard back to the one eye keeping the object in view. The eye to which the child brought the hole was recorded as the dominant eye. This is monocular sighting at far-point.

(3) For near point sighting the child was handed a cylindrical tube and told to look through it, placing it near his eyes. The eye to which he brought the tube was recorded as the dominant eye at near point.

(4) Also at near point: A small x was placed on a sheet of paper. The child sat at a table with the paper at reading distance. He was handed a three inch tube in both hands and asked to sight the x. The eye to which the tube was brought was recorded as the near-point sighting eye.

(5) The controlling eye was determined by having the child follow a point on an object (top of pencil, for example) in a circular or vertical movement. The movement of the eye was observed and the controlling eye noted.

Handedness was tested in the following manner: Each child was asked to do several things; to show how he would brush his teeth, to cut
with a scissors, to write his name, to throw a ball, and to pretend he was eating. He was asked to do these things several times and the hand used in each of the actions was noted. If the child consistently used his right hand, he was classified as right-handed; if he consistently used his left hand, as left-handed; if he used his right hand for some actions and his left hand for others; this was noted and he was classified as mixed handed.

Footedness was determined by having the child kick with a football, step on a chair, and take a step forward.

General Neurological Organization

Other tests that were administered to determine the degree of general neurological development were:

(1) Creeping: There are varying degrees of perfection in creeping. The lowest is homologous type of moving, i.e., moving both hands forward first, followed by a moving forward of both legs. The next stage of refinement is a homolateral pattern of moving forward of the same hand and leg simultaneously. Finally, the perfect pattern is one in which the opposite hand and leg move forward simultaneously. This is called cross-pattern. The scale was scored good if cross-pattern creeping was done, fair if homolateral creeping was done, and poor if homologous creeping was done.

(2) Cortical opposition was measured by opposing the thumb and forefinger and then repeating the action rapidly. The ability to do this act rapidly more than once is a brain function, controlled by the cerebella. Although mammals do develop neurologically the same as man, this function is peculiar to man.
Supination and pronation is measured by extending the lower arms with palms up and turning the palm down; then reverse the procedure. This should be done rapidly. This too, is an act only man can execute.

Results of the Tests

Doman-Delacato Scale: The results of the testing using the Doman-Delacato Scale divided the fifth grade reading disability cases into two groups; Group A, those who were well organized; and Group B, those who were poorly organized. Table III shows the incidence of well-organized and of poorly organized fifth grade children in the three socio-economic groups.

The highest percentage of poorly organized children was found in the low socio-economic areas, and the highest percentage of well-organized children in the high socio-economic areas. In the total fifth grade population that was tested sixty-nine per cent of the group was found to be poorly organized and thirty-one per cent was measured to be well-organized. The specific type of neurological disorganization will be discussed in Chapter V.

Table III

Percentage of Well-Organized and of Poorly Organized Fifth Grade Children in the Three Socio-Economic Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>High</th>
<th>Middle</th>
<th>Low</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>35%</td>
<td>30%</td>
<td>27%</td>
<td>31%</td>
</tr>
<tr>
<td>(Well-organized)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group B</td>
<td>65%</td>
<td>70%</td>
<td>73%</td>
<td>69%</td>
</tr>
<tr>
<td>(poorly-organized)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N=</td>
<td>68</td>
<td>68</td>
<td>67</td>
<td>203</td>
</tr>
</tbody>
</table>
Lorge-Thorndike Intelligence Test: Non-Verbal Battery: Standard test results were obtained from this test. Table IV presents the frequency distribution of the intelligence quotients for the fifth grade children and shows the distribution in both Group A and Group B. With a mean intelligence quotient of 108, Group A, (well-organized), was superior in intelligence as measured by this test. Group B, poorly organized, had a mean IQ of ninety-nine. Both groups

**TABLE IV**

Distribution According to Intelligence Quotients on the Lorge-Thorndike Test of Fifth Grade Children who Are Well-Organized and Those Who Are Poorly Organized Neurologically

<table>
<thead>
<tr>
<th>Number of Pupils</th>
<th>Well-Organized Group A</th>
<th>Poorly-Organized Group B</th>
<th>Total Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>125-129</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>120-124</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>115-119</td>
<td>14</td>
<td>10</td>
<td>24</td>
</tr>
<tr>
<td>110-114</td>
<td>11</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>105-109</td>
<td>8</td>
<td>15</td>
<td>23</td>
</tr>
<tr>
<td>100-104</td>
<td>10</td>
<td>23</td>
<td>33</td>
</tr>
<tr>
<td>95-99</td>
<td>9</td>
<td>34</td>
<td>43</td>
</tr>
<tr>
<td>90-94</td>
<td>3</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>85-89</td>
<td>5</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>80-84</td>
<td>1</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>75-79</td>
<td></td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>70-74</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

N= 63
Mean= 108
\(\sigma^2=27.14\)

N= 140
Mean= 99
\(\sigma^2=34.35\)
approximate the measure of average intelligence. The range of both groups had the same upper limits, 129, while the lower limit of Group A was eighty-two and the lower limit of Group B was seventy-two. The standard deviation was computed for both groups, showing a sigma of 27.14 for Group A and a sigma of 34.35 for Group B. A z score was computed to be 1.97 showing the difference between the groups to be significant at the .05 level. Table V shows the means and other statistics in the comparison of both groups on the intelligence test.

**TABLE V**

Means and Other Statistics in the Comparison of Group A and Group B on Lorge-Thorndike Intelligence Test

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>63</td>
<td>140</td>
</tr>
<tr>
<td>M</td>
<td>108</td>
<td>99</td>
</tr>
<tr>
<td>(\sigma)</td>
<td>27.14</td>
<td>34.35</td>
</tr>
<tr>
<td>(\sigma_{M})</td>
<td>3.46</td>
<td>2.91</td>
</tr>
<tr>
<td>(\sigma_{d-M})</td>
<td></td>
<td>4.52</td>
</tr>
<tr>
<td>(d_{M})</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>(\overline{z})</td>
<td></td>
<td>1.97</td>
</tr>
</tbody>
</table>

*Grade Expectancy:* The Lorge-Thorndike scale also yields a grade expectancy score. Table VI shows the frequency distribution of the groups. The mean grade expectancy of Group A was approximately one year higher than the mean grade expectancy of Group B. A wide range of grade expectancy scores characterized both groups: from 11.2 as upper limits for both groups to 3.2 for Group A and to 2.3 for Group B. The z score was also applied to this group.
<p>| Grade Expectancy of Fifth Grade Children Who Are Well-Organized and Those Who Are Poorly-Organized Neurologically |
|---------------------------------------------------|-----------------------------|-----------------------------|-----------------------------|</p>
<table>
<thead>
<tr>
<th>Well-Organized Group A</th>
<th>Poorly-Organized Group B</th>
<th>Total Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.0-11.4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>10.5-10.9</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>10.0-10.4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>9.5-9.9</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>9.0-9.4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8.5-8.9</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>8.0-8.4</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>7.5-7.9</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>7.0-7.4</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>6.5-6.9</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>6.0-6.4</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>5.5-5.9</td>
<td>8</td>
<td>22</td>
</tr>
<tr>
<td>5.0-5.4</td>
<td>5</td>
<td>18</td>
</tr>
<tr>
<td>4.5-4.9</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>4.0-4.4</td>
<td>6</td>
<td>16</td>
</tr>
<tr>
<td>3.5-3.9</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>3.0-3.4</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>2.5-2.9</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>2.0-2.4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>63</td>
<td>140</td>
</tr>
<tr>
<td><strong>M</strong></td>
<td>6.4</td>
<td>5.5</td>
</tr>
<tr>
<td><strong>σ</strong></td>
<td>4.00</td>
<td>5.09</td>
</tr>
</tbody>
</table>
and no significant difference between the groups was found. Table VII shows the statistics of the two groups.

**TABLE VII**

Means and Other Statistics in the Comparison of Group A and Group B on the Lorge-Thorndike: Grade Expectancy Scores

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>63</td>
<td>140</td>
</tr>
<tr>
<td>M</td>
<td>6.4</td>
<td>5.5</td>
</tr>
<tr>
<td>σ</td>
<td>4.00</td>
<td>5.09</td>
</tr>
<tr>
<td>σ_M</td>
<td>.508</td>
<td>.432</td>
</tr>
<tr>
<td>&quot;M</td>
<td>.666</td>
<td>.9</td>
</tr>
<tr>
<td>(\bar{z})</td>
<td>1.34</td>
<td></td>
</tr>
</tbody>
</table>

Every one of the children tested was on an instructional level lower than the grade expectancy score on this test would anticipate.

Reading Status of the Children:

**Iowa Test of Basic Skills:** Table VIII is a record of the mean scores of each group for vocabulary, comprehension and arithmetic. The arithmetic scores were included as another measure to see if there were any significant differences in the way the two groups performed in this subject. When considering the scores of children in the two groups and after applying the formula for measuring the z score, no significant difference was found between the well-organized group and the poorly-organized group. Table IX shows these statistics.
## TABLE VIII
Mean Scores of Fifth Grade Children on the Iowa Test of Basic Skills

<table>
<thead>
<tr>
<th>Group</th>
<th>Arithmetic</th>
<th>Vocabulary</th>
<th>Comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>Well-Organized</td>
<td>5.4</td>
<td>5.4</td>
</tr>
<tr>
<td></td>
<td>Poorly-Organized</td>
<td>5.0</td>
<td>5.3</td>
</tr>
<tr>
<td>Group 2</td>
<td>Well-Organized</td>
<td>5.3</td>
<td>5.2</td>
</tr>
<tr>
<td></td>
<td>Poorly-Organized</td>
<td>5.1</td>
<td>4.9</td>
</tr>
<tr>
<td>Group 3</td>
<td>Well-Organized</td>
<td>5.0</td>
<td>4.7</td>
</tr>
<tr>
<td></td>
<td>Poorly-Organized</td>
<td>5.4</td>
<td>4.9</td>
</tr>
<tr>
<td>Total</td>
<td>Well-Organized</td>
<td>5.2</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td>Poorly-Organized</td>
<td>5.4</td>
<td>5.0</td>
</tr>
</tbody>
</table>
### TABLE IX
Means and Other Statistics in the Comparison of Group A and Group B in the Iowa Test of Basic Skills

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Arithmetic</th>
<th></th>
<th></th>
<th>Vocabulary</th>
<th></th>
<th></th>
<th>Comprehension</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group A</td>
<td>Group B</td>
<td>Group A</td>
<td>Group B</td>
<td>Group A</td>
<td>Group B</td>
<td>Group A</td>
<td>Group B</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>63</td>
<td>140</td>
<td>63</td>
<td>140</td>
<td>63</td>
<td>140</td>
<td>63</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>5.2</td>
<td>5.4</td>
<td>5.1</td>
<td>5.0</td>
<td>5.3</td>
<td>5.2</td>
<td>5.1</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>σ</td>
<td>2.04</td>
<td>2.49</td>
<td>2.39</td>
<td>3.19</td>
<td>2.57</td>
<td>3.39</td>
<td>2.39</td>
<td>3.19</td>
<td></td>
</tr>
<tr>
<td>$\sigma_M$</td>
<td>.259</td>
<td>.212</td>
<td>.303</td>
<td>.271</td>
<td>.327</td>
<td>.359</td>
<td>.303</td>
<td>.271</td>
<td></td>
</tr>
<tr>
<td>$\alpha_M$</td>
<td>.334</td>
<td></td>
<td>.406</td>
<td></td>
<td>.485</td>
<td></td>
<td>.406</td>
<td>.485</td>
<td></td>
</tr>
<tr>
<td>$\alpha_M$</td>
<td>.2</td>
<td></td>
<td>.2</td>
<td></td>
<td>.1</td>
<td></td>
<td>.2</td>
<td>.1</td>
<td></td>
</tr>
<tr>
<td>$\tilde{z}$</td>
<td>.59</td>
<td></td>
<td>.24</td>
<td></td>
<td>.20</td>
<td></td>
<td>.24</td>
<td>.20</td>
<td></td>
</tr>
</tbody>
</table>

**Silent Reading Diagnostic Test:** The Silent Reading Diagnostic Test was administered to the same groups of children as another check on reading efficiency. Table X shows the mean scores for comprehension, recognition, skills and phonics. Without exception, the mean scores for phonics was the lowest of the three. Scores in recognition were next, and the highest scores were obtained in comprehension skills. The results of the Silent Reading Diagnostic Test closely resembled the results of the Iowa Test of Basic Skills.
### TABLE X

Mean Scores of Fifth Grade Children on the Silent Reading Diagnostic Test

<table>
<thead>
<tr>
<th></th>
<th>Comprehension</th>
<th>Recognition</th>
<th>Phonics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well-Organized</td>
<td>5.5</td>
<td>4.8</td>
<td>4.4</td>
</tr>
<tr>
<td>Poorly-Organized</td>
<td>5.1</td>
<td>4.8</td>
<td>4.3</td>
</tr>
<tr>
<td>Group 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well-Organized</td>
<td>5.2</td>
<td>4.7</td>
<td>4.4</td>
</tr>
<tr>
<td>Poorly-Organized</td>
<td>4.9</td>
<td>4.9</td>
<td>4.3</td>
</tr>
<tr>
<td>Group 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well-Organized</td>
<td>4.7</td>
<td>4.3</td>
<td>4.2</td>
</tr>
<tr>
<td>Poorly-Organized</td>
<td>5.4</td>
<td>4.4</td>
<td>4.2</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well-Organized</td>
<td>5.1</td>
<td>4.4</td>
<td>4.3</td>
</tr>
<tr>
<td>Poorly-Organized</td>
<td>5.0</td>
<td>4.7</td>
<td>4.2</td>
</tr>
</tbody>
</table>

A wide span of reading ability characterized the group as a whole. Table XI gives the results of the application of z score to the test data which showed no significant differences in the well-organized and poorly-organized groups.
<table>
<thead>
<tr>
<th>Statistic</th>
<th>Comprehension</th>
<th>Recognition</th>
<th>Phonics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group A</td>
<td>Group B</td>
<td>Group A</td>
</tr>
<tr>
<td>N</td>
<td>63</td>
<td>140</td>
<td>63</td>
</tr>
<tr>
<td>M</td>
<td>5.1</td>
<td>5.0</td>
<td>4.4</td>
</tr>
<tr>
<td>σ</td>
<td>3.54</td>
<td>2.97</td>
<td>2.14</td>
</tr>
<tr>
<td>( \bar{\sigma} )</td>
<td>.449</td>
<td>.252</td>
<td>.272</td>
</tr>
<tr>
<td>( r_{aM} )</td>
<td>.515</td>
<td>.475</td>
<td>.289</td>
</tr>
<tr>
<td>( \rho_{\sigma M} )</td>
<td>.1</td>
<td>.3</td>
<td>.1</td>
</tr>
<tr>
<td>( \bar{\rho} )</td>
<td>.19</td>
<td>.63</td>
<td>.55</td>
</tr>
</tbody>
</table>
### TABLE XII

Statistics in the Comparison of Group A and Group B on the Silent Reading Diagnostic Subtests

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Comprehension</th>
<th>Recognition</th>
<th>Phonics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Isolation</td>
<td>Context</td>
<td>Visual</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>N</td>
<td>63</td>
<td>140</td>
<td>63</td>
</tr>
<tr>
<td>M</td>
<td>4.8</td>
<td>5.5</td>
<td>5.5</td>
</tr>
<tr>
<td>σ</td>
<td>2.47</td>
<td>1.94</td>
<td>1.94</td>
</tr>
<tr>
<td>σ⁻dm</td>
<td>.426</td>
<td>.434</td>
<td>.422</td>
</tr>
<tr>
<td>Dm</td>
<td>.7</td>
<td>.9</td>
<td>.9</td>
</tr>
<tr>
<td>β</td>
<td>1.40</td>
<td>2.07</td>
<td>2.13</td>
</tr>
</tbody>
</table>
Table XII shows the statistics in the comparison of Group A and Group B on the Silent Reading Diagnostic Sub-Tests. Means were computed for both groups in comprehension in isolation and in context; in both visual and auditory recognition and in phonetic analysis and synthesis. The standard error of the mean and the z score were computed and showed a significant difference in three areas. In each case Group A scored higher. The highest z score was found in visual recognition scores of Group A. The mean score was 5.2 with a standard deviation of 3.50 while the mean of Group B was 4.3 with a standard deviation of 3.07. The standard error of the mean was .422 and the z score of 2.13 was significant at the .05 level.

Group A also scored higher in comprehension in context showing a mean of 5.5 with a standard deviation of 1.94 while Group B had a mean of 4.6 with a standard deviation of 4.23 showing a standard deviation to be .434 with a z score of 2.07. This was significant at the .05 level.

Finally, Group A scored significantly higher in auditory recognition with a mean score of 5.1 and a standard deviation of 2.58 while Group B had a mean score of 4.2 with a standard deviation of 2.77. The z score of 2.01 was significant at the .05 level.

There was no significant difference between the groups in phonetic analysis and synthesis. The mean of Group A was 4.4 and the mean of Group B was 4.3 in analysis; the mean of Group A was 4.2 and the mean of Group B was 4.5 in synthesis.

Informal Reading Inventory: This tool provided a measure of the child's oral reading and at the same time placed him on an instructional reading level. Each child's instructional reading level was noted as below his grade expectancy, and the oral reading of Group A was more generally superior to the oral reading of Group B. The children's oral reading was taped and rated only
by a general evaluation.

The range of reading level as measured by the Informal Inventory was from level one through level four. The largest number of children read on level four; only two children read as low as level one.

Summary

Two hundred three children in fifth grade reading disability groups from three socio-economic areas of Chicago were tested on the basis of intelligence, achievement and neurological organization.

Significant findings are: (1) high incidence of neurological disorganization, (2) reading disability of neurologically disorganized children does differ from the reading disability in organized children. Neurologically disorganized children scored significantly lower in (a) comprehension in context, (b) visual and auditory recognition, and, (c) oral reading performance.
CHAPTER V

ANALYSIS OF THE TEST RESULTS

The large number of conferences, seminars, and publications regarding the disabled reader indicate not so much the volume of new information available but the intensity of the search for new information. Consultants, administrators, teachers and parents are looking to theory and practice for answers to the haunting question of why some children are not reaching their potential in reading efficiency.

An analysis of the results of the tests used in this investigation may partially answer the query, or may answer it for at least one group of disabled readers.

Many investigators have pointed out the observations of mixed dominance of disabled readers and even looked to this as an etiological factor in the disability. Studies done with young children would appear to be inadequate in this regard because laterality is not established until after six or seven years of age in some children. Because of the varieties of type, investigation results differ slightly. Because of the multiple causes for reading disability and the influence of the psychological, environmental and physical factors that are operative, investigators have hesitated ascribing poor neurological development, or at least mixed dominance, as a cause of reading disability. Orton and Dearborn have agreed that consistent left-sidedness is less of a
problem than mixed dominance, and that left-eye dominance is more important, as far as reading is concerned, than left-hand dominance. But whether the incidence of mixed dominance is large enough to consider significant and how this anomaly should be treated was usually not a part of these earlier studies.

**Incidence of Neurological Disorganization**

The 203 fifth grade children were reading below grade expectancy as measured by the Lorge-Thorndike Intelligence Test. Reading level was measured by the Iowa Test of Basic Skills and the Informal Reading Inventory. Each child was given a test for general neurological organization which included the Doman-Delacato tests for laterality. This test did two things: (1) pointed out the incidence of poorly organized children in the fifth grade disability groups, and, (2) showed the type of neurological disorder.

This study showed that in the total group 140 children, or sixty-nine per cent of the group, were poorly organized. An interesting trend was noted in the incidence of poorly organized children from the three socio-economic areas. In the high area, sixty-five per cent of the group was poorly organized, seventy per cent in the middle class area and seventy-three per cent in the poor or low socio-economic area. Fewer children (only twenty-seven per cent) of this last group were well organized. This may be due to the fact that these children come from smaller homes, usually live in crowded conditions and perhaps lacked the opportunity for mobility, an important factor in developing neurologically. We may point to the children in the highest socio-economic area as those having less difficulty with organization and this may be due to the fact that they have the space needed for this development. It may be that for children in culturally deprived areas, where space is often at a premium, the opportunity to refine the skills of motor development is missing.
On the other hand, the large percentage in the high economic area, only eight points less than in the low socio-economic areas is a surprising finding. Here, in suburban areas, where one assumes children given the opportunity to have large spaces in which to play, and living in homes where freedom is easily given, we may expect a smaller incidence of poorly developed children. Perhaps this study may look to schools to set up some program for all children which would offer opportunity for this type of development.

Type of Neurological Disorder: When the tests for laterality and general neurological organization had been given, a high proportion of mixed hand dominance was found. This would support the findings of Harris, Orton, and Dearborn. The anomaly presenting the largest incidence was that of children who were dominantly left-eyed and right-handed. Only one child was left-eyed, left-handed and right-footed and only one child had the reverse pattern.

Table XIII shows the incidence of the type of neurological disorder in each of the three socio-economic groups and in the total group. The table shows an overlap in number because of course many of the children who were mixed-eyed at the same time possibly had poor patterns of creeping. It will be noted that 137 of the 140 children had some type of laterality disorganization. It may be well to list here the different types of lateral dominance. Fifty children were consistently left-eyed and right-handed; ten children were right-eyed and left-handed; one child was left-eyed, right-handed, and right-footed; fifty-two children were mixed-eyed. Sometimes they preferred the right and sometimes they preferred the left eye, for sighting at near or at far point. With some children the telescope was brought between the eyes rather than to either one. Ten children were ambidextrous, performing some actions well and easily with the right hand and other actions with the left hand or all actions with either hand. Thirteen children had not established handedness, eyedness nor footed-
TABLE XIII
Incidence of Type of Neurological Disorder in Each of the Three Socio-Economic Groups and in the Total Group

<table>
<thead>
<tr>
<th>Condition</th>
<th>High</th>
<th>Middle</th>
<th>Low</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left-eyed; right-handed</td>
<td>12</td>
<td>15</td>
<td>23</td>
<td>50</td>
</tr>
<tr>
<td>Right-eyed; left-handed</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Left-eyed; left-handed; right-footed</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Right-eyed; right-handed; left-footed</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Mixed-eyed</td>
<td>21</td>
<td>23</td>
<td>8</td>
<td>52</td>
</tr>
<tr>
<td>Ambi-dextrous</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Mixed-eyed; mixed-handed; mixed-footed</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>Poor cortical opposition</td>
<td>13</td>
<td>18</td>
<td>33</td>
<td>64</td>
</tr>
<tr>
<td>Poor creeping pattern</td>
<td>6</td>
<td>21</td>
<td>36</td>
<td>63</td>
</tr>
<tr>
<td>Poor supination and pronation</td>
<td>7</td>
<td>12</td>
<td>23</td>
<td>42</td>
</tr>
</tbody>
</table>
ness. Three children in the group of 140 children had established laterality on the dominant right side. Their neurological disorganization was accounted for in one of the other categories. Sixty-four children were unable to effect good cortical opposition; sixty-three crept in a poor pattern and supination and pronation in forty-two children was inadequately done. This variety in type or pattern of neurological disorder complicates the picture further. It is not possible to isolate one of the anomalies and prevent further disability through treating this as a cause.

Anecdotal notes concerning some of the children: It may be interesting to point out in case-study fashion interesting information regarding some of the individual children included in the population. This may give the reader an idea of combination of reading disability and type of neurological disorder. The following children come from the high socio-economic group and they are children for whom a program of re-organization will be set up. This program is not a subject of this study but it is a program toward which the study points. This program has for its main feature the occlusion of the child's sub-dominant eye by means of a red filter over the lens of the glass and a green filter over the printed matter in the text or workbook. This prevents the child from seeing anything with this sub-dominant eye while continuing the use of the muscles of the eye. This is an attempt to align the dominant eye with the dominant hand. A second part of the program includes periods of creeping in cross-pattern movement. Here the child is functioning with both sides of his body in concert. Creeping, which is a function of mid-brain, is done to increase efficiency in movement, and the ability to integrate many formerly separated receptive and expressive functions.

Student No. 1: Paul's IQ of 115 denotes a grade expectancy of 8.2. At present he is reading on level four and scores on reading tests range
from a low of 3.9 in phonics to a high of 5.5 in vocabulary.

He is left-eyed and right-handed and right-footed.

Student No. 2:
Jean had an IQ of 107 with a grade expectancy on the Lorge-Thorndike of 5.7. She is presently scoring about one year below this and her instructional level is fourth grade. She shows greatest weakness in vocabulary technique as measured by the Iowa Test. She is mixed-eyed, bringing the cardboard with the hole in the center between her eyes. She is right-handed in all actions and left-footed in kicking and walking upstairs.

Student No. 3:
Michael's tests report an IQ of 110, with a grade expectancy of 7.2. He is being instructed on level four and his scores on the Iowa and the Silent Reading Tests support this. When tested on the Informal Inventory he hesitated, read quite jerkily, and backtracked in many of the words. He is right-eyed and right-footed and consistently left-handed.

Student No. 4:
An IQ of ninety-six reports a grade expectancy of 5.5 for John who is reading on level four. Scores on the Iowa and the Silent Reading Tests range from 4.0 to 6.0 with the highest scores being gained in recognition skills. His oral reading was very poor from the standpoint of fluency. He is mixed-eyed, sighting with the left-eye at near-point and with the right eye at far point. He is left-handed and right-footed.

Student No. 5:
Cynthia's IQ of 116 yields a grade expectancy of 7.5, higher than the Iowa shows in performance. The scores on the reading tests show fifth level work and the informal inventory finds this child able to read well on level four. She is left-eyed, right-handed and left-footed. Her creeping pattern is very
The case studies have one similar thread running through them: children reading below their grade expectancy with a particular pattern of reading defect, disclosed by analysis of the subtests of the tests administered: significantly lower scores in (a) comprehension in context; (b) visual and auditory recognition; and (c) oral reading performance. Each of the children is poorly organized from the viewpoint of laterality. That this may be an etiological factor of the reading disability cannot be overlooked.

Consideration of Intelligence Quotients and Grade Expectancy Scores

In examining the results of the Lorge-Thorndike Intelligence Test: the Non-Verbal Battery, it was found that the range of intelligence quotients was a large one - from 129 to 74. The mean IQ of the total group was 101, an IQ falling within the average range of ability. The mean IQ of the well organized children was slightly higher, 108. The mean IQ of the poorly organized group was 99. The mean IQ of the middle class, poorly organized children was the lowest found in the group; it was 97. Tables XIV and XV point out the mean scores on the Lorge-Thorndike Scales, for both groups. The score of 1.97 showed the groups to be significantly different at the .05 level.

We cannot infer from this that poorly organized children are less intelligent nor do we even mean to imply this to the reader. On the other hand we would mention that it will be possible to treat the groups as fairly well matched on the basis of the intelligence scores obtained in the Lorge-Thorndike Test.

The cluster of scores in both groups fell between 95-104 which may point to weaknesses in the instructional program for these children. We are not in a position to determine if the large number of children in this group:
TABLE XIV
Mean Intelligence Quotients of Fifth Grade Children in the Three Socio-Economic Groups

<table>
<thead>
<tr>
<th></th>
<th>High</th>
<th>Middle</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well-organized</td>
<td>110</td>
<td>107</td>
<td>102</td>
</tr>
<tr>
<td>Poorly-organized</td>
<td>102</td>
<td>97</td>
<td>99</td>
</tr>
<tr>
<td>Total Group</td>
<td>104</td>
<td>99</td>
<td>100</td>
</tr>
</tbody>
</table>

N= 68  68  67
TABLE XV

Mean Scores of the Grade Expectancy of the Three Socio-Economic Groups of Fifth-Grade Children who are Well Organized and Those who are Poorly-Organized Neurologically

<table>
<thead>
<tr>
<th></th>
<th>High</th>
<th>Middle</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>7.1</td>
<td>6.7</td>
<td>5.8</td>
</tr>
<tr>
<td>(Well-organized)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group B</td>
<td>5.7</td>
<td>5.2</td>
<td>5.6</td>
</tr>
<tr>
<td>(Poorly-organized)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Group</td>
<td>6.1</td>
<td>5.6</td>
<td>5.8</td>
</tr>
</tbody>
</table>

N= 68 68 67
(fifty-seven out of the 140 in Group B, and nineteen of the sixty-three of Group A) or thirty per cent of the total group is there because we are not providing for these children in the kind of teaching we are doing, or whether we might do well to give attention to neurological development and then consider the instructional program.

Consideration of the grade-expectancy scores of the fifth graders shows the well-organized group in all three socio-economic areas with higher mean scores. See Table XV. The highest mean score was found in the highest socio-economic area of the well-organized group. An analysis of the data summary sheets for each child (Appendix VI) showed that there was a one-to-one relationship between grade expectancy and instructional level of the child at the time of testing. Everyone of the children included in the study was performing below the grade expectancy score on the Lorge-Thorndike. Here was a population of children who, receiving adequate instruction, had the use of proper materials and for some reason were not meeting their potential. It would appear that a careful study of the neurological pattern of these children would be helpful and would give insight to their problem. Unfortunately, most of the variables we study in education and psychology are highly complex and instead of having a single cause may have many contributing causes.

Reading Status of the Population

The Betts Informal Reading Inventory is an adequate measure of a child's instructional reading level if the test is properly administered. The proper rapport was established and each child was given this inventory individually. This was an opportunity to obtain an evaluation of the oral reading habits of the children as well. More children in the well-organized group were reading at level four, only one year below the instructional level of the grade. Some
of these children, however, showed wide discrepancies between their instructional level and their grade expectancy. However, when combining level four and level three-two and looking at the number of children in both groups we find eighty per cent of the population at these levels. Here again the groups are similar and the contrast in neurological development sharpens as we see them alike in so many other ways.

In listening to the oral reading of the children as they read selections from the Betts Informal Reading Inventory, it was noted by the investigator that the oral reading habits of Group A were better than the oral reading habits of Group B. Errors in oral reading skill were noted in such points as repeating words already read correctly, lack of expression which was also manifested in their oral speech, and a lack of fluency in general. These errors were not as prevalent in Group A. Tables XVI and XVII present the findings of the Betts Informal Reading Inventory.

The Iowa Test of Basic Skills gave an index of the reading performance of both groups on the basis of vocabulary and comprehension. The groups did not differ from one another as noted in Table XI in Chapter IV. The mean scores were quite similar. The score of Group A was the higher in the high and middle socio-economic areas and was slightly lower in the low economic areas. This test then showed no significant differences between the groups. The second hypothesis of this study - that the reading pattern of the two groups would differ - would have to be rejected if no further analysis of this test had been made.

Silent Reading Diagnostic Test was administered as an added measure of the reading ability of the children. Here, too, the results were similar to those of the Iowa Test of Basic Skills and showed mean scores almost identical with those obtained on the first test.
TABLE XVI

Table Showing the Incidence of Well-Organized Children Reading at Each Level According to the Betts Informal Reading Inventory

<table>
<thead>
<tr>
<th>Level</th>
<th>High</th>
<th>Middle</th>
<th>Low</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 4</td>
<td>22</td>
<td>15</td>
<td>11</td>
<td>48</td>
</tr>
<tr>
<td>Level 3/2</td>
<td>1</td>
<td>2</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Level 3/1</td>
<td></td>
<td>4</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Level 2/2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Level 2/1</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>
TABLE XVII

Table Showing the Incidence of Poorly-Organized Children Reading at Each Instructional Level According to The Betts Informal Reading Inventory

<table>
<thead>
<tr>
<th>Level</th>
<th>High</th>
<th>Middle</th>
<th>Low</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 4</td>
<td>32</td>
<td>25</td>
<td>34</td>
<td>91</td>
</tr>
<tr>
<td>Level 3/2</td>
<td>3</td>
<td>12</td>
<td>7</td>
<td>22</td>
</tr>
<tr>
<td>Level 3/1</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>Level 2/2</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Level 2/1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 1</td>
<td>2</td>
<td></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>
But a significant finding is noted when an analysis of the sub-tests is made. When dividing the comprehension scores into comprehension in isolation and comprehension in context we find the well-organized group with a higher mean score in the latter and the poorly-organized group scoring higher in comprehension in isolation. The z score of 2.07 showed significance at the .05 level when comparing the groups in comprehension in context scores. A z score of 1.40 for the groups in comprehension in isolation was approaching significance.

The mean scores in both visual and auditory recognition tests for the poorly organized group was lower than for the well organized group. Z scores of 2.13 and 2.01 showed significance at the .05 level in both instances. This would point to less efficiency of neurologically disorganized children in two important areas of word recognition: visual and auditory competence.

The purpose for examining sub-tests in phonic scores was to determine if there were any significant difference between the method in which these children attack words phonetically. Mean scores, quite similar, showed no significant differences when well or poorly organized children attacked words analytically or synthetically.

The informal reading inventory also showed weakness in neurologically disorganized children in fluency in oral reading.

The idea of qualitative differences in the reading disability pattern in children who are neurologically organized and those who are neurologically disorganized would appear to be an important finding. This indicates a need for detailed and refined analysis when examining the results of tests of these children in order to plan a program for them.

On the basis of the analysis of the sub-tests the second hypothesis of this paper may be supported.
When the data from the present study are compared with the findings of other studies of reading disability and laterality quite general agreement is found in the incidence of neurologically disorganized children in the population. There would be further reason then in pointing to the realm of neurological organization as an etiological factor at least in case of some disabled readers. Future investigations will need to clarify through experimentation the process of re-organization mentioned earlier in this study.
CHAPTER VI

SUMMARY AND CONCLUSIONS

Restatement of the Problem and Procedure

The present study had two purposes: (1) to ascertain the incidence of neurological disorganization present in fifth grade children reading below grade level; and (2) to compare the patterns of reading disability of children who are neurologically disorganized with those who are neurologically well organized.

Because of the interest of the writer in children with reading disability it was hoped that the investigation would bring further light to the relation of neurological organization to reading disability, point out the incidence of neurologically disorganized children, provide further insights into the types of reading handicap, and give direction to consultants and teachers in how to adjust instruction for children who are neurologically disorganized.

The following tests were administered to each of the 203 fifth grade children in the three differing socio-economic areas:

(1) The Lorge Thorndike Intelligence Test: Non-Verbal Battery
(2) The Iowa Test of Basic Skills
(3) The Silent Reading Diagnostic Test
(4) The Doman-Delacato Scale of neurological organization

(5) The Informal Reading Inventory

After the tests had been administered, and scored, the following results may be noted:

(1) The range of IQ scores on the Lorge-Thorndike Intelligence Test was 74-129. The mean IQ of the total group was 101; the mean IQ of the group of neurologically well-organized children was 108, slightly higher than the mean IQ of the poorly organized group, that of 99. The children in both groups fell within the average or above average range; only a few children scored below 90. The groups were significantly different at the .05 level.

(2) The Lorge-Thorndike also gives a grade expectancy score which again provided a wide range in both groups. Well-organized children ranged from 11.4 to 3.0 in grade expectancy; the poorly organized group ranged from 11.4 to 2.0. On the basis of the Lorge Thorndike Test both groups were well matched. There was no significant difference between the groups.

(3) The Doman-Delacato scale divided the children into two groups: Group A those who were well organized neurologically and Group B those who were poorly organized. The number in Group A was sixty-three or thirty-one per cent, while the number in Group B was much larger, 140, or sixty-nine per cent. The variations of poor organization have been discussed in chapter four.

When the children were divided on the basis of socio-economic areas, it was found that thirty-five per cent of upper group was well-organized and sixty-five per cent of this group was poorly organized. The proportion changed in the middle class area with thirty per cent of the group well organized and seventy per cent poorly organized. The smallest number of well organized children was found in the lowest socio-economic area: twenty-seven per cent well organized and seventy-three per cent of the children poorly organized.
This was a significant incidence of poorly organized children to look to neurological organization and its relation to reading disability in terms of treatment.

The writer was unable to find any studies of reading disability and lack of neurological organization differentiating the various socio-economic levels. The results of this investigation, however, support the studies of Orton, Monroe and Harris who found incidence of mixed dominance in children with reading disability.

(4) The results of the Iowa Test of Basic Skills show that most of the children scored between 4.9 and 5.1 on the various tests. The mean scores did not differ significantly for the two groups. There was a positive relation between the results of the Iowa Test and the results of the Silent Reading Diagnostic Test. Through the analysis of the diagnostic sub-tests poorly organized children scored significantly lower than organized children in comprehension in context, and in both visual and auditory comprehension. Their oral reading as measured by the informal reading inventory was less well done.

This data may prove to be of significance in supporting the second hypothesis of this investigation.

Conclusions

Subtle and complex interaction among several variables may greatly increase the probability of a child having reading difficulties, but it does not insure that he will have such difficulties. When the conclusions of this study are pointed out it will be not only to point out that neurological disorganization is a factor to be investigated, but possibly a cause of reading disability.

The following conclusions may be made within the limitations of this
study:

(1) The incidence of lack of neurological organization among disabled readers is high enough to warrant a consideration of lateral dominance anomalies as a type of etiological factor in reading disability.

(2) From the results of this study it would appear that there is more than a chance relationship between lateral dominance and general neurological development and reading disability.

(3) This is supported by the fact that neurological disorganization, as measured in this study, presents the same incidence irregardless of social class. One might expect the factor of neurological disorganization to occur in much greater frequency in lower socio-economic areas simply because their reading retardation is greater. But in this investigation this is not the case.

(4) The reading pattern of children who are poorly organized does differ from the reading pattern of children who are well organized when sub-tests are analyzed.

(5) The high incidence of left-eyed, right-handed cases may point to a significant pattern in neurological disorganization.

Implications of the Findings for Teachers

Educators know that neurological disorganization occurs. They know it occurs in high incidence irregardless of factors such as social class and IQ. We can determine who is and who is not neurologically disorganized. It seems beyond the scope of comprehension that no action is taken. The implication for teachers, then, is action.

In an intensive and structured program for children identified as neurologically disorganized, teachers of four, five and six year olds should
initiate programs to help establish sidedness. Such programs would include the following:

1) Practice the sleep pattern for both the right and the left-handed child.

2) Practice the cross-pattern creeping for ten-minute periods two or three times a day.

3) Practice cross pattern walking for the same length of time (see Illustration I).

4) Play games that will coordinate large muscles. Such games are suggested in *Success Through Play* by Newell Kephart.

Inform the parents of these children of the purpose of neurological training for their children. They could supplement the program of the school by having their children do similar activities at home.

As children move into second grade, teachers may give them tests of laterality described in Chapter IV. These tests would show if the child had mixed dominance or not. Children who have mixed dominance may be urged to continue walking and creeping exercises. Older children may occlude the sub-dominant eye to strengthen the performance of the dominant eye. The occlusion is done by placing a red filter over the lens of the sub-dominant eye and a green filter over the printed matter. Such practice can be suggested for two or three short periods daily.

Exercises that pertain to areas of weakness in the neurologically disorganized child are: exercises to strengthen visual recognition;

1) Visual discrimination: display a variety of pictures in duplicate form, but on separate cards. These may be pictures of fruits, vegetables, pastries, toys, animals, and other things cut from magazines and advertisements. Have the pupils find the pictures that match, or are alike, and place
Cross-pattern creeping

Note that as the right hand is moved forward the left leg moves forward. As this takes place, the head and neck turn slightly toward the forward hand.

Points to be observed in this activity:
- Hands are to be flat on the floor and pointed forward.
- The hand and knee should move forward simultaneously.

Cross-pattern walking

The right hand and left leg move forward with the head and neck turned slightly toward the forward hand.
The ideal sleep position of the completely right-sided child.

The ideal sleep position of the completely left-sided child.

The child is not expected to remain in this position during sleep, since it is natural for him to shift from one position to another. A child not yet six years old should not be limited to one preferred position for a particular side.
them as a pair in the card holder or along the chalk ledge.

2) Use the same pictures suggested above. Give one of each kind to each child in the group. Display the others in the card holder. Have each child show his picture to the group, then find the one that matches his picture in the card holder.

3) Meaning of left and right and directional orientation. Have the words left and right printed on word cards. Present one card at a time, and ask pupils to show that particular hand, foot, arm, or any other part of the body.

4) Visual recognition of letters of the alphabet.

5) Tracing forms and letters or directional sequence of pictures.

Exercises to strengthen auditory recognition:

1) Auditory perception of rhyming words: let children choose a phonetic picture card, tell what it is and name a word that rhymes with it.

2) Auditory perception of beginning sounds in words: refer children to pictures and ask them to find and name things in the picture whose names begin with a given sound.

3) Auditory recognition of rhymes.

Exercises to develop comprehension on context:

1) Recall nursery tales and retell a story.

2) Identify pictures of objects that belong together.

3) Present vocabulary so that the child assumes an active part in order that he sees the meaning of the word in relation to the rest of the sentence and the story.

Exercises to improve oral reading skill:

1) Read longer thought units for practice.

2) Read easier material to gain fluency.
3) Dramatize stories reading the character parts.

In the intermediate and upper grades, these activities may be important to stress in the instructional program:

1) Visual recognition: noting the importance of pictures as a clue to recognition, interpreting maps, graphs, and time lines, noting the meaning of signal words in paragraph structure.

2) Auditory recognition: observe the sounds in accented and unaccented syllables, check mastery of vocabulary meaning through word discrimination.

3) Comprehension in context: recognizing antonyms and synonyms, and homonyms, studying word derivatives.

The administrator who has the final responsibility for these children must become aware of the nature and manifestations of neurological disorganization such as:

1) Confusion children experience in directional patterns;

2) If the school is in a high socio-economic area he must not overlook neurological disorganization as a cause of reading disability.

3) Examine profiles of each class for disability patterns;

4) With teachers he must stress:
   a) When testing for laterality look to eyedness rather than handedness as the determining factor;
   2) Build upon the strengths of neurologically disorganized children as indicated in test profiles;
   3) Avoid the "osmosis approach"; use direct training rather than incidental instruction.

"Action," to be more than a "Don Quixote attack on a modern wind mill" depends on the concerted effort of all school personnel.
Further Needed Research

A serious limitation of the causal-comparative method of research is that the investigator must start with the observed effects and try to discuss the possible causes or antecedents of these effects. This causal-comparative field study followed by the experimental-laboratory study is a productive sequence for the researcher to follow. It is for this reason that the following areas are suggested as means of further research. These are investigations that should clarify points made in this study, and which will offer answers to the continuing challenge of every generation: the education of its children. Because of the obvious importance and necessity for bringing every bit of scientific knowledge to the attention of educators further investigations may serve to broaden the conclusions already reached in this study:

(1) This study suggests that a significant proportion of children with reading disability display poor neurological organization and that in these children there is evidence of less efficient comprehension in context, visual and auditory recognition and oral reading skill. If these syndromes can be linked with incomplete cerebral dominance, it might be said that these patterns of disability reflect functions in the two hemispheres.

(2) Other studies done in this area with disciplines of neurology and psychology may consider whether this maldevelopment is constitutional, i.e., genetically determined, or whether it is due to such a factor as minimal brain damage at birth.

(3) It has to be considered why all poorly-organized children do not exhibit reading disability. Such an investigation would offer a positive contribution to this field.

(4) Reviews of the literature in the areas of cerebral dominance, (handedness, eyedness, footedness) and general neurological organization could
well become an integral part of the elementary school program and this study
may point the way to the establishment of such programs. Particularly at the
kindergarten and primary levels we may look to studies that will attempt to
show the effects of an organization program with children who have not become
lateraled.

(5) The case studies showed the positive effects of a modified
program of retraining; we may expect other investigations, using larger
numbers and more controlled circumstances, to substantiate these findings.

(6) An attempt should be made where groups chosen from distinct
social classes would be tested neurologically and programs set up for the
experimental group to substantiate the assumption that neurological
organization is a factor irrespective of social class and that neurological
disorganization can be prevented through a definite program.

It is difficult to arrive at any clear cut conclusions. If it is
agreed that reading disability is more frequently found among poorly
organized children and this further implies atypical cerebral dominance, it
would follow that atypical cerebral dominance is characteristic of a pro-
portion of disabled readers. This may result from brain injury, maturation,
or an emotional problem. Or it may be due to a combination of these factors.

These comments re-emphasize to the educator the responsibility that is
his. A fuller understanding of reading and its disorders must presuppose
fuller understanding of the ways in which asymmetrical functions become
established in the human brain. This provides the challenge that must be
accepted by educators, reading specialists, neurologists and psychologists,
who working as a team provide insights built on earlier research and
substantiated by current experimentation.
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Unpublished Works


APPENDIX I

IOWA TEST OF BASIC SKILLS
Marking Your Name

Your answers to the test exercises will be marked on a separate answer sheet. The answer sheet will be scored by a machine. This machine will also "read" and copy your name from the answer sheet. To make this possible, you must mark your name in a special way on the "Name Block" on the answer sheet.

Look at the Sample Name Block below. This block has been marked for ARTHUR L. SWANSON. The name has been printed in the row of boxes across the bottom of the block. Notice that the last name is printed first, then the first name, then the middle initial. Notice, too, that a letter of the name has been covered with a heavy black mark. The S has been blackened above the W, and so on. Nothing is blackened above the empty box after SWANSON.

Study this sample carefully. Do not mark your own name on your answer sheet until you are told to do so.

SAMPLE NAME BLOCK

This test booklet is used by pupils in grades 3-9. You will answer some exercises in each of eleven tests, but never all the exercises in any test. The directions for each test will tell you where to begin and where to stop work on that test. Your answer sheet also will help you to keep the right place. It has answer spaces for marking.

Marking the Test Exercises

To help you understand how to answer the test exercises, a practice test is given on this page. In each exercise, you are to decide which one of the four numbered words has most nearly the same meaning as the word in heavy black type above the line. The right answer has already been marked for each exercise.

This was done by filling in a little circle. You are not to make any marks on this page.

PRACTICE TEST

1. A large lake
   ① small ② pretty ③ big ④ tiny

2. The nice lady
   ① man ② woman ③ boy ④ girl

3. I am glad
   ① hungry ② sleepy ③ sad ④ happy

In the test that you are about to take, the rows of circles are on the separate answer sheet instead of on the test page. There is a row of circles numbered to match each test exercise.

To mark an exercise, decide first which is the best answer. Then, on the answer sheet, find the row of circles numbered the same as the question. Make a round black mark in the circle for the best answer.

There are three important things to remember in marking:

1. Make a heavy round mark. The mark should be large enough to fill the circle, but it should not go outside the circle. Do not waste time making very neat marks. It is more important to make very black marks. Be sure to use a soft pencil.

2. Keep your place on the answer sheet. Make certain each time that your mark is placed in the row number that is the same as the exercise.

3. Mark only ONE circle in a row. If you change your mind about an answer, erase your first mark as completely as you can.

MAKE NO MARKS ON ANY PAGES OF THIS TEST BOOKLET. Other pupils will use the same booklet later. Do not fold or bend your answer sheet.
<table>
<thead>
<tr>
<th><strong>58.</strong> His daring plan</th>
<th><strong>59.</strong> A bird’s plumage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) bold</td>
<td>1) coloring</td>
</tr>
<tr>
<td>2) sensible</td>
<td>2) feathers</td>
</tr>
<tr>
<td>3) remarkable</td>
<td>3) food</td>
</tr>
<tr>
<td>4) original</td>
<td>4) nesting place</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>60.</strong> To regret the error</th>
<th><strong>61.</strong> The site of the school</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) be sorry about</td>
<td>1) size</td>
</tr>
<tr>
<td>2) make up for</td>
<td>2) location</td>
</tr>
<tr>
<td>3) make fun of</td>
<td>3) picture</td>
</tr>
<tr>
<td>4) be ashamed of</td>
<td>4) opening</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>62.</strong> A long stride</th>
<th><strong>63.</strong> They heartily agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) expedition</td>
<td>1) generally</td>
</tr>
<tr>
<td>2) delay</td>
<td>2) hardly</td>
</tr>
<tr>
<td>3) drive</td>
<td>3) fully</td>
</tr>
<tr>
<td>4) step</td>
<td>4) always</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>64.</strong> To cherish the prize</th>
<th><strong>65.</strong> Transparent plastic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) treasure</td>
<td>1) tough</td>
</tr>
<tr>
<td>2) acquire</td>
<td>2) clear</td>
</tr>
<tr>
<td>3) furnish</td>
<td>3) shiny</td>
</tr>
<tr>
<td>4) present</td>
<td>4) colored</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>66.</strong> To ponder the idea</th>
<th><strong>67.</strong> Arouse her jealousy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) grasp</td>
<td>1) interest</td>
</tr>
<tr>
<td>2) reject</td>
<td>2) sympathy</td>
</tr>
<tr>
<td>3) propose</td>
<td>3) anger</td>
</tr>
<tr>
<td>4) consider</td>
<td>4) envy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>68.</strong> Sew irregular stitches</th>
<th><strong>69.</strong> Spent money</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) invisible</td>
<td>1) extravagantly</td>
</tr>
<tr>
<td>2) unusual</td>
<td>2) secretly</td>
</tr>
<tr>
<td>3) uneven</td>
<td>3) willingly</td>
</tr>
<tr>
<td>4) difficult</td>
<td>4) wastefully</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>70.</strong> A gnarled tree</th>
<th><strong>71.</strong> Console the child</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) twisted</td>
<td>1) bathe</td>
</tr>
<tr>
<td>2) rotted</td>
<td>2) feed</td>
</tr>
<tr>
<td>3) splintered</td>
<td>3) comfort</td>
</tr>
<tr>
<td>4) hollow</td>
<td>4) amuse</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>72.</strong> The specific book</th>
<th><strong>73.</strong> It’s tedious work</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) suitable</td>
<td>1) terrifying</td>
</tr>
<tr>
<td>2) particular</td>
<td>2) temporary</td>
</tr>
<tr>
<td>3) essential</td>
<td>3) tiresome</td>
</tr>
<tr>
<td>4) elementary</td>
<td>4) thrilling</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>74.</strong> A very solemn occasion</th>
<th><strong>75.</strong> Repeat the query</th>
</tr>
</thead>
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<tr>
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<td>1) answer</td>
</tr>
<tr>
<td>2) joyful</td>
<td>2) warning</td>
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<td>3) special</td>
<td>3) question</td>
</tr>
<tr>
<td>4) serious</td>
<td>4) message</td>
</tr>
</tbody>
</table>

**IN THIS BOOKLET**

**MAKE NO MARKS IN THIS BOOKLET**
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<td>Recollect the address</td>
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<td>Find several defects</td>
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<td>recognize</td>
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<td>77.</td>
<td>A Chinese proverb</td>
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<td>Choose their delegate</td>
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<tr>
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<td>gown</td>
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<td>To predict the winner</td>
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<td>Efficient workers</td>
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<td>The shrewd general</td>
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<td>1.</td>
<td>tireless</td>
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<td>retired</td>
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<td>2.</td>
<td>capable</td>
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<td>typical</td>
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<td>lazy</td>
<td></td>
<td>clever</td>
</tr>
<tr>
<td>80.</td>
<td>To execute the order</td>
<td>92.</td>
<td>To detect the odor</td>
</tr>
<tr>
<td>1.</td>
<td>carry out</td>
<td>2.</td>
<td>produce</td>
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<td>issue</td>
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<td>4.</td>
<td>cancel</td>
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<td>81.</td>
<td>Restrainted by his friends</td>
<td>93.</td>
<td>To quell the disturbance</td>
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<td>approved of</td>
<td>2.</td>
<td>add to</td>
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<td></td>
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<td>calm</td>
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<td></td>
<td></td>
<td>4.</td>
<td>create</td>
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<td>82.</td>
<td>Was decidedly wrong</td>
<td>94.</td>
<td>A dilapidated castle</td>
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<td>1.</td>
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<td>2.</td>
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<td>2.</td>
<td>often</td>
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<td>3.</td>
<td>rarely</td>
<td>4.</td>
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<td>4.</td>
<td>definitely</td>
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<td>partly ruined</td>
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<td>To astound his listeners</td>
<td>95.</td>
<td>Please be punctual</td>
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<td>2.</td>
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<td>2.</td>
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<td>inform</td>
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<td>appeal to</td>
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<td>84.</td>
<td>Find several defects</td>
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<td>85.</td>
<td>Choose their delegate</td>
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<td>candidate</td>
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<td>96.</td>
<td>A familiar refrain</td>
<td>98.</td>
<td>To span the river</td>
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<td>1.</td>
<td>warning</td>
<td>2.</td>
<td>dam up</td>
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<td>2.</td>
<td>song</td>
<td>3.</td>
<td>widen and deepen</td>
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<td>face</td>
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<td>97.</td>
<td>A valiant deed</td>
<td>99.</td>
<td>A happy vagabond</td>
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<td>100.</td>
<td>Show little zeal</td>
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<td>102.</td>
<td>Point out the distinction</td>
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<td>weakness</td>
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<td>Make a wager</td>
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<td>3.</td>
<td>bet</td>
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<td>104.</td>
<td>Implied what was wrong</td>
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<tr>
<td>1.</td>
<td>suspected</td>
<td>2.</td>
<td>did not say</td>
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<td>3.</td>
<td>hinted</td>
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<td>105.</td>
<td>Offer no opposition</td>
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<td>assistance</td>
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<tr>
<td>3.</td>
<td>suggestion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>resistance</td>
<td></td>
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</tr>
<tr>
<td>106.</td>
<td>To sever the rope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>tangle</td>
<td>2.</td>
<td>tighten</td>
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<td>3.</td>
<td>cut</td>
<td>4.</td>
<td>splice</td>
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<tr>
<td>107.</td>
<td>The jubilant students</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>guilty</td>
<td>2.</td>
<td>rejoicing</td>
</tr>
<tr>
<td>3.</td>
<td>brilliant</td>
<td>4.</td>
<td>mischievous</td>
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<tr>
<td>108.</td>
<td>Comprehend the instructions</td>
<td></td>
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</tr>
<tr>
<td>1.</td>
<td>follow closely</td>
<td></td>
<td></td>
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<tr>
<td>2.</td>
<td>be confused about</td>
<td></td>
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<tr>
<td>3.</td>
<td>understand</td>
<td>4.</td>
<td>make clear</td>
</tr>
<tr>
<td>109.</td>
<td>To saunter out the door</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>dash</td>
<td>2.</td>
<td>stroll</td>
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<tr>
<td>3.</td>
<td>skip</td>
<td>4.</td>
<td>stagger</td>
</tr>
<tr>
<td>110.</td>
<td>A lenient judge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>fair</td>
<td>2.</td>
<td>severe</td>
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<td>3.</td>
<td>merciful</td>
<td>4.</td>
<td>respected</td>
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<td>111.</td>
<td>Menaced the village</td>
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<tr>
<td>1.</td>
<td>threatened</td>
<td>2.</td>
<td>surrounded</td>
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<tr>
<td>3.</td>
<td>destroyed</td>
<td>4.</td>
<td>captured</td>
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<tr>
<td>112.</td>
<td>Of dubious value</td>
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</tr>
<tr>
<td>1.</td>
<td>double</td>
<td>2.</td>
<td>questionable</td>
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<tr>
<td>3.</td>
<td>genuine</td>
<td>4.</td>
<td>little</td>
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<tr>
<td>113.</td>
<td>Have eccentric ideas</td>
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<tr>
<td>1.</td>
<td>peculiar</td>
<td>2.</td>
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<tr>
<td>3.</td>
<td>clever</td>
<td>4.</td>
<td>strict</td>
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<tr>
<td>114.</td>
<td>Admire his perseverance</td>
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</tr>
<tr>
<td>1.</td>
<td>helpful attitude</td>
<td></td>
<td></td>
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<tr>
<td>2.</td>
<td>frank manner</td>
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<tr>
<td>3.</td>
<td>good nature</td>
<td>4.</td>
<td>steady effort</td>
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</tbody>
</table>
In each exercise, you are to decide which one of the four words has nearly the same meaning as the word in heavy black type above them. On the answer sheet, find the row of circles numbered the same as the exercise you are working on. You are to fill in the circle on the answer sheet that has the same number as the answer you picked. The sample exercise in the right has already been marked correctly on the answer sheet.

Use this table to find where your grade is to begin and stop on this test.

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<tr>
<td>GRADES 8 AND 9</td>
<td>Exercise 67 on page 5</td>
<td>Exercise 114 on page 6</td>
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</table>

6. To invite a friend
   1) write
   2) visit
   3) meet
   4) ask

7. To dash up the street
   1) ride
   2) walk
   3) hurry
   4) glance

8. Come here instantly
   1) sometime
   2) often
   3) at once
   4) soon

9. A queer name
   1) difficult
   2) foreign
   3) fancy
   4) strange

10. The silent water
    1) cool
     2) still
     3) moving

11. To mend the fence
    1) damage
     2) jump
     3) build
     4) repair

12. Intended to do it
    1) had
     2) planned
     3) remembered
     4) got ready

13. Accept the cash
    1) gift
     2) excuse
     3) money
     4) dare

14. The proper way
    1) easiest
     2) shortest
     3) safe
     4) right

15. To bother the neighbors
    1) respect
     2) greet
     3) disturb
     4) amuse
16. The shrieks of the children
   1) screams
   2) garments
   3) playthings
   4) whispers

17. A time to rejoice
   1) make plans
   2) be happy
   3) retreat
   4) begin again

18. The spare room
   1) large
   2) special
   3) extra
   4) quiet

19. To recover the money
   1) get back
   2) spend
   3) bury
   4) earn

20. Enjoy the voyage
   1) program
   2) party
   3) letter
   4) journey

21. Gaze at the picture
   1) laugh
   2) stare
   3) point
   4) throw

22. To terrify the animals
   1) slaughter
   2) tend
   3) frighten
   4) round up

23. The whole supply
   1) complete
   2) regular
   3) usual

24. Welcome a visitor
   1) stranger
   2) guest
   3) companion
   4) relative

25. The sway of the trees
   1) movement
   2) appearance
   3) shadow
   4) height

26. A keen knife
   1) dull
   2) sharp
   3) bent
   4) shiny

27. To pluck the flowers
   1) arrange
   2) plant
   3) grow
   4) pick

28. Speak distinctly
   1) clearly
   2) softly
   3) harshly
   4) slowly

29. A savage tribe
   1) friendly
   2) brave
   3) warlike
   4) powerful

30. To plead for help
   1) send
   2) wait
   3) search
   4) beg

31. To publish the name
   1) dislike
   2) choose
   3) announce
   4) recall

32. A vast farm
   1) huge
   2) dusty
   3) fertile
   4) run-down

33. Broke it deliberately
   1) into pieces
   2) on purpose
   3) by accident
   4) with a loud noise

34. The sentinel at the entrance
   1) tower
   2) bell
   3) arch
   4) guard

35. To inspect the papers
   1) collect
   2) arrange
   3) examine
   4) conceal

36. The gradual increase
   1) slow
   2) noticeable
   3) enormous
   4) immediate

37. Inquire his name
   1) ask
   2) sign
   3) remember
   4) look up

38. Multitude of flowers
   1) study
   2) arrangement
   3) scent
   4) great number

39. Respect his wisdom
   1) advice
   2) age
   3) knowledge
   4) courage
ions: This test consists of several reading selections. For each selection there are some questions.

Read each selection quickly and then answer the questions. Four answers are given for each question, but only one of these answers is right. You are to choose the one answer that you think is better than the others. Then, on your answer sheet, find the row of circles numbered the same as the exercise. Fill in the circle for the best answer.

The sample exercise at the right shows you how to mark your answers on the answer sheet.

Use this table to find where your grade is to begin and stop on this test.

| GRADE 3 | Exercise 1 on page 8 | Exercise 60 on page 13 |
| GRADE 4 | Exercise 12 on page 9 | Exercise 79 on page 15 |
| GRADE 5 | Exercise 25 on page 10 | Exercise 98 on page 17 |
| GRADE 6 | Exercise 61 on page 14 | Exercise 136 on page 21 |
| GRADE 7 | Exercise 80 on page 16 | Exercise 157 on page 23 |
| GRADES 8 AND 9 | Exercise 99 on page 18 | Exercise 178 on page 26 |

MAKE NO MARKS IN THIS BOOKLET
When my brother Ted and I were sick, a man from the health department came to our house. He put a sign with the words MUMPS—KEEP OUT on our door. When the other boys saw that red sign, they knew they could not play with us. We had to stay at home until the man came back and took down the sign.

1. Who is telling this story?
   1) Ted's mother
   2) Ted's brother
   3) One of Ted's playmates
   4) A man from the health department

2. What was the matter with Ted?
   1) He did not want to play with the other boys.
   2) He did not like to go to school.
   3) He was angry with his sister.
   4) He was sick.

3. Why was the sign put on the door?
   1) To scare the people in the neighborhood
   2) To let the doctor know someone was sick
   3) To help keep other children from catching the mumps
   4) To tell the attendance officer why the children were not in school

4. Who took the sign down?
   1) The man who put it up
   2) Another man from the health department
   3) Ted's doctor
   4) Ted

5. What does this story show?
   1) That boys are more likely to catch mumps than girls
   2) That children will get sick if they play outdoors
   3) That the health department tries to protect children

Mary, Jane, and Helen were saving their money to buy a doll house. The price of the doll house was $4.50. The girls had saved $3.75. Their mother wanted to help them get some more money. She told them she would buy all the blueberries they could pick, and would pay them 30 cents a quart. She paid Jane 15 cents, Mary 30 cents, and Helen 60 cents. When the girls put all their money together, they had enough for the doll house, and 30 cents left over.

6. Which of these words tells who the girls the story were?
   1) Sisters
   2) Cousins
   3) Friends
   4) Neighbors

7. What were the girls planning to do with the money?
   1) Put it in the bank
   2) Give it to their mother
   3) Buy a present for their father
   4) Buy a toy they all wanted

8. How did their mother help the girls get the money they needed?
   1) She bought the blueberries they picked.
   2) She made blueberry pies for the girls to sell.
   3) She gave them some money she had saved.
   4) She asked their father to give them the money

9. How many blueberries did Mary pick?
   1) Less than a quart
   2) One quart
   3) Two quarts
   4) There is no way of telling from the story

10. How many blueberries did Helen pick?
    1) Fewer than either Jane or Mary
    2) Fewer than Jane and Mary together
    3) Just as many as Jane and Mary together
    4) More than Jane and Mary together

11. After their mother paid them, did the girls have enough money to buy the doll house?
    1) Yes, they had just enough money.
    2) Yes, they had enough money, and 30 cents more.
    3) No, they needed 30 cents more.
    4) There is no way of telling from the story.
A cowboy needs the kind of clothes he wears. His big felt hat with its high crown and wide brim protects his head when he rides in the hot sun or in the rain or snow. His gay neckerchief can be pulled up over his mouth and nose when the dust rises, or when the sleet and wind blow in his face. His heavy leather chaps serve as armor for his legs while he is riding through sagebrush or cactus, and they also shield him against rain and snow. The high, slanting heels on his boots help him to stay in his saddle when his horse gets frisky. When he is roping cattle on foot, the heels dig into the ground and keep him from being dragged.

While George Washington was president, the first United States mint was started at Philadelphia. Today the United States has a mint in Philadelphia, one in Denver, and one in San Francisco. All of our coins are made in these mints. You can tell where a coin was made by looking for the mint mark. The mint mark is a small letter. It is usually on the back of a coin. If a coin has a “D” on the back, it was made at the Denver mint. If it has an “S,” it was made in San Francisco. If it has a “P,” or if it has no mint mark at all, it was made in Philadelphia.

18. Where was the first United States mint?
   1) In Washington  2) In Denver  3) In Philadelphia  4) In San Francisco

19. How many mints do we have now?
   1) One  2) Two  3) Three  4) Four

20. What does the mint mark tell?
   1) How old the coin is  2) Where the coin was made  3) How much the coin is worth  4) Who was president when the coin was made

21. If you want to see whether a coin has a mint mark, what will you look for?
   1) A letter  2) A number  3) A secret sign  4) A man’s name

22. How can you tell if a coin was made in San Francisco?
   1) It will have a picture of a bridge on it.  2) The mint mark will be an S.  3) It will be larger than the coins made in other cities.  4) It will not have a mint mark.

23. If a coin has no mint mark, what does that tell you?
   1) The coin is not worth anything.  2) The coin was made in a mint that opened after this story was written.  3) The coin was made before the United States had a mint.  4) The coin was made in Philadelphia.

24. Which kind of money is not made in our mints?
   1) Dollar bills  2) Half dollars  3) Dimes  4) Pennies
The Indians who lived on Long Island were tall, slender, straight, and strong. They had straight black hair and reddish brown complexions. They greased their bodies with bear fat to keep insects away from them. They also believed that it would make their arms and legs nimble. To keep their skin smooth, they used fish oil and eagle fat.

The Indians used to paint themselves, because they thought it made them look handsome, and also because they thought it would keep away bad luck and sickness. They used minerals and vegetables for making the paints. Red paint came from iron rust, white from finely ground shells, green and blue from the juice of berries or flowers, yellow from clay, and black from fire soot. For paint cups, they used small hollowed-out stones.

In painting themselves, the Indians usually put a spot of paint on each cheek. They also put paint on their eyelids, and on their foreheads. The color red meant power, success, or war. Blue meant trouble, black stood for death, and yellow was for joy or travel. White was for peace.

Usually, the Indian man wore just a breech cloth of skin, and the woman a short skirt of skins decorated along the bottom. For very special events, a robe of dressed deerskin or fur or turkey feathers was also worn. The children did not wear any clothes in summer until they were about thirteen years old.

It was very hard for the Indians to make their clothes. Animals had to be killed and skinned with very crude stone tools. Then the hides had to be tanned, and sewed with needles made out of bones and thread made from milkweed or animal sinews.

25. The Indians made most of their clothes out of which material?
1) Seaweed 2) Skins 3) The bark of tree 4) Homespun cloth

26. The Long Island Indians did not have
1) long legs. 2) curly hair. 3) strong muscles. 4) smooth skin.

27. Which of these did the Indians hope to frighten away by painting themselves?
1) Animals 2) Insects 3) Enemies 4) Bad luck

28. Paragraph 2 tells why the Indians paint themselves. What else does it tell?
1) How they made their paints 2) How they looked after they had painted themselves 3) What the different colors meant 4) What they used for paint brushes

29. For coloring matter for their paints, the Indians used all of the following except
1) shells. 2) berries. 3) fish oil. 4) clay.

30. When the Indians went out to fight, with what color did they paint their faces?
1) White 2) Black 3) Red 4) Yellow

31. An Indian boy who was sent with a message of friendship to another tribe would probably paint himself with which color?
1) White 2) Red 3) Blue 4) Black

32. Out of what material did the Indians make their needles?
1) Milkweed stalks 2) Animal sinews 3) Stone 4) Bone

33. Which of these titles is a good one for the story?
1) "How Paint Was Made in Indian Days" 2) "How the American Indian Lived" 3) "Superstitions of Indian Tribes on Long Island" 4) "The Appearance and Dress of Long Island Indians"
The game "Jack Frost" is lots of fun to play. 

The object of the game is to keep from laughing when everyone else around you is laughing. Any number of players can play — the more the merrier! 

A player is chosen to be Jack Frost. All players except Jack Frost stand in a circle facing the center. 

Jack Frost goes round and round the outside of the circle quietly, touching a player here and there. As soon as a player feels the touch of Jack Frost, he begins to shiver and shake, exaggerating his motions in an effort to make the others laugh. The players who have not been touched try to keep from laughing as they see the others trying to "keep warm." 

The job of keeping a straight face becomes harder and harder as the players who have been touched begin to stamp their feet, slap their arms across their chests, clap their hands to their ears, and puff and blow into their cupped hands. 

Any player who laughs before Jack Frost touches him must drop out of the game. The player who holds out the longest without laughing is the winner. 

1. What does Jack Frost do? 
   1) He walks around the circle and taps players one by one. 
   2) He tries to make the other players laugh. 
   3) He shivers, shakes, and tries to "keep warm." 
   4) He tries to keep a straight face. 

2. How is Jack Frost chosen? 
   1) By the winner of the last game 
   2) By drawing numbers 
   3) By counting out 
   4) The story does not tell. 

3. Why is "Jack Frost" a good name for this game? 
   1) Because winter is the best time to play this game 
   2) Because the players act as if they were really cold 
   3) Because "Jack Frost" is a name that makes you want to laugh 
   4) Because one thinks of Jack Frost as a happy go-lucky person.
Baby water turtles make fine pets. They are easy to care for and cheap to feed. What is more, they are friendly, interesting to watch, and fun to play with.

You can buy a baby water turtle in almost any pet shop or five and ten cent store. When you choose your turtle, be sure that his eyes are clear and his shell hard all over. Do not buy a turtle with paint on his back. The paint keeps the shell from growing properly.

The best home for your turtle is a glass tank. The tank should be about fourteen inches long, six inches wide, and six inches high. The bottom of the tank should be lined with a one-inch layer of gravel and pebbles. On one side of the tank there should be a beach made out of gravel and rocks. The rest of the tank should be filled with enough water to form a swimming pool about two inches deep.

Turtles like a warm climate. When they get cold, they go into a sleeping state. If you want your turtle to stay awake and active, keep his home in a warm place, and let him take a sun bath now and then. A temperature of between 70 and 85 degrees is ideal for a turtle home.

Baby turtles do not eat very much. They like raw meat or fish, green vegetables, and hard cheese. You can buy turtle food already prepared. If you fix your turtle's food yourself, chop or shred it. The food should be served in portions about the size of your finger tip. Occasionally, you should treat your turtle to a live meal, such as an earthworm. If you feed your turtle at the same time every day, he will learn to look for you. He may learn to eat out of your hand.

Whenever you pick up your turtle to play with him, grasp him carefully but firmly around the middle of his upper shell. When you put him down, be very gentle. Until he gets to know you, a turtle will pull into his shell when he is picked up. But he will come out again as soon as he gets over his fear.
Long ago in far away China there lived a little boy named Mencius.

One day Mencius came home in the middle of the day and told his widowed mother he was leaving school. His mother said nothing, but picked up scissors and slashed the piece of cloth she was sewing, cutting it right in two.

The boy cried out, “Oh, Mother, what have you done? That was such a beautiful pattern!”

“I have done just what you are doing, my son,” he answered. “If you leave your books, you will be cutting across the pattern of your life, just as I have ruined the pattern on my loom.”

Young Mencius was so impressed that he went back to school. Later he became a famous scholar and teacher.

55. Why did Mencius return to school?
1) He was afraid that his mother would punish him.
2) He felt sorry for his mother.
3) His mother begged him to go back.
4) His mother convinced him that it would be a mistake to quit.

56. Which is the best title for this story?
1) “A Stubborn Boy”
2) “The Ruined Cloth”
3) “A Wise Mother”
4) “Education in China”

57. What is this poem about?
1) Blowing bubbles
2) Washing clothes and taking care of children
3) April showers and May flowers
4) An apple orchard in summer

58. The poet uses “silver suds” to mean which of these things?
1) Raindrops
2) Rain clouds
3) Snowflakes
4) Soap suds

59. What are the “dance frocks” of the apple-blossom buds?
1) Their petals
2) Their leaves
3) The sunbeams shining on them
4) Spider webs

60. The poet talks about April and May as if they were
1) flowers
2) months
3) fairy godmothers
4) people
The thistle of Scotland is said to be the oldest national flower on record. According to legend, it became Scotland's national flower as a result of the part it played in the Battle of Largs, fought in 1263 while Alexander III was king. A war was being fought at the time between the Scots and the Norwegians, and an army of the Northmen led by King Haakon landed one night on the west coast of Scotland near the mouth of the Clyde River. Although this was not far from Alexander's camp, the enemy landing was unobserved. The Norwegians regarded it as most improper to attack an enemy at night, but on this occasion the temptation to win an easy victory was so great that they decided not to wait for daylight. Barefooted, they crept noiselessly toward the Scottish camp in order to take the sleeping soldiers by surprise. Certain success seemed to be within their grasp when one of the Norwegians stepped on a thistle. Its prickles hurt him so that he cried out in pain. The alarm was, of course, given in the Scottish camp, and the defenders seized their weapons. They proceeded to drive the invaders from their shores, killing a great number of them. Since that time, so the legend goes, the thistle has been the national emblem of Scotland.

61. What does this story explain?
1) Where Scotland got its name
2) Why Scotland and Norway are old enemies
3) How the thistle became Scotland's national flower
4) How wars were fought in early days

62. How did the enemy soldiers reach Scotland?
1) By land
2) By sea
3) By air
4) There is no way of telling from the story.

63. When did the Scots first learn of the approach of the enemy?
1) When they sighted the enemy ships near the mouth of the Clyde River
2) Not until the enemy was almost upon them
3) After the enemy had opened attack on them
4) There is no way of telling from the story.

64. Why did the Norwegians decide to attack while it was still dark?
1) They thought they were sure to win that way.
2) They did not want the Scots to see how small their army was.
3) They thought Alexander's soldiers had already spotted them.
4) They were angry with the Scots for having broken the rule against night fighting.

65. What was the outcome of the fighting?
1) The Norwegians were defeated.
2) The Scots were driven from their own shores.
3) Neither side could claim a victory.
4) Both sides claimed a victory.

66. The story implies that the outcome of the battle might have been different if
1) Alexander's men had been better fighters.
2) Haakon's men had followed his orders.
3) the attackers had waited for daylight.
4) the Norwegians had been wearing shoes.

67. According to the story, the thistle is the national flower of Scotland because
1) so many thistles grow there.
2) the thistle has such a pretty flower.
3) the thistle once helped save Scotland from invasion.
4) Scotland was the first country to grow thistles.

68. About how long ago are the events in this story supposed to have taken place?
1) 100 years
2) 700 years
3) 1263 years
4) 3000 years

69. In the events described, the thistle was important because it was
1) handsome.
2) prickly.
3) hardy.
4) colorful.

70. When the writer calls this story a "legend," what is he telling you?
1) It is a story about kings.
2) It is a story about soldiers.
3) It is an old story that is known to be historically correct.
4) It is a story handed down from earlier times that may or may not be true.
Many years ago an ornamental vine was brought to this country from the Orient. In the south it grew very well. It made such a fine, shady screen for the front porch that almost everybody saw it for this purpose. In fact, it wasn’t long before people were calling the plant “porch vine.”

Then, a little more than thirty years ago, some scientists got interested in this plant, whose real name is kudzu. They noticed that it would grow almost anywhere in that warm climate. They also saw how quickly the new shoots sprouted. “Isn’t there anything else we can use kudzu for?” they asked themselves.

The scientists began planting it in gullies to see if it would keep topsoil from being washed away in the heavy rains. “If it makes a good screen for the porch,” they thought, “maybe it will make a good cover for the soil.” And the plant did just that. Its long, trailing shoots spread over the ground quickly. At every joint it sent out roots that anchored the vines solidly into the ground. Then farmers discovered that cows liked to eat kudzu. They found it to be a very good plant for hay or pasture.

Today, kudzu protects the soil on thousands of acres of land and furnishes a valuable feed for livestock. Many Southern farmers who never had a good pasture before, now find they can have one by planting porch vine.

73. Which of these happened first?
1) Scientists experimented with kudzu as a cover crop.
2) People in the South found that kudzu made a good porch screen.
3) Farmers began using kudzu as feed for cows.
4) Kudzu was planted on thousands of acres of land.

74. Why is kudzu able to keep the soil from washing away?
1) The plants suck up most of the rain water.
2) The plant has very long roots.
3) The plant sends out many shoots, each with its own roots.
4) The plant has wide, flat leaves.

75. Which use for kudzu was probably last to be discovered?
1) As feed for livestock
2) As a cover crop
3) As a porch screen
4) There is no way of telling from the story.

76. What does paragraph 1 tell us?
1) How kudzu protects the soil
2) What kudzu looks like
3) How kudzu was first used in this country
4) When kudzu was first brought to this country

77. What is the best heading for paragraph 3?
1) “Growing habits of kudzu”
2) “Conserving the soil”
3) “Discovering new uses for kudzu”
4) “Planting kudzu”

78. Three of these statements are shown by the story to be true. Which one is not true?
1) Kudzu will climb, and it will grow on level ground.
2) Kudzu will grow in almost any climate.
3) Kudzu will grow in poor soil.
4) Kudzu grows rapidly.

79. Which is the best name for this story?
1) “A Plant with a Funny Name”
2) “Conserving the Soil in the South”
3) “The South Finds a New Crop in Its Front Yard”
4) “How Kudzu Is Raised in the United States”
How are chickens able to peck so rapidly and accurately? Is it because they “just naturally know how to peck,” as most people would probably say? Or do chicks have to learn to peck in much the same way that a child has to learn how to feed himself?

A number of years ago a scientist decided to conduct an experiment that would reveal the answers to these questions. He had observed how poorly newly-hatched chicks peck, but how rapidly they improve. There were two possible ways of explaining this. It could be that the chicks become experts automatically as they grow older — “just naturally,” in other words. But it could also be that chicks learn to peck efficiently through practice. This, of course, takes some time, during which the chicks get older. But the practice is the important thing. In scientific terms, the first explanation would mean that pecking was a “result of maturation.” The second would indicate that pecking was “learned behavior.”

Before he could carry out his experiment, the scientist had to decide what he would call a “successful peck.” After studying chickens for a while, he found that a peck was really three different motions in one. There was the movement of the head toward the object, the movement of the beak in grasping the object, and the movement of swallowing. A chick had to make all three motions perfectly for a “successful peck.”

The scientist took 75 newly-hatched chicks and divided them into three equal groups. He was very careful that all the chicks were of the same kind. The three groups were kept in separate pens in a dark room. At one o’clock each day, the first group was brought into a lighted room. Each of the chicks in this group, called Group A, was allowed to take 50 pecks at grains of wheat. Then back into the dark room they went. The second group, called Group B, was brought to the lighted room next. The chicks in this group were allowed only 25 pecks each. Then they were returned to the dark room. Finally, Group C was brought in. These chicks were allowed only 12 pecks in the lighted room. The experiment was carried on for twenty days. A record was kept of the number of times each chick made a successful peck.

When the experiment was over, the scientist compared the records of the three groups. It had found on the last day that the chicks of Group A had improved most, Group B next, and Group C least of all. Thus it seems that baby chicks must learn to peck. Even in the chicken world “practice makes perfect.”

80. Which of these questions did the scientist want to answer?
1) How quickly do chicks learn to peck?
2) What kind of feed do chicks like best?
3) Is pecking a skill that must be learned?
4) Can chicks learn to peck in the dark?

81. Why did the scientist first spend time watching chickens?
1) So that he could understand the pecking motion
2) So that he could tell his chicks apart
3) So that the chicks would become used to him
4) So that he could make sure none of the chicks were sick

82. In what way were the three groups treated differently?
1) They were given different kinds of food.
2) They were kept in different rooms.
3) They were given different kinds of pecking practice.
4) They were given different amounts of pecking practice.

83. Why were the chicks kept in a dark room?
1) So they could not get extra pecking practice
2) So one group could not see the others
3) So their eyes would not get used to sunlight
4) So they could learn to peck in the dark
Test L-1: Spelling

Directions: The exercises in this spelling test are like the exercises shown at the right. Many of the exercises contain a mistake in spelling. Some do not have any mistakes at all.

You are to look for mistakes in spelling. When you find a mistake, fill in the circle on the answer sheet that has the same letter as the word which is wrong. If there is no mistake in the exercise, fill in the fifth circle.

The sample exercises at the right show what you are to do.

Use this table to find where your grade is to begin and stop on this test.

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6. 1) drink<br>2) sending<br>3) street<br>4) name<br>5) (No mistakes)

7. 1) water<br>2) tabel<br>3) fish<br>4) candy<br>5) (No mistakes)

8. 1) leaf<br>2) among<br>3) jump<br>4) small<br>5) (No mistakes)

9. 1) some<br>2) ponny<br>3) all<br>4) hear<br>5) (No mistakes)

10. 1) sed<br>2) fished<br>3) them<br>4) call

11. 1) wear<br>2) tail<br>3) shure<br>4) crying<br>5) (No mistakes)

12. 1) guess<br>2) fourth<br>3) comb<br>4) music<br>5) (No mistakes)

13. 1) earth<br>2) porch<br>3) blew<br>4) wunder<br>5) (No mistakes)

14. 1) hunted<br>2) eight<br>3) thoght<br>4) these<br>5) (No mistakes)

15. 1) troo<br>2) brushed<br>3) rice<br>4) forehead<br>5) (No mistakes)
| 16. | 1) picked  
| | 2) Monday  
| | 3) bite  
| | 4) grandmother  
| | 5) (No mistakes)  

**MAKE NO MARKS IN THIS BOOKLET**

| 17. | 1) care  
| | 2) foreget  
| | 3) eye  
| | 4) pail  
| | 5) (No mistakes)  

| 18. | 1) alone  
| | 2) cross  
| | 3) stone  
| | 4) sope  
| | 5) (No mistakes)  

| 19. | 1) monkey  
| | 2) raise  
| | 3) writing  
| | 4) ladder  
| | 5) (No mistakes)  

| 20. | 1) tomorrow  
| | 2) branch  
| | 3) Desember  
| | 4) field  
| | 5) (No mistakes)  

| 21. | 1) brokin  
| | 2) yellow  
| | 3) Indian  
| | 4) paint  
| | 5) (No mistakes)  

| 22. | 1) leson  
| | 2) nearly  
| | 3) board  
| | 4) great  
| | 5) (No mistakes)  

| 23. | 1) blowing  
| | 2) offen  
| | 3) fair  
| | 4) teeth  

| 24. | 1) April  
| | 2) which  
| | 3) right  
| | 4) almost  
| | 5) (No mistakes)  

| 25. | 1) hurt  
| | 2) brite  
| | 3) helper  
| | 4) tied  
| | 5) (No mistakes)  

| 26. | 1) calf  
| | 2) Thursday  
| | 3) markit  
| | 4) listen  
| | 5) (No mistakes)  

| 27. | 1) excuses  
| | 2) neatly  
| | 3) copy  
| | 4) proud  
| | 5) (No mistakes)  

| 28. | 1) once  
| | 2) Saterday  
| | 3) kept  
| | 4) spoken  
| | 5) (No mistakes)  

| 29. | 1) skateing  
| | 2) begin  
| | 3) races  
| | 4) fight  
| | 5) (No mistakes)  

| 30. | 1) able  
| | 2) window  
| | 3) barking  
| | 4) anamal  
| | 5) (No mistakes)  

| 31. | 1) bescue  
| | 2) coal  
| | 3) dresses  
| | 4) letter  
| | 5) (No mistakes)  

| 32. | 1) dirit  
| | 2) scout  
| | 3) highway  
| | 4) arrest  
| | 5) (No mistakes)  

| 33. | 1) serve  
| | 2) quiet  
| | 3) pakage  
| | 4) dozen  
| | 5) (No mistakes)  

**MAKE NO MARKS IN THIS BOOKLET**

| 34. | 1) leather  
| | 2) anywhere  
| | 3) plenty  
| | 4) persons  
| | 5) (No mistakes)  

| 35. | 1) silent  
| | 2) powder  
| | 3) barre  
| | 4) collar  
| | 5) (No mistakes)  

| 36. | 1) ranch  
| | 2) weight  
| | 3) begged  
| | 4) pumpkin  
| | 5) (No mistakes)  

| 37. | 1) teligram  
| | 2) ugly  
| | 3) property  
| | 4) famous  
| | 5) (No mistakes)  

| 38. | 1) point  
| | 2) wheet  
| | 3) blade  
| | 4) gain  
| | 5) (No mistakes)  

| 39. | 1) cutting  
| | 2) prehaps  
| | 3) steal  
| | 4) movies  
| | 5) (No mistakes)  

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Grade 3 Stop
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2) remember  
3) obayed  
4) blood  
5) (No mistakes)  
50. 1) instead  
2) match  
3) railroad  
4) awake  
5) (No mistakes)  
51. 1) rusty  
2) invention  
3) support  
4) forever  
5) (No mistakes)  
52. 1) liberty  
2) opposite  
3) lawndry  
4) tailor  
5) (No mistakes)  
53. 1) temper  
2) ounce  
3) forgotten  
4) enemies  
5) (No mistakes)  
54. 1) conductor  
2) memory  
3) gasoline  
4) salary  
5) (No mistakes)  
55. 1) square  
2) several  
3) idle  
4) darling  
5) (No mistakes)  
56. 1) zero  
2) reply  
3) cellar  
4) neighbor  
5) (No mistakes)  
57. 1) diamond  
2) model  
3) tribe  
58. 1) scarce  
2) engineer  
3) exersize  
4) perfect  
5) (No mistakes)  
59. 1) poetry  
2) fashion  
3) education  
4) colony  
5) (No mistakes)  
60. 1) check  
2) pavement  
3) gentleman  
4) stiff  
5) (No mistakes)  
61. 1) purpose  
2) further  
3) temple  
4) condition  
5) (No mistakes)  
62. 1) cradle  
2) lying  
3) sprinkle  
4) squirrel  
5) (No mistakes)  
63. 1) easier  
2) suffer  
3) score  
4) distance  
5) (No mistakes)  
64. 1) bandage  
2) express  
3) disgrace  
4) jealous  
5) (No mistakes)  
65. 1) stool  
2) punish  
3) carpet  
4) bacon  
5) (No mistakes)  
66. 1) happened  
2) station  
3) important  
4) bushel  
5) (No mistakes)  
67. 1) compleat  
2) injury  
3) stomach  
4) direction  
5) (No mistakes)  
68. 1) attract  
2) southern  
3) progress  
4) postage  
5) (No mistakes)  
69. 1) guest  
2) deaf  
3) union  
4) collision  
5) (No mistakes)  
70. 1) companion  
2) wholesome  
3) inspection  
4) liquid  
5) (No mistakes)  
71. 1) delivery  
2) examin  
3) twist  
4) opportunity  
5) (No mistakes)  
72. 1) author  
2) mention  
3) treasure  
4) cautious  
5) (No mistakes)  
73. 1) shelter  
2) agent  
3) valueable  
4) material  
5) (No mistakes)  
74. 1) uniform  
2) eagle  
3) pioneer  
4) autum  
5) (No mistakes)  
75. 1) rescue  
2) primery  
3) foundation  
4) timber  
5) (No mistakes)  

**Make no marks in this booklet.**

| 1 | cookies  
2 | hurry  
3 | reason  
4 | peices  
5 | (No mistakes)  
| 1 | sweater  
2 | candels  
3 | notice  
4 | during  
5 | (No mistakes)  
| 1 | sore  
2 | cabbage  
3 | goldin  
4 | honey  
5 | (No mistakes)  
| 1 | steady  
2 | stuff  
3 | recite  
4 | agree  
5 | (No mistakes)  
| 1 | entered  
2 | mischief  
3 | furnice  
4 | shae  
5 | (No mistakes)  
| 1 | skraps  
2 | starve  
3 | rusty  
4 | honey  
5 | (No mistakes)  
| 1 | eighteen  
2 | salary  
3 | bandage  
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| 1 | (No mistakes)  
2 | (No mistakes)  
3 | (No mistakes)  
4 | (No mistakes)  
5 | (No mistakes)  

**IN THIS BOOKLET:**

- Always remember:
- Do not make any mistakes.
- Obey:
- Pay attention:
- Check:
- Examine:
- Study:
- Write:
- Read:
- Learn:
- Remember:
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<th>7</th>
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<tr>
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<td>84. 1) region 2) violet 3) puzzel 4) settlement 5) (No mistakes)</td>
<td>95. 1) earnest 2) attendance 3) revolution 4) content</td>
<td>107. 1) conference 2) laboratory 3) endeavor 4) theory 5) (No mistakes)</td>
<td>110. 1) competent 2) positive 3) equipped 4) survey 5) (No mistakes)</td>
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<td>87. 1) occupation 2) dreadful 3) scheme 4) attacked 5) (No mistakes)</td>
<td>96. 1) duties 2) assistance 3) novel 4) suitable 5) (No mistakes)</td>
<td>109. 1) acquire 2) executive 3) reduction 4) analyze 5) (No mistakes)</td>
<td>112. 1) vicinity 2) miserable 3) allegiance 4) discipline 5) (No mistakes)</td>
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<td>97. 1) notify 2) criticize 3) sensible 4) basis 5) (No mistakes)</td>
<td>107. 1) pilot 2) knowledge 3) appreciate 4) pursue 5) (No mistakes)</td>
<td>114. 1) faith 2) actual 3) situation 4) pityful 5) (No mistakes)</td>
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<td>89. 1) science 2) furious 3) exceed 4) commission 5) (No mistakes)</td>
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</tr>
<tr>
<td>82. 1) horrible 2) ivory 3) monument 4) cocoa 5) (No mistakes)</td>
<td>92. 1) nonsense 2) thorough 3) accomplish 4) nervous 5) (No mistakes)</td>
<td>101. 1) religious 2) standard 3) electricity 4) compliment 5) (No mistakes)</td>
<td>110. 1) supreme 2) distribution 3) subscription 4) considerably 5) (No mistakes)</td>
<td>111. 1) competent 2) positive 3) equipped 4) survey 5) (No mistakes)</td>
<td></td>
</tr>
<tr>
<td>83. 1) absense 2) cheerful 3) total 4) request 5) (No mistakes)</td>
<td>93. 1) orchestra 2) debate 3) commerce 4) sketch 5) (No mistakes)</td>
<td>102. 1) elected 2) neglect 3) amusement 4) stitches 5) (No mistakes)</td>
<td>111. 1) competent 2) positive 3) equipped 4) survey 5) (No mistakes)</td>
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<td>84. 1) region 2) violet 3) puzzel 4) settlement 5) (No mistakes)</td>
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</tbody>
</table>
Test L-2: Capitalization

Directions: This is a test on capitalization. It will show whether you know which words in a sentence should be capitalized.

The exercises in the test are like the samples shown at the right. Many of the exercises contain mistakes in capitalization. Some do not have any mistakes at all.

You are to look for mistakes in the test exercises. When you find a mistake, fill in the circle on the answer sheet that has the same number as the line containing the mistake. If there is no mistake in an exercise, fill in the fourth circle.

The sample exercises at the right show what you are to do.

Use this table to find where your grade is to begin and stop on this test.

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<thead>
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<td>Exercise 58 on page 34</td>
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<tr>
<td>GRADES 8 AND 9</td>
<td>Exercise 59 on page 35</td>
<td>Exercise 102 on page 36</td>
</tr>
</tbody>
</table>

Sample Exercises

S1. 1) I asked John 2) to go to the store 3) with me yesterday. 4) (No mistakes)

S2. 1) We told Sam 2) not to feed onions 3) to the Cat. 4) (No mistakes)

S3. 1) Mary has moved 2) to a little town 3) named Chester. 4) (No mistakes)

Answers

S1 1 2 3 4
S2 1 3 2 4
S3 1 2 3 4

Make no marks in this booklet
1. I asked George to stay here for dinner, but his mother wanted him to come home. (No mistakes)

2. Jimmy's grandfather came to this country from Ireland when he was a little boy. (No mistakes)

3. In the spring, many people go to Washington, D.C., to see the cherry trees in bloom. (No mistakes)

4. We visited the Johnson Paper Mill and learned how paper is made from wood and rags. (No mistakes)

5. Our teacher read us a story about the giant fir trees that are found in California. (No mistakes)

6. The policeman couldn't find Fairview on the map either. Maybe it isn't a very big town. (No mistakes)

7. We always have a holiday on Thanksgiving, and sometimes the Friday after is also a holiday. (No mistakes)

8. My dog is very smart. He comes to meet me when I get out of school each afternoon. (No mistakes)

9. The railroad station is on the other side of town, between Maple and Hillside avenues.

10. Many of the Indians of Mexico make beautiful jewelry out of silver. (No mistakes)

11. On hot afternoons in August, we like to go to that air-conditioned theater on Broadway to get cool. (No mistakes)

12. When we go to the zoo, my sister likes to watch the monkeys, but the lions and snakes frighten her. (No mistakes)

13. Albany, the capital city of New York, is located on the Hudson River. (No mistakes)

14. Mrs. Scott invited Ann's teacher, Miss Evans, to come to dinner next Sunday. (No mistakes)

15. Allen decided to buy a book with his birthday money. He picked out a story entitled "Seabird." (No mistakes)

16. It was getting dark when we left. It was not very late, but there were heavy clouds. (No mistakes)

17. Howard needs some German stamps to complete his collection of stamps from all over Europe. (No mistakes)

18. Mary made herself a witch's costume to wear to the Halloween party. (No mistakes)
1) My home address has changed
   2) from 111 East Tenth Street
   3) to 41 North Second Avenue.
   4) (No mistakes)

2) When we visit New York, I like
   3) to go to the museums, such as
   4) the Museum of Natural History.
   5) (No mistakes)

3) Our family bought a new Ford
   4) car this year, but before
   5) that we had a Plymouth.
   6) (No mistakes)

4) Last fall my best friend,
   5) Mary, moved from our town
   6) to a farm in south Carolina.
   7) (No mistakes)

5) When Sam told us the name of
   6) his pet turtle, we all laughed.
   7) He called it "speedy."
   8) (No mistakes)

6) Kay's mother is going to teach me
   7) to knit, so I can make Dad a
   8) scarf for a Christmas present.
   9) (No mistakes)

7) Jill doesn't watch television
   8) on Wednesday because that is
   9) the day for her dancing lesson.
  10) (No mistakes)

8) The First National Bank was the
   9) tallest building in the town, and
   10) it was only three stories high.
  11) (No mistakes)

9) The girls sang "Silent night,"
   10) and the boys sang "O Little
   11) Town of Bethlehem."
   12) (No mistakes)

10) The tulips and daffodils in
  11) my aunt's yard were brought
  12) to this country from Holland.

11) The frost made pretty patterns
    12) on the window panes on.
    13) the north side of the house.
    14) (No mistakes)

12) When we go to a large restaurant
    13) to eat, I always order chop suey.
    14) It is my favorite Chinese food.
    15) (No mistakes)

13) Do you get the magazine called
    14) "Children's digest"? It has
    15) many jokes and stories in it.
    16) (No mistakes)

14) Alice asked me to go to the
    15) Movies with her, but I had
    16) already seen the picture.
    17) (No mistakes)

15) The only words our parrot
    16) can say are "Man overboard!"
    17) I hope it's Captain Bly."
    18) (No mistakes)

16) Nick said, "That fishing trip will have
    17) to wait. I promised Father I would
    18) clean out the garage this Friday."
    19) (No mistakes)

17) Grandmother gave me a Dime for
    18) candy, but I decided to get
    19) an ice cream cone instead.
    20) (No mistakes)
39. 1) "I just love the circus, don't you?" asked Marcia. "No, I like the rodeo better," replied Barry.  
   2) (No mistakes)  
40. 1) I hope aunt Millie will give me the wishbone from the Thanksgiving turkey, so that Tony and I can make a wish.  
   2) (No mistakes)  
41. 1) There is an old man on Park Lane who has rabbits for sale. He is listed as John W. Davis in the telephone book.  
   2) (No mistakes)  
42. 1) On the radio program called "Songs of the Wild," recordings of all kinds of bird songs are played.  
   2) (No mistakes)  
43. 1) The picture showed a little dutch boy and his sister. Both of them were wearing wooden shoes.  
   2) (No mistakes)  
44. 1) I like the mountains and lakes in New England, but the winters are long and cold.  
   2) (No mistakes)  
45. 1) The birthstone for May is the emerald. The flower for the month is the lily of the valley.  
   2) (No mistakes)  
46. 1) My father says he saw a baseball game in which Babe Ruth hit a Home Run that won the game.  
   2) (No mistakes)  
47. 1) Sarah picked up the telephone and said, "Operator, please connect me with the Police Department."  
   2) (No mistakes)  
48. 1) This book looks interesting. It has several colored pictures in it. The title is the Wizard of Oz.  
   2) (No mistakes)  
49. 1) I thought the Atlantic ocean was bigger than the Pacific, but Miss Dale said I was wrong.  
   2) (No mistakes)  
50. 1) Agnes is an American, though she was born in China. Her parents were Christian missionaries.  
   2) (No mistakes)  
51. 1) The Senior Class of Clinton high school is presenting a play next Friday evening.  
   2) (No mistakes)  
52. 1) If you visit the southwest, you ought to see the Grand Canyon of the Colorado River.  
   2) (No mistakes)  
53. 1) This article tells you how to make a toy indian canoe out of brown wrapping paper.  
   2) (No mistakes)  
54. 1) I got a Camera as a present, and this summer I plan to take a lot of pictures.  
   2) (No mistakes)  
55. 1) Pennsylvania was named for William Penn, the founder of the colony. He was a quaker.  
   2) (No mistakes)  
56. 1) The baseball park where the Chicago Cubs play is named Wrigley field.  
   2) (No mistakes)  
57. 1) The first English navigator to sail around the world was sir Francis Drake.  
   2) (No mistakes)  
58. 1) Each page of the calendar was illustrated with a scene from a famous bible story.  
   2) (No mistakes)
70. 1) Mr. Henry R. Brooks
   2) Red cross headquarters
   3) Plainfield, Wisconsin
   4) (No mistakes)

71. 1) Dear sir:
   2) Do you have any material on
   3) the latest life saving methods?
   4) (No mistakes)

72. 1) If you do, please send it to me.
   2) Sincerely Yours,
   3) Thomas R. James
   4) (No mistakes)

73. 1) In the florist's window were
   2) vases of carnations and roses
   3) and several Easter lily plants.
   4) (No mistakes)

74. 1) The department of state is the
   2) division of the Federal Government
   3) that deals with foreign affairs.
   4) (No mistakes)

75. 1) The great lakes form part of
   2) the boundary between southern
   3) Canada and the United States.
   4) (No mistakes)

76. 1) The bus station on Ninth Avenue was
   2) crowded with servicemen who were
   3) leaving the city after the holiday.
   4) (No mistakes)

77. 1) The only bridge connecting New
   2) Jersey with Manhattan Island
   3) is the George Washington bridge.
   4) (No mistakes)

78. 1) When my grandfather came to
   2) this country from Europe, he
   3) could not speak any English.
   4) (No mistakes)

79. 1) A dining car will be attached
   2) to the train when it stops at
   3) Kansas City at five o'clock.
   4) (No mistakes)

80. 1) Helen can play tennis better than
   2) most girls in high school even
   3) though she is only in fifth grade.
   4) (No mistakes)

---

1) I took this picture of old
   Faithful, the famous geyser,
   in Yellowstone National Park.
   (No mistakes)

2) Donald said to me, "Please wrap
   this package for me. I can't
   tie the ribbon into a neat bow."
   (No mistakes)

3) The drought began in early
   spring and continued throughout
   the Summer and Autumn months.
   (No mistakes)

4) More ships use the Suez
   canal than any other
   waterway in the world.
   (No mistakes)

5) The first Europeans to reach
   this territory were French
   priests and fur traders.
   (No mistakes)

6) There is a Catholic church at the
   corner of Cedar Street, and a
   protestant one in the next block.
   (No mistakes)

7) The nearest Drugstore is
   down this street four blocks.
   It is next to the supermarket.
   (No mistakes)

8) My father's office is on the fifth
   floor of the Briggs building, at
   the corner of State and Ash Streets.
   (No mistakes)

9) Don runs a delivery route for
   the evening newspaper and also
   sells the Saturday evening post.
   (No mistakes)

10) Around noon the sun came out,
    and the snow began to melt
    on the roof that faces South.
    (No mistakes)

11) As seen from the earth, the planet
    Venus appears to be one of the
    brightest stars in the heavens.
    (No mistakes)
81. 1) Have you ever seen a peacock?
2) their tails look like fans, with
3) beautiful blue-green feathers.
4) (No mistakes)

82. 1) Although Spanish is spoken in most
2) South American countries, the national
3) language of Brazil is Portuguese.
4) (No mistakes)

83. 1) The little girl stared at me.
2) "My name is Emily," she said
3) to me. "What's your name?"
4) (No mistakes)

84. 1) The entire island in the
2) middle of Half Moon lake
3) was hidden by the fog.
4) (No mistakes)

85. 1) They drove along the main street
2) and through several parking lots,
3) looking for a place to park the car.
4) (No mistakes)

86. 1) That statue in the park is a
2) memorial to the soldiers who
3) fought in the Mexican war.
4) (No mistakes)

87. 1) "Do you have a Television set?"
2) Rosie asked. "We are getting
3) one at the end of this week."
4) (No mistakes)

88. 1) "Sit down and eat your
2) oatmeal," Bill's mother told
3) him, "Before it gets cold."
4) (No mistakes)

89. 1) The gulf stream is a warm ocean
2) current that flows in a northeastern
3) direction toward the British Isles.
4) (No mistakes)

90. 1) The candy for St. Valentine's
2) day was packed in red boxes
3) made in the shape of a heart.
4) (No mistakes)

91. 1) Sapphires, Rubies, and Emeralds have
2) been prized for centuries because they
3) can be made into such beautiful gems.
4) (No mistakes)

92. 1) Honolulu, the capital of Hawaii,
2) Roger caught the chicken pox
3) and was quarantined for ten days.
4) (No mistakes)

93. 1) "That excuse," said Ralph,
2) "Is so silly that I'm sure
3) your teacher won't believe it."
4) (No mistakes)

94. 1) Branches of holly, with their glossy
2) green leaves and bright red berries,
3) make nice Christmas decorations.
4) (No mistakes)

95. 1) There is a boat named 'Maid
2) Of The Mist' which takes visitors
3) near the bottom of Niagara Falls.
4) (No mistakes)

96. 1) Seattle, Washington, which is located
2) on Puget Sound, is one of the
3) largest cities in the northwest.
4) (No mistakes)

97. 1) As I started upstairs, my brother
2) called, "You'd better set the alarm
3) clock. We have to get up early."
4) (No mistakes)

98. 1) No one knows when gunpowder was
2) invented, but the Chinese used it
3) in Fireworks hundreds of years ago.
4) (No mistakes)

99. 1) I believe the graduation exercises
2) are usually held the first Tuesday
3) in June at the Jefferson school.
4) (No mistakes)

100. 1) When I went to visit grandma this
2) morning, she gave me this silver
3) bracelet as a birthday present.
4) (No mistakes)

101. 1) Honolulu, the capital of Hawaii,
2) is located on the Southern coast
3) of the island named Oahu.
4) (No mistakes)

102. 1) The Library closes at six
2) o'clock, except on Thursdays,
3) when it stays open until nine.
4) (No mistakes)
Test L-3: Punctuation

Directions: This is a test on punctuation. It will show how you can use periods, commas, question marks, apostrophes, etc.

The exercises in the test are like the samples shown at the right. Many of the exercises contain mistakes in punctuation. Some do not have any mistakes at all.

You are to look for mistakes in the test exercises. When you find a mistake, fill in the circle on the answer sheet that has the same number as the line containing the mistake. If there is no mistake in an exercise, fill in the fourth circle.

The sample exercises at the right show what you are to do.

Use this table to find where your grade is to begin and stop on this test.

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<td>GRADE 5</td>
<td>Exercise 19 on page 39</td>
<td>Exercise 58 on page 40</td>
</tr>
<tr>
<td>GRADE 6</td>
<td>Exercise 39 on page 40</td>
<td>Exercise 80 on page 41</td>
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<tr>
<td>GRADE 7</td>
<td>Exercise 49 on page 40</td>
<td>Exercise 91 on page 42</td>
</tr>
<tr>
<td>GRADES 8 AND 9</td>
<td>Exercise 59 on page 41</td>
<td>Exercise 102 on page 42</td>
</tr>
</tbody>
</table>

Sample Exercises

S1. 1) The goat couldn't
2) get down from
3) the garage roof
4) (No mistakes)

S2. 1) Danny would like
2) very much, to ride
3) in a police car.
4) (No mistakes)

S3. 1) That was a very
2) funny story. Where
3) did you hear it?
4) (No mistakes)
1. 1) We were worried when the
    2) clock struck six. We knew
    3) we were late for dinner.
    4) (No mistakes)

2. 1) I'm going to cut out my cookies
    2) in the shape of little snowmen.
    3) How are you going to make yours?
    4) (No mistakes)

3. 1) The date on the back of this
    2) picture is June 12, 1947. I
    3) was only three years old then.
    4) (No mistakes)

4. 1) I have an appointment to have
    2) my teeth examined by Dr. Rice
    3) at 3:30 tomorrow afternoon.
    4) (No mistakes)

5. 1) Mr. Murray gave us a
    2) dollar for raking the
    3) leaves in his front yard.
    4) (No mistakes)

6. 1) My brother always signs his
    2) letters J. M. Johnson, because he
    3) has such a funny first name.
    4) (No mistakes)

7. 1) We'll have to go home for
    2) lunch this week. The school
    3) lunchroom is being painted.
    4) (No mistakes)

8. 1) I was born in Houston, Texas.
    2) My family moved to Iowa and
    3) bought a farm four years ago.
    4) (No mistakes)

9. 1) That is a very good book to give
    2) to someone who is sick in bed
    3) I read it when I had the mumps.

10. 1) May we take the puppy
    2) with us to the farm?
    3) He won't be any trouble.
    4) (No mistakes)

11. 1) Mary has gone to Washington,
    2) D.C., to spend the holidays
    3) with her aunt and uncle.
    4) (No mistakes)

12. 1) You should never leave tools
    2) out in the rain if you don't
    3) want them to get rusty.
    4) (No mistakes)

13. 1) The postman must have delivered
    2) this letter to us by mistake. It's
    3) for a man named Robert G. Lewis.
    4) (No mistakes)

14. 1) We're making a braided rug for
    2) our room. Aunt Rose taught us
    3) how to weave the strips of cloth.
    4) (No mistakes)

15. 1) That isn't the end of the
    2) story. Are there some
    3) pages missing from the book?
    4) (No mistakes)

16. 1) In Menlo Park, New Jersey there
    2) is a monument to Thomas Edison,
    3) who invented the electric light.
    4) (No mistakes)

17. 1) My oldest sister has already
    2) finished high school. She
    3) was graduated on June 4, 1954.
    4) (No mistakes)

18. 1) The elevator man forgot to stop at
    2) the fourth floor. Anne got off on the
    3) fifth floor and walked down the stairs.
    4) (No mistakes)
1) We are going to have a visitor next week. Mrs Thompson is coming to spend a few days with us. (No mistakes)

2) My mother tried to phone yours at three o'clock. I guess no one was at home then. (No mistakes)

3) Rita says she can't get the frying pan clean. We used it to cook over the campfire. (No mistakes)

4) The sleeves are so long that I can't find another one. (No mistakes)

Bobby asked me to help him wrap up the birthday present that he got for Dick. (No mistakes)

I would like to live in a state in which the weather is always warm Florida is like that. (No mistakes)

Doris said her family is moving to Portland. Did she mean Portland Oregon? (No mistakes)

I have to stay inside during recess and help Miss. Walters put up the Christmas decorations. (No mistakes)

Do you want to ask Joe and Donald to help us build our clubhouse? (No mistakes)

This shirt doesn't fit me. The sleeves are so long that they come down over my hands. (No mistakes)

Where did you find that key. I looked all over the house for it yesterday. (No mistakes)

We aren't sure what time the train will get here. It often arrives an hour or two late. (No mistakes)

I'm thirsty from eating all those peanuts. Did you see a drinking fountain anywhere? (No mistakes)

Mother took me to see Dr Grant today. He said that I grew two inches in the past year. (No mistakes)

That is not my jacket I had a bag of marbles in the pocket. (No mistakes)

The Jacksons have gone to Miami Florida. They will spend the winter there. (No mistakes)

Who's that player wearing number 17. Is that Steve Wilson, the new pitcher? (No mistakes)
39. 1) "Be sure to bring your bathing suit when you come to visit, said Ethel. "Our town has a new pool."
2) (No mistakes)

40. 1) If that's Bill's bicycle, he must still be in school. Did you look for him in the library?
2) (No mistakes)

41. 1) The snowman's eyes and mouth were made from pieces of coal.
2) His nose was made from a carrot.
3) (No mistakes)

42. 1) "When I went to school," my grand-father said, "all we learned was reading writing and arithmetic."
2) (No mistakes)

43. 1) Dad says that those big oak trees are probably more than two hundred years' old.
2) (No mistakes)

44. 1) Peter and I had lots of fun pretending, that he was a Texas cowboy and I was an Indian.
2) (No mistakes)

45. 1) The babys sweater is much too big. Can you exchange it for a smaller one?
2) (No mistakes)

46. 1) "Bring some logs in from the garage" John's mother called.
2) "We need more wood for the fire."
3) (No mistakes)

47. 1) This morning the mailman brought us a box of plump, juicy pears from a friend who lives near Medford Oregon.
2) (No mistakes)

48. 1) This electric train includes a locomotive, two passenger cars, a box car, and a caboose.
2) (No mistakes)

49. 1) There's no use shoveling the sidewalk now, Gary. Let's wait until it stops snowing.
2) (No mistakes)

50. 1) Helen called out "Did you see this funny picture of Don's father in tonight's paper?"
2) (No mistakes)

51. 1) The picture in the newspaper showed a stocky, bald-headed man with a very unhappy expression on his face.
2) (No mistakes)

52. 1) The last day of school before the spring vacation this year will be Friday April 3.
2) (No mistakes)

53. 1) All the stores banks and offices will be closed on Thursday, New Year's Day.
2) (No mistakes)

54. 1) "Don't be greedy, Ben," said Martha. "You've already had two pieces of cake. That's enough."
2) (No mistakes)

55. 1) I've decided to call my short story The Man with Two Left Hands.
2) Do you think that's a good title?
3) (No mistakes)

56. 1) Small children are full of curiosity about the way things look, feel and taste.
2) (No mistakes)

57. 1) "Did you hear the fire engines go past? called David. Where do you suppose the fire is?"
2) (No mistakes)

58. 1) The American band leader who wrote more, famous marches than any other composer was John Philip Sousa.
2) (No mistakes)
Test L-4: Usage

Directions: This is a test on the use of words. It will show whether you know how to use words properly in sentences.

The exercises in the test are like the samples shown to the right. Many of the exercises contain mistakes in the use of words. Some do not have any mistakes at all.

You are to look for mistakes in the test exercises. When you find a mistake, fill in the circle on the answer sheet that has the same number as the line containing the mistake. If there is no mistake in an exercise, fill in the fourth circle.

The sample exercises at the right show what you are to do.

Use this table to find where your grade is to begin and stop on this test.

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SAMPLE EXERCISES

S1. 1) We are ready to begin. 2) Our dog bit the mailman. 3) It ain't your turn. 4) (No mistakes)

S2. 1) Are you coming? 2) Don't go near the river. 3) Those apples are green. 4) (No mistakes)

ANSWERS

S1 1 2 3 4
S2 1 2 3 4

MAKE NO MARKS IN THIS BOOKLET
1. 1) Jane quickly tore open the envelope.
   2) Put the scissors away when you're done.
   3) Jerry threwed the ball with all his might.
   4) (No mistakes)

2. 1) We don't have a rake, but they has one.
   2) Three chickens were killed by the fox.
   3) Lois has always worn her hair in braids.
   4) (No mistakes)

3. 1) Did you hear those police sirens?
   2) Wipe your shoes well before you come in.
   3) He shouldn't have gone there alone.
   4) (No mistakes)

4. 1) I like the coat with fur on the collar.
   2) The snake was curled up into a big knot.
   3) Have you brung your bathing suit with you?
   4) (No mistakes)

5. 1) That wood is too wet to burn.
   2) We were so scared we run all the way home.
   3) He has come to borrow our snow shovel.
   4) (No mistakes)

6. 1) There weren't anything that we could do.
   2) Several of the men were digging for clams.
   3) The policeman was angry at Larry and me.
   4) (No mistakes)

7. 1) I wish I had known about that before!
   2) My napkin always slips off my lap.
   3) I and Jim are going to the movies.
   4) (No mistakes)

8. 1) I have saw this magazine already.
   2) In the trunk were several old dresses.
   3) Does anyone know whose cap this is?
   4) (No mistakes)

9. 1) They done the job as fast as they could.
   2) The wheels on my scooter squeak.
   3) She and Louise are the same age.
   4) (No mistakes)

10. 1) Father doesn't like onions in his salad.
     2) The show began almost an hour late.
     3) We often paint pictures on rainy days.
     4) (No mistakes)

11. 1) I am glad I wore my heavy coat today.
     2) Leave me ride your bicycle for a while.
     3) Make yourself at home in the living room.

12. 1) When we come home, the house was dark.
     2) My pet squirrel eats nuts out of my hand.
     3) The wind blew over the trash cans.
     4) (No mistakes)

13. 1) If Sandra goes, I want to go, too.
     2) Mrs. Jones paid us for the work we did.
     3) I called to Pete, but he didn't hear me.
     4) (No mistakes)

14. 1) This game isn't any fun for me and Sally.
     2) That lazy dog just lies there in the sun.
     3) Suddenly the lights in the room grew dim.
     4) (No mistakes)

15. 1) We always hides the key in the mail box.
     2) I think I ate too much turkey.
     3) Pat came inside because his feet were cold.
     4) (No mistakes)

16. 1) The kittens slept in a basket by the fire.
     2) The baby thrown his dish on the floor.
     3) We couldn't find them anywhere.
     4) (No mistakes)

17. 1) Has anyone fed the goldfish today?
     2) David traveled on the train by himself.
     3) That isn't none of my business.
     4) (No mistakes)

18. 1) I lost a button off my coat.
     2) Joan's mother won't let her wear lipstick.
     3) It begun to snow about six o'clock.
     4) (No mistakes)

19. 1) We can't ever make the grass grow here.
     2) Those weak steps are very dangerous.
     3) Let me see that magazine for a minute.
     4) (No mistakes)

20. 1) The roof of the cabin leaked terribly.
     2) The shoes she has bought are too tight.
     3) We blewed up about a dozen of the balloons.
     4) (No mistakes)

21. 1) I forgot there was a hole in my pocket.
     2) Has the postman bring us any mail?
     3) I can't put three candles into two holders.
     4) (No mistakes)

22. 1) I heard the birds singing at four o'clock.
     2) Is it all right if I and Nancy leave now?
     3) Don't the church bells sound beautiful?
     4) (No mistakes)
3. 1) Aunt Sue brought presents for him and me.
2) I don’t think that ice will hold us.
3) We drank the whole pitcher of lemonade.
4) (No mistakes)

4. 1) He doesn’t never play ball with our team.
2) Those stamps are all stuck together.
3) Did you get the first word wrong, too?
4) (No mistakes)

5. 1) The snow made the road even more slippery.
2) These trousers were pressed very badly.
3) Without warming, the rope gave way.
4) (No mistakes)

6. 1) The sudden thunder gave us a scare.
2) This here street is full of holes.
3) We fourth graders are planning a trip.
4) (No mistakes)

7. 1) I can’t go swimming because of my cold.
2) The twins were excited about the party.
3) Jack said he don’t want to play with us.
4) (No mistakes)

8. 1) Our goldfish sleep with their eyes open.
2) Who brung all this dirt into the kitchen?
3) Betty says she likes to eat raw potatoes.
4) (No mistakes)

9. 1) Alex hasn’t ever been late to school.
2) I cannot get these two nails out.
3) The workmen have taken the tractor away.
4) (No mistakes)

10. 1) What was they whispering so much about?
2) There is no use in our waiting longer.
3) Our canary won’t sing any more.
4) (No mistakes)

11. 1) We have came just ten minutes too late.
2) That doesn’t look like the right key.
3) There are too many bones in this stew.
4) (No mistakes)

12. 1) Dad taught me how to fish for bass.
2) Sometimes him and me fish all day.
3) We would rather catch fish than eat them.
4) (No mistakes)

33. 1) The candy was soft, but it tasted good.
2) They chose a present to give their dad.
3) How did you get the answer so quickly?
4) (No mistakes)

34. 1) We were most done when it started to rain.
2) I can’t see very well without my glasses.
3) The river flows more swiftly by the dam.
4) (No mistakes)

35. 1) Don’t leave go of your dad’s hand, Judy.
2) She shouldn’t ever wear so much jewelry.
3) Silent as mice, we crept down the hall.
4) (No mistakes)

36. 1) She and her mother went shopping together.
2) Ask them if we may use their telephone.
3) Frank and me saw that movie yesterday.
4) (No mistakes)

37. 1) The plane flew quite low over the island.
2) The ship had broken in two on the reef.
3) We could do nothing but sit and wait.
4) (No mistakes)

38. 1) Be sure to read the directions carefully.
2) We have ridden at least two miles already.
3) I can go, but Jim he has to mow the lawn.
4) (No mistakes)

39. 1) Rita waved to Bill and me from the window.
2) This overcoat is more nearer my size.
3) Russ ran forward and dived for the ball.
4) (No mistakes)

40. 1) Mr. Lewis said there won’t be no meeting.
2) Whose dog is smarter, his or yours?
3) He must have sneaked in by the back door.
4) (No mistakes)

41. 1) One of my favorite records is cracked.
2) What odd-looking birds those are!
3) Sometimes he makes me really angry.
4) (No mistakes)

42. 1) Is there enough room for him and me?
2) His hands and face were covered with dirt.
3) Carry these dishes very careful.
4) (No mistakes)

43. 1) The best seats had already been taken.
2) In the morning the fog had cleared.
3) The sleeves of the coat was an inch short.
4) (No mistakes)
44.  1) On this map it don't look far at all from here to Mexico.
     2) The boys themselves didn't know how the fire started.
     3) To Europeans, we Americans seem very wasteful.
     4) (No mistakes)

45.  1) The windows of the old barn were covered with cobwebs.
     2) Jackie insisted on wearing those cowboy boots to school.
     3) Them flowers will last longer if you put them in fresh water.
     4) (No mistakes)

46.  1) The life guard said they had not ought to swim out beyond the ropes.
     2) At the saw mill the logs were cut into boards of different sizes.
     3) There was a long line of cars halted before the open bridge.
     4) (No mistakes)

47.  1) This piece of wood smells like cedar.
     2) We had drove for more than two hours without seeing another car.
     3) If Millie and Ruth aren't here by now, I suppose they're not coming.
     4) (No mistakes)

48.  1) If we want the job done correctly, we will have to do it ourselves.
     2) It was a hot, muggy night, and none of us slept very well.
     3) His French accent was so strong that we could hardly understand him.
     4) (No mistakes)

49.  1) The cookies that Anne and I made looked almost good enough to eat!
     2) Uncle Ben wrote that Aunt Emily and him would arrive Sunday.
     3) You and Tom can build a playhouse out of these packing cases.
     4) (No mistakes)

50.  1) Neither Ken nor I could reach the books on the top shelf.
     2) Those tropical birds have the beautifullest coloring I have ever seen.
     3) Ronald remembered many songs which they had sung at Boy Scout Camp.
     4) (No mistakes)

51.  1) My father doesn't think women can drive automobiles very well.
     2) I asked him and Ray to go with me, but they had work to do.
     3) Every morning before breakfast Dick and I swum out to the float.
     4) (No mistakes)

52.  1) The boys promised their mother that they would behave themselves.
     2) Dave made this scooter all by hisself.
     3) Patty was so disappointed that she cried herself to sleep.
     4) (No mistakes)

53.  1) In the morning Jack found that the beanstalk had grew up to the sky.
     2) The three dogs lay in the shade, panting from the heat.
     3) Why do so many artists paint pictures of bowls of fruit?
     4) (No mistakes)

54.  1) Mary wrote a cute little poem in my autograph book.
     2) If you went to Holland, you would see many windmills.
     3) I got to take my watch to be repaired tomorrow.
     4) (No mistakes)
At the end of the program each pupil gave his brother a small present.

The boys pushed with all their might, but they couldn't move the boat by themselves.

By midnight the heavy clouds had blown away, and we could see hundreds of stars.

(No mistakes)

The meeting had already begun by the time we arrived.

One of my letters was returned because I had not put a stamp on the envelope.

Much of the gold which Captain Kidd is supposed to have buried has never been found.

(No mistakes)

Lightning had struck the tree, and a large limb had fell across the road.

This desk drawer is stuck so tightly that I can hardly get it open.

Mother asked me to try to take the top off the jar, but I couldn't do it either.

(No mistakes)

MAKE NO MARKS IN THIS BOOKLET

1. They told us boys to come back the day after tomorrow.
2. Our neighbor gave my brother and me a quarter for doing an errand.
3. Us pupils in the sixth grade are collecting money for the Red Cross.
4. (No mistakes)

The icicles that hung from the garage roof were almost two feet long.

When the ice cream cone fell to the ground, Johnny bursted into tears.

That old house looks as if it hasn't been lived in for many years.

(No mistakes)

I don't know whether or not to believe that story she told me.

I'll take this book back to the library, unless you want to read it.

He don't seem to be very surprised by the news.

(No mistakes)

We were in such a hurry to start on the picnic that we forgot to take the lunch basket.

A tube must of burned out in our television set. It wouldn't work at all last night.

Arthur and Joe have a fight almost every week, but they always make up afterwards.

(No mistakes)

Do you know to whom we should write for tickets to a radio broadcast?

1. Pearls are not found in that kind of oyster.

2. The crowd laughed when the three umpires began arguing among themselves.

3. (No mistakes)

4. I've never swam in the ocean, but I don't think I would like it.

1. Some people think rattlesnake meat is very good to eat.

2. There were so many apples on the tree that several of the branches had split.

3. (No mistakes)

4. The mountains in Pennsylvania are not so high as those in California.

1. Natalie had ought to save part of her allowance each week for Christmas presents.

2. This table rocks back and forth because one of the legs is too short.

3. (No mistakes)

4. Can you tell the difference between an oak leaf and a maple leaf?

1. Janet received more valentines than any other girl in the class.

2. We have a hammer, but there isn't any nails in the house.

3. (No mistakes)
Test W-1: Map Reading

Directions: This is a test of your ability to read maps. It contains several maps, with some questions about each one.

Four answers are given for each question, but only one of these answers is right. You are to choose the one answer that you think is better than the others. Then, on the answer sheet, find the row of circles numbered the same as the exercise. Fill in the circle for the best answer.

Use this table to find where your grade is to begin and stop on this test.

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MAKE NO MARKS IN THIS BOOKLET
The picture map on this page shows the center of town. Each of the most important buildings is marked. The signs for the streetcar line, the railway line, the bus line, and the bus stops are shown in the map.

13. What street is two blocks south of Maple Street?
   1) Birch Street  2) Station Street  3) Oak Street  4) Pine Street

14. Which building is on a street corner?
   1) The school  2) The post office  3) The fire station  4) The church

15. The park covers how many blocks?
   1) One  2) Two  3) Three  4) One cannot tell from the map.

16. Which of these is closest to a bus stop?
   1) The public library  2) The bank  3) The fire station  4) The police station

17. On which corner does the bus line cross the streetcar line?
   1) Birch Street and Fourth Avenue  2) Elm Street and Third Avenue
   3) Elm Street and Fourth Avenue  4) It does not cross the streetcar line on this map.

18. Sally lives two doors from the public library. John lives south of the park. Which has the shorter way to school?
   1) Sally  2) John  3) Neither. They live the same distance from school.
   4) One cannot tell for sure.

19. Which street is the longest?
   1) Birch Street  2) Elm Street  3) Maple Street  4) One cannot tell from the map.
The map below is a map of a make-believe country. There are four states in this country, numbered I, II, III, and IV. The key at the bottom of the page tells what the signs on the map mean.

21. Which city is located where two rivers meet?
   1) Clay  3) Pablo
   2) Morris 4) Tides

22. Which state has the most mountains?
   1) I  3) III
   2) II  4) IV

23. Which railroad trip from Tides would be shortest?
   1) To Clay  3) To Morris
   2) To Low 4) To Pablo

24. On which train trip might you be able to look at the sea all the way?
   1) Between Clay and Morris
   2) Between Pablo and Low
   3) Between Morris and Tides
   4) Between Tides and Pablo

25. Which river is longest?
   1) Beaver River 3) Nes River
   2) Duck River 4) Tin River

26. Three of the states meet at one point on the map. Where is the point located?
   1) In the mountains
   2) In a city
   3) In the middle of a lake
   4) Where a railroad crosses a river

27. If you wanted to go from Morris to Ross, which of these ways of traveling would probably be fastest?
   1) River boat to Tides, then boat
   2) Train to Clay, then boat
   3) Train to Tides, then boat
   4) Train to Pablo, then boat
The maps below show a make-believe country. There are five states in this country, numbered I, II, III, IV, and V. The large map at the top shows the rivers, mountains, highways, and railroads. The small map at the bottom shows the livestock and production. The names of the cities and towns are in alphabetical order, beginning near the top.

### Maps
- **Main Highways**
- **Railroads**

#### LIVESTOCK
- **Sheep**
- **Cattle**
- **Hogs**

#### CROPS
- **Corn**
- **Wheat**
- **Cotton**

### Questions

29. On which river would you expect to find the most traffic?

1. Bon
2. Fox
3. Hile
4. Lino

30. Ships leaving Doyle would most likely be loaded with which of these?

1. Pork and beef
2. Woolen goods
3. Wheat flour
4. Bales of cotton

31. In driving from Baxter to Alva, what would one see in great numbers along the highway?

1. Mountains
2. Sheep ranches
3. Fields of cotton
4. Fields of corn and wheat

32. Which railroad goes through a mountain pass?

1. The railroad from Alva to Cole
2. The railroad from Baxter to Cole
3. The railroad from Glacier to Hope
4. The railroad from Hope to Klee

33. About how far is it by airplane from Lubec to the nearest city on the mainland?

1. 75 miles
2. 120 miles
3. 165 miles
4. 230 miles

34. Where are the most sheep raised?

1. Near the ocean
2. Where there is plenty of corn for feed
3. Where cattle and hogs are also raised
4. Where the land is rough and mountainous

35. How do the railway and the highway distances between Baxter and Hope compare?

1. The railway distance is greater.
2. The highway distance is greater.
3. The two distances are the same.
4. One cannot tell from the map.

36. Which of these cities is shown in the picture above?

1. Baxter
2. Cole
3. Fay
4. Jasper

37. In which of these cities is there certain to be a railroad bridge over a river?

1. Baxter
2. Doyle
3. Hope
4. Klee
The map on this page is a part of a road map. To help you to find any city or town shown on the map, the names of the cities and towns appear in alphabetical order, beginning near the top.

1. Which of these is a true statement about Highway No. 17?
   1) It is a four-lane state highway.
   2) It is a paved state highway.
   3) It is a paved county road.
   4) It is a paved U.S. highway.

2. Beston is what direction from Lux?
   1) Northwest
   2) Northeast
   3) Southwest
   4) Southeast

3. In driving from Lux to Butte, how many side roads will your left hand pass by?
   1) Two
   2) Three
   3) Four
   4) Five

4. A man from Lux is driving home from Blue Lake. How many miles will he save by taking Highway No. 54 rather than Highway No. 17?
   1) 13 miles
   2) 17 miles
   3) 21 miles
   4) 24 miles

5. Which of these is a true statement about Highway No. 54?
   1) It is a paved U.S. highway.
   2) It is a paved state highway.
   3) It is a paved county road.
   4) It is a paved state highway.

6. A man in Lux wants to be in Galt in one hour. How fast must he drive, on the average?
   1) 25 miles per hour
   2) 30 miles per hour
   3) 40 miles per hour
   4) 54 miles per hour

7. If Highway No. 54 were blocked off for the first thirty miles south of Eden, what route from Lux to Eden would be the best?
   1) Highways No. 54, 3, and 9
   2) Highways No. 54, 5, and 9
   3) Highways No. 54, 1, and 54
   4) Highways No. 17, 2, and 9

8. How many of the cities shown along Highway No. 54 have populations of more than 5000?
   1) None
   2) One
   3) Two
   4) Three

9. At which of these towns is there a highway junction?
   1) Elms
   2) Fulton
   3) Galt
   4) Nusk

10. Where would this road sign be located?
    1) At Elms
    2) At Durham
    3) At the junction of Highways No. 9 and 2
    4) One cannot tell from the map.

11. Which of these is a true statement about Highway No. 54?
    1) It is a paved U.S. highway.
    2) It is a paved county road.
    3) It is a paved U.S. highway.
    4) It is a paved state highway.
Directions: This is a test of your ability to read graphs and tables. After each graph or table there are several questions. For each question, decide which answer is correct. Then mark the proper circle on the answer sheet. Mark only one circle for each question.

Use this table to find where your grade is to begin and stop on this test.

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</thead>
<tbody>
<tr>
<td>GRADE 4</td>
<td>Exercise 9 on page 62</td>
<td>Exercise 32 on page 63</td>
</tr>
<tr>
<td>GRADE 5</td>
<td>Exercise 21 on page 63</td>
<td>Exercise 46 on page 64</td>
</tr>
<tr>
<td>GRADE 6</td>
<td>Exercise 33 on page 64</td>
<td>Exercise 60 on page 65</td>
</tr>
<tr>
<td>GRADE 7</td>
<td>Exercise 41 on page 64</td>
<td>Exercise 68 on page 66</td>
</tr>
<tr>
<td>GRADES 8 AND 9</td>
<td>Exercise 47 on page 65</td>
<td>Exercise 74 on page 66</td>
</tr>
</tbody>
</table>

Number of Books Read by the Four Best Readers in Grade 3 between January 1 and June 1

1. Who read the most books?
   1) Betty  3) David
   2) Pete   4) Tom

2. How many books did David read?
   1) 14  3) 17
   2) 16  4) 18

3. How many more books did Pete read than Tom?
   1) 1  3) 4
   2) 3  4) 6

4. What was the total number of books read by David and Tom?
   1) 10  3) 27

5. The 25th comes on what day?
   1) Tuesday  3) Thursday
   2) Wednesday
   4) Friday

6. On what day does the month start?
   1) Sunday  3) Thursday
   2) Monday
   4) Saturday

7. What is the date of the third Sunday in the month?
   1) 3rd  3) 20th
   2) 7th
   4) 21st

8. One week from the 12th is what date?
   1) 13th  3) 19th
   2) 14th
   4) 20th
The drawing below shows the number of things which were turned in to the Lost and Found Department at a movie theater during one month.

The drawing below shows the number of things which were turned in to the Lost and Found Department at a movie theater during one month.

13. About how much money was turned in?
   1) $0.35  2) $0.65  3) $6.50  4) $63.00

14. How did the number of men's hats turned in compare with the number of women's hats?
   1) More women's hats were turned in.
   2) Three times as many men's hats were turned in.
   3) The same number of each was turned in.

15. Lost and found received as many coats what other article?
   1) Women's hats  2) Purses  3) Watches  4) Umbrellas

16. How many of the articles turned in to Lost and Found were returned to their owners?
   1) None  2) About half  3) Almost all of them  4) One cannot tell from the drawing.

Sue hates to get up in the morning. She found that by planning her time carefully she sleep until 8:00 o'clock and still get to school by 9 o'clock. The drawing below shows how she use her time.

17. For which of these does Sue use the most time?
   1) Washing her face and brushing her teeth
   2) Dressing, and combing her hair
   3) Eating breakfast
   4) Walking to school

18. What time is it when Sue finishes washing her face and brushing her teeth?
   1) 8:05  2) 8:07  3) 8:10  4) 8:

19. Which of these takes Sue 12 minutes?
   1) Washing her face and brushing her teeth
   2) Dressing, and combing her hair
   3) Eating breakfast
   4) Walking to school

20. Which of these takes Sue exactly one-half much time as eating breakfast?
   1) Washing her face and brushing her teeth
   2) Dressing, and combing her hair
   3) Feeding her pets
   4) Walking to school
Which of these appliances uses electricity about twice as fast as a vacuum cleaner?
1) Electric iron 3) Toaster
2) Coffee maker 4) Floor lamp

How long do some sheep live?
1) 14 years 2) 18 years 3) 20 years 4) 25 years

According to the drawing, how many of the animals listed have been known to live longer than 20 years?
1) 1 2) 2 3) 6 4) 10

The oldest lion in a large zoo would probably be about how old?
1) 5 2) 35 3) 50 4) 100

28. What kind of appliances are most expensive to run?
1) The largest ones
2) Those which supply light
3) Those which supply heat
4) Those which have motors

29. About how tall was Fred when he was in the fifth grade?
1) 30 inches 3) 50 inches
2) 40 inches 4) 55 inches

30. During which year did Fred grow fastest?
1) The first year of his life
2) The year after his first birthday
3) The year after his fifth birthday
4) The year after his tenth birthday

31. At what age was Fred twice as tall as he was at birth?
1) Two 2) Four 3) Six 4) Eight

32. About how many inches did Fred grow between his first and second birthdays?
1) 1 2) 5 3) 10 4) 35

---

The drawing below shows how long some animals have been known to live.

<table>
<thead>
<tr>
<th>Animal</th>
<th>Number of Years Lived</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camel</td>
<td>20</td>
</tr>
<tr>
<td>Cat</td>
<td>15</td>
</tr>
<tr>
<td>Cow</td>
<td>20</td>
</tr>
<tr>
<td>Dog</td>
<td>10</td>
</tr>
<tr>
<td>Elephant</td>
<td>35</td>
</tr>
<tr>
<td>Goat</td>
<td>25</td>
</tr>
<tr>
<td>Horse</td>
<td>30</td>
</tr>
<tr>
<td>Sheep</td>
<td>40</td>
</tr>
</tbody>
</table>

---

Every year on Fred's birthday his father measured his height. He then made a drawing which showed how tall Fred was at each age. This is the way it looked when Fred was in the fifth grade.

---

Which of these appliances uses electricity about twice as fast as a vacuum cleaner?
1) Electric iron 3) Toaster
2) Coffee maker 4) Floor lamp

It costs a little less than 2¢ to run a 60-watt light bulb for 10 hours. This cost is about the same as for which of these?
1) Floor lamp 3) Sewing machine

---

28. What kind of appliances are most expensive to run?
1) A refrigerator 3) A floor lamp
2) A radio 4) An electric iron

---

Every year on Fred's birthday his father measured his height. He then made a drawing which showed how tall Fred was at each age. This is the way it looked when Fred was in the fifth grade.
A sixth-grade class conducted an experiment to see the importance of milk in the diet. Two white rats, Pat and Mike, were fed the same diet for the first 20 days except that Pat was given milk and Mike received water. On the 21st day Mike began getting milk with his food, while Pat got water to drink. This is a record of their weights during the experiment.

<table>
<thead>
<tr>
<th>Days</th>
<th>Weight in Ounces</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>2</td>
<td>4.2</td>
</tr>
<tr>
<td>3</td>
<td>6.0</td>
</tr>
<tr>
<td>4</td>
<td>8.9</td>
</tr>
<tr>
<td>5</td>
<td>11.9</td>
</tr>
</tbody>
</table>

How the Motor Vacationist's Dollar Is Spent

33. What is the average monthly rainfall for September in Miami?
   1) 1.3 inches
   2) 2.6 inches
   3) 9.0 inches
   4) 81 inches

34. In which of these cities is April the driest month of the year?
   1) Fairbanks
   2) Memphis
   3) Miami
   4) San Francisco

35. Which two cities have most nearly the same average temperature in May?
   1) Fairbanks and Memphis
   2) Phoenix and San Francisco
   3) Memphis and Miami
   4) Miami and Phoenix

36. Which day generally is warmer, January 15 in Miami or July 15 in San Francisco?
   1) January 15 in Miami
   2) July 15 in San Francisco
   3) They are about equally warm.
   4) The table gives no clue to the answer.

37. Which city may be said to have cool summers and mild winters?
   1) Fairbanks
   2) Memphis
   3) Phoenix
   4) San Francisco

38. Which two items together account for exactly one-half of the total?
   1) Lodgings and retail purchases
   2) Lodgings and transportation
   3) Retail purchases and transportation
   4) Transportation and meals

39. Which type of expense ranks fourth?
   1) Transportation
   2) Lodgings
   3) Retail purchases
   4) Theaters and other amusements

40. One-fifth of each dollar is spent for what?
   1) Lodgings
   2) Meals
   3) Admissions to travel attractions
   4) Retail purchases

---

Monthly Average Temperature and Rainfall* in Selected North American Cities

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Fairbanks</td>
<td>-21</td>
<td>-11</td>
<td>-1</td>
<td>-4</td>
<td>8</td>
<td>16</td>
<td>25</td>
<td>37</td>
<td>32</td>
<td>28</td>
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<td>-35</td>
<td>-32</td>
<td>-7</td>
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<td>28</td>
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<td>Seattle</td>
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<td>-45</td>
<td>-41</td>
<td>-38</td>
<td>-15</td>
<td>2</td>
<td>25</td>
<td>42</td>
<td>37</td>
<td>32</td>
<td>28</td>
<td>16</td>
</tr>
<tr>
<td>San Francisco</td>
<td>-64</td>
<td>-60</td>
<td>-56</td>
<td>-53</td>
<td>-20</td>
<td>6</td>
<td>30</td>
<td>47</td>
<td>42</td>
<td>37</td>
<td>30</td>
<td>28</td>
</tr>
</tbody>
</table>

*Includes snow, hail, sleet, etc.

41. On which of these days did Mike weigh the least?
   1) The 1st day
   2) The 10th day
   3) The 20th day
   4) The 58th day

42. Pat's weight was the same for which of these days?
   1) The 4th and 30th
   2) The 10th and 28th
   3) The 30th day
   4) The 52nd day

43. During which of these periods did Pat's weight change the least?
   1) The 1st to the 5th day
   2) The 21st to the 25th day
   3) The 30th to the 35th day
   4) The 50th to the 55th day

44. What happened when milk was added to Mike's diet?
   1) He started to gain weight on the very first day.
   2) His weight doubled the first week.
   3) He continued to lose weight for a few days.
   4) He stopped losing weight but did not gain immediately.

45. Which was the difference in weight between two rats the greatest?
   1) The 20th day
   2) The 24th day
   3) The 30th day
   4) The 32nd day

46. How long after the change in diet did it take Mike to catch up to Pat in weight?
   1) 3 days
   2) 17 days
   3) 31 days
   4) 37 days
Directions: This is a test of study skills such as looking up words, alphabetizing, using an index, and locating information.

Read the directions for each part carefully, and then mark your answers to the questions on your answer sheet.

Use this table to find where your grade is to begin and stop on this test.

<table>
<thead>
<tr>
<th>GRADE 3</th>
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<th>Exercise 42 on page 70</th>
</tr>
</thead>
<tbody>
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<td>Exercise 66 on page 72</td>
</tr>
<tr>
<td>GRADE 5</td>
<td>Exercise 27 on page 69</td>
<td>Exercise 82 on page 72</td>
</tr>
<tr>
<td>GRADE 6</td>
<td>Exercise 43 on page 70</td>
<td>Exercise 101 on page 74</td>
</tr>
<tr>
<td>GRADE 7</td>
<td>Exercise 67 on page 72</td>
<td>Exercise 125 on page 76</td>
</tr>
<tr>
<td>GRADES 8 AND 9</td>
<td>Exercise 83 on page 73</td>
<td>Exercise 141 on page 76</td>
</tr>
</tbody>
</table>

Below is a word list which shows the correct spelling and the meaning of several words. Use this list to answer the questions on this page.

adhere: to stick; become joined
concede: admit as true
deem: think; believe
desist: stop
irate: angry
jocose: playful; joking
laden: loaded
lave: wash
lucid: easy to understand
mobile: easy to move

What is the correct spelling of the word which means “stop”?
1) disest
2) desist
3) disist
4) dezist

Which is the correct spelling of the word meaning “easily moved”?
1) mobel
2) jocose
3) mobele
4) mobile

3. Which of these is most often thought of as “jocose”?
1) A fireman
2) A clown
3) A bus driver
4) A thief

In each of the next three exercises, decide which word in the list has been left out of the sentence.

4. Scotch tape will not ___ to anything that has oil on it.
   1) adhere
   2) concede
   3) desist
   4) lave

5. Peggy had spent all her money Christmas shopping and was ___ with packages.
   1) adhered
   2) desisted
   3) laden
   4) lucid

6. Stan’s home run broke up the ball game in more ways than one. The lady whose window he broke was ___
   1) irate
   2) jocose
   3) lucid
   4) mobile
8. Which would you use to find the distance from Denver to Chicago?
1) A book about Denver
2) A history book
3) The National Geographic Magazine
4) A map of the United States

9. Which of these books would help you use the word *obtrusive* correctly?
1) A spelling book
2) A language book
3) Pocketful of Rhymes

10. Where would you look for help in writing a letter of invitation?
1) In a language book
2) In a spelling book
3) In a children’s magazine
4) In a book of games

11. Which of these is sure to be a fairy tale?
1) *The Prince and the Dwarfs*
2) *Tim and Tom*
3) *My Animal Friends*
4) *Life in a Log Cabin*

12. If you wanted to learn something about the different kinds of bears, which book would you choose?
1) *How the Bear Lost His Tail*
2) *Junior Bear Goes to Town*
3) *Bears of North America*
4) *Bimbo, the Talking Bear*

13. If you wanted to know what to feed a white rabbit, which book would help you?
1) *Farm Animals*
2) *Food for the Nation*
3) *Bugs Bunny Picture Book*
4) *How to Care for Your Pets*

14. Which of these books would be sure to contain stories about Indians?
1) *Saddle Boy*
2) *Junior Learns to Tell Time*
3) *Then and Now*
4) *Along the Pacific*

15. 1) habitual
   2) girl
   3) effort
   4) iceman

16. 1) wallet
   2) usual
   3) waffle
   4) vacant

17. 1) tadpole
   2) rascal
   3) sabre
   4) punch

18. 1) gist
   2) friend
   3) garlic
   4) habit

19. 1) people
   2) rat
   3) rage
   4) pole

20. 1) rock
    2) saddle
    3) table
    4) rubble

21. 1) island
    2) jar
    3) ice
    4) jump

22. 1) overhaul
     2) overnight
     3) overgrow
     4) overflow

23. 1) unfair
     2) undue
     3) unequal
     4) unfit

24. 1) Irwin, Ralph C.
     2) Jacobs, Philip
     3) Kelley, E. G.
     4) Holter, Richard

25. 1) Person, Omar
     2) Olson, Thomas T.
     3) Mosley, T. J.
     4) Riverton, Jessie

26. 1) Moore, Edward
     2) Moore, George R.
     3) Moore, Paul O.
     4) Moore, Donald M.
Sometimes the answer to a question is not given in the index. If you cannot find the answer in the index, mark the fourth circle, "Not in index."

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Air, fresh, 17
Burns, how to treat, 18-19
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Diseases, chicken pox, 20; colds, 36-37; measles, 15
Dress. See Clothing
Drinks, compared for health value, 21
Ear, picture of, 26; earache, 27; earwax, 28
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Food, healthful meals, 2-5; fruits as, 8; vegetables as, 6; keeping food fresh, 8-9. See also Drinks, Teeth
Germ s, 8, 10, 15, 36
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Safety, in the home, 61; on the streets and sidewalks, 65-67; in wintertime, 69
Sleep, hours of sleep needed, 43-44; temperature in bedroom, 45
Teeth, baby, 74; daily care of, 75-76; having teeth examined and fixed, 78; of the Eskimos, 80; teeth and food, 79-80

**27.** What page tells about measles?
1) 15 2) 20 3) 36 4) Not in index

**28.** What page tells about the harmful effects of smoking?
1) 2 2) 19 3) 61 4) Not in index

**29.** What page probably tells why so many Eskimos have nearly perfect teeth?
1) 76 2) 78 3) 80 4) Not in index

**30.** Which of these pages tells how to keep food fresh?
1) 2 2) 6 3) 9 4) Not in index

**31.** What page might tell what to do for a person with an earache?
1) 26 2) 27 3) 28 4) Not in index

**32.** What page might tell how the pioneers dressed to keep warm?
1) 47 2) 51 3) 52 4) Not in index

**33.** What page would tell how to clean and trim the fingernails?
1) 32 2) 34 3) 35 4) Not in index

**34.** What page might give you the safety rules for riding bicycles in the street?
1) 61 2) 67 3) 69 4) Not in index

**35.** What page tells why some people need glasses to see well?
1) 52 2) 53 3) 56 4) Not in index

**36.** If you wanted to know if coffee drinking is bad for the health, where would you look?
1) 2 2) 21 3) 43 4) Not in index

**MAKE NO MARKS IN THIS BOOKLET**
Below is the table of contents of a book called Food for All. Use this table to answer the questions below it.

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>How Farmers Plant Crops</td>
</tr>
<tr>
<td>2</td>
<td>How the Weather Affects Crops</td>
</tr>
<tr>
<td>3</td>
<td>Harvesting the Crops</td>
</tr>
<tr>
<td>4</td>
<td>The Transportation of Food</td>
</tr>
<tr>
<td>5</td>
<td>Health Laws and Food</td>
</tr>
<tr>
<td>6</td>
<td>What the Grocer Does</td>
</tr>
<tr>
<td>7</td>
<td>The Cost of Food</td>
</tr>
<tr>
<td>8</td>
<td>Daily Food Needs</td>
</tr>
<tr>
<td>9</td>
<td>Growing Your Own Food</td>
</tr>
</tbody>
</table>

37. Which chapter might tell how much milk we should drink each day?
   1) 5  2) 6  3) 8  4) 9

38. The part of the book which tells how to raise a garden begins on what page?
   1) 5  2) 15  3) 46  4) 52

39. Which chapter might tell us why the price of meat changes so much?
   1) 4  2) 5  3) 6  4) 7

40. Which chapter might tell how the government makes sure the food we buy is pure?
   1) 4  2) 5  3) 6  4) 8

41. Which chapter might tell us how food gets from the farmer to people in cities?
   1) 3  2) 4  3) 6  4) 7

42. Which one of these topics might be included in Chapter 6?
   1) How food is kept from spoiling
   2) What kinds of soil are needed for different crops
   3) How much the farmer gets for his share
   4) Which foods can be raised in the home garden

43. If you wanted to know the mean pronunciation of some difficult words in a textbook, which of these would you use?
   1) The index  3) The intr  4) The glossary
   2) The preface

44. Which would you use to find whether you would get farther north than England?
   1) A globe  2) A dictionary  3) An encyclopedia  4) A map of the United States

45. Where would you look for picture of people living in far-away countries?
   1) In the World Almanac  2) In the Reader's Digest  3) In the National Geographic Magazine  4) In an atlas

46. Which of these would help you to use the word garnish in a sentence?

47. If you wanted to read about the Victoria, which of these would you use?
   1) A geography  3) An atlas

48. Which would you use to find the capital of Oklahoma?
   1) An atlas  3) A history, n. A riv
   2) A dictionary  4) A telephone

49. If you wished to know on which page each of these topics might be included in Chapter 6?
   1) How food is kept from spoiling
   2) What kinds of soil are needed for different crops
   3) How much the farmer gets for his share
   4) Which foods can be raised in the home garden

50. What, probably, would a book of Our Dwindling Resources be?
   1) Conservation  3) Our dwindling resources be
   2) War  4) ms used: adj., n., pl., plural;
SAMPLE DICTIONARY

alac'ri-ty (al-āk’rē-tē), n. A cheerful readiness to do something; briskness; liveliness.

benign (bē-nin’), adj. 1. Kind or gentle. 2. Favorable; healthful; mild.

cal’low (kal’ō), adj. Immature; not experienced; not fully grown.

celer’i-ty (sēl’ē-rē-tē), n. Swiftness; speed.

chim’er-a (ki-mē’rā; ki-mē’rā), n. An imaginary monster; an absurd idea or wild fancy. — chim’er-i-cal (-mēr’i-kl), adj.

deco’rum (dē-kō’rūm), n. Dignity; orderliness; proper conduct.

due (dū), adj. 1. Owed or owing as a debt; as, the rent is due. 2. Proper; fit; suitable; as, a due reward. 3. Caused by; as, an accident due to carelessness. 4. Scheduled or expected; as, due at 8:00 o’clock.

facto’tum (fak-tō’tūm), n. A person employed to do all kinds of tasks.

mat’ri(x) (mā’triks), n.; pl. MATRICES (mā’triks). That which gives origin or form to something enclosed within it.

pre-co’cious (prē-kō’shēz), adj. Developing very early, earlier than usual.

solem’nize (sōl’ēm-niz), v. 1. To observe or honor with ceremony. 2. To perform with ceremony or legal forms.

Thames (tēmz), n. A river in England.

51. Which of these spellings of the word meaning “to observe with ceremony” is correct?
   1) sollemnize 3) solemniz
   2) sollemnise 4) solemnize

52. How many syllables are there in celerity?
   1) Two 3) Four
   2) Three 4) Five

53. Which letters make the accented syllable of chimera?
   1) chi 3) me
   2) chim 4) ra

54. Which letter in benign is silent?
   1) b 3) the first n
   2) e 4) g

AIDS TO USING THIS SAMPLE DICTIONARY:

1. Key words for pronunciation: āge, ādd, āc-count, càre, ārm, āsk, sofā; ēve, hēre, ēvent, ēnd, silēnt, makēr; ēce, īll, chārity; āld, ābey, ōrb, ōdd, ānnēct; ēéd, ēōst; āut, oil; ēībē, ānīte, ārn, īp, cirēfs.

2. Syllables are indicated by a dot (·) or by the light (’) or heavy (‘) accent mark.

3. Abbreviations used: adj., adjective; adv., adverb; n., noun; pl., plural; v., verb.

55. Celerity comes closest in meaning to which of these words?
   1) alacritity
   2) benign
   3) decorum
   4) factotum

56. Which meaning given in the dictionary fits the word due in this sentence? “Sue’s absence was due to illness.”
   1) Number 1 3) Number 3
   2) Number 2 4) Number 4

57. How is the plural of matrix spelled?
   1) matrices
   2) matrisez
   3) matrixs
   4) matriks

58. Which of these words rhymes with Thames?
   1) James
   2) gems
   3) lamb
   4) came

59. Which of these would be described as precocious?
   1) A three-year-old child who can walk
   2) A four-year-old child who can read
   3) A boy who gets to school an hour early
   4) A dog that can sit up and beg

60. Which of these words best fits in this sentence? “His noisy conduct disturbed the
   1) alacritity
   2) callow
   3) decorum
   4) solemnize
61. If you wanted to read about the city of Rome, the capital of Italy, which volume would you choose?
1) Volume 2 3) Volume 7
2) Volume 4 4) Volume 8

62. Arizona and Utah are among the leading states in copper production. Which volume would tell about some of the uses of this mineral?
1) Volume 1 3) Volume 5
2) Volume 2 4) Volume 6

63. Which volume would tell whether tigers are found in the jungles of India and Africa?
1) Volume 1 3) Volume 7
2) Volume 4 4) Volume 8

64. Which volume might have pictures of the robin, the sparrow, the hawk, and the crow?
1) Volume 1 3) Volume 3
2) Volume 2 4) Volume 7

65. In which volume would you read about Daniel Boone, the famous pioneer from Kentucky?
1) Volume 1 3) Volume 4
2) Volume 2 4) Volume 6

66. If you wanted to read how iron, silver, and gold are obtained, which volume would you select first?
1) Volume 3 3) Volume 5
2) Volume 4 4) Volume 7

In the exercises below you are to choose a word that would appear first if the four words were arranged in alphabetical order.

67. 1) fable
2) ending
3) drowsy
4) duck

68. 1) lumber
2) number
3) lump
4) lunch

69. 1) strangle
2) table
3) sprite
4) talkative

70. 1) garble
2) garb
3) garbage
4) garage

71. 1) making
2) maple
3) marble
4) nab

72. 1) defend
2) defective
3) detective
4) defensive

73. 1) limb
2) limbate
3) limber
4) limbo

74. 1) numb
2) numbness
3) numbly
4) mumps

75. 1) kilogram
2) kilo
3) kilowatt
4) kilometer
Test A-1: Arithmetic Concepts

Directions: This is a test of how well you understand the number system and the terms and operations used in arithmetic.

Four answers are given for each question, but only one of these answers is right. You are to choose the one answer that you think is better than the others. Then, on the answer sheet, find the row of circles numbered the same as the exercise. Fill in the circle for the best answer.

Use this table to find where your grade is to begin and stop on this test.

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1. In what part of this picture is the house?
   1) Upper left
   2) Upper right
   3) Lower left
   4) Lower right

2. Which of the figures above is a square?
   1) A
   2) B
   3) C
   4) D

3. What time is it by this clock?
   1) 20 minutes to 12
   2) 10 minutes after 11
   3) 5 minutes to 4
   4) 5 minutes after 4

4. How would you write four hundred thirty-nine in figures?
   1) 439
   3) 4039

5. Which of the figures above is a square?
   1) A
   2) B
   3) C
   4) D

6. What time is it by this clock?
   1) 20 minutes to 12
   2) 20 minutes after 11
   3) 5 minutes to 4
   4) 5 minutes after 4

7. How would you write seven dollars and thirty-eight cents in figures?
   1) $7.38
   2) $7.38
   3) 7.38¢
   4) $738

8. Gloria visited her cousin in the country for two weeks. How many days did she stay?
   1) 7
   2) 10
   3) 12
   4) 14
10. How much money is shown above?
1) 51¢ 3) 87¢
2) 76¢ 4) 96¢

MAKE NO MARKS IN THIS BOOKLET

11. Which of the figures above is divided into fifths?
1) A 3) C
2) B 4) D

12. How many minutes are there from 10 o’clock to 11 o’clock?
1) 30 3) 60
2) 50 4) 100

13. What is the largest number that can be written by using the figures 3, 6, and 9 once each?
1) 693 3) 639
2) 936 4) 963

14. In counting, Sue said, "16, 19, 22, 25, 28, 31." How was she counting?
1) By 2’s 3) By 4’s
2) By 3’s 4) By 5’s

15. Which of the lines above is about 1 inch long?
1) a 3) c

16. Uncle Martin carries his lunch to work each day. How much coffee does he probably take?
1) ½ gallon 3) 3 quarts
2) 1 pint 4) 1 gallon

17. Which of these numbers is larger than 6 and smaller than 9?
1) 5 3) 9
2) 7 4) 11

18. Which of these groups of coins is equal in value to a dollar?
1) 10 dimes 3) 5 quarters
2) 50 pennies 4) 25 nickels

19. Which group of three months is in the proper order?
1) March, April, February
2) May, July, June
3) September, August, October
4) November, December, January

20. How would you read 2803?
1) Two thousand eight hundred three
2) Twenty-eight thousand three
3) Two hundred eighty thousand three
4) Two thousand eighty-three

21. Only 4 oranges are left in the grocer's bin. How many must he take from a new crate to make a dozen?
1) 2 3) 8
2) 6 4) 11

22. Which of these numbers is the smallest?
1) 1007 3) 732
2) 1121 4) 498

23. Jack has the coins shown above. How much money can he spend and still have 17¢ left for bus fare?
1) 31¢ 3) 35¢
2) 34¢ 4) 36¢
1. Which one of the number facts below does not belong to the same family or group as 15 - 11 = 4?
   1) 11 + 4 = 15
   2) 15 - 4 = 11
   3) 7 + 4 = 11
   4) 4 + 11 = 15

2. Larry built a kite 2 feet long. How many inches long did he make it?
   1) 18
   2) 20
   3) 24
   4) 36

3. Which of the figures above is one-fourth shaded?
   1) A
   2) B
   3) C
   4) D

4. Which of these addition facts is not shown by either of the pictures above?
   1) 4 + 2 = 6
   2) 3 + 3 = 6
   3) 2 + 4 = 6
   4) 5 + 1 = 6

5. What is the meaning of 236?
   1) 23 hundreds and 6 ones
   2) 2 hundreds and 36 tens
   3) 2 hundreds, 30 tens, and 6 ones
   4) 2 hundreds, 3 tens, and 6 ones

6. In which of these examples should the question mark be a plus sign?
   1) 4 ? 3 = 7
   2) 8 ? 2 = 4
   3) 9 ? 5 = 4
   4) 3 ? 2 = 6

7. Which of these pictures shows how to divide 12 marbles equally among 3 boys?
   1)
   2)
   3)
   4)

8. In the picture, how long is the line above the ruler?
   1) 1 inch
   2) 1 and one-quarter inches
   3) 1 and one-half inches
   4) 2 and three-quarters inches

9. What is the smallest number that can be written by using the figures 7, 2, 4, and 1 once each?
   1) 1247
   2) 1724
   3) 1274
   4) 1427

10. Jerry listens to his favorite radio program each afternoon at 5:15. At the time shown by this clock, how many minutes must he wait for the program to begin?
    1) 8
    2) 20
    3) 22
    4) 32
37. Jane bought a coin purse for 59¢ and gave the clerk a dollar. How would the clerk count Jane's change?
   1) 58¢, 59¢, 60¢, 65¢, 75¢, $1.00
   2) 58¢, 63¢, 73¢, 74¢, 75¢, $1.00
   3) 58¢, 68¢, 73¢, 74¢, 75¢, $1.00
   4) 58¢, 59¢, 60¢, 85¢, 90¢, $1.00

38. In which of these addition exercises do you carry a ten?
   1) 43
   2) 352
   3) 241
   4) 147
   5) 72
   6) 164
   7) 128
   8) 235

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39. What part of this figure is shaded?
   1) \( \frac{3}{8} \)
   2) \( \frac{3}{4} \)
   3) \( \frac{5}{8} \)
   4) \( \frac{5}{6} \)

![Shaded Figure]

40. Eddie is 10 inches taller than a yardstick. How many inches tall is he?
   1) 34
   2) 40
   3) 46
   4) 58

41. How many hours is it from 12 o'clock noon until 12 o'clock midnight?
   1) 48
   2) 24
   3) 12
   4) 10

42. What does the Roman number XXXIV mean?
   1) 24
   2) 34
   3) 35
   4) 36

43. These groups of numbers show how Mary counted by 2's, 3's, 4's, and 5's. In which group did she make a mistake?
   1) 37, 39, 41, 43, 45
   2) 20, 23, 26, 30, 33
   3) 10, 14, 18, 22, 26
   4) 17, 22, 27, 32, 37

44. Which of these is an odd number?
   1) 122
   2) 21
   3) 21

45. Fred's father saw candy priced at 31.50 per lb. Which of these would be the best way to estimate the cost of 3 boxes?
   1) $1.00 \times 3
   2) $1.50 \times 3
   3) $1.90 \times 3
   4) $2.00 \times 3

46. If a number is divided by 7, what is the largest size the remainder may have?
   1) 6
   2) 7
   3) 8
   4) Larger than 8

47. Sally's mother opened a quart carton of milk and used 2 cups for cooking. How much milk left in the carton?
   1) 3 cups
   2) 1 cup
   3) 1 pint
   4) None

48. What temperature does this thermometer show?
   1) 61°
   2) 60°
   3) 59°
   4) 58°

49. Nancy's little sister is 16 months old. Which is another way to express her age?
   1) 1 yr. 6 mo.
   2) 1 hr.
   3) 1 yr. 2 mo.
   4) 1 yr. 4 mo.

50. In which of these exercises is the 10 a product?
   1) 10 \div 2 = 5
   2) 5 \times 2 = 10
   3) 6 + 4 = 10
   4) 2 \times 10 = 20

51. How would you find the average of the numbers 4, 2, 8, and 6?
   1) Add the numbers and divide the sum by 4.
   2) Add the numbers and multiply the sum by 4.
   3) Add the numbers and divide the sum by 4.
   4) Multiply each number by 4 and add the answers.
1. In the number 2165, which figure has the greatest
value?
1) 2
2) 1
3) 6
4) 5

2. In the number 2165, which figure has the greatest
size from largest to smallest?
1) 2
2) 3
3) 6
4) 5

3. Which of these fractions is a pair of like fractions?
1) \( \frac{2}{3}, \frac{2}{3} \)
2) \( \frac{3}{5}, \frac{6}{10} \)
3) \( \frac{5}{9}, \frac{3}{6} \)
4) \( \frac{4}{5}, \frac{6}{10} \)

4. Which group of fractions is arranged in order of
size from largest to smallest?
1) \( \frac{1}{6}, \frac{1}{4}, \frac{1}{8} \)
2) \( \frac{1}{5}, \frac{1}{4}, \frac{1}{2} \)
3) \( \frac{1}{3}, \frac{1}{6}, \frac{1}{5} \)
4) \( \frac{1}{2}, \frac{1}{3}, \frac{1}{6} \)

5. Which of these fractions is greater than 1?
1) \( \frac{3}{5} \)
2) \( \frac{5}{8} \)
3) \( \frac{2}{3} \)
4) \( \frac{4}{5} \)

6. Which of these is the greatest weight?
1) 1 lb. 10 oz.
2) 1 lb. 4 oz.
3) 1.5 lb.
4) 14 oz.

7. Which of these is the greatest distance?
1) 2 yd.
2) 3 ft. 2 in.
3) 42 in.
4) 1 yd. 2 ft.

8. Which of these fractions is greater than 1?
1) \( \frac{3}{4} \)
2) \( \frac{5}{4} \)
3) \( \frac{4}{4} \)
4) \( \frac{4}{3} \)

9. Which of these is the longest period of time?
1) 50 wk.
2) 1 yr.
3) 11 mo.
4) 360 da.

10. Which of these is a pair of like fractions?
1) \( \frac{1}{2}, \frac{3}{6} \)
2) \( \frac{2}{3}, \frac{3}{5} \)
3) \( \frac{1}{3}, \frac{3}{5} \)
4) \( \frac{1}{2}, \frac{1}{3} \)

11. How would you write the time for 15 minutes
before midnight?
1) 12:15 A.M.
2) 12:15 P.M.
3) 11:45 A.M.
4) 11:45 P.M.
67. How many 4's are there in six 5's?
   1) 2  3) 24
   2) 12  4) 32

68. Which of these expressions is a mixed number?
   1) \( \frac{2}{3} \)  3) 1\( \frac{1}{2} \)
   2) \( \frac{3}{5} \)  4) \( \frac{7}{8} \)

69. Which of these pairs of fractions has a denominator of 12?
   1) \( \frac{1}{4}, \frac{5}{8} \)  3) \( \frac{1}{5}, \frac{2}{3} \)
   2) \( \frac{3}{8}, \frac{1}{2} \)  4) \( \frac{1}{6}, \frac{3}{4} \)

70. How would you write five hundred six thousand seventy-two in figures?
   1) 506,072  3) 506,72
   2) 500,672  4) 506,702

71. Which of these fractions can be reduced by using 3 as a divisor?
   1) \( \frac{8}{15} \)  2) \( \frac{5}{16} \)  3) \( \frac{12}{18} \)  4) \( \frac{7}{21} \)

72. Which of the subtraction exercises below is worked correctly?
   1) \( \frac{5}{6} \)  3) \( \frac{7}{8} = \frac{7}{8} \)
   \( \frac{2}{3} \)  4) \( \frac{1}{4} = \frac{2}{8} \)
   \( \frac{3}{6} = \frac{1}{2} \)  5) \( \frac{5}{8} \)

73. The automobile distance from Chicago to New York is about 800 miles. Which of these explains the meaning of “about 800 miles”?
   1) Slightly more than 800 miles
   2) Slightly less than 800 miles
   3) Exactly 800 miles
   4) Either slightly more or slightly less than 800 miles

74. Which of these distances along the ruler above is 2\( \frac{1}{2} \) in.?
   1) A to B  2) A to C  3) A to D  4) A to E

75. Which of these is a correct way to find a fraction equal to \( \frac{4}{6} \)?
   1) \( \frac{4}{6} = \frac{4 \times 2}{6 \times 2} = \frac{8}{12} \)
   2) \( \frac{4}{6} = \frac{4 + 2}{6 + 2} = \frac{6}{8} \)
   3) \( \frac{4}{6} = \frac{4 - 2}{6 - 2} \)
   4) \( \frac{4}{6} = \frac{4 \div 2}{6 \div 2} \)

76. Which of these is a correct way to find the perimeter of the figure below?
   1) \( \frac{2 \times 10}{6} \)
   2) \( \frac{6 + 8}{6} \)
   3) \( \frac{6 \times 8}{8} \)
   4) \( \frac{6 + 8 + 6 + 8}{8} \)

77. The average of 4 numbers is 12. What is the sum?
   1) 48  2) 36  3) 24  4) 18

78. If 13.48 is rounded off to the nearest whole number, what is the result?
   1) 10  2) 13  3) 14  4) 13

79. Which of these reductions in the price of an article would result in the greatest saving for the customer?
   1) \( \frac{1}{4} \) off  2) \( \frac{1}{5} \) off  3) \( \frac{1}{3} \) off  4) \( \frac{1}{10} \) off

80. Broadcast time for a Thanksgiving Day football game in Minneapolis is 1:15 P.M. At what time should a person in New York tune in for broadcast?
   1) 2:15 P.M.  3) 12:15 P.M.
   2) 1:15 P.M.  4) 11:15 A.M.
Problem Solving

Directions: This is a test of your skill in solving arithmetic problems.

The problems in the test are like the samples shown at the right. After each problem are three possible answers and a "Not given" — meaning that the correct answer is not given.

Work each problem and compare your answer with the three possible answers. If the correct answer is given, fill in the circle on the answer sheet that has the same number as the right answer. If the correct answer is not given, fill in the fourth circle.

The sample exercises show you what to do.

Use this table to find where your grade is to begin and stop on this test.

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3. On Tuesday Miss Lee began to read a story to the third grade. She read 6 pages on Tuesday, 4 on Wednesday, 5 on Thursday, and 4 on Friday. How many pages of the story did she read that week?
   1) 15  2) 18  3) 39  4) (Not given)

4. The third-grade pupils were reading animal stories. They had 12 books about animals in the schoolroom. Miss Lee brought others from the library. How many books about animals did they have then?
   1) 5  2) 7  3) 12  4) (Not given)
To work problems 5 – 10, look at the picture above to find the prices of things. Do not allow for sales tax.

5. Kathy bought a pencil, an eraser, and a notebook. How much did she pay in all?
   1) 17¢  2) 18¢  3) 19¢  4) (Not given)

6. How much did Steve pay for a jar of paste and a pair of scissors?
   1) 13¢  2) 35¢  3) 37¢  4) (Not given)

7. How much more did Wanda have to pay for a box of paints than for a box of crayons?
   1) 9¢  2) 11¢  3) 47¢  4) (Not given)

8. Paul bought a ruler and paid for it with a quarter. How much change did he receive?
   1) 12¢  2) 13¢  3) 37¢  4) (Not given)

9. How much did Joyce have to pay for a tablet and an eraser?

10. Ned bought a box of crayons and a pencil. How much did they cost?
    1) 14¢  2) 24¢  3) $1.14  4) (Not given)

11. The third grade had a picnic in the park. The school bus took 25 of the 32 pupils. The others went in cars. How many pupils went in cars?
    1) 7  2) 13  3) 17  4) (Not given)

12. The children gave most of the food for the picnic. The class paid $2.24 for ice cream and $1 for pop. How much did the class spend?
    1) $3.24  2) $3.40  3) $3.44  4) (Not given)
18. Bobby's brother sent him 29 German stamps. He already had 7 stamps from that country. How many German stamps did he have then?
   1) 22  2) 26  3) 35  4) (Not given)

20. Dick had 15 airmail stamps and Bobby had 28. How many more airmail stamps did Dick need to equal Bobby's collection?
   1) 28  2) 13  3) 3  4) (Not given)

21. Bobby bought a package of 42 Japanese stamps. He found that 8 were exactly like stamps already in his collection. He gave these to Dick. How many stamps did Bobby keep from the package?
   1) 34  2) 46  3) 50  4) (Not given)

22. Lucy planned a birthday party for her sister, Janet. Janet was 8 years old. Lucy was 7 years older. How old was Lucy?
   1) 7  2) 13  3) 15  4) (Not given)

23. Lucy had $4.75 to spend for Janet's party. Their mother baked the cake. The napkins and favors cost $2.70. How much could Lucy spend for ice cream?
   1) $2.05  2) $2.75  3) $4.75  4) (Not given)

24. Lucy cut the cake into 24 pieces. She served ice cream and cake to 16 children. How many extra pieces of cake did Lucy have?
   1) 8  2) 12  3) 18  4) (Not given)

25. Janet's aunts gave her money for her birthday. Aunt Mary gave her 50¢ and Aunt Kate gave her 75¢. How much money did Janet receive?
   1) $1.15  2) $1.20  3) $1.25  4) (Not given)
To work problems 26 – 31, look at the picture above to find the prices of things. Do not allow for sales.

26. Pete chose a pork chop, milk, peas, and pie for his lunch. How much did his lunch cost?
   1) 38¢  3) 48¢  
   2) 47¢  4) (Not given)

27. Alan wanted 2 hot dogs and an apple for his lunch. He had only a quarter. How much money would he need to borrow?
   1) 3¢  3) 19¢  
   2) 9¢  4) (Not given)

28. For dessert Dorothy bought 4 cookies and ice cream. How much did she pay for dessert?
   1) 13¢  3) 28¢  
   2) 18¢  4) (Not given)

29. Ralph bought ice cream for himself and the four other boys at his table. How much did the ice cream cost?
   1) 22¢  3) 40¢  
   2) 28¢  4) (Not given)

30. Linda’s lunch included soup, 2 cheese wiches, salad, and ice cream. How much did lunch cost?
   1) 30¢  2) 40¢  3) 55¢  4) (Not given)

31. Miss White reported that 27 of the 32 pupils in her room bought milk for lunch. How much did they pay in all for milk?
   1) $1.22  2) $1.62  3) $1.92  4) (Not given)

32. The fourth grade was studying about lions. Doris found 4 stories about these animals. Rose found 3 times as many as Doris. How many stories did Rose find?
   1) 3  2) 7  3) 9  4) (Not given)
34. Art read that a cattle-eating tiger kills a cow about every 5 days, sometimes oftener and sometimes not that often. About how many cattle would one of these tigers kill in a year? (1 year = 365 days)
   1) 80  2) 70  3) 60  4) 50 (Not given)

35. Jim had 60 customers on his paper route. Friday evening his brother carried 1/4 of the papers so they could go to the early movie. How many papers did Jim's brother carry?
   1) 20  2) 23  3) 30  4) (Not given)

36. Tom had 47 customers on his morning paper route. If he received 7¢ a week for delivering the papers to each customer, how much did he earn each week on his paper route?
   1) $2.89  2) $3.29  3) $3.39  4) (Not given)

37. Hugh and Alice went with their father to buy a Christmas tree. It cost $2.39. Their father paid the clerk with a five-dollar bill. How much change should he have received?
   1) $2.61  2) $2.71  3) $3.39  4) (Not given)

38. Alice bought some new decorations for the Christmas tree. She paid 98¢ for a can of snow spray, 13¢ for a package of angel hair, 25¢ for a large box of icicles, and 29¢ for a package of Christmas rope. How much did she pay in all for these decorations?
   1) $1.55  2) $1.64  3) $1.65  4) (Not given)

39. Hugh spent 76¢ for 4 Christmas tree light bulbs. How much did he pay for each light bulb?
   1) 19¢  2) 18¢  3) 14¢  4) (Not given)

40. Lincoln school collected money for the Junior Red Cross. Each of the 29 pupils in the fourth grade gave 15¢. How much did the fourth-grade pupils give altogether?
   1) $1.45  2) $3.95  3) $4.35  4) (Not given)

41. The fifth grade passed a collection box, and each pupil gave as much as he wished. The total amount in the box was $5.76. If there were 32 pupils in the fifth grade, what was the average amount each gave?
   1) 13¢  2) 18¢  3) 32¢  4) (Not given)

42. About 1/4 of the money collected in the city schools for the Junior Red Cross was given by the pupils in Lincoln School. They gave $29.67. About how much did all of the city schools give?
   1) $10.00  2) $60.00  3) $70.00  4) $90.00

43. Mrs. Richards, Ted, and Diana made a train trip from Chicago to New York City. Diana, who was 10 years old, rode for half fare. If the round-trip full fare was $52.26, how much did the round-trip ticket for Diana cost?
   1) $21.13  2) $26.03  3) $26.13  4) (Not given)

44. The total round-trip fare for Mrs. Richards and the two children was $130.65. If they had been able to use a special family-travel plan, they could have made the trip for $78.39. How much would they have saved?
   1) $52.26  2) $52.36  3) $62.26  4) (Not given)

45. On the route they traveled, the distance from Chicago to Pittsburgh was 468 miles; from Pittsburgh to Harrisburg, 245 miles; from Harrisburg to Philadelphia, 109 miles; and from Philadelphia to New York City, 86 miles. How many miles was it from Chicago to New York City by this route?
   1) 898  2) 907  3) 908  4) (Not given)

46. It took 9 hours to go the 468 miles from Chicago to Pittsburgh. What was the average speed of the train in miles per hour for this part of the trip?
   1) 50  2) 52  3) 62  4) (Not given)

47. Mrs. Richards and the children had dinner on the train. Diana and her mother each chose the $1.50 plate dinner and Ted the $2.75 dinner. What was the total cost of the meal?
   1) $4.70  2) $5.65  3) $6.55  4) (Not given)
49. The owner of the local greenhouse gave the Cubs in Kenny's Den 192 petunia plants to beautify the neighborhood playground. They made 12 flower beds and planted the same number of petunias in each bed. How many petunias did they plant in each bed?  
1) 11  2) 12  3) 16  4) (Not given)

50. Kenny's brother had just joined the Cub Scouts. His father gave him $5.00 to buy his outfit. He bought a cap for $1.10, a shirt for $2.95, a neckerchief for 55¢, and a neckerchief slide for 12¢. How much money did he have left?  
1) $.28  2) $.38  3) $1.28  4) (Not given)

51. Kenny is saving 30¢ each week to buy a Cub-Scout knife. The knife costs $1.50. If he now has 90¢, how many more weeks must he wait before he can buy the knife?  
1) 5  2) 3  3) 2  4) (Not given)

52. Mr. Stone bought a flash camera outfit for Jerry and Judy. He paid $7.20 for the camera, $3.65 for a flash unit, $1.38 for 3 rolls of film, and $1.04 for 8 flash bulbs. How much did Mr. Stone pay for the outfit?  
1) $12.27  2) $13.27  3) $13.38  4) (Not given)

53. Jerry paid $2.04 for a roll of color film. The cost included developing the film and making one print for each of the 12 pictures. How much did each color picture cost?  
1) 17¢  2) 18¢  3) 22¢  4) (Not given)

54. Jerry and Judy sent 3 rolls of film to the photo shop for developing and printing. There were 12 exposures on each roll. If five of the pictures were not clear, how many pictures were good?  
1) 31  2) 21  3) 7  4) (Not given)

55. The track for Joe's electric train was a 200-inch oval. Roger's train had 12 curved and 4 straight sections of track each 10 inches long. How many inches longer was Joe's track?  
1) 40  2) 60  3) 80  4) (Not given)

56. Joe's train cost $24.95. He made a down payment of $4.95 and paid the balance at $5.00 per month. How many months did it take Joe to finish paying for the train?  
1) 6  2) 5  3) 4  4) (Not given)

57. Roger's train was 31 inches long. After he added the 2 new cars his father gave him for Christmas, the train was 48 inches long. How long in inches was each car?  
1) 8  2) 8½  3) 9  4) (Not given)

58. Roger wanted to buy a pair of hand-operated switches costing $8.95, 7 more sections of track costing $2.50 each, and a talking station costing $19.95. How much money would Roger need for this additional equipment?  
1) $29.15  2) $30.65  3) $39.60  4) (Not given)

59. The locomotive and tender on Joe's train were 19 inches long. Those on Roger's train were 16½ inches long. How much longer in inches were the locomotive and tender on Joe's train?  
1) 3  2) 3½  3) 3½  4) (Not given)

60. Mr. Miller's lot was a rectangle 48.7 feet wide and 106.5 feet long. How many feet of fencing would he need for one side and one end of the lot?  
1) 57.8  2) 77.6  3) 155.2  4) (Not given)

61. When the contractor used a level to check the fall in the drain for Mr. Miller's basement, he found that the reading was 7.48 feet at the basement and 10.05 feet at the outlet. What was the fall in feet from the basement to the outlet?  
1) 2.53  2) 3.57  3) 17.53  4) (Not given)

62. Mr. Miller's lot was 48.7 feet wide. His neighbor's lot was 50.0 feet wide. How many feet narrower was Mr. Miller's lot?  
1) 1.3  2) 2.3  3) 11.3  4) (Not given)
APPENDIX IV

DOMAN-DELACATO SCALE
### TEST SHEET FOR LATERALITY AND NEUROLOGICAL ORGANIZATION

- **Name of child:** ____________________________  Age: __________  Grade: __________
- **Address:** ____________________________  Telephone: __________

### Ulford Reading Test

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### Laterality Tests

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<td></td>
</tr>
<tr>
<td>a. Binocular (telescope)</td>
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</tr>
<tr>
<td>b. Monocular (board with hole)</td>
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<tr>
<td>2. Near point</td>
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<td>3. Fusion</td>
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<td>4. Controlling eye</td>
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| B. Hand preference |       |      |      |
| 1. In writing |       |      |      |
| 2. In throwing a ball |       |      |      |
| 3. In eating |       |      |      |
| 4. In brushing teeth |       |      |      |
| 5. In using scissors |       |      |      |

| C. Foot preference |       |      |      |
| 'High step (at least two feet high) |       |      |      |

### Neurological Tests

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<tr>
<td>B. Cortical opposition</td>
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<td>C. Supination</td>
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<tr>
<td>D. Pronation</td>
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APPENDIX V

INFORMAL READING INVENTORY
READING SELECTIONS

Informal Reading Inventory, No. 2

Betts Series '1950'

American Book Company
Publisher

This is the property of the

Chicago Archdiocesan Reading Service
Kim and Wendy look and look.
It is fun to look for a toy.

"Here is a blue toy," said Kim.
"Here is a big blue toy for you."

Wendy said, "A big toy!
I do not want a big toy.
I want a little toy.
I do not see what I want."
Soon the Shoe Man looked up. He saw something.

"Look, Freddie," he said
"My kitten likes to play with old shoes. Do you see what I see?"

"Oh, oh," said Freddie.
"It is my old shoe. The little kitten had my shoe."
By and by a man came out of the farm house. He was looking for a duck to eat. The man looked at Sonny.

"Oh, there is a good duck," said the man.

"A good duck to eat."

The other ducks laughed.
But not Sonny.
Oh, no, not Sonny!
One day Mr. Brooks said to his family, "Mary and George are growing up. This apartment is too little for us. It is time to find a house."

So Mr. Brooks looked for a house. At last he found one in a town not far from Harbor City.

"Lots of oak trees grow there," he told his family. "In the fall the oak leaves turn red. So the town is called Red Oaks. I hope you will like it."

Then Mr. Brooks showed his family a picture of the new house. It was white, with a blue door and a red chimney. The picture showed a swing in a big tree.
One February afternoon I was walking my bicycle carefully along Maple Street, trying to keep off the icy spots. Coming around the corner for all he was worth was Don Welch. Don knew about that ice, but today his mind seemed to be a thousand miles away.

He started to pedal straight across the ice. When he had pedaled a few feet, his bicycle suddenly slipped from under him and went spinning across the ice. The show lasted for about fifty feet. Then Don’s head tunneled into a snowbank near a telegraph pole.

I began to laugh. But Don wasn’t laughing. Neither was I when I saw him come out of the snowdrift. He looked as cheerful as a ram cloud as he crawled toward his bicycle.

“Here, let me help you, Don,” I said.

“Stand back, Stephen Piper,” he warned. “You don’t dare hinder one of Sam’s boys.”
A wind swept across Lake Henry, stretching the sail of the catboat. Jimmy Johnson sat in the stern of the *Eager Beaver*, one hand on its tiller.

Jimmy loved sailing. His mother said it must be his Norwegian blood. Jimmy wished he had lived long ago when Norwegian sailors had battled the Atlantic. They surely had their problems!

Jimmy had a problem, too. It was his cousin from Nevada, now perching near by. Oliver was tall and thin, with huge, humorless eyes behind heavy rimmed spectacles. As usual, he was reading a book.

"Look, Oliver," said Jimmy. "Thanks for offering to be my crew in the race Saturday, but I know you don't want to. So I'll get Don Shepherd instead."

"No, James," Oliver replied in a way that Jimmy usually connected only with professors. "I will be delighted to go along and assist you. By Saturday I will be a regular sailor, for I will have impressed upon my mind the information in this manual."
But the glory of the heavens first burst forth when Galileo trained his spyglass on the Milky Way. People had wondered about the bluish-white streak that ran like a ribbon across the canopy of the heavens.

Galileo answered their inquiries by saying, "Millions of stars, too far away to be seen by the eye alone!"

The world was breathless with excitement. Galileo was discovering the hidden universe. But the most inspiring spectacle came on the night of January 7, 1610. The discoverer, that night, turned his attention to the planet Jupiter. He was surprised to see three bright stars near the planet. The next night he found that those three stars were all on the same side of Jupiter.

Galileo was elated. And what was his excitement when one of the stars disappeared around the edge of the planet! Later he saw from his conservatory four stars where before there had been only three.

"There are four moons wheeling around Jupiter," Galileo announced, no longer in doubt.
The half-bent figure suddenly straightened. The orchestra, holding its breath for one tense moment, waited for the initial down beat. I was holding my breath, too, as I stood watching from the corner of my eye the profile of the conductor.

The poised baton signaled its first decisive command. Four detached raps of the kettledrum modestly announced the opening of this Beethoven masterpiece, the most serene of all violin concertos. Unique from his pen, it reflects, perhaps, the one unclouded period of that master’s life. With the Fourth Symphony and the G-major Piano Concerto it shares a confident faith in what life promised to hold for him.

The long orchestral introduction which precedes the soloist’s first entrance is at once a challenge and an invitation: a challenge to the nerves and an invitation to memory. Waiting your cue, you relive the past and anticipate the future with a kind of lightning rapidity; the spur of heightened excitement lifts your imagination over the barriers of time and space. At least, it was so for me.
Motivation: Have you ever been in a toy store? Did you buy a big toy or a little one? Let's see what happened in this story.

Comprehension check:

I 1. What happened in this story?  
 Responses: Kim and Wendy went to a toy store to buy a toy. Any answer

F 2. What did Wendy want?  
 Responses: A little toy

I 3. What kind of toy do you think Wendy will take?  
 Responses: Any answer

F 4. What color toy did Kim want Wendy to have?  
 Responses: A blue toy

I 5. What shows that Kim and Wendy were kind to each other?  
 Responses: They thought of each other.

Motivation: Did you ever lose something and then have a surprise when you found it? That's what happened to little Freddie in our story.

Comprehension check:

I 1. What is the story about?  
 Responses: A lost shoe

F 2. When did the man see the kitten?  
 Responses: When he looked up

F 3. Whose kitten was it?  
 Responses: The Shoe Man's

F 4. What did the kitten like to play with?  
 Responses: Old shoes

I 5. What happened to the old shoe?  
 Responses: The kitten took it up onto a shelf

F 6. To whom did the old shoe belong?  
 Responses: Freddie

I 7. How do you think Freddie felt about what the kitten did?  
 Responses: He didn't care, or he thought it was a good joke.
Motivation: This is a story about a family who is moving to a new home.

Comprehension check:

1. What were the names of Mr. Brooks' children?
2. Why was Mr. Brooks looking for a house?
3. Was it easy to find a new home?
4. Where was the new home located?
5. Why was the town called Red Oaks?
6. Do you think the Brooks family will like to live in the new house?
7. How does an apartment differ from a house?
8. How did the family know what the new house would look like?
9. What three colors describe the new house?
10. What is something about the new house the children will like?

Responses:

1. Mary and George
2. the apartment was too small
3. not too easy: "at last"
4. not far from Harbor City
5. in fall the oak leaves turn red
6. yes; more convenient, larger, attractive
7. usually smaller; many homes together
8. Mr. Brooks showed them a picture
9. red, white and blue
10. the swing
Book Three: Along Friendly Roads

Page 169 (130 words)

Motivation: Have you ever moved to another city? Can you imagine how this little boy felt when his family moved to another section of our country? Let's read this part of the story to find out how this family built their new home.

Comprehension check:

1. In what section of the U.S. do you think this story takes place?
2. What is the "rolling prairie"?
3. With what did Mr. Kimball build the house?
4. What held the pieces of earth together?
5. Find the part that tells how the walls were made.
6. Why didn't Mr. Kimball use logs for his house?
7. After the house was built, what other important work did Mr. Kimball have to do?
8. How would Mr. Kimball "till" the land?
9. Explain how long this house would last.
10. Find the part that tells you Mr. Kimball was not too satisfied with his new house.

Responses:

1. middle west states
2. stretches of flat land
3. pieces of earth
4. grass roots
5. pieces were placed on top of one another
6. because there were no trees
7. till the land and plant the crops
8. he would use a sharp instrument to dig up the land
9. Not very long because the rains would wash away the mud
10. "We will build a better house later."

Book Four: American Adventures

Page 191 (149 words)

Motivation: Do you have any idea of what would happen when a bike and an icy street get together?

Comprehension check:

1. What would be a good name for this page of the story?
2. What is the setting, time and place, for this story?
3. Why did Don happen to slide on the ice?
4. How far had Don been riding before his bicycle slipped?
5. Why didn't Stephen fall as Don did?
6. What happened when Don's bicycle slipped from under him?
7. What kind of a disposition did Don have when he came out of the snow drift?
8. What did Don say when Stephen wanted to help him?
9. Give another word for hinder and use it in a sentence.

Responses:

1. Disaster on Ice
2. February afternoon on Maple Street
3. he was thinking about something else
4. a few feet
5. he was walking his bike
6. he tunneled into a snowbank
7. an unpleasant one
8. "don't hinder one of Sam's boys."
9. stop; prevent
**Comprehension check:**

1. What is the name of this sailboat?
2. From the picture, what idea would you have of a catboat?
3. Where is the "stern" of a boat?
4. What is a "tiller"?
5. What problem did Jimmy have?
6. What sort of boy was Oliver?
7. What do you think is meant by the expression that Oliver had huge, humorless eyes?
8. How did Jimmy feel about having Oliver as his crew?
9. Find the part that tells what Jimmy said that makes you think he didn't want Oliver.
10. Do you think from Oliver's answer that he will be a help or a hindrance in the race?

**Book Six: Adventures Now and Then**

**Comprehension check:**

1. How do you know that Galileo was not the only one to notice the Milky Way?
2. What is another word for sky?
3. What did Galileo use to see the Milky Way?
4. How did the Milky Way look?
5. How did the people feel about the discoveries?
6. What two discoveries did Galileo make?
7. In what year did Galileo discover that Jupiter had four moons?
8. What showed that the heavenly bodies move?
9. What is a conservatory?
10. What does the phrase "wheeling around" mean?
This is a story that any boy and girl will enjoy because of the kind of people in it.

Comprehension check:
F 1. What injury had the boy received?
I 2. How do we know that the boy was young?
F 3. What three things did he foresee as his future?
V 4. What is gangrene?
V 5. Explain: "he lay on the field of agony".
I 6. What emblem replaced the old yellow hospital flag on the battlefield?
F 7. What pleasant and unexpected joy did the boy experience?
F 8. Describe Clara Barton as he saw her.
V 9. Give a synonym for save in the second paragraph.
F 10. Why had Clara been loved by children?

Responses
His right arm was mangled.
He was not long out of school.
The enemy might find him; the surgeon might operate with unclean instruments; he would become ill in a prison camp.
Decayed tissue
He was suffering intensely; dying.
The blood-bright emblem of the Red Cross.
Clara Barton, his former teacher came to him.
Like an angel; dark compassionate eyes; long, tender mouth; hands like his mother's.
Except
Low, sweet voice; never punished; was a friend to all

Book Eight: Worlds of People

Motivation: Find out how you would like to have been in the author's place.

Comprehension check:
I 1. What was the author describing?
I 2. Why could the author be watching the conductor at the opening of the selection?
F 3. By whom was the masterpiece written?
V 4. Which word means that this selection was not like his ordinary ones?
I 5. What was the theme of the masterpiece?
F 6. How is the soloist's entrance both a challenge and an invitation?
V 7. What is a cue?
F 8. What does the soloist do while waiting for his turn to play.
F 9. What made the author forget time and space?
I 10. Is this a statement of fact or opinion?

Responses:
A soloist's first appearance with an orchestra
He didn't play until later.
Beethoven
Unique
What life held for the author.
A challenge to the nerves; an invitation to the memory
A signal to do something.
Relives the past; anticipates the future
Great excitement
Opinion
INFORMAL READING INVENTORY
Chicago Archdiocesan Reading Service

Record Sheet

Examiner ___________________________________________ Date __________________________

Child's name ________________________________________ Age _______ Grade _______

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Instructional reading level: __________
APPENDIX VI

DATA SUMMARY SHEET
Data Summary Card

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Lorge-Thorndike:

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Iowa Basic Skills Test:

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Instructional Rdg. Level: __________

Oral Rdg. Performance: __________

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<th>Cortical</th>
<th>Creeping</th>
<th>Sup-Pro</th>
<th>Performance</th>
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Silent Rdg. Diagnostic Test: Bond-Clymer Hoyt

Rdg. Abilities: Vocabulary, Factual, Organize, Evaluate, Appreciate

Recognition Pattern: Isolation, Context, Orientation

Recognition Techniques: Visual: Location, Syllabication, Root Word

Phonetic: Word elements, Beginning sounds, Rhyming sounds, Letter sounds

Error Analysis: Initial, Medial, Final, Orientation

Word Synthesis: ________
APPROVAL SHEET

The dissertation submitted by Sister Mariam, O.P. has been read and approved by five members of the Department of Education.

The final copies have been examined by the director of the dissertation and the signature which appears below verifies the fact that any necessary changes have been incorporated, and that the dissertation is now given final approval with reference to content, form, and mechanical accuracy.

The dissertation is therefore accepted in partial fulfillment of the requirements for the Degree of Doctor of Philosophy.

11/22/64

Date

Arthur P. O'Mara
Signature of Adviser